

Presocratic and Buddhist Cosmologies: A Comparative Analysis

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Introduction

In the sixth century BC two novel ways of looking at the world appeared in as yet separated cultures. These visions were to revolutionize East and West, and in a later period, they would interact producing what we now call the Hellenistic philosophy. These worldviews, the Presocratic philosophy and Buddhism, offered up new cosmologies, i.e. representations of the physical universe. My purpose here is to provide a comparative short study of these two cosmologies.

I shall focus exclusively on Theravada Buddhism², since the later Mahayana and Vajrayana forms were influenced by Greek ideas. The history and details of the exchanges between Indian and Greek cultures after Alexander's campaigns in the fourth century BC are too complex and rich to be considered here (the reader is referred to McEvilly 2002). The assumption that the Theravada form of Buddhism arose independently of the events occurring approximately at the same time in Ionia is historically sound (Holder 2006). The sources were preserved by oral tradition till the second Buddhist council held in Vaisali, 383 BC. The standard Pali canon, the *Tipitaka*, which includes three "baskets" of texts, the *Suttas* (Buddha's discourses), the *Vinaya* (rules for monks) and the *Abhidhamma* (higher teachings and later commentaries), was compiled probably about two hundred years after Buddha's death, occurred around 483 BC (there is some controversy among scholars about the date). Buddha himself did not write anything, and he explicitly rejected metaphysical and cosmological speculation. Nonetheless, his followers engaged in cosmological discussions and in the *Abhidhamma* and later sources, especially Vasubandhu's *Abhidharmakosa*, a complex cosmological model was developed.

As for the Presocratics, the extant fragments are scarce, of course. I shall use the new English edition by Graham (2010). I shall rely as little as possible in the doxography, so as to avoid contamination from later influences. A major source in what follows is Graham's outstanding reinterpretation of the Ionian tradition (Graham 2006).

Miletus and the origin of a new worldview

Miletus was located in Asia Minor, on the eastern shore of Aegean Sea (see Fig. 1). In the early years of the sixth century BC, the city was the most important of the many colonies of Greeks of the Ionian tribe. With three harbours, the city was extremely prosperous thanks to the trade with other colonies in the Black Sea, the central Mediterranean, and Egypt (Fig. 2 shows a map of the city, and Fig. 3 some current day ruins). Goods arriving from Middle East were shipped in Miletus to destinations in the whole known world. The first prose books were written in Miletus, where the wealth of merchants allowed the luxury of a high multi-cultural education to many citizens. It was in this city where Western philosophy and science were born.

²Along this article I use simplified (without diacritical marks) Pali words for Buddhist terms.



Fig. 1. Ancient Greece.

In Miletus something extraordinary occurred in the early sixth century BC: some men started to think about the nature of things, the origin of the world, without resorting to any kind of mythological element. Thales is credited as the first person that attempted at providing a fully rational explanation of the world. Very little, however, is actually known about the extent of Thales real contribution. He left, apparently, no writings and his thought was not clear even for the Greeks of the classical period. In any case, he seems to have been tolerant with criticisms, a basic feature of the rational enterprise, since his disciple Anaximander offered a different account of the world. Thales is said to have maintained that water was a generating substance from which everything else arose. For Anaximander, the vastness of the empirical universe might not be produced by such a common element as water, and he suggested the existence of a special basic stuff that he called "the boundless", the *apeiron* (ἄπειρον).

The basic points of Anaximander view are (1) there is a source from which everything arises, (2) this arising obeys regular patterns, (3) what arises from the original stuff is a number of substances, such as fire, air, earth, water, (4) this

substances are later naturally arranged in a stable configuration that forms the world, (5) the living things emerge from these substances, and evolve from simple to complex organisms.

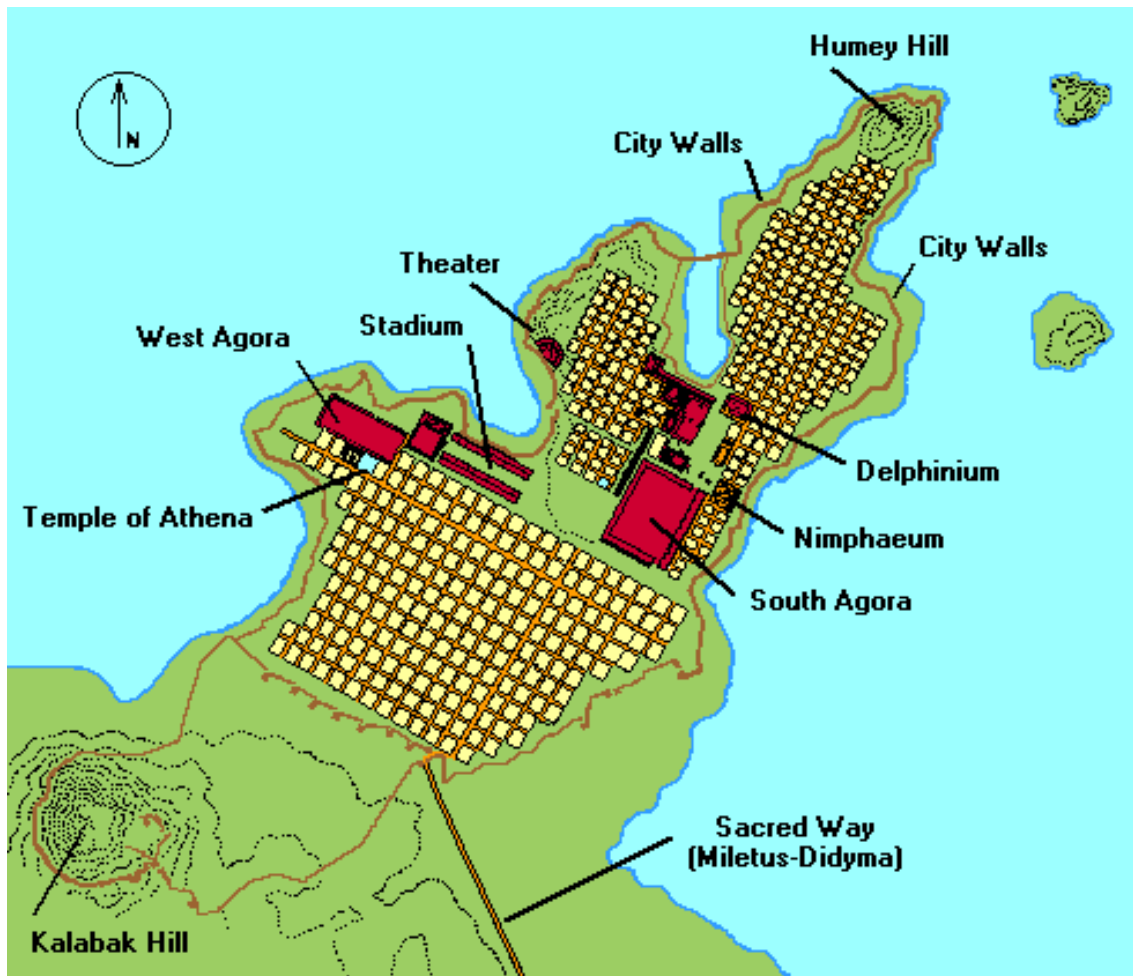


Fig. 2. Map of Miletus.

The theory of a generating substance proposed by Anaximander would be essential in the Milesian worldview. This worldview was purely naturalistic, based on empirical observations, causal, and of great explanatory power. Its weak point was its little predictive power, which made difficult to put it to test. Nonetheless, all major ingredients of a scientific worldview are already in Anaximander. Moreover, he presented his view in prose, while mythological accounts were always written in verse.

Anaximander also is said to have produced a map of the known world. This was also a landmark of rationality, since by first time a representation relation was established between a pictorial language and reality.



Fig. 3. Ruins in Miletus.

Anaximander and the origin of cosmology

Perhaps, Anaximander's most daring proposal was that there is one, and just one world, and that whatever happens in the world obeys regular patterns. There is no magic. If there are gods, they are part of the world as well. Things appear by evolution and not spontaneously. For instance, men evolved from different species of animals. The world itself evolved impersonally from *apeiron*. The *apeiron* is a source of the world but it is not present in it; its existence is inferred.

The cosmological views of Anaximander were as original as his ontology. Thales seems to have said that the Earth rests on the water; Anaximander rejected the need for support, explaining that the earth is stationary and at the centre of the universe. The equidistance to any point explained that would not fall. This was the first known use of the principle of sufficient reason. The stars, the sun, the moon, and the planets were openings or holes that showed the fire that was beyond the skies. Anaximander's universe is represented in Fig. 4.

Anaximenes (b. 585 BC, d. 528 BC) was a younger friend or student of Anaximander. Following the Milesian tradition he tried to improve the theories of his mentor. He postulated that the generating substance was air, instead of the rather mysterious *apeiron*. The great advance made by Anaximenes was to describe, by first time, a mechanism that would operate in order to produce the transformation of the various substances. This mechanism was based on the compression and rarefaction of the air, and the other elements. When air is

compressed, according to Anaximenes, it is transformed in water. The compression of water, in turn, results in the generation of earth, etc.

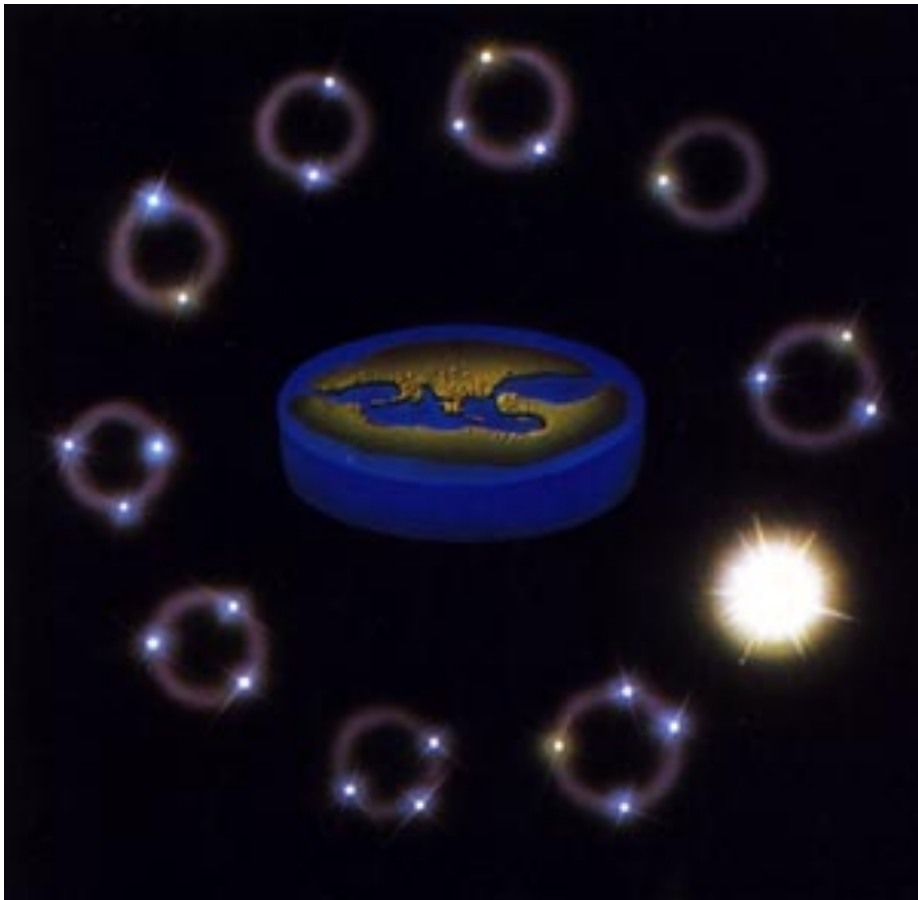


Fig.4. The universe according to Anaximander.

Anaximenes was also the first “meteorologist”, providing tentative explanations of phenomena such as the rain, the rainbow, and the lightening.

Generating substance cosmology

Milesian thinkers shared both a methodology and an ontological view. Contrary to a widespread opinion (e.g. Barnes 1982, Kirk et al. 1983), they were not substance monists: they accepted the existence of several substances. Not all these substances, however, were on equal foot. Each Milesian distinguished a particular substance as responsible for generating the rest (Graham 2006). We can call this ontological view the “generating substance cosmology”. We can present this theory as a system of axioms (Graham 2006):

- There is a primary generating substance.
- The generating substance gives rise, through appropriate mechanisms to derived substances or elements.
- When the generating substance changes, ceases to exist.

- In turn, derived substances can rebuild the primordial substance.

In current formal notation,

- ▶ 1. The world is composed by a collection of basic substances $S=\{S_1, \dots, S_n\}$.
Def. S_i =basic substance.
- ▶ 2. $\exists S_g \in S$ / before a time t_0 , S_g was the only substance in existence. Def. S_g =generating substance.
- ▶ 3. $\forall S_i \in S \exists T$ / S_i is generated from S_g by the transformation T .
- ▶ 4. $\exists M$ / M is a material mechanism that enforces T .
- ▶ 5. The world exists in accordance to regular (i.e. legal) transformations of S_g and the derived transformations.

This theory presents remarkable resemblance in structure with contemporary scientific theories. Namely: 1. All phenomena are explainable by natural mechanisms. 2. Mechanisms are lawful, i.e. there are no supernatural events. 3. Human beings play no role in the functioning of the world. Actually, the world is indifferent to human will. Although the world is a material system, it is not alive, and hence has no emotions, feelings, or will.

Heraclitus

Heraclitus was born in Ephesus, Minor Asia, on the Ionian coast. He lived at the turn of the sixth and fifth centuries BC. He is famously associated with the *maxima Pantha rei*, “everything flows”, a formula actually given by Plato, and likely due to Cratylus. It is true, however, that Heraclitus offered a criticism of the Milesian theory of the generating substance. The image of the world that seems to emerge from the extant fragments (Graham 2010), is one of a changing world, where there is no generating or original substance, but just a set of substances in everlasting change. Although it has been argued that fire was for Heraclitus a substance with some kind of prominence over the rest, it is more likely that he considered fire as an example of something that can obtain stability by changing. As noted by Graham (2010): “Heraclitus does indeed believe in flux, probably of elemental changes, but unlike Cratylus he sees the flux as compatible with, or even the cause of, the stability of higher structures (for a discussion from the point of view of contemporary physics see Romero 2013).

Heraclitus, then, belongs to the Milesian tradition, although he brings forward several important criticisms to the ideas of his predecessors. We should remind, nonetheless, that opening to critic is a basic ingredient of the Milesian approach to knowledge. The conjectural character of knowledge would be later emphasized by Xenophanes, who was deeply concerned with epistemological issues.

Heraclitus’ ontological views seem to be those of a forerunner of process philosophy. For him, change is the most essential feature in the world. Change is basic and legal (i.e. due to $\lambda\omicron\gamma\omicron\sigma$). Local change is necessary for global stability.

The basic substances of the world are constantly undergoing transformation from one another. An important implication is that if the change is legal then the world is not a *chaos* (χάος), it is a *cosmos* (κόσμος).

There is another important aspect of Heraclitus. He showed a concern for the role of humans in the universe. In this aspect he can be considered a precursor of later Presocratics, such as Democritus, and the Socratic and Hellenistic traditions. Heraclitus seems to have been a cosmologist, with broad interests ranging from ontology to the nature of truth. He appears to be the first complete philosopher of the West.

Parmenides

Parmenides (born at the end of the sixth century BC in Elea) occupies a special place among the Presocratics; actually, in the history of Western philosophy. Parmenides put forward a radical criticism to the concept of change. Although he used a poetic form of expression (probably influenced by Xenophanes), he was rigorous in his analysis. He presented the first known deductive argument, which can be enunciated as follows:

- What is, is.
- What is not, is not.
- What is cannot come from what is not.

Then, being cannot come to be. Being is necessary.

As a consequence, since change requires ceasing to be something and coming to be something else, change is not possible. The universe is homogeneous, complete, immutable, eternal. Reality must be quite different from what our senses suggest and we naively accept.

To be incomplete is to lack or need something that is not. Since what-is-not, is not, incompleteness is not. Being cannot lack anything. Being is complete. Being complete, it cannot change. The world consists of nothing else than pure being.

Parmenides position was defended by Zeno and later expanded by Melissus of Samos. His attack to the theory of a generating substance and change completely shifted the direction of philosophical speculation in the West (for a contemporary assessment of Parmenides see Romero 2012).

Later Presocratics

The reaction against Parmenides consisted in accepting some of his ontology, in particular accepting the absence of a generating substance, while negating other aspects, such as the impossibility of change. The pluralists, Anaxagoras and Empedocles, and the atomists, Leucippus and Democritus, proposed new theories of change, but based on the emergence of new things from immutable components.

Anaxagoras proposed that everything is composed by everything else, but with varying proportions. He advanced a kind of primitive fractal theory. For Empedocles, all things were made of combinations of 4 immutable elements. Finally, the atomists accepted the Parmenidian idea of unchanging things (they called them *atoms* -ἄτομος-), but they also accepted the existence of the void. Then, atoms combine to produce complex things, which can change by modifying their composition. The emergent things have also emergent properties. These ideas would be later adopted by the Epicureans, and by modern science.

At the end of the Presocratic period, the Ionian legacy had already shaped a new worldview. The main elements of this view are the following:

- Knowledge is gained through reason and experience. It is not revealed.
- All truth is transient.
- Natural phenomena are impersonal and physical; they obey laws. There is no magic.
- The value of a theory is given by its aptitude to represent the real world.
- No thought or idea is final. There is no perfect knowledge.
- Everything is open to criticism.

With regard to cosmology, the Presocratic view would end up shaping Aristotle's great synthesis – that would dominate Western ideas on the universe until the sixteenth century AC. The main points of this cosmology are:

- The universe is eternal, finite, and spherical.
- The Earth is the centre of the universe.
- Everything on Earth is made up of four elements (earth, fire, water, air).
- The heavens are composed of a fifth element: 'ether'.
- The 4 elements are affected by properties (dryness, coldness, humidity, heat).
- Real objects are composed of form and substance (matter).
- Change involves changing of form and permanence of substance.
- Natural motion in the sub-lunar sphere is rectilinear. In the higher spheres, motion is circular.
- There is no central role for man in the machinery of the universe.

By the time these views were widely accepted, a completely different vision was consolidating in India.

The rise of Buddhism

As is the case with Christ, there is a debate among scholars about the actual historical existence of Siddhattha Gotama (Sanskrit form: Siddhartha Gautama), and the alleged details of his life. For those who accept his historicity, Siddhattha was born in Lumbini (current Nepal), son of a king of the Sakya clan (hence he is also known as Sakyamuni). This might have occurred around 563 BC.

Siddhattha enjoyed a sound education and had a rich albeit isolated life till his 30s. He married and had a son. At some point he started to question the purpose of his life. He realised of the inevitability of sickness and death, and tried to figure out an answer to the most basic existential questions: Why we exist? How we should behave? Why we suffer? Why we die? Why are things the way they are and not otherwise? He lived in anguish and sought to set him free from the burden of ignorance.

Siddhattha decided to change his lifestyle and pursued a life of ascetic practices. At the time, it was common in the north of India to find *samanas*, wandering philosophers and ascetics. The sixth century BC in India was a time of crisis, with massive movements of people to the new cities and the change of a rural society to a trade-oriented social environ located around crowded urban centres. It was a time of changing moral values and many people, as it would happen 7 centuries later in Egypt and Asia Minor, looked for a more spiritual life retired from the world.

Siddhattha, in his search for answers to his existential questions, went to the opposite extreme of his previous life. He practiced meditation, ascetics, and self-mortification in an attempt to transcend the limitations of the body. With time, he realised that he only achieved to debilitate him, making no major progress in understanding himself and the world. He then quit a life of extremes and tried a middle way. This middle way led him to the longed answers. Once the ignorance was dispelled, through introspection and analyses of his past experiences, once he clearly saw the nature of things, he became the *Buddha*, the “illuminated one”.

Buddha devoted the remaining 40 years of his life to explain his understanding of things and how to liberate the humans from anguish and unnecessary suffering. He talked to many people in many places, using different approaches and styles. He did not write anything, but after his death, around 483 BC, his discourses (*Suttas*), were gathered in five collections, that form part of the Pali Canon, on which the Theravada school is based. These *Suttas* contain all the basic elements of the Buddhist philosophy that would be later expanded and enriched, and finally would yield different schools, such as the Mahayana and Vajrayana forms of Buddhism.

The Theravada philosophy

There were 18 different schools of early Buddhism (Bhagwat 2006), of which only the Theravada form survives to present day. The Theravada follows the Pali canon, without the later additions. The main points of the Theravada philosophy, which are shared also by the later forms of Buddhism, are: the Forth Noble Truths, the Eightfold Path, the doctrine of the “no-self” (*anatta*), and the doctrine of dependent arising (*Paticca-Samuppada*). I shall sketch these below.

The Forth Noble Truths, in words attributed to the Buddha, are (Bhagwat 2006):

“The First Noble Truth is that of suffering. Birth is suffering, old age is suffering, sickness is suffering, death is suffering, to be united with the disagreeable is

suffering, to be separated from the agreeable is suffering, not to obtain what one desires is suffering – in short, the fivefold clinging attachment-groups constitute suffering.”

“The Second Noble Truth is the origin of suffering. It is the craving for life, which leads from birth to birth³, together with lust and desire, which finds gratification here and there, the thirst for pleasure, the thirst for being, the thirst for power.”

“The Third Noble Truth is the cessation of suffering. It ceases with the complete cessation of thirst – a cessation which consists in the absence of every passion, with the abandonment of this thirst, with the deliverance from it, with destruction of it.”

“The Forth Noble Truth is the Path, leading to the cessation of suffering.”

The mentioned path is the Eightfold Path, which consists in achieving the right speech, the right action, the right effort, the right livelihood, the right mindfulness, the right concentration, the right view, and the right intention. Following the Eightfold Path the initiated obtains knowledge of the Three Characteristics of existence (*anicca*): suffering, impermanence, and soullessness or lack of essence. The Theravada ontology, like Heraclitus', emphasizes that the basic substratum of the world is formed by events. Contrary to Heraclitus and the Ionian tradition, it denies the existence of substances. All things are transient aggregates of events. There is no permanent essence or substance below these events. Hence, there is no self behind our psychological structure. All our attempts of gratifying our selves are a vain product of our ignorance: there is no self, no soul, no enduring entity over the manifold of events. Humans are *anatta*, they do not have *atta*, a permanent substantial nature or soul. Neither the universe does.

The other prominent teaching of the Buddha is his understanding of causality: the doctrine of dependent arising (*Pattica-Samupadda*, see Laumakis 2008 for an account in terms of Western philosophy). There are no isolated events. All events are causally related to other events. The world is a system of events. The dependent arising is essential to understand the origin of suffering and the world itself. In Buddha's words (Bhagwat 2006):

“On ignorance depends *kamma*, on *kamma* depends consciousness, on consciousness depends name and form, on name and form depends the six organs of sense⁴, on the six organs of sense depends contact, on contact depends sensation, on sensation depends desire, on desire depends attachment, on attachment depends existence, on existence depends birth, on birth depends old age, death, sorrow, lamentation, misery, grief, and despair.”

³We should remind here that Buddhism accepts the common Indian beliefs on re-birth and *kamma* (Sanskrit, *karma*). For forms of naturalized Buddhism, see Batchelor (1997) and Flanagan (2011).

⁴In Buddhsim, reason is added to the five usual sensory senses.

Thus, the entire aggregation of misery arises. But on the complete fading out and cessation of ignorance, by descending down by the chain of dependence, all this mass of suffering will cease.

Buddha stops here, in the liberation from illusion and suffering. He neglected cosmic questions. His followers, however, would create a whole cosmology centred in the concept of dependent arising. For them, the universe exists because of ignorance, and will cease with it.

***Abhidharmakosa* cosmology**

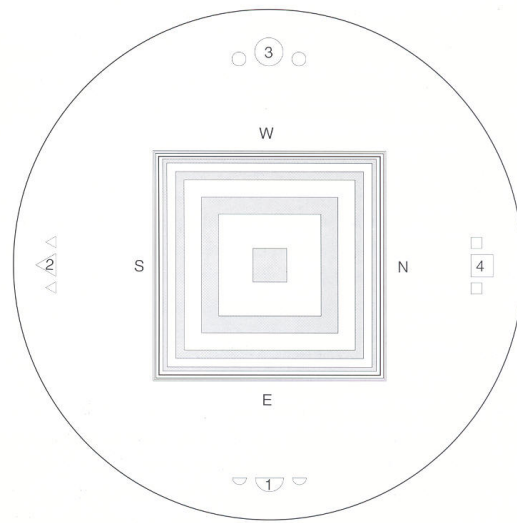
According to the Buddhist tradition, which borrowed many elements from Brahmanic and Vedic mythologies, the universe came into existence through *kamma*, i.e. the action and volitions, of living beings. The universe is maintained by *kamma*, and disintegrates with the destruction or dissipation of *kamma* by knowledge. Whatever exists, exists out of ignorance, and ceases by terminating ignorance.

The physical universe is a disk around which a wind circle blows. The disk sustained by the wind is formed by water, on the top of which there is a ring of golden earth. On this earth there is an ocean with four continents. The southern one is what we know as the Earth. Its name is Jambudvīpa. At some distance from the continents there are concentric rings of mountains and seas. At the centre of the universe is Mount Meru. The height of Mount Meru is 560000 km. Through Mt. Meru runs the axis of the universe, which is, on large scale, symmetric. Little attention is paid to astronomical phenomena in this cosmology. The stars, the sun, and the moon, simply turn around Mt. Meru. The ancient Indians seem not to have realised, as Parmenides did, that the moon reflects the light of the sun. They even considered that the celestial bodies actually have their apparent size.

Above and below Mt. Meru there are different levels of existence. The square summit of Mt. Meru is the Tavatimsa heaven. This is the last heaven that has contact with the earth. There are inferior heavens above Mt. Meru, and superior heavens above these. Below earth there are eight hot and eight cold hells. These hells are inhabited by different demons and evil spirits; see Sadakata (2009) and Randolph Kloetzli (2007) for detailed accounts of this complex mythology.

Above the realms of gods, there are realms of “form” and of “formlessness”. Beings, according to their *kamma*, are re-born in different realms or hells. The path of knowledge takes beings from the lower hells and elevates them to the realms of form and, finally, to realms where they are liberated of both form and change. The whole building of the universe is maintained by the craving and desire of beings: the wind that sustains the world is formed by the exhalation of these numberless beings exhausted in wanting, fighting, pursuing, longing, craving without other reason than ignorance of the vanity of their actions and the emptiness of things. All this huge mass of pain and suffering will cease with the universal understanding of the Four Noble Truths and the dependent arising.

Figs. 5 and 6 show drawings of the Buddhist universe.



6 Plan view of the cosmos according to Abhidharmakośa. The twelve continents are shown enlarged 25 times: (1) eastern continents; (2) southern continents; (3) western continents; (4) northern continents.

Fig. 5. Sketch of the Buddhist universe.

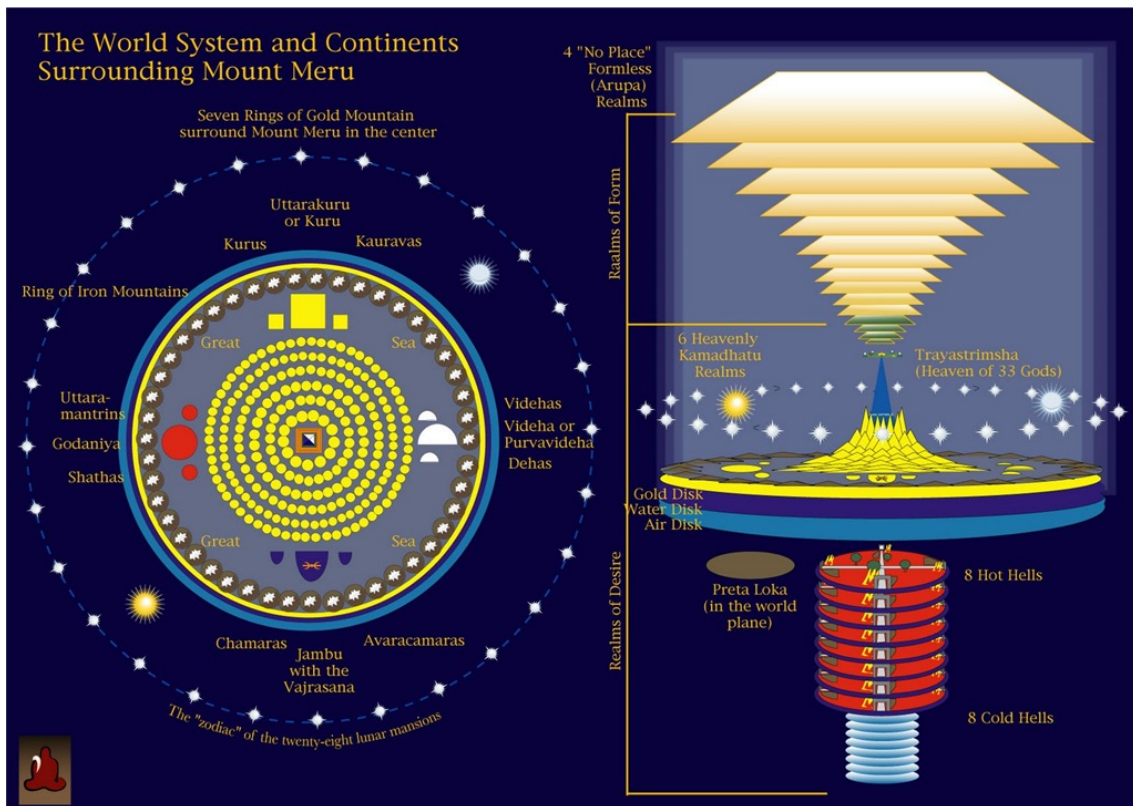


Fig. 6. Mount Meru (also known as Sumeru) and the Buddhist cosmic system.

Today, this complex Buddhist cosmology is understood allegorically. The most important point to remark, for us, is that in Buddhism the physical universe is intrinsically united to living beings. Actually, it is caused by the ignorance of these beings. This view is in the antipodes of the Presocratic understanding of the Cosmos.

Cosmology East and West

The brief sketch of Presocratic and Buddhist worldviews presented above shows that there are both some similarities and several differences between these traditions. Among the similarities we can mention:

- Both views adopt bottom-up approaches. There is no “revelation” by gods or supernatural entities. Knowledge about the world is obtained through experience, both external and internal. In the Presocratics the emphasis is on the external senses and reason. In Buddhism on subjective psychological analysis and rational introspection.
- For both traditions the earth is at the centre of the universe. For Buddhism, strictly speaking, Mt. Meru is at the centre, and the astronomical objects orbit around it. But a case can be made about the allegorical character of Mt. Meru.
- In both worldviews the problem of change is of paramount importance.
- There is a clear rejection of cosmogony in both the Presocratics and in early Buddhism: there is no "beginning" or "origin" of the universe. What can be known are its workings and evolution.
- Strict causality is assumed by both traditions. Whatever exists is the result of a causal chain.
- There is a strong adherence to a basic form of the principle of sufficient reason: whatever occurs, occurs for some reason.
- Both the Presocratics and Theravada Buddhists maintain that reality is different from appearances. They depart from the most elementary forms of empiricism and naive realism. Our ignorance can hide the way things really are.

Beyond these common features, there are deep differences. In later times, when the exchange between East and West was intense, many of the differences were smoothed out (see, e.g., Kuzminski 2008). However, the fact remains that in the case of the Presocratics and the Theravada Buddhism the differences were so radical that different kinds of ethics and general attitudes towards the world emerged in the corresponding societies.

Among the most important differences we can point out:

- Presocratics: They generally avoided adopting mythological elements. In the Ionian view the human factor does not play a significant role in the cosmos. Nature is deeply indifferent to us. We are the result of natural processes, which are legal. These processes constitute mechanisms behind

phenomena. The Presocratics were engaged in the pursuit of knowledge, i.e. they tried to unveil the mechanisms through which the world evolves.

- In the case of Buddhism, on the contrary, the mythological is accepted as a metaphor of the existence. The vital processes (those of human beings, animals, gods, demons) are at the centre of the cosmos and determine the way the world is. Phenomena are based on the vital condition: what we experience is totally conditioned by our dispositions. Hence, Buddhists were interested in the search for wisdom, not knowledge.

The ethical consequences are obvious. For the Ionian cosmologists the way to change our situation is through knowledge of the physical structure and dynamics of the world. The more we know, the less we fear, and the stronger is our ability to manipulate our environment. The Buddhist, on the other hand, tries to change his inherited view of himself and his relation to experience. The Buddhist, at least the Buddhist from the 5th century BC, does not try to change the world. He tries to change any thoughtless attitude towards the appearances, in an attempt to free himself from the anguish and suffering of an existence dominated by ignorance. Hence we consider Buddhism, as any other attempt directed towards individual salvation, as a religion or at least as a religious philosophy. Buddhism serves as a cure for unnecessary desire, a cure for craving, an extrication from the persisting illusion of being, a dispeller of delusion. Ionian philosophy, on the contrary, is an acceptance of the process of being, an attempt to understand how to flow, as painlessly as possible, with the torrent of things.

Final remarks

The Presocratics and early Buddhists followed divergent paths. The former would provide the basis on which modern science and western philosophy would be built. The latter would evolve into various religious forms and would yield the richest empiricist psychological wisdom the humans have produced in the form of the two most important works of the *Abhidhamma*: the *Dhammasangani* and the *Patthana* (see Bodhi 1993).

Only after the East-West interaction produced in the Hellenistic period (350 BC - 200 AC) convergences are evident in the cynical, stoic, epicurean and sceptical schools on the one hand, and the various aspects of Mahayana Buddhism on the other. The study of this interaction and the perspectives it opens for an emergent worldview adequate for our times is a pending, may be urgent, task.

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