The Vedic Planetarium

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Revision 2
2024-05-04

NOTE: This is a preview that contains only the first half or so of the complete book. It is only being released to a selected few who are involved with this actual topic and project. Please refrain from sharing it beyond those directly involved in the project. Thank you.

Also, the layout, typography and so on is still a bit rough around the edges, especially in the later pages, which still lack a lot of images. Please for now, focus on the content.

/The Author

Introduction

Throughout history, humans have looked up at the sky, wondering about the world we live in and our place in the cosmos. Yes, that is how a book on cosmology could normally start off, and so does this one. But from here, it might not be much like anything you could expect to read about cosmology.

You may even think, "A planetarium? Who cares anyway? And what in the world is a Vedic Planetarium?" Well, that's what I also asked myself throughout the journey that this story is about. We will get to that, of course.

I first thought of calling this book *Purāṇic Cosmology*. Whatever that is. Well, for now, *Purāṇas* are Sanskrit texts from India, and the word itself means "old," which they are. And yes, this book explores a worldview that was once prevalent all over the world and is still common, especially in Asia and in indigenous communities worldwide. But we will get to that also.

I also considered calling this book "Consciousness-based Cosmology for Dummies." But that sounds like I think you are stupid. In any case, you can think of "cosmology" as "worldview" for now. We all need a worldview. We may not even think we do, but we all carry some kind of fundamental idea deep down of what this world is and who we are anyway. We probably could not live otherwise. In fact, a civilization rests upon such a cosmology; a basic idea of what the world is that we live in, which makes cosmology important for establishing and upholding a society.

Some think that cosmology is about astronomy and science and all that. But to most people on this planet, the world is much more than meets the physical eye. For instance, most of us accept the existence of some kind of otherworld besides this one that we perceive through the senses of our physical bodies — whether it is called "heaven," the "astral realm," or something else. Even in modern physics, it seems acceptable to speak of parallel worlds, at least as a possibility. Cosmology, dealing with "the world at large," should then reasonably also include the possibility of such realms, right?

This is, I learned throughout this journey, what the Vedic Planetarium is meant to be: a place that can help us to see the world differently — hopefully in a way that makes sense and that we can live in without messing up. It is being constructed in India and uses the Indian *Purāṇic* cosmology as a reference, but it's there all over the world, just expressed slightly differently in different cultures, and competing with the ideas upheld by modern materialism.

As I write this, the Vedic Planetarium is still under construction. Many riddles are yet unsolved. My own engagement in that project led me into what some would call a rabbit hole, but where I gradually started to see not only that project but our whole world in a new light, even compatible with a new emerging frontier in science. Little pieces of a great puzzle, from all over the world and from all ages, started falling into place. I found modern philosophers and physicists discussing the possibility that our cosmos have developed from consciousness rather than from matter — well aware of how similar this is to ancient cosmologies of India and elsewhere. They found something there, and they started to seriously study the Vedic classics of India for clues to their own science. Those people were no dummies. They were the very founders of quantum theory — Max Planck, Erwin Schrödinger, Werner Heisenberg, David Bohm, and Niels Bohr — most of them Nobel Prize winners. Did you know that they all shared an interest in the *Upaniṣads*, the *Bhagavad-gītā*, and *Vedānta*?

Today, after more than forty years of study, I believe that I have come a bit closer to understanding what those scientists glimpsed. My aim here is to share those bits of insight, as seen from both the East and the West. I am convinced that this cosmology can provide a foundation for a new, updated, and more practical worldview. The future of our global community depends on our actions and assumptions about life and the world.

So where do we start? Well maybe right where it began:

The Cosmic Challenge

I experienced my first culture shock as the old bus turned onto a small dirt road through the jungle, instantly transporting us back a few hundred years in time. The guy in the seat next to me had just explained that here in rural India, people still live much like they did thousands of years ago, and now I understood what he meant.

It was 1980, and it was my first visit to India. We found ourselves driving through little villages with huts made of clay and straw, women squatting on the reddish earth cooking their meals over burning cow dung. They were dressed in what seemed like gray rags, some not even covering their breasts. To me, it was like driving through the aboriginal African villages I had seen on TV as a kid and had learned was how humans lived when they were primitive. Yet I had come here to find a civilization that had knowledge even beyond that of our advanced western science. Or so I had been told.

Here I was, wondering what I had got myself into. Well, this would all have been OK for a spoiled westerner if we had been cruising through this dusty baking-oven in an air-conditioned tourist bus, but this was an ordinary Indian bus where you spend four hours on a worn-out seat with climate control consisting of the broken windows, just hoping that what feels like an upcoming diarrhea is ... not ... so.

In front of some houses, in stark contrast to the primitive setting, stood exquisitely beautiful young girls, adorned in colorful saris and dazzling bangles. The guy next to me explained that their parents dressed them up like that hoping that they would attract one of the western men regularly passing through these days and get carried away to the heavenly abode of America. Well, in any case, I understood that this was not even ordinary Indian countryside — West Bengal was the poorest and most densely populated state in the country.

We passed mosques sheltered by walls decorated with blood-red hammers and sickles, images of black goddess Kālī garlanded by human skulls, grinning at us with sword-like tongue, and graffiti in Sanskrit where I could spot the words "Krishna" and "Hare." This was West Bengal in the '80s — a strange mix of hardcore communism, Hindu Shakta worship, Islam, and Chaitanya Bhakti. I still have no idea how they kept that brew from boiling over.

After a while, we found ourselves riding along the Ganges — the holy river, brown like milk chocolate after the long journey through India. The guy next seat (a rough-looking lad from "Scouland," which I eventually understood meant Scotland), who seemed to have a taste for the bizarre, happily chatted on about someone he knew who got eaten by a crocodile here, and how you could sometimes see human corpses floating by in the swift current. In India, people burn the dead, he explained, but firewood is scarce and the poor can rarely afford burning them fully, so they just dump whatever is left right there in the Ganga. Yes, this was the country where birth, death, old age and disease were as natural as eternal life in bliss and knowledge.

His stories did not sit well with my stomach meltdown, and it was a great relief to see the long wall with some larger buildings, signaling our destination. Behind that wall was another world. This was where the great Planetarium was to be built.

We checked into our room — an empty cubicle with a stone floor that we were supposed to sleep on. Behind the building was a shallow water puddle in the field where the famous local malaria-laden mosquitoes lived, getting ready to feast upon sweet western blood as the sun sank towards the horizon. We quickly rigged up our mosquito nets and rolled out our sleeping bags on the thin straw mats, then headed up on the roof to get a view of the place.

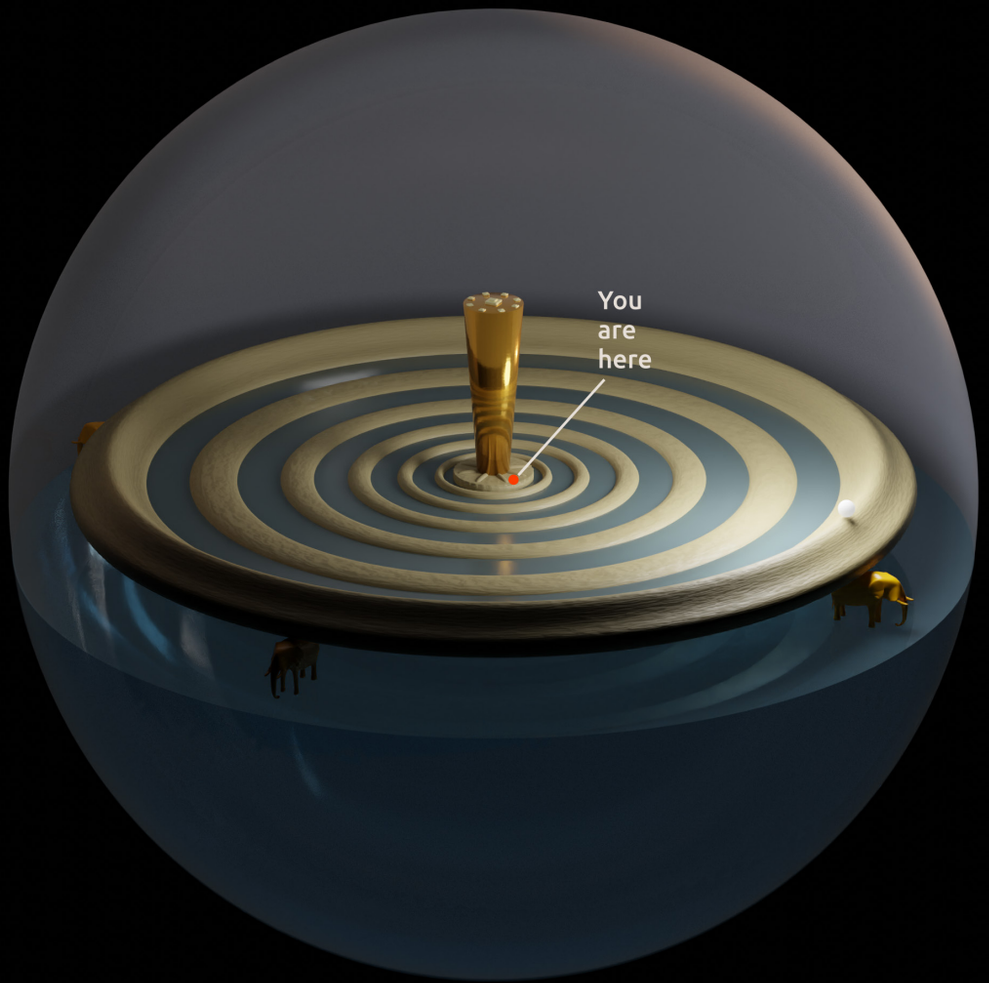
The sound of *bhajan* chants from cracked temple loudspeakers hovered over the rice fields. Hare Krishna, Hare Krishna, Krishna Krishna, Hare Hare, Hare Rama, Hare Rama, Rama Rama, Hare Hare — an exotic chant when heard on the streets of the cities in the west, but here as part of the very atmosphere. The air was filled with the scent of incense, burnt cow dung, and kerosene to keep the mosquitoes away. On the other side of the river, we saw the lights of Navadvīpa, a small town that used to be an important cultural and historical site in West Bengal. A steady stream of pilgrims was still passing by on the dirt road outside the wall.

Many years earlier, a vision had been conceived for a large cultural center at this place — the Temple of Vedic Planetarium. Eventually, some international funds were raised for the development, and where we now sat was the humble beginning. The next day, some American scientists were going to make a presentation. They had been trying to "decode" the *Purāṇic* cosmology of ancient India, claiming that it was actually advanced and scientific, giving an even deeper understanding of the cosmos than western science did. Now was the time for their results to be revealed.

I was excited. Physics was my favorite topic in school, and if age-old scriptures from India could explain the cosmos as well or even better than our modern science, then that would really be something, wouldn't it?

We gathered in a *paṇḍāl* looking like a big colorful party tent, and the scientists — all of them Ph.D.s in physics and mathematics — pulled up some large panels with illustrations. They showed the cosmos according to the *Bhāgavata Purāṇa*. The *Purāṇas* are some of the oldest scriptures of India — some say thousands of years old. The *Bhāgavata Purāṇa*, sometimes called the *Mahā-Purāṇa* or the "Big *Purāṇa*," is generally considered the main one. It is filled with detailed descriptions of the creation — written in archaic Sanskrit language. But these scientists had cracked the code, I was told.

I stared in disbelief at their display panels. They showed the universe as an egg or a bubble, half full of water. Just above the surface of that water was a round disc, divided into seven concentric regions. These were circular islands, separated by oceans. The oceans were, in order, made of salt water, sugarcane juice, liquor, butter oil, milk, yogurt and sweet water. In the middle of the disk was a huge golden mountain called Meru, looking like an ice cream cone, and around it orbited the sun and the moon. Those scientists looked dead serious though, and one of them pointed at the central "island" on the flat disc. It was divided into nine regions, separated by sharp ridges supposed to be mountain ranges. "This is Himalaya", he said and pointed at a ridge, then moved his finger to a region next to the mountain. "And this is where we are now."



I took a walk across the rice fields and sat down on the bank of the Ganges, thinking about what I had just seen and heard. A small boat was slowly passing, carried by the current. The mighty Ganga was hundreds of meters wide at this place — old, muddy and impatient to finally reach the fresh ocean in the Bay of Bengal.

I looked north where the river appeared from behind the palm trees. There, somewhere far up in the Himalayas, all this mass of water was bursting out of a mountain cave, for some reason. The *Purāṇas* tell us that the Ganges trickles out from a crack in the shell of the universe, then flows down through the heavens and onto the head of Śiva who sits and meditates up there in the Himalaya.

Yes, here I was in a different cosmos, and of course one that could make any standard western scientific mind cringe. But the thing with India is that either you succumb to the cultural shock and close up like a clam or you learn to adapt, relax, sit by mother Ganga and watch the world pass by, as it looks like from there.

And when you do, things may just start to make sense in unexpected ways. As when it suddenly struck me one day that something with this ancient cosmos was strangely similar to certain discoveries in the most cutting-edge science of today.

But that would come years later. For now, let's just start with the first question:

What is a cosmos anyway?

Well, a cosmos is a space, some planets, galaxies, and all of that, right? And there is something called cosmology, which is, according to Wikipedia, "a branch of physics and metaphysics dealing with the nature of the universe."

But then we learn that there are *two* kinds of cosmology:

Physical Cosmology

Physical cosmology is the study of the observable universe's origin, its large-scale structures and dynamics, and the ultimate fate of the universe, including the laws of science that govern these areas. It is investigated by scientists, such as astronomers and physicists.

Religious or Mythological Cosmology

Religious or mythological cosmology is a body of beliefs based on mythological, religious, and esoteric literature and traditions of creation myths and eschatology.

So there is the modern way of looking at the cosmos, dominated by western physical science.

Then there is the old, traditional way of most cultures on the planet, such as the one I encountered during my visit to India. And should you, for instance, go back to the roots of my own Scandinavian civilization, this would be the cosmos:

Here we have humans and other beings inhabiting places on Earth and elsewhere. And a world tree. Instead of an impersonal view of the cosmos as a structure of matter in a space, this is what you find in the cosmologies that are based on a more personal, life-based understanding of existence and the world. They draw the cosmos not in terms of spatial locations of objects but of us who live here and the realms we populate according to our modes of nature. We now live in the Earthly realm. In the old Norse mythology it is called Midgard, in Greece it is Gaia, the Celts called it Abred; in India it is called Bhūrloka; the Egyptians called it Djet, and we can find names for it in other cultures as well. But there are also other worlds existing parallel to this — sometimes said to be three, or seven, or nine or fourteen. In some of those there are people far more advanced than us, that we call angels or gods, and others are, well not so nice.

It is easy to dismiss these old world views, and of course some think we should. They have decided that only this physical world exists and nothing more, and we ought to simply ignore the rest of it. However, most of us don't agree with such a materialistic cosmology. According to sociologists, less than 10% of people on Earth believe that only the physical world exists and that there are no other worlds or life beyond it. The rest of us, including most religions, agree that there may be, and most probably are, worlds beyond this and that life is going on there too. Call it heaven and hell, the otherworld, afterlife, *lokas*, or what you prefer. This is, in fact, the cosmology we find dominant all over the world, historically and still today, in one form or another.

Building a Cosmos

The London suburb suddenly seemed to vanish when you entered the white office building squeezed among the tidy little redbrick homes in Radlett. Here you were in India, *masālā* scent and soft *bhajan* music flowing through rooms where architects were quietly working over light tables. The walls were filled with curious drawings of something that looked like a mixture between a temple and a planetarium. Well, that's exactly what it was.

It was 1997, and we were a diverse crew that providence had pulled together here — Germans, Russians, Aussies, Indians, Brits, Americans, and a couple of Swedes. Our job was to solve the secrets of the cosmos.

On the walls were those same puzzling cosmic drawings that I had seen there in India back in 1980. The strange cosmos that they depicted had suddenly become my job. One day I had received an unexpected phone call that made me the production manager for the Exhibition Department of the project — a team of creative people and scholars working on the development of the Planetarium content. We were gathered here together outside London with the architects to produce an exhibition based on the cosmology of the ancient Indian scriptures called the *Purāṇas*, for the Temple of Vedic Planetarium that was to be constructed over there in West Bengal.

Just a few years earlier none of us had a clue about the *Purāṇas*, what to speak of a Vedic Planetarium. Now we had to quickly figure it all out because production had already started — decoding old Sanskrit texts from ages almost unknown to human history; describing a cosmos that to us might as well have been

picked from Dr. Who. We westerners would of course fix it, wouldn't we? And God knows we tried. The project had risen and collapsed, groundbreaking concepts enthusiastically drafted, grandiose plans, great theories, only to crumble under their own weight, crews scattering and new ones taking their place. This was the third attempt or so — and we were going to nail it this time, weren't we? It was 1997, and the project seemed to finally be taking off for real.

The exhibition we were working on was not our own idea. The project had been conceived long before by an Indian *sādhu*, Śrīla Bhaktivedānta Swami, based on ideas by his friend Śrīla Śrīdhara Swami. They wanted to build a large exhibition in Māyāpur north of Calcutta, showing the cosmos of the *Purāṇas*. It would be made in three floors, each one representing one *dhāma*, level of the multi-tiered cosmos. And there would be a planetarium.

In a way, it was going to be an exhibition in India for Indians, showing the stories and imagery about their traditional worldview that they were already so familiar with, using spectacular western cutting-edge technology. Some wanted to make it an Indian spiritual Disneyland. And it had grown to an impressive size.

Well, when you studied Bhaktivedānta Swamis' concepts for the exhibition, they clearly went deeper than that. He wanted this exhibition to draw intelligent visitors from all over the world, and he wanted real science. He was convinced that these ancient scriptures contained knowledge that filled the gaping holes in modern science when it came to understanding what the world is that we live in and how our life here can become truly successful.

So here we were, with some pages of notes given to us directly by Bhaktivedānta Swami back in the '70s. This all sounded good and well. But soon we ran into some unexpected challenges. Like for instance:

The Planetary Model

We were building a planetarium. And it included The Planetary Model, dreaded by us all. It was a mobile planetary system model that should hang from the ceiling of the main dome, which was supposed to be about the size of St. Peter's Basilica in Rome. Apart from the technical challenges involved in building a huge clockwork high up inside a mastodon temple dome,

maintaining it and securing it from breaking and falling down on the visitors, the problem was how it should look.

For starters, what is a "planet"? You may say the question is silly — a planet is, of course, a round thing out there in space. The word "planet" comes from the Greek word *planetes*, which means "to wander" — apparently referring to bodies in space that move rather than being stationary. And nowadays, our cool telescopes and spaceships can take good photos of them, looking like round balls out there. So, western minds get into action with their very precise idea of what the planet word means.

But what did an Indian *sādhu*, born in the 19th century and living with the traditional Indian worldview, based on scriptures from many centuries ago, think of when he heard and used that very same word, "planet"? And what did the authors of those ancient scriptures mean?

I looked up every occurrence of the word "planet" in the English translation of the *Bhāgavata Purāṇa*, which our exhibition was to be based on. The original Sanskrit words were mainly *loka* and *graha*.

Loka means "world," "realm," "locus," or "location." As we can see, this is not the same meaning as "object moving in space" or "globe". Of course, the modern mind may, again without even noticing the leap, take it for granted that the two are describing the same thing. But they are not, and although it may not be apparent at first, the difference may be crucial. As we shall see.

Another Sanskrit word that is sometimes translated as "planet" is *graha*. Again, that seems natural, since it is the word used, for instance, in Indian astrology to describe Mars, Mercury, Jupiter, Venus, Saturn, the Sun, the Moon, and so on. So how could that word not mean "planet"? But if you look closer, you will find that it mainly refers to certain cosmic influences. Indeed, the word denotes beings rather than objects, much like the Greek, Roman, and Norse gods.

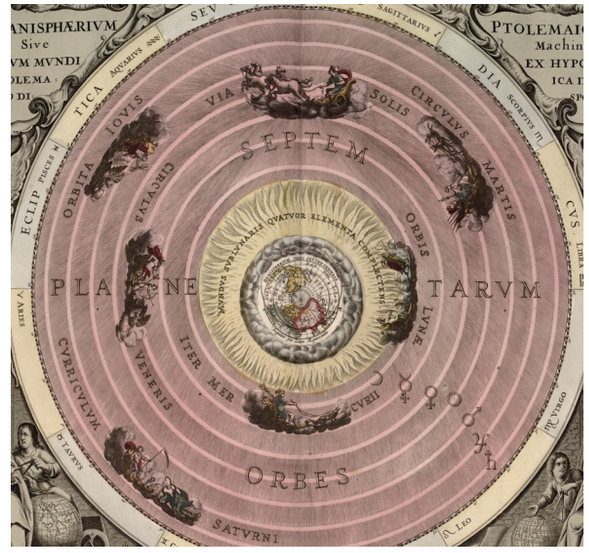
So there we are again, old gods and fantastic realms from a bygone age. How in the world would you make science out of that? And how should that frickin' Planetary Model look?

Some suggested we just dodge the problem altogether by rather creating a big chandelier, which would then symbolize planets and whatever. The purists revolted against such heresy, and ... the Planetary Model remained an enigma.

To most of us, cosmology was of course about that: planets, places, measurements and things in space. Strangely so, actually, because most of the *Purāṇic*

The Grahas

Mercury, Mars, Venus, Jupiter, Saturn, Sun, Rahu and Ketu in Indian astrononomy/ astrology.



The Greek Planets

In the Ptolemaic universe from Greece, largely influential in Europe, we also find the planets shown as persons, resembling the divinities representing the planets in the astrological system.

cosmology, which the exhibition was supposed to be based on, is not at all about astronomy but about a creation of life going on in different realms. The cosmos described there looks more like a big cosmic dream.

Some parts of the *Bhāgavata Purāṇa*, most notably the Fifth Canto, do mention planets and stars and orbits, and of course, we Westerners jumped straight into that one because to us that was science. What if we could prove that people back then also had science, maybe even as advanced as ours or more?

We Westerners love to measure things, write lots of numbers and invent fancy names. It makes us feel we have understood something. And yes, there seemed to be numbers and measurements there in the *Purāṇas*. We thus summoned our calculators, rulers and computers, and got down to it.

Well, some of us were actual scientists, and they were the first to admit it: there may be more to this than meets the eye. What's more, we are talking about Sanskrit writings from thousands of years ago. After passing through countless generations, they have reached us as an echo from a time when not only the language was different, but the ways of using it, the social context, the meaning of allegory — the entire cultural framework within which the knowledge was expressed. It would be strange if nothing was lost in translation during that journey.

Yes, it can get a bit awkward when Westerners with modern ideas drilled into their minds try to grapple with the cosmos of the ancients. And here we were, some of us becoming flat-earthers and some being convinced there is a 100,000 km high golden mountain at the north pole which our leaders are hiding from us in the greatest conspiracy ever. Oh, and the entire cosmos is a huge egg with a shell somewhere out there in space, that you could puncture with a rocket if you are not careful, causing the water from the ocean outside to inundate our world.

But somewhere in all this, a few words once uttered by Bhaktivedānta Swami to one of his students kept coming to my mind:

"You have to understand, I am seeing all this from a very different point of view than you do."[1]

Hamlet's Mill

Dr. Richard L. Thompson had his office in a rural area outside of Gainesville, Florida. He was one of the scientists that had made the presentation back there on the Indian countryside in the eighties. A mathematician with a Ph.D. in information theory, he had eventually extended his interests to physics and cosmology — especially the ancient *Purāṇic* worldview of India. His theory was that in spite of its odd appearance to modern scientists, the *Purāṇic* cosmology may actually have some very advanced knowledge encoded into it.

So here he was, working on his own, knowing that he was treading into "forbidden territory" which could get him stonewalled, as he put it, from the mainstream scientific community for life. He had just co-written the book Forbidden Archaeology which listed one instance after another of "anomalous" archaeological discoveries that somehow went against the current mainstream consensus. Some of those archaeologists had lost their jobs and reputations for even daring to report such discoveries, and Richard knew what was at stake. Having relinquished all chances of a comfortable life as a university professor, he earned his income from his book sales and a part-time job as a computer programmer for NASA.

Since I had become involved with the Vedic Planetarium exhibition, our paths had crossed again. I spent months there in Gainesville as Richard's guest and had long discussions with him about how ancient Indian cosmology could be explained in terms of modern science.

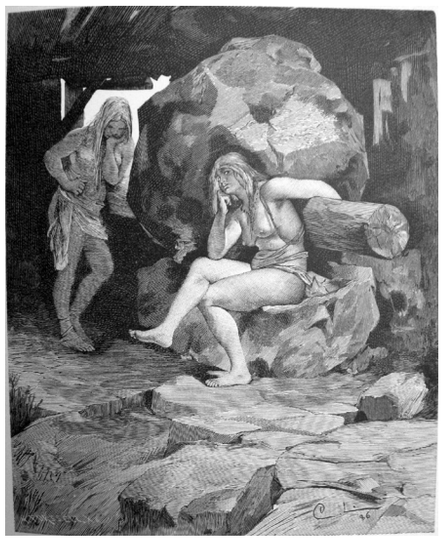
He was trying to "crack the code". The old display panels with the golden ice cream cone mountain surrounded by seven islands were still there on the wall, but after all these years Richard had more to say about what they actually meant, and it started to make a little more sense — well, kind of.

His point was that even to draw a map of planet Earth onto a sheet of paper is a tricky thing. You can't just take a round ball and squish it flat. That's why people like Mercator invented special projection techniques to create the

maps we use today. Now what if you want to make a map not only of Earth but of space too, and time, maybe even other dimensions or realms? Or what if you want to describe the universe not in terms of "geography" — locations of planets and stars in space — but from a different point of view altogether? Like from the mind who is observing it?

One day he pulled out a curious book called Hamlet's Mill, written by a professor at MIT and a German scientist. They proposed, just like Richard, that what may often seem like mere mythology in ancient cultures may have been misinterpreted and could actually contain valuable information. More importantly, Richard showed me how the cosmologies in many older cultures all over the planet are surprisingly similar to the *Purāṇic* one from India, although expressed in slightly different language and imagery.

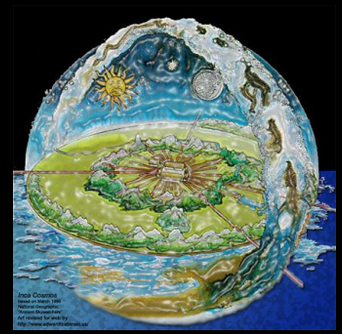
It appears that much of what you find in old mythology and stories somehow relates to cosmology. For instance, speaking of Hamlet, some suggest that Shakespeare drew inspiration from the old Icelandic story about Prince Amleth (Amlóði) that has cosmological significance. This tale is linked to Amlóða's mill in Snorri Sturluson's Prose Edda, which seems to connect to the story of Grottasöngr in the Poetic Edda. The story is about two girls who work a mill that initially produces all wealth and well-being for people, but eventually breaks down due to human greed. (The Swedish writer Viktor Rydberg used the mill from Grottasöngr as a literary backdrop in his poem 'Den nya Grottesången' [The New Grotti Song], in which he fiercely criticized the greedy capitalism and dismal working conditions in factories of his time.) And yes, here we are, in a world spinning through space and time, where the drama of life unfolds. And this is the cosmos you find in those old tales — a living cosmos where the clockwork of moving matter is the stage for our dreams and desires. Not the other way around. In the book *Hamlet's Mill*, the mill is thought to represent the cycles of time, such as the precession of the equinoxes. These cycles are often linked with the destiny of life on Earth. For instance, in India, there are the cycles of *yugas*, which also start off with a golden age of abundance and then, due to human greed, end in an age of turmoil. Then our ascent begins again, from a beastly life in darkness towards enlightenment and divine living. This is the story we find spoken one way or other in different cultures — the "hero's journey". And as we shall see, this is also the story of the cosmos in the *Purāṇas.*



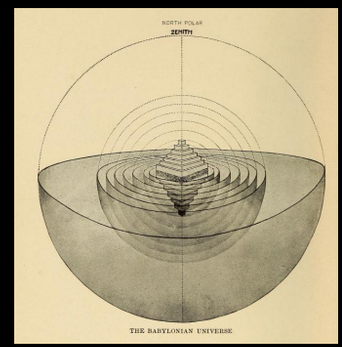
Fenja and Menja churning the mill.

Richard had still not cracked the code, but he convinced me of one thing: the solution would be found not by gazing through the instruments we have been accustomed to by our western upbringing, but by finding a different angle altogether. We had to look through the eyes of the ancients. The images of the Old Cosmos were there, from all over the world, and it seemed that they were trying to tell us something.

So I started collecting pictures.



Inca cosmos



Babylonian cosmos

Seven upper and lower worlds.

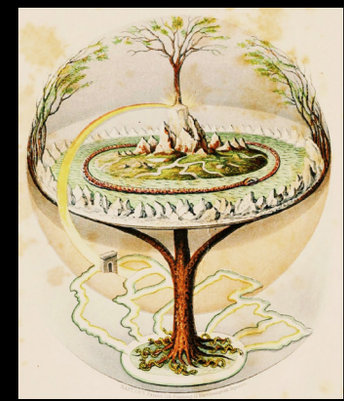
Mayan cosmos

Centered on a tiered pyramid, and rests upon a cosmic sea.

Hebrew cosmos

Chinese cosmos

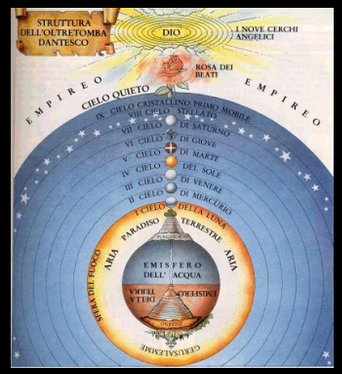
With Mt. Meru (Yuan dynasty).



Scandinavian cosmos

Mississippi native cosmos

At the center is a great cedar tree connecting the earth to the sky above and the waters below.

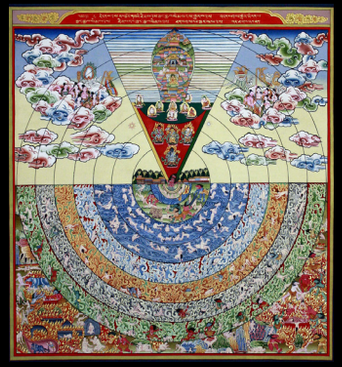


Dante's cosmos

From Divina Comedia.

Greek cosmos

Mt. Parnassus with God on top.

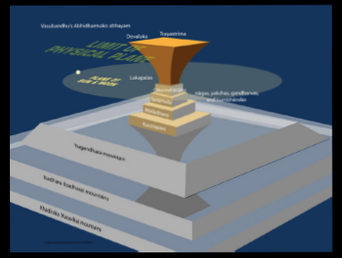


Tibetan cosmos

The Kalachakra depiction of the cosmos with Mt. Meru at the center.

Islamic cosmos

The Qur'an mentions seven *samāwāt*, heavens.

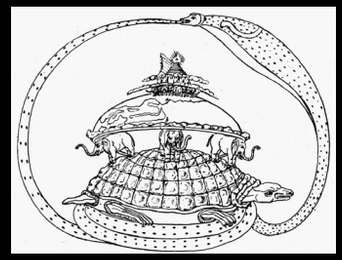


Buddhist cosmos

Abhidharmakośa by Vasubandhu.

Navajo cosmos

The four quarters of the world characterized by color, and a holy mountain.

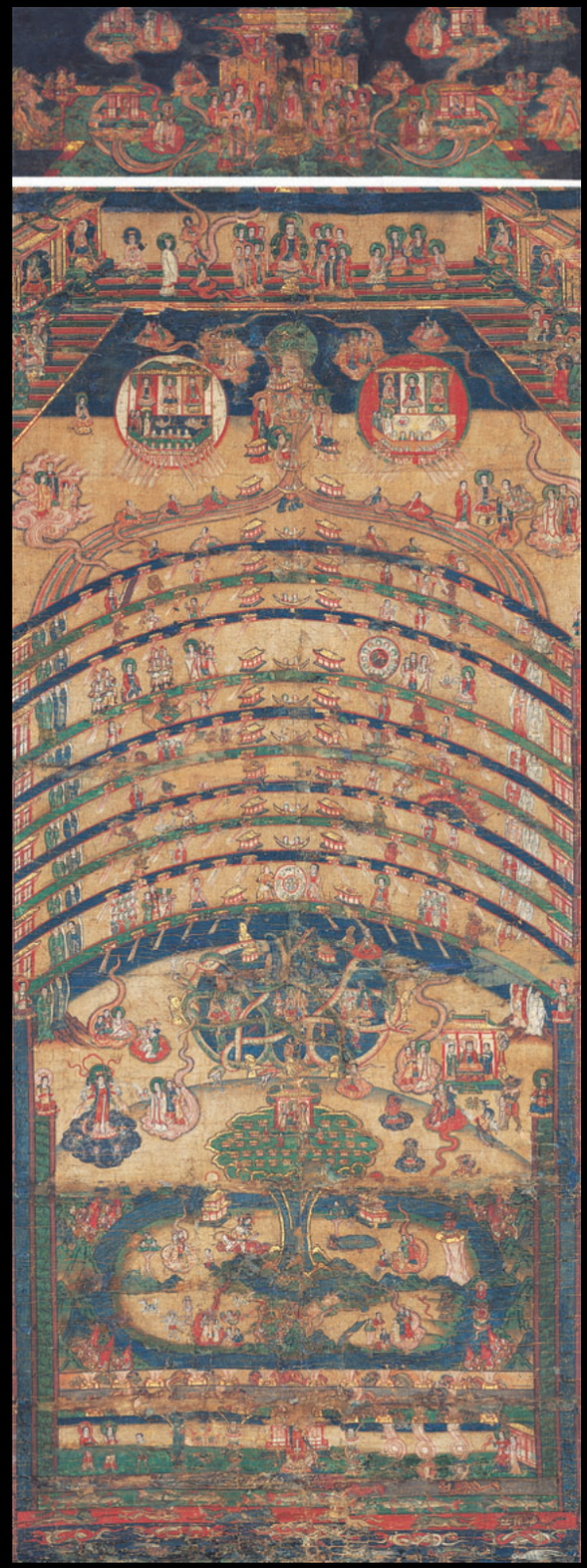


Hindu cosmos

At the center mount Meru, and the elephants, tortoise and serpent upholding the cosmos.

Bhutan cosmos

Buddhist cosmos with Mt. Meru.



Persian cosmos

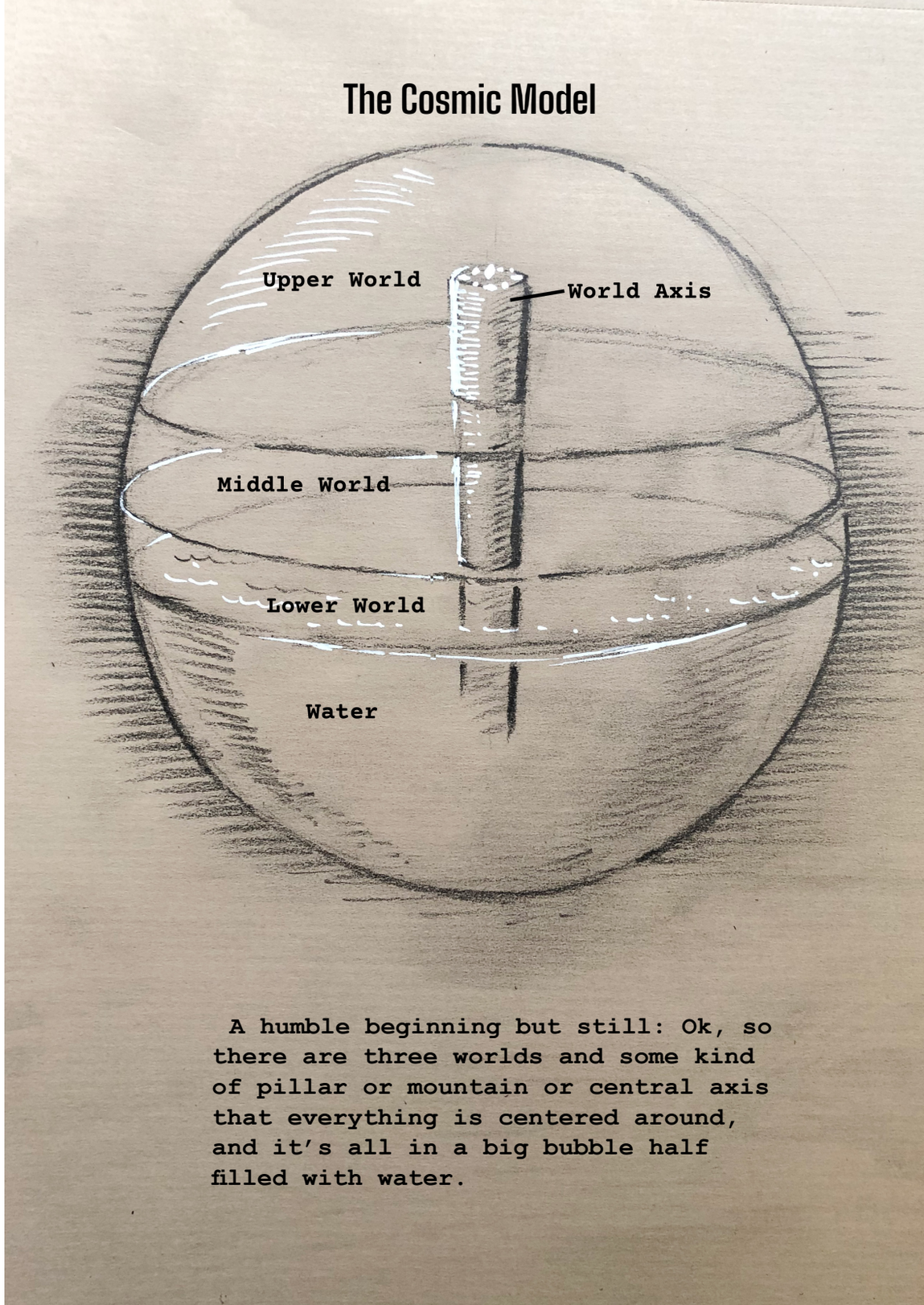
Under the Manichaean view of the universe, originating in Persia and spread as far as to China and Britannia during 300–500 CE, the world is formed by ten layers of heaven and eight layers of the Earth. The separated top section depicts paradise, below it are the sun (right) and moon palaces, which are shown in two circles. Then the ten layers of heaven, where angels, demons and the twelve zodiac signs are included. Below the ten firmaments of heaven are the eight layers of the Earth, the Mount Meru is shown as a mushroom-shaped mountain on the ground where humans live; and hell is depicted in the lowermost part.
(Source: Wikipedia)

I just sat there for a while, looking at all those old drawings, noticing the similarities between them, whether they were from India, China, America, Europe or Africa. Some were from small local tribes, and others came from the big civilizations. But what was really going on in these strange images?

Then I got an idea that made sense to me: If we gather the main elements that these cosmic models have in common and try to understand what they mean in each specific culture, this could maybe help us decode them. Are these images just naive depictions of what those people believed about our solar system and the starry sky, or is there an entirely different dimension involved here?

I got another idea. I was going to build my own cosmos. I would draw it, mold it in clay, create it in a virtual reality world or whatever, but gathering what I learned on my way and trying to eventually turn it into a model. Wouldn't it be cool to have a cosmos in your living room? And who knows, maybe it could even be useful for the Vedic Planetarium.

So, I picked up my sketchpad and made a first draft for:



The Three Worlds

"Why do you ask that question?" The woman looked suspiciously at me across the open fire with the boiling coffee kettle. I found myself sitting on a reindeer skin inside a Sami home, a *goahti* hut, and we could have been far up in Lapland in the northernmost Sweden but were right in the capital of Stockholm, in the open-air museum Skansen — a piece of traditional rural Sweden with salvaged old buildings and even endangered domestic animal species from all over the country (a must-see if you are a tourist and a great place to hang out with the kids). Just behind the trees below the hill was the bustling city center, as a backdrop projected by some strange time machine into this world we were in now. The timeless Sápmi universe.

The woman, herself a Sami (the original natives of Northern Scandinavia) and in traditional dress, had mentioned that she was also an ethnologist affiliated with the university. I had then asked her if she could describe the Sami cosmology — their view on the world. Her reluctant reaction puzzled me.

"I am doing a comparative study of the cosmologies of different original people on Earth," I tried.

She poked the fire a bit and apologized. It was trendy to be interested in Sami culture these days, she said, but people don't understand the Sami worldview and often end up exploiting or even ridiculing it, so the Samis are not keen to talk about it.

I explained that I was already a bit familiar with other ancient cosmologies, such as the Indian Vedic one, and wanted to find the common elements in them. She looked up at the smoke passing through the hole in the ceiling, thinking for a few seconds.

"Well, first of all: there are three worlds."

She looked at me, as if anticipating the smirk of a skeptic. But when I simply

nodded and mentioned that I recognized the three worlds from other cultures, she lit up a bit. She explained that the Sami people see the cosmos as alive, with the spirits of animals, humans, plants, and others, higher and lower, small or big living beings, pervading and making up existence. And there are different realms of life, she said — the higher, the middle where we are, and the lower.

"Actually, most of us Sami people still have that worldview."

She showed an image of a Sami drum, the one used by their *shamans*, the *noaidis*, and explained how the symbols on it represent those three worlds. There was a vertical line drawn at the center of the drum, with a shorter horizontal line intersecting it.

"This is the world pillar or tree, a vertical axis going through the three worlds."

"Gosh, it's like that central mountain Meru in old Indian cosmology," I exclaimed, thinking of the ice-cream cone I had seen on the images from the *Purāṇas* ever since my first visit to India. "It is also said to lead through the three worlds."

"Yes, mountain, pillar, tree, there are different words for it."

She told me that what is popularly called "drum journeys" was about the *noaidis* using the drum for entering a state of trance and then being able to communicate with beings in other worlds. They were supposedly even able to travel between the worlds in that way.

I mentioned having read that the yogis of India could go into trance and travel between different worlds through inner space along that axis — the *merudaṇḍa*.

She raised an eyebrow.

A tourist couple entered through the little door and looked around curiously. The Sami lady interrupted the conversation, gave me her card and some web links for me to study further, and the kids wanted to go and see the reindeer. I crawled out of the *goahti* and followed them, intrigued by this surprising meeting between the Indian *Purāṇic* cosmology and that of the original people of my own home country. And when looking further into the literature she recommended, I kept finding even more similarities.

The Magic Drum

The Swedish Sami scholar Biret-Máret Kallio[2] explains the symbolism of the south Sami drum as referring to the three worlds, found in Sami cosmology.

The upper world, which is sometimes referred to as the "world of the gods," is thought to be the home of powerful supernatural beings, including the gods and the spirits of the ancestors.

The middle world is the realm inhabited by humans, animals, and plants. It's where we find ourselves now.

The underworld, which is sometimes referred to as the "world of the dead," is the realm of the spirits of the deceased.

Máilmmi Cuolda, represented by the vertical line in this image, means "The World Pillar", and is also described as a tree with its roots in the underworld and its tip attached to the Pole Star.

I decided to continue digging down into the historical roots of that tree, as far as I could get, to the ancestors of the Sami people. That would lead me all the way back to the Ice Age.

Shamanism rock art

There were people living in northern Scandinavia during the late ice age, probably around 10,000 years ago, and we can still find rock art they created in Sweden, Norway, and particularly in Finland. In other parts of the world, such as Germany, Spain and Indonesia, such rock art has been found from more than 40,000 years ago. You have probably seen photos of it — stylized images of animals, humans, boats and other symbols. I learned in school that these pictures simply showed the domestic life back then, but nowadays it

South Sami drum.

Máilmmi čuolda means the "World pillar". Máilmmi čuolda can also be seen as a tree rooted in the netherworld and the top attached to the Pole star.

Our world:

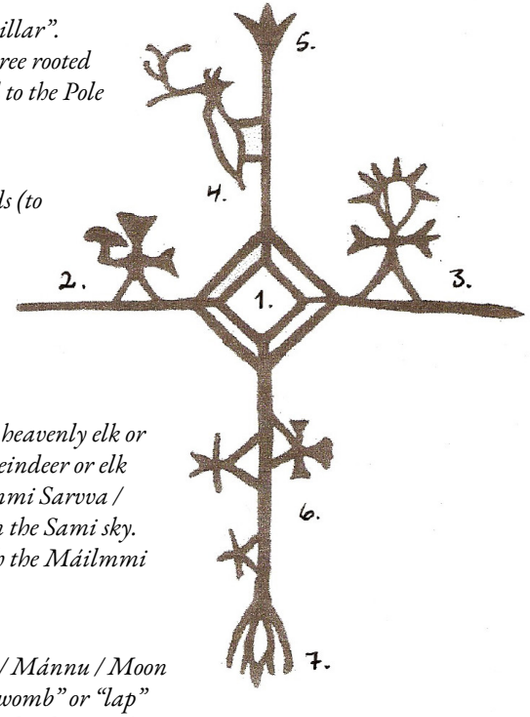
1. Uvssot: the entrance to the other worlds (to shamanic awareness). It is this opening that one enters when using the drum.
2. Diermmes: the power of Thunder.
3. Bieggolmmái: the Wind Man. The power of the wind.

The upper world:

4. Almmi Sarvva / Almmi Sarvvis: the heavenly elk or reindeer. The old drums have either a reindeer or elk here, sometimes on top of the pillar. Almmi Sarvva / Almmi Sarvvis is a star constellation on the Sami sky.
5. Boahjenásti: the Pole Star, onto which the Máilmmi čuolda / World pillar is attached.

The lower world:

6. The three days per month when Aske / Mánnu / Moon is in the lower world. Aske also means "womb" or "lap" (probably related to the menstruation cycle of women). It can also be a "serpent" around Máilmmi čuolda.
7. The roots of the pillar and a mádjit / beaver between the roots. The beaver lives both on land and in the water. A "liminal" animal you could say.



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seems more and more accepted by scholars that they are rather depicting supernatural beings in other worlds and were used ceremonially by shamans.

Shaman is a term derived from the Tungus in central Siberia[3]. In other countries they may be called something else but are there in all original cultures it seems[4]. The term refers to someone who can heal, manipulate rain and foretell the future[5]. In addition, a shaman is also believed to become a link between our world and other worlds[6].

Many scholars today agree that even the oldest known rock art, such as the Maros-Pangkep in Indonesia[7], which dates back more than 40,000 years, likely served shamanistic purposes:

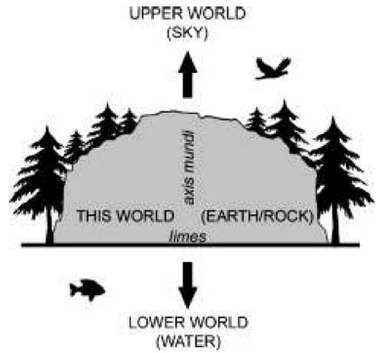
> Shamanism rock art generally has certain characteristics drawn from its depiction of motifs that can be understood by comparison with nature or physical effect in trance ... Shamanism rock art is found in many sites around the world, including North America, Africa, some sites in Australia, and Siberia.[8]

There are several similar figures appearing in rock art all over the world that seem to depict supernatural beings from other worlds. In some cases, even the sites where they appear are places of worship or ritual and may have had a cosmological significance on their own. For instance, some rock art in Finland was painted on rocks distinctly rising as small "mountains" next to lakes or ponds of water, which may contain a symbolism similar to the cosmological image of a primeval ocean, the earth, and the mountain or pillar leading up towards heaven.

If these theories are correct, people 30,000–50,000 years ago had a developed cosmology that included the existence of other worlds, besides the physical. They also had practices for connecting with such other realms, much like the shamans of the Samis and the yogis of India. Whether you believe they could actually do that or merely thought they could, the very idea of worlds beyond ours, inhabited with supernatural beings, is a sophisticated one.

Why and when did such a concept develop among humans, and how come it was there all over the world thousands of years ago among tribes that could hardly have had any contact with each other?

This also seemed to confirm what I had suspected: that the three worlds you find common in those older cosmologies is not about locations within this physical space, but that our physical world is but one of those



The rock painting site as a reflection of the cosmic order (from Between the Worlds. Rock Art, Landscape and Shamanism in Subneolithic Finland Antti Lahelma, Norwegian Archaeological Review, Vol 38, No. 1, 2005)

three worlds. The world axis or pillar is the route that connects them, reached not by journeying with vehicles through the world of the senses but by somehow accessing an entirely different dimension of existence. This was done by shamans, yogis, and similar figures that are found in most original cultures as those responsible for connecting to other worlds.

You even find that understanding embedded in the very architecture of the dwellings of the Sami people and eastward to Siberia, in the ger tents of the people of Mongolia, and in the *tipis* of America. The round floor area represents Earth, and the center of the tent, with the fire and the smoke rising up through the top opening, represents the World Pillar, leading to the higher worlds. Thus, their very homes are seen as sacred spaces and microcosms, and their ceremonies are about connecting to higher realms.

In fact, I now started finding this image of the cosmos from all over, in architecture, in the human body, in symbols like mandalas and *yantras*, and even in ritualistic or meditative practices like *tantras* and *mantras*.

The Seven Worlds, or Fourteen or...

You know the Bible story about the Tower of Babel, right? The one where people attempted to build a tower to heaven and were punished by God with the confusion of languages. According to the Bible, the Tower of Babel was located in Shinar, which is the Hebrew name for Babylonia — an ancient region in Mesopotamia that encompassed parts of present-day Iraq, Syria, and Turkey. The Sumerian civilization, regarded as one of the earliest in Mesopotamia, emerged around 4000 BCE.

Along with the Indus Valley civilization, Mesopotamia is often called the "Cradle of Civilization" because of its significant social, political, technological, and urban development during that period. Of course, an equally important criteria of a civilization is its cultural, spiritual, and intellectual development. As we saw in the rock paintings, a relatively sophisticated sense of spirituality and artistry existed tens of thousands of years earlier. In fact, ancient teachings suggest that the very concept of being "civilized" was once associated with inner, spiritual growth rather than material development. But by now humans had started building cities and temples. And just as their simple homes of the past were made to represent the cosmos, so were these large buildings.

The *ziggurat*

The Biblical account of the Tower of Babel bears similarities to the Sumerian legend of Enmerkar and the Lord of Aratta, dating back to around 2300 BC. Both tales revolve around the building of temples and the ensuing confusion of languages. In the Sumerian legend, the tower is a temple built by the pious King Enmerkar for a goddess, and the language confusion isn't portrayed as a punishment. (Some scholars speculate that the Bible's authors

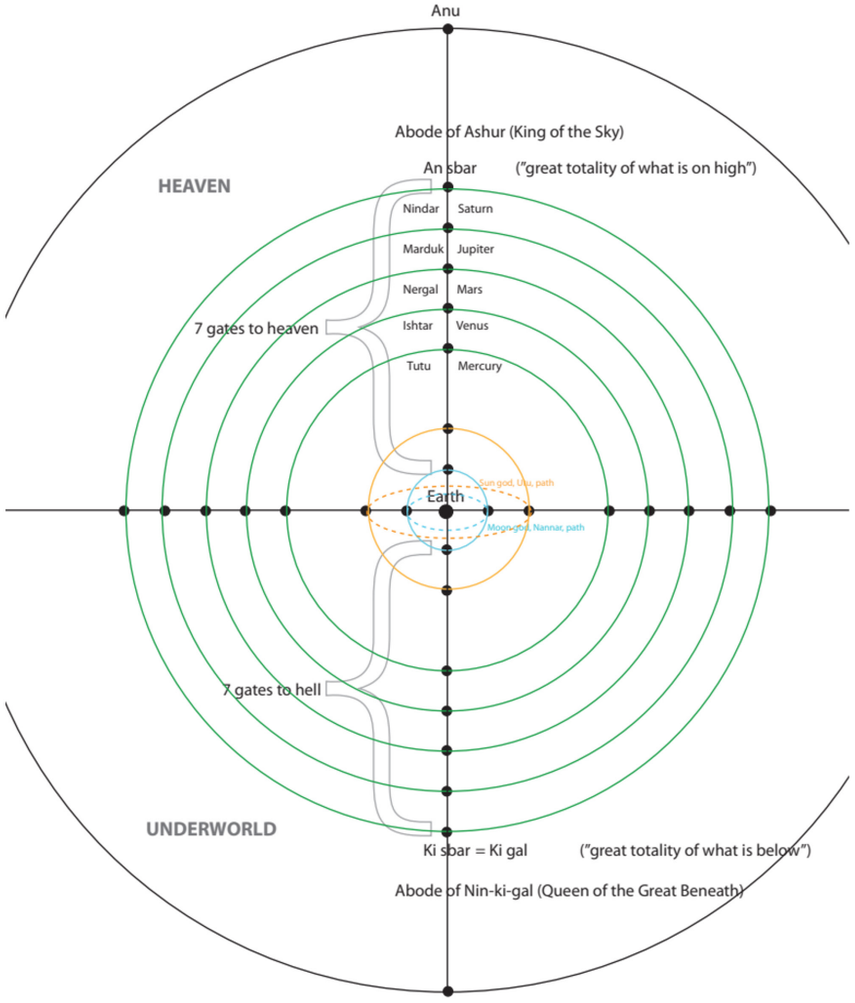
may have modified the Mesopotamian legend to challenge the religious beliefs of ancient cultures in the region.)

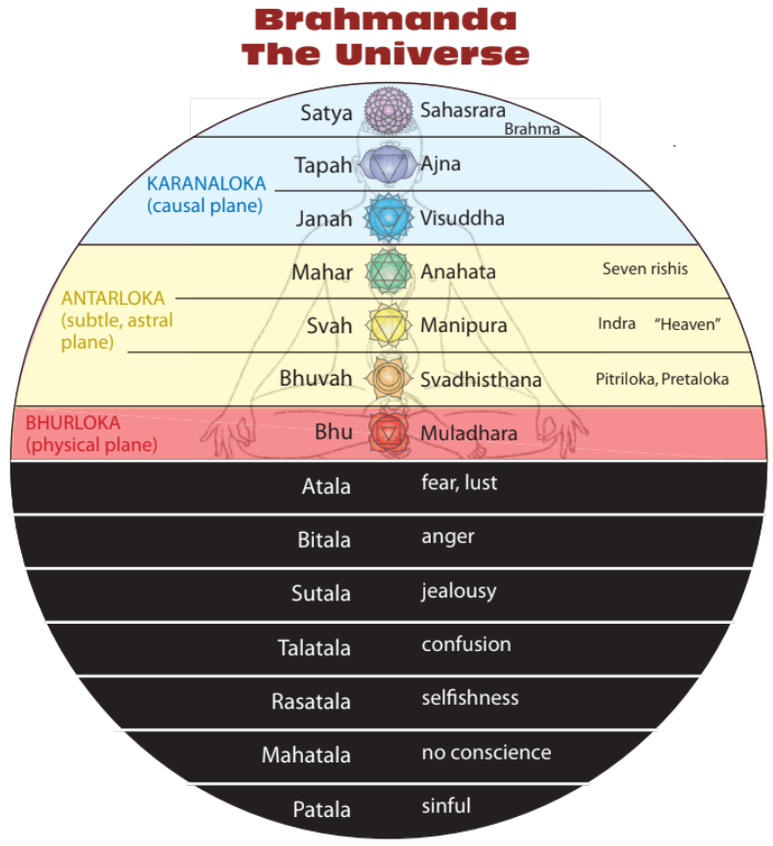
It seems that the Tower of Babel actually did exist. In the area that the Biblical story refers to there were several major temples, called *ziggurats*, which you can still see ruins from if you go there. Those buildings are interesting in themselves, apart from the fact that they may be around 6000 years old. They were constructed to represent the cosmos. They had several "steps" or levels — often seven, symbolizing the seven heavens — and yes, in a way they were meant as "stairways to heaven" as the Bible describes it — not in the banal sense of building a physical stairway leading throughout the sky, but as shrines showing the way for people to ascend from the lower levels of existence to the higher. They linked heaven and earth and provided a means of communication between humans and the divine.

The *ziggurat* was also seen as a sacred mountain, and its tiers were sometimes compared to the terraced slopes of a mountain. The ascent of the *ziggurat* was therefore seen as a symbolic journey up the mountain to the realm of the gods. In some interpretations, the *ziggurat* was also seen as a symbol of the cosmic pillar, which was believed to hold up the heavens and link them to the earth.

In Sumerian cosmology the universe is divided into three worlds: the heavens, the earth, and the underworld. But it is also divided into seven higher and seven lower worlds. Each realm is associated with different deities who were believed to control various aspects of the universe. Anu was the chief god of heaven, Enlil was the god of the earth, and Enki was the god of the underworld. And speaking of the Bible — many Christians are familiar with the concept of the Seven Heavens, which was likely inherited from Mesopotamia.

The cosmos of Mesopotamia





Those seven higher and seven lower worlds are also there in Indian *Purāṇic* cosmology. The higher worlds are the *saptalokas*, the seven *lokas*, and then there are the seven lower *talas,* the *sapta Pātāla*. As we shall see later, the two cosmologies are so similar that I started suspecting India and Mesopotamia to have had connections already back then, 4000–5000 years ago.

Turns out they did. There is evidence suggesting that the Sumerians and other civilizations in Mesopotamia engaged in long-distance trade with the Indus Valley civilization. Archaeological excavations in Sumerian cities such as Ur and Kish have uncovered artifacts such as seals and pottery from the Indus Valley.

A Global Cosmology

We could continue our cosmological exploration of the old world, and we would find similar images of the cosmos in many countries and cultures, em-

bedded in architecture and art from at least 5000 years ago. For instance, here is an example from China, in this 14th century tapestry from the Yuan dynasty. Again we have Meru, surrounded by seven regions. On top is a lotus showing the same topology as that of the *Bhāgavatam* with the abode of Brahmā surrounded by those of the eight *loka-pālās*. And still today, you can find this sculpture depicting Mount Meru in the yard of the Lama Temple in Beijing.

Egypt, *māyā*, Jewish kabbalah cosmos — we can go on and on. As we see, all these have some things in common:

A primeval ocean with a round disc, often divided into seven concentric ring-like portions.

Some kind of peak there in the middle, a world mountain, tree, pillar or axis, protruding up from the center of that disc.

Seven higher and seven lower vertical levels of existence, and seven *dvīpas*, horizontally distributed.

The sun and the moon encircling the central mountain or pillar.

Different deities governing different aspects of the cosmos, often around a central Deity.

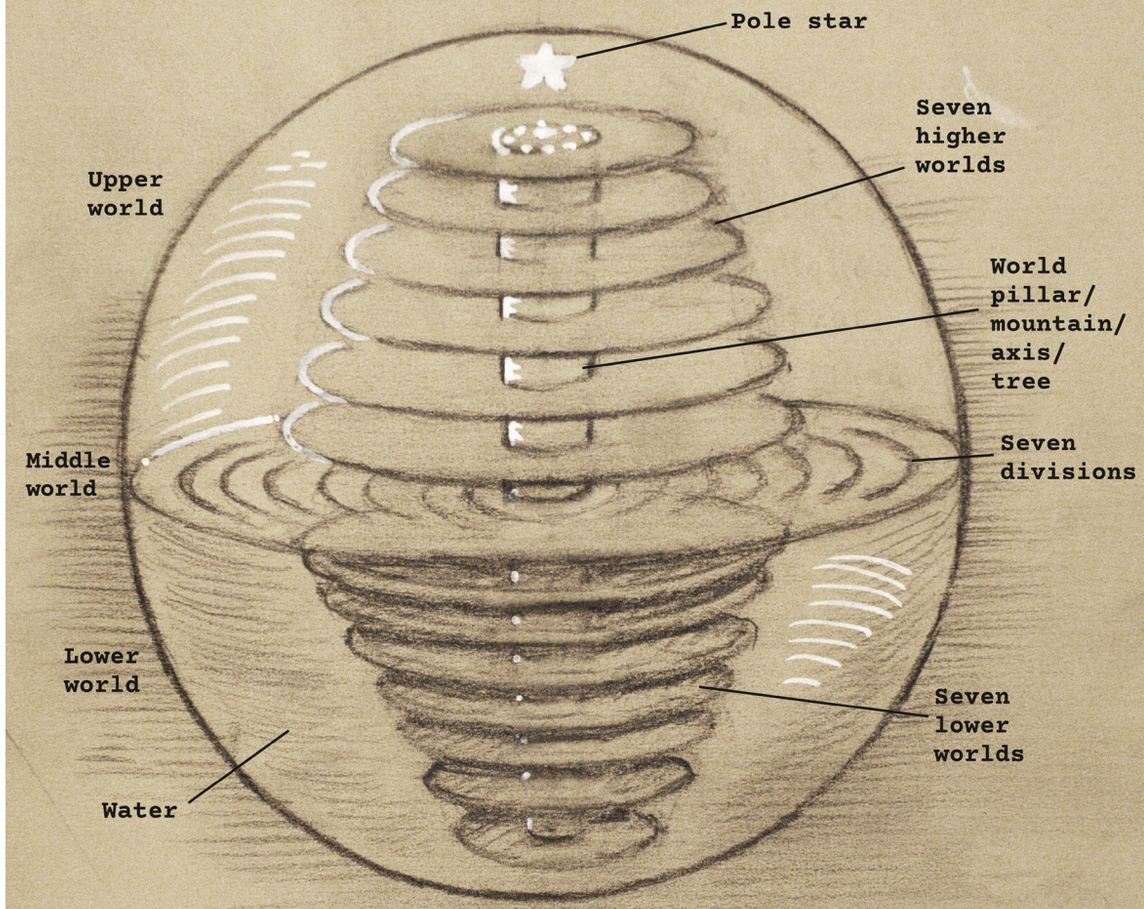
All of this divided into three worlds.

So here I sat, and maybe you too, asking myself, “Now really, what in the world does this strange image of the cosmos actually mean?”

Chinese tapestry showing Mt. Meru. with a lotus on top, symbolizing the abodes of the eight loka-palas.

Mount Meru in a courtyard at the Lama Temple of Beijing..

Cosmic draft, v. 2



A Conscious Cosmos

There is no matter

The world is not made of matter. It rests on mind and consciousness. Well, those words are not from some old Eastern spiritual scriptures if that's what you thought. They come from the very father of quantum physics, Max Planck, who said, "I can tell you as a result of my research about atoms this much: There is no matter as such. All matter originates and exists only by virtue of a force which brings the particle of an atom to vibration and holds this most minute solar system of the atom together. We must assume behind this force the existence of a conscious and intelligent mind. This mind is the matrix of all matter."[9]

Something happened there with the advent of quantum physics in the early 20th century, which challenged the very foundation of modern science. Physicist Sir James Jeans, one of the founders of British cosmology, said: "I incline to the idealistic theory that consciousness is fundamental, and that the material universe is derivative from consciousness, not consciousness from the material universe... In general the universe seems to me to be nearer to a great thought than to a great machine."[10] Oh, and his co-founder of British cosmology, Sir Arthur Eddington, wrote: "The universe is of the nature of a thought or sensation in a universal Mind ... To put the conclusion crudely — the stuff of the world is mind-stuff."[11]

Erwin Schrödinger, who got the Nobel Prize in physics in 1933 and is famous for his cat, took it even further: "The only reality is consciousness; everything else is just an illusion."[12]

So what does this all mean, and what does it have to do with cosmology and a planetarium? Should we not rather stick to the real stuff, like planetary orbits and measurements, the nature of spacetime, and the substantial things you can touch, rather than ... consciousness and mind, which belong to the psychology

and religion departments, right? But that's the thing. They were talking not about metaphysics and philosophy but about the cosmos. About cosmology. And they were the main geniuses and founders of quantum physics.

In fact, several of those men started taking great interest in the teachings of ancient India. It appeared that they had found something, probably something so significant that they dared step into what many scientists considered and still consider forbidden territory: bringing the mind into this cosmos.

What was it that they had found? And why did it seem so close to what I learned when studying the ancient *Purāṇic* cosmology, and the shamans and yogis?

Now, quantum physics has been, I guess it's fair to say, a bit abused by all kinds of new age-ish folks who love to throw in the word "quantum" here and there as if quantum physics was spiritual or something. On the other hand, mainstream physicists tend to ignore this consciousness issue altogether or dismiss such ideas as irrelevant metaphysical speculations. But the fact remains that something significant happened back then, so what was it, really?

Simply stated, quantum physics revealed that the state of matter (for instance where an electron is located at a certain place at a certain time) is kind of ambiguous and undefinable until it is observed. That state was rather described as a mathematical probability, called the Wave Function, which "collapses" into a specific form when observed by us. The one who brought mind into quantum physics was probably John von Neumann who concluded that the collapse of the wave function was caused by the consciousness of the experimenter.[13] This idea was supported by a number of other physicists, starting with Fritz London and Eugene Wigner. Others, like Einstein, objected, and a controversy developed regarding subjectivity versus objectivity.

You know, we learn that science is supposed to gather objective knowledge — facts that are valid for all of us — rather than subjective knowledge, which relies upon the perception of the observer. So the entry of the conscious observer into the scientific picture, especially as being fundamental, made some physicists rather uncomfortable. As did the idea of the mind existing independently of the material body. It became a kind of conflict between "realism" and "subjectivism" or "anti-realism", and Einstein accused Bohr of just that, of opening some kind of Pandora's box that contaminates science with spiritual nonsense. The problem with solipsism came up, with Einsteins famous question to Abraham Pais, "Do you really believe the moon is not there when you are not looking at it?" While those on the more *vedāntic* side may have

answered that just as there is the sun and its rays, consciousness is both local (each one of us) and non-local (God — in whose mind everything exists and who therefore is the Subject who defines all objects).

So it went deeper. Back in the 19th century, many scientists had tried to abolish religion, believing that everything including mind and consciousness could be accounted for as material processes. However, there was no proof — or even a working theory — of how consciousness and mind could develop from matter. There still isn't. Serious and honest scientists will consider such a thing a major problem within their science. So there were — and still are — ongoing efforts among such scientists to also accommodate us conscious living beings, whose presence is not only conspicuous and obvious but, as these men realized, precedes the world of matter which is after all only known to us as experienced in our minds. What's really "out there" we can't tell by just observing the world with our senses.

Apparently the findings within quantum physics stimulated or added to a general interest for Eastern philosophy. Niels Bohr was very interested in the *tao* teachings of China and when being knighted he included the *yin-yang* symbol in his coat-of-arms. He is often quoted saying, "I go into the *Upaniṣads* to ask questions."[14] Werner Heisenberg is often quoted saying, "Quantum theory will not look ridiculous to people who have read *Vedānta*"[15]

Is quantum theory then based on the *Vedānta* as some like to say? Nah, it's based on modern physics. However, at that time eastern teachings including the *Vedānta* had become popular among intellectuals, including influential philosophers like Schopenhauer, who influenced quantum physicists. Much of that started when Indian Sanskrit classics like the *Upaniṣads* and *Bhagavad-gītā* were translated into German and English in the mid-19th century. So it may be fair to presume that quantum theory received a healthy dose of Indian *Vedic* influences. The similarities in terms of a cosmic background in a non-local consciousness seems more than coincidental. And again, those prominent quantum physicists wrote and spoke about their own involvement with *vedāntic* ideas.

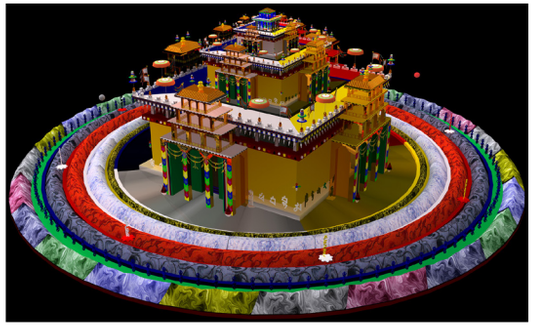
At the end of the day, this was not a dramatic change in the worldview of humans. For thousands of years, until the rise of materialism, that outlook had dominated all over the world — in the religions, in Eastern and indigenous worldviews, and in philosophies based on idealism: All existence is ultimately a conscious living being — whether called the Cosmic Consciousness,

Brahman or God — that we are part of. At that time some scientists attempted to somehow harmonize this with science, and that is still going on.

How would then a cosmology look like based on such a view? And moreover, does any of this have anything to do with the enigmatic cosmic model that we have looked at so far? Well, those scientists started looking eastward, and maybe the secret is found where secrets are said to be — far up in the Himalayas, in the mysterious Tibet. Anyway, that's where I happened to find a quite well developed model of such a consciousness based cosmos that those scientists seemed to have glimpsed. Let's go there, for some cosmic clues:

The *Kālacakra* Mystery of Tibet

The *Kālacakra* is kind of an open secret, because you may have seen it but not learned about its meaning. Have you ever marveled at pictures of Tibetan monks gathering and painstakingly working for days to create a magnificent *cakra* (round pattern) out of colored sand? That image is not just some decoration but is made with intricate patterns and symbols, according to very exact rules. This mystical figure may actually help us to understand our cosmic model from the past, and maybe even give us a clue to what those quantum physics geniuses may have found over there in the East.



First of all the *Kālacakra* is more than what we see there in the sand. It should actually be understood as three-dimensional, and you can find it made like that in Tibetan temples.

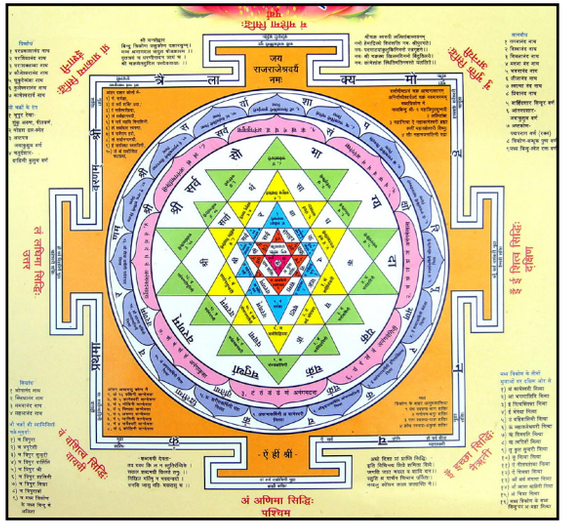
This symbol comes from the *Kālacakra Tantra*, Buddhist scriptures about a thousand years old, but also draws from older Indian *Vedic* teachings like *Vaiṣṇavism* and *Kashmir Shaivism*.[16]

It consists of what are called the Outer Kālacakra and the Inner Kālacakra. To put it simple: The outer-

most part represents the five material elements (the five *mahābhūtas*, that we will soon talk about) and the physical world. Then the palace rising from that round platform is the body and the mind, represented by different floors. On top is bliss, represented by the *Kālacakra* deity, which is a divine couple in sexual union. This can be seen macrocosmically, with the body representing the Cosmic Being (*puruṣa*) and microcosmically as the body of you and me. (At least that's how I understand it.) These are two perspectives of the total existence — as seen from God and as seen from us. The central axis and peak represents Meru, that pillar that we are now familiar with. The *Kālacakra Tantra* also describes that there are *cakras* along the central axis. You know, those *cakras* that you learn about in *yoga*, that are placed along the spinal column of the body.

If we from Tibet go down to India we find a similar symbol that is even more famous:

The *Śrī Yantra*



You may have heard of *yantras* from India — various geometric, symbolic, and often visually intricate diagrams. The word *yantra* comes from Sanskrit and has its roots in the term *yam*, which means "to sustain, support", and *tra*, which means an instrument or tool. A *yantra* is considered a mystical diagram or device that is used as an instrument for meditation and spiritual practice. The *Śrī Yantra* is the most prominent of them. It is a complex symbol, consisting of interlocking triangles, circles and lotus petals, arranged symmetrically around a central point, the *bindu*.

Again, when we look closer into the *Śrī Yantra*, the mystery starts to unfold. Just as with the *Kālacakra* from Tibet, this form, that we may be used to seeing two-dimensionally, is actually three-dimensional and is often made like

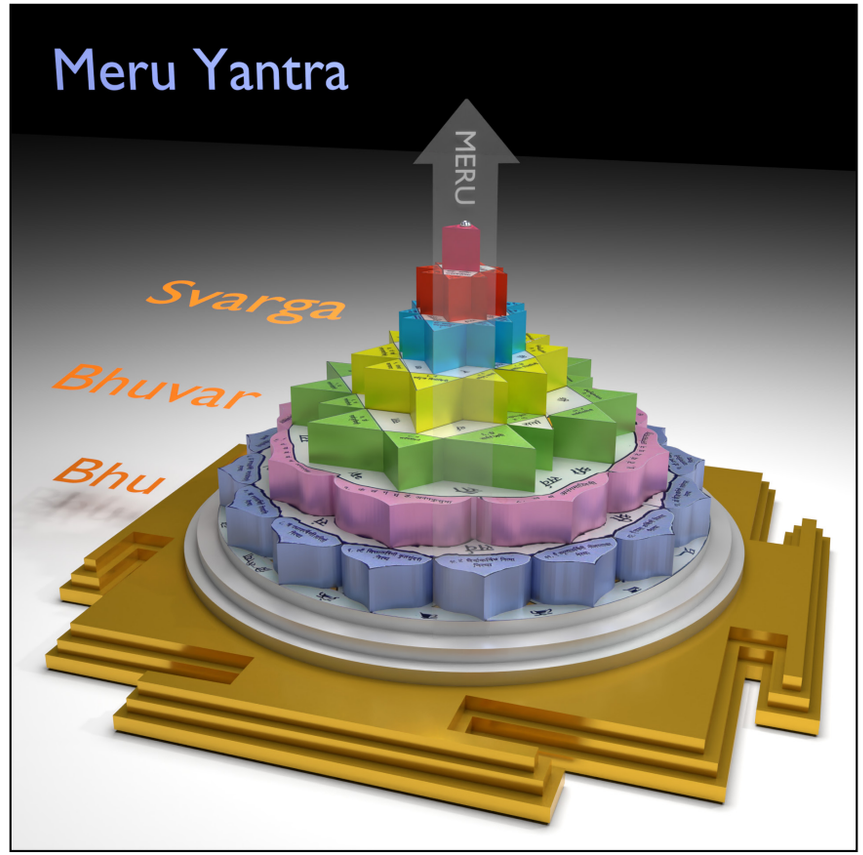
that too. It is then called the *Meru Yantra*. Its central peak is Meru, ascending through the three worlds of the cosmos: *bhū*, *bhuvar* and *svarga*. We also find, represented in the system of triangles, the seven levels leading upwards from the gross physical plane to the highest realms of consciousness.

On a macrocosmic level, the *Śrī Yantra* represents the *virāṭ-puruṣa*, which is the cosmic form or the universal Divine Being. It embodies the manifestation of the entire universe and symbolizes the interconnectedness of all existence. Furthermore, the *Śrī Yantra* also has a microcosmic significance, representing the individual *jiva* or soul. It is then believed to symbolize the body, mind, and soul of the individual. The physical elements are represented at the base, representing the material aspects of existence. The central axis, known as the *merudaṇḍa* or spinal column, corresponds to the subtle energy channels and the seven *cakras*, which are energy centers within the body. The *cakras* are associated with specific qualities, aspects of consciousness, and spiritual awakening.

Thus, the *Śrī Yantra* provides a holistic representation of the cosmic order, the individual's journey of self-realization, and the interplay between the physical, energetic, and spiritual aspects of existence.

What is significant here is that both in the *Śrī Yantra* and the *Kālacakra*, the higher levels of the "building" represent not the existence of physical forms but rather the subtle existence of mind, intelligence and ultimately the *ātma*, the conscious self. It is to be understood as developing from the central *bindu* point which is just that: the fundamental conscious being from whom the body evolves — we as the souls of our bodies, and the soul of the entire cosmic body. Here we are, our consciousness acting in a mind, with an intelligence, through senses, out into a physical world. On the macrocosmic level, the cosmos at large, it shows the Supreme Being, on top of the subtle and gross levels of the cosmic body.

So these two really show a cosmos based on consciousness. And well, the attentive reader may have noticed that these images fit quite well into our cosmic model that we are developing here.



The Śrī Yantra is often made three-dimensionally and is then called the Meru Yantra. Its central peak is Meru, ascending through the three worlds of the cosmos: bhū, bhuvar and svarga.

The Purāṇic Cosmos

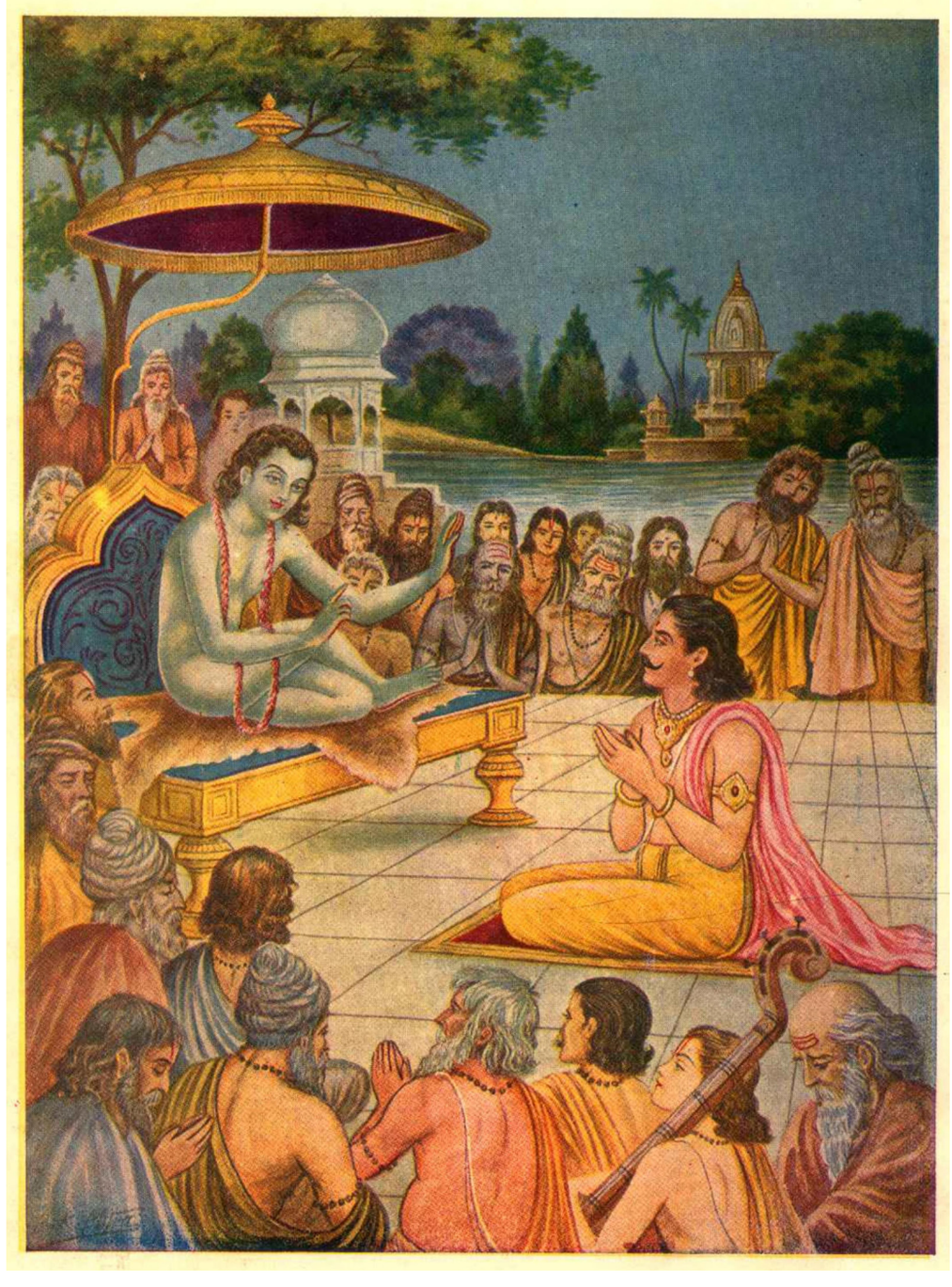
We have found cosmologies across the entire planet that mysteriously appear quite similar, don't they? They also seem to somehow describe the cosmos as based on consciousness, which incidentally even the main founders of quantum physics suggested, leading them towards ancient Indian teachings. So let's continue following that path and see what we find.

My job was about that Vedic Planetarium, presenting a cosmology based on the ancient *Purāṇas* of India, specifically the *Bhāgavata Purāṇa*. So let me return to that. We have gathered clues from different countries, and yet the ancient Indian texts give very detailed descriptions of this whole cosmic view. So let's look into the *Purāṇic* cosmos for a while, to see how it can be understood in the light of what we have found so far, and also shed its own light upon the still rather mystifying model of the cosmos that we have pieced together.

There are eighteen main *Purāṇic* scriptures, and they are described as dealing with five topics: cosmogony, cosmology, genealogy, cosmic cycles (*manvantaras*) and accounts of royal dynasties. The most famous and respected *Purāṇa* is the *Bhāgavata Purāṇa*, and this is the one that we focus on in this book, since the Vedic Planetarium was and is supposed to be based on that one. It is sometimes called the *Śrīmad-Bhāgavatam* or simply the *Bhāgavatam* (which I mainly use here), and that's the one we are now going to dive into.

The Cosmic inquiry

The *Bhāgavata Purāṇa* tells the story of King Parīkṣit, who was cursed to have only one week left to live and thus approached the sage Śukadeva Gosvāmī, asking him what was best to do in that situation. Śukadeva told him that it was to stop being absorbed in the temporary material forms and see the world the way it is. He explained the method of *yoga* and how one should meditate on the cosmic form of God, the *Puruṣa*, thereby learning to see not only the temporary material forms but also the higher, permanent reality behind them, which is beyond birth and death.



Śukadeva begins by describing the cosmos as the body of God, the *virāṭa-puruṣa*[17]. The legs of that cosmic body represent the lower of the three worlds, the *Pātāla*, consisting of seven realms. The hips represent the middle world — the earthly realm — and the navel, chest, neck, mouth, forehead, and head represent the *lokas*, realms in the higher of the three worlds. So again, here we have the three worlds with seven upper and seven lower realms.

This is where the cosmology of the *Bhāgavatam* starts, from the very beginning of its main story, by the first words from Śukadeva Gosvāmī to king Parīkṣit. He immediately paints a cosmos that we recognize from our simple pencil drawing so far, don't we? And again, it is a cosmos that is recognized not only by the forms seen in the physical space but — most importantly — as the totality of life, with the Supreme Soul at the top and center, and all of us living in the three worlds. In fact, when describing this cosmic body as representing the seven higher and lower worlds, it also describes living beings on four different levels of development — *brahmāṇas*, *kṣatriyas*, *vaiśyas* and *śūdras*. So the way of looking at the cosmos here is not mainly about places but about life.[18] The purpose is not to give astronomical information. The king was dying and needed the most important knowledge about life and death, so Śukadeva teaches him the yogic process of ascension through the seven levels (*cakras*), finally reaching the top to liberation from this material existence. The model of the cosmos that we are now familiar with is here used both macrocosmically (the big cosmos that we all share) and microcosmically (the private lives of us individuals).

Why is this the first thing he starts talking about to a dying king? It is because he is describing the cosmos world the way it is. He is giving the actual understanding of what this model, this way of depicting and illustrating the cosmos is about. It's not just about matter in space and all that, objects, but about how this is basically going on in consciousness. The levels and worlds and all of that are really to accomodate different levels of consciousness, from the lowest most primitive animalistic selfish life to the enlightened life of heavenly existence. He is telling the king that as you only have a few days left to live, you should learn to see that all these forms and objects, including your kingdom and everything enjoyable, are just like objects in a dream. By doing so you will wake up, and then when you die, as it is called, you will return to reality. That's the purpose of knowledge, and of course of the entire Śrīmad-Bhāgavatam.

The virāṭa-puruṣa, as described by Śukadeva Gosvāmī at the very beginning of speaking the Bhāgavata Purāṇa, showing the three worlds and the seven upper and lower realms, lokas.

The king then asks more specifically how this cosmos was created.[19] Śukadeva answers by telling a story about how Brahmā, the creator of the entire cosmos, is asked the same question by his son Nārada. Brahmā answers by again first explaining that this entire world is manifested by the illusory energy, *māyā*, of *Bhagavān*, the Supreme Being. A remarkable explanation of the creation follows throughout the *Bhāgavatam*. Let's see if we can understand it.

The Creation Story of the *Bhāgavata Purāṇa*

All of existence is ultimately *Bhagavān* — the Supreme Personality of Godhead, who expands into many living beings in many worlds, for enjoying pastimes. We are like rays of God, same in quality but infinitesimal rather than infinite. Thus we have the same creative propensity as God, in a small portion. So we are free to dream up our own worlds that we can play around in. But, being limited, we may also mess those worlds up.

The world we are in now is such a realm, where each one of us can act out our desires to be and do what we want. That is why the creation of the material world takes place, and it happens like this:

In the real world, called *Vaikuṇṭha* (which means "the world without anxiety"), a cloud appears in the sky. In this cloud there is an ocean, called the Causal Ocean. In that ocean, God lies down in His form as Mahā-Viṣṇu, together with His consort Mahā-Lakṣmī, on the bed of a many-hooded serpent called Ananta Śeṣa. He dreams, and with every breath universes appear from His body like bubbles and disappear again, like foam at the shore of the ocean, just between the real world *Vaikuṇṭha* and the dreamworld of *māyā*.

In each such bubble, which is half-filled with water, Viṣṇu and Lakṣmī again lies down on the Ananta Śeṣa serpent, and from Viṣṇus navel a shining lotus flower sprouts. In the whorl of that lotus, the first resident of the cosmos is born, the four-headed Brahmā. He creates the three worlds in the cosmos, including the one we are in now.

Then into Brahmās creation, Viṣṇu again enters, simultaneously present in the hearts of each one of us and as the cosmic consciousness underlying and upholding this manifest world.

That's it, and now you know how the creation took place and how this cosmos came about. Any more questions?

I guess so. Let's try and look at what this story could mean. When we hear it we of course tend to get images in our minds that stem from our own experiences of what is a cloud, an ocean and so on. And we have seen colorful Indian paintings showing Viṣṇu with four arms lying there on the serpent bed with Lakṣmī at His feet. But let's first remember that whatever is being described here takes place at a level far above and beyond the world we experience with our senses now and can picture in our minds — even going on outside of what we perceive as time (which as we shall see enters at a certain point in the creation process).

I know some would consider it an allegorical story, and others don't like that because they think that then it is not real. But how else can something entirely beyond our material senses be described other than by using objects from our world as examples? Well, that is what allegory is. What it describes can be totally real, but it metaphorically uses words and examples that are familiar to us Earthlings. That is why this older wisdom is often presented as stories that appear fantastic and sometimes absurd for those who don't know what they are actually about.

In any case, the story does not stop there. The *Bhāgavatam* goes on to fill in the details, giving an amazing account of the creation, which may be a bit hard to see though, since it is spread out through the text and you need to piece it

together a bit to understand it. Let's try — and possibly also place it alongside modern scientific views, from quantum physics and other theories discussed today. For instance, it all has to start with something, right, so let's begin with:

Brahman — the Energy of It All

How do you make a cosmos? What does it ultimately consist of? If you ask physicists today, they may tell you their theory of how the physical world came about: A Big Bang when something or nothing exploded and there were suddenly lots of stuff and laws of nature that everything started following, and it is all made of some energy that sometimes manifests as particles, sometimes waves and make up everything. You may then ask what that energy is that everything is made of, and where did it come from? They will then probably answer that yes, there is the Unified Field theory to explain that. However, that theory is still not ready but under development and has been so for one and a half century. They like to say that one day when the theory is complete you can have the recipe for the cosmos as a formula on your t-shirt. I have not seen any such t-shirt yet — not to speak of one with the formula for consciousness. But there is some energy here, right, and nobody can deny that. (Well some physicists actually do, but that's another story.)

The creation story of the *Purāṇas* also starts with an energy. You may have heard about it: Brahman (and a primal vibration: OM. Actually in Quantum Field Theory (QFT), which many prominent quantum physicists endorse, matter is not seen as a grid of particles but more as a matrix of energy exhibiting vibrations at different frequencies, but you already learned that in school didn't you?[20]). That is also what Śukadeva starts with — the source of this existence is the *brahmājyoti*, the effulgence of the Supreme Being, with all of us and all energies like rays from that sun.[21]

So we start not with nothing, and not with some dead matter, but with an energy that is also living and conscious and is the very basic existence of every-

one and everything. *Sarvaṁ khalv idaṁ brahma,* as the *Upaniṣads* famously say.[22] As we could expect then, the cosmogony and cosmology (creation and nature of the cosmos) in the *Purāṇas* is a process going on in consciousness. What we call matter, the forms we can experience with our senses, develops from mind, much like a dream does.

Again, in western philosophy that approach also exists and is called idealism, and it was that view that those prominent quantum physicists started looking into, as a result of their discoveries, which also led them to these teachings from India.

In a nutshell, Brahman, when taking on the three *guṇas* and being activated by time (*kāla*), manifests the false ego (*ahaṅkāra*), the material mind (*mānasa*), senses (*indriya*) and intelligence (*buddhi*), and the sense objects (*mahābhūtas*).[23] And well, that is us in this material world, and there you basically got the cosmogony of the *Purāṇas*. Just in case you still have some questions, let's go through those steps of creation one by one and try to understand them.

Māyā appearing to serve Viṣṇu by creating the dreamy illusion of the material existence.

Māyā — the Grand Illusion

Speaking of energy, there is also *māyā* — sometimes described as an energy, sometimes as an illusion — forms that seem to exist but aren't what they seem to be, much like a dream. Thus it is often called "illusory energy".

So what is *māyā*? It is an illusion that makes us not see reality as it is. There is *mahā-māyā* and *yoga-māyā*. *Mahā-māyā* is the illusory energy that makes

us think that the world of matter is real and either there is nothing beyond it or just something that doesn't concern us. The other one, *yoga-māyā,* is very interesting but kind of beyond this book. It is another form of illusion, where you may have God as your personal friend but not knowing who it really is. For instance, in the tenth canto of the *Bhāgavatam* it is described how Kṛṣṇas father, Nanda Mahārāja, once saw Kṛṣṇa's opulence as God, but nonetheless he thought of Kṛṣṇa as his son.

I guess the dream example is a good way to understand *māyā*. We all know that feeling when, just as we fall asleep, we forget ourselves and this world and slip into that other realm wherein the dreamworld soon appears and draws us in. Then we think of that as reality, and we are not even aware of the existence of this world where we are now (or think we are). The realm wherein our dream is going on is of course existing as some kind of mental fabric in the bigger cosmos, much as this world we are in exists in the energy of Brahman. But then there is this mystical, hypnotic spell that comes over us, making us think of the dreamworld as real while forgetting this world.

Entering a different cosmos

Before we continue, let's stop and take a look at all this. As you can see, the cosmos described here is a bit different from what we may be used to. It's not just the world we see through the eyes of these bodies, however far they can reach with their telescopes and microscopes. It's not just about your location as a physical body in a physical space. It is about your location as an incredibly rich and deep living being in a world of countless other incredibly rich and deep living beings.

Turn within and take a step back from the surface world out there, and where are you? You are in a mental realm, with so much going on there. You can feel your body from the inside; how does it feel? There is some energy in there right? And if you close your eyes, there are still forms of light and the sound of thoughts in there, right?

We can go on exploring our own personal world in that way. And if some hardcore materialistic science believer then comes and tells you that no, that inside world does not exist, then well, what do you say? Of course it exists, even primary to that physical realm out there which we anyway only know in terms of our mental image of it.

If you can see it that way; if you can at least experimentally step into that

larger cosmos, which includes both the physical world that we see through these physical senses and the mental, subtle realm. If you can be there, at least for a while, then you may be able to understand this cosmic model of the *Purāṇas* and other traditions. The one we are just trying to paint and understand in this book.

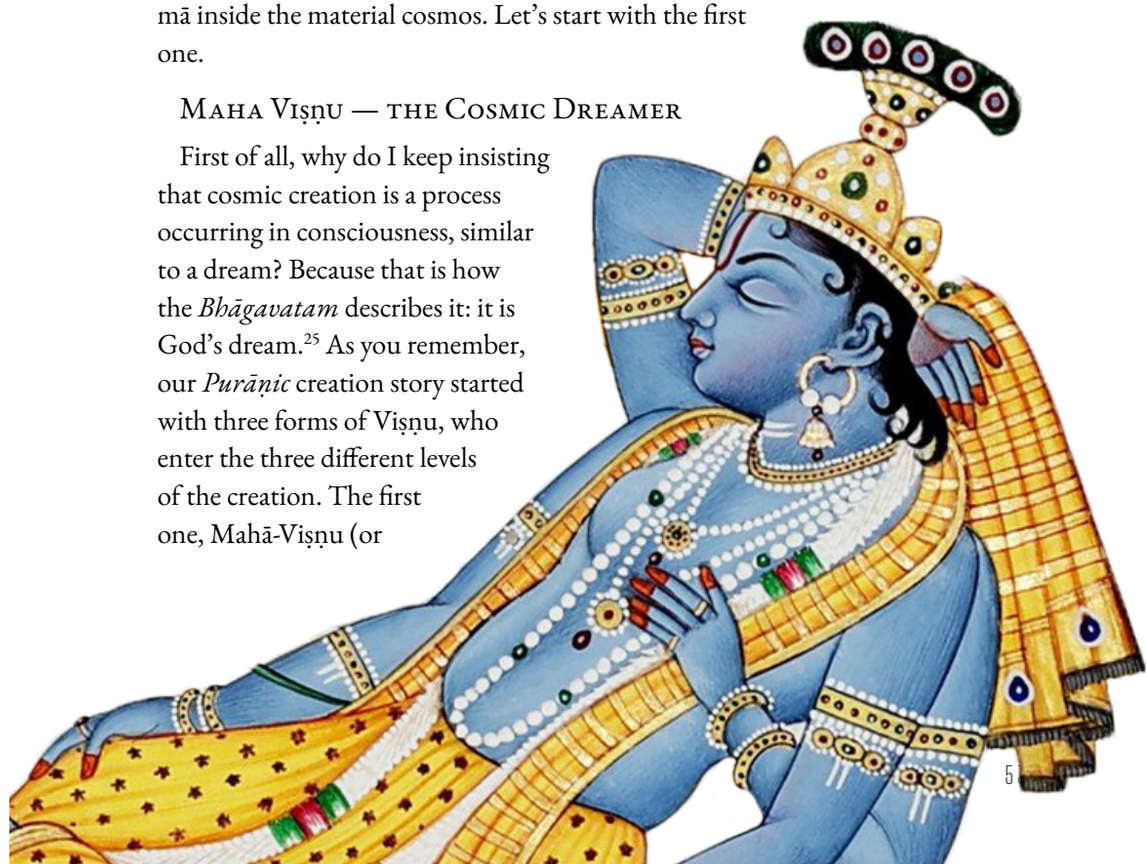
It may be tempting for a mind steeped in the western worldview to look at these old cosmic images and try to somehow place them within that physical space that we have been trained to see as Reality. But they are different, much broader. They see and describe the cosmos the way you see it now, in our little thought experiment here. And once we catch that fact, then these old images and stories start to get really interesting. So let's just stay there for a while and move on to:

The first level of creation (sarga) — by Viṣṇu

The *Bhāgavatam* deals with ten topics, and the first two of them are *sarga* and *visarga*.[24] *Sarga* refers to the creation of the material realm as such, by *Mahā*-Viṣṇu, and *visarga* is the subsequent creative work of Brahmā inside the material cosmos. Let's start with the first one.

Maha Viṣṇu — the Cosmic Dreamer

First of all, why do I keep insisting that cosmic creation is a process occurring in consciousness, similar to a dream? Because that is how the *Bhāgavatam* describes it: it is God's dream.[25] As you remember, our *Purāṇic* creation story started with three forms of Viṣṇu, who enter the three different levels of the creation. The first one, Mahā-Viṣṇu (or



Kāraṇodakaśāyī Viṣṇu), lies down in the Causal Ocean (*kāraṇārṇava jale*) in what is called *yoga-nidrā* (divine sleep). In His body, all the living beings who are desirous of entering and enjoying in the material world rest in the state of *suṣupti* — deep sleep.

This can be compared to our deep sleep at night when there are not yet any dreams — our unconscious mind. There are not yet any forms, but then ... desires emerge like bubbles, craving forms. They cause the dreams to take shape. That state is therefore also called *kāraṇam*, the causal level. (We also find that in modern psychology. For instance, Sigmund Freud discovered, in his research into the mind, what he called the "dreamwork" — a deeper, still "unconscious", level of the mind where dreams do not yet exist but that produces the dreams, by desires, fears, and so on.) In this way, even our daily life in the three realms of wakefulness, dream and deep sleep is understood as a microcosmic equivalent to the original macrocosmic event described in this story.

(If you are a Bhāgavata follower, you may ask where I got that from. It is all there in the *Bhāgavatam* too — in the teachings of the *catur-vyūha*. We will get to those a little later here.)

Mahā-Viṣṇu's dreamwork transforms Brahman (*nirguṇa* Brahman) into an appearance (*saguṇa* Brahman) that is the foundation of material existence. (If you happen to be an Advaita Vedantist and have heard of *nirguṇa* as meaning without qualities at all, the *Purāṇas* rather explain the *guṇas* as the three fundamental qualities of *material existence,* characterized by beginning, sustenance and end, as fleeting reflections of the true forms existing in the real world beyond it. You know Plato's cave and that.) The *Bhāgavatam* is repeatedly emphasizing that although Mahā-Viṣṇu dreams and His dream is the material world, He is not really bewildered or controlled by that dream — being God after all — but does it as a *līlā*, a pastime, and to manifest this place for us to fulfill our dreams.

The Three *guṇas*

The very first step in the creation of this material world is when the Brahman energy takes on what can be called material qualities, and is then called *saguṇa* Brahman. Those material qualities are in Sanskrit called the *guṇas*. This word *guṇa* is quite important. The word itself means "quality" or "characteristic". There are three *guṇas*, or "modes of nature" that this entire material existence is characterized by you could say. They are:

Sattva-guṇa — "the mode of goodness"

The Sanskrit word *sat* means "enduring existence". It is also often used to denote "truth" and "reality", since the more real something is, the more endurance it has. (Yes, this is how reality and unreality are defined in the Vedic tradition: Reality is that which lasts, *sat,* and what does not last but ceases to be after some time is not real but is *asat*.) That state of clarity, harmony and peace is called *sattvic*, and according to the *Bhagavad-gītā* it is happy.[26]

Sattva-guṇa also refers to what upholds the existence of that which has been created (by *rajo-guṇa*).

Rajo-guṇa — "the mode of passion"

This refers to the passionate mode. It is where the stillness of *sattva-guṇa* is agitated by a creative desire. Like when your mind is stirred up by desires for things that you want. There is passion and action. Everything that will appear and happen in the material world is instigated by this *rajo-guṇa.*

Tamo-guṇa — "the mode of ignorance"

This is when the forms that have been created by *rajo-guṇa* and upheld by *sattva-guṇa* eventually dwindle and disappear. It is also called the mode of darkness. It is about destruction, chaos, unreality. It is when that which seemed real eventually disappears as an illusion.

The *Bhāgavatam* explains: "These three modes of material nature, being further manifested as matter, knowledge and activities, put the eternally transcendental living entity under conditions of cause and effect and make him responsible for

The three guna-avataras, Brahmā, Viṣṇu and Śiva, with Goddess Durga, the mother of material nature.

such activities."[27]

These *guṇas* are so fundamental that they are represented by three *avatāras*, divinities, called the *guṇa-avatāras*. They are Brahmā (*rajo-guṇa*) who creates, Viṣṇu (*sattva-guṇa*) who upholds what has been created, and Śiva (*tamo-guṇa*) who eventually destroys. They really represent modes of consciousness, which we also find powering our lives in this world: we desire something and thus create it, we maintain it for a while and then we end it.

Time

What is time? It is a superior force that causes beginning, sustenance and end to all things, including our bodies here. So it can be seen as the power of God, ultimately dictating over everyone and everything in this world.

So time, in Sanskrit called *kāla*, is related to what we just mentioned, the *guṇas*. In fact, time is described not as linear but as cyclic, and is likened to a wheel — *kālacakra* (remember that Tibetan chakra made of sand?) — that represents the activity of the *guṇa-avatāras* — Brahmā, Viṣṇu and Śiva. And yes, at the most fundamental level, this existence we are in is ruled by that wheel of time, causing repeated creation, maintenance and destruction, everywhere from the highest cosmic level down to our daily lives. Time is described as the primeval source of the interactions of the three *guṇas*.[28] The *Bhāgavatam* describes cycles of time, from the longest time spans of the entire cosmos down to the shortest ones called the *paramāṇu*[29], and how different living beings in different worlds of the cosmos are controlled by different time cycles. However, even the entire existence of this cosmos is said to be just a short moment in the real world.[30]

Time, *kāla*, is the framework within which everything happens in the cosmos, and is thus seen as a form of God, Hari, giving, preserving and taking away. Then once all the temporary things are over, there is only reality left. So although we may spend time chasing our dreams, fearing the end that we call

death, it is the very presence of that obvious evident supreme power that eventually brings us back to reality.

Mahat-tattva

When the *guṇas* are agitated by time, the *mahat-tattva* appears. What is the *mahat-tattva*? It is described as consciousness that is affected by the *guṇas*. Who's consciousness? Well, since we are still at the first level of creation (*sarga*), the creation by Mahā-Viṣṇu, it is actually the consciousness of Viṣṇu, God, that takes on those modes, *guṇas*. Does that mean that God enters the dreamworld of *māyā* and is under the influence of the *guṇas*? No, as we already mentioned it is emphasized in the *Bhāgavatam* that Viṣṇu is always transcendental to this material creation but chooses to dream like that for our sake, and for the sake of enjoying pastimes.

This subtle shift from pure consciousness to consciousness affected by the *guṇas* is, for those who may be interested, the point where Viṣṇu shifts to Śiva[31], meaning where God appears in a form that is still God but appears a little different. Mahā-Viṣṇu is also called Sadāśiva, and the relation between Viṣṇu and Śiva is described as that between milk and yoghurt — both are milk but in different forms, one derived from the other.

The *mahat-tattva* is sometimes likened to a cloud on the spiritual sky, *brahmājyoti*, a "covered portion".[32] In his purports to the *Bhāgavata Purāṇa*, Śrīla A.C. Bhaktivedānta Swami writes, based on the understanding given by the *Gauḍīya Bhāgavata* scholars: "The *mahat-tattva* is the total consciousness because a portion of it is represented in everyone as the intellect. The *mahat-tattva* is directly connected with the supreme consciousness of the Supreme Being, but still it appears as matter. The *mahat-tattva*, or shadow of pure consciousness, is the germinating place of all creation. It is pure goodness with the slight addition of the material mode of passion, and therefore activity is generated from this point."[33] It is described as the "junction of matter and spirit wherefrom the false ego of the living entity is generated."[34]

Ahaṅkāra — the False Ego

When the *mahat-tattva* has appeared as consciousness influenced by the *guṇas* and time, something interesting happens. The False Ego appears. *ahaṅkāra*. This word deserves more explanation. The word *ahaṁ* means "I", and *kāra* means "making". So what it means is just that: When the "I",

meaning the self, the conscious person, makes up another identity, appearing seemingly as the real person but not actually being so, then that is *ahaṅkāra*, false ego.

So what happens at this stage of creation is that now, in this new dreamy realm, a sense of an identity appears. However, that is not a real identity but a created sense of self, wherein a person can enter and play different roles. Again, the *Bhāgavatam* repeatedly compares this material realm to a dream, and we are all familiar with suddenly finding ourselves inside a dream as if we have an identity in there. But that is a false identity. This is a good example to understand the appearance of *ahaṅkāra*. It is about the very act of entering this material realm and taking on another persona at the stage of our creation story.

Since everything within this material realm is controlled by the *guṇas*, three modes of nature, so is *ahaṅkāra*. It thus manifests in three forms: in *sattva-guṇa* as the mind, in *rajo-guṇa* as intelligence and senses, and in *tamo-guṇa* as the physical elements. Let's look at these three one by one:

The Mind[35]

You are a conscious being, and what is the first sign of your consciousness? The mind. You think. So when the pure consciousness identifies with the material realm and wants to enter it to act in there, that consciousness first develops a material mind to act with. Meaning a mind that appears just like original pure mind but which is under the material modes.

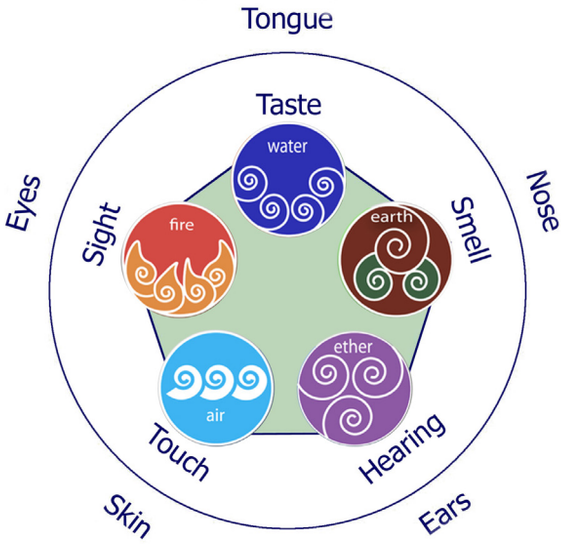
More specifically, that material mind appears through the *ahaṅkāra* in *sattva-guṇa*, the mode of goodness. It is just clear, still consciousness, the space where the activities of our senses and intelligence can take place. That action starts as the *ahaṅkāra* continues into *rajo-guṇa*, the mode of passion:

Intelligence and Senses[36]

The mode of passion, *rajo-guṇa*, means desires are there, creativity is going on, things are happening. How? By intelligence and senses acting. The intelligence works in the mind to figure out how to get desires fulfilled. Senses here means the outreach of the conscious mind with the faculties of hearing, touching, seeing, tasting and smelling. When those senses are present they desire objects, leading to:

The Sense Objects — the *mahābhūtas*. Physical matter.[37]

This is where matter come into being. The physical elements. In Sanskrit they are called the *mahābhūtas*. And again, if "physical elements" makes you think of little atoms pieced together into objects in space, you need to clean your slate. Because this is where it leads out of the box, and it gets very interesting for those who can think outside it.



The mahābhūtas: The five senses acting in the mode of tama-guna give rise to the sense objects, as the five gross elements.

Hearing — space

The first sense that is activated in this physical realm is that of hearing. When the sense of hearing starts acting within this realm then its object appears: sound. Sound is that which the sense of hearing perceives. And the most subtle physical element appears as it's medium: space, ether. In his commentary to the *Bhāgavatam*, Śrīla A.C. Bhaktivedānta Swami writes: "By our sense perception, the beginning experience is the sky. Sky is the beginning of form. And from the sky, other forms emanate. Therefore the objects of knowledge and sense perception begin from the sky."[38] Sky here meaning space itself, which is of course a medium, since for instance radio waves can travel through it.

In the *Bhāgavatam*, sound is described as a vibration in space, carrying some kind of information.[39]

Touch — air

The next sense that enters this *ahaṅkāra* realm is that of touch. Touch is an impulse that give the perception of some form. It may be hard, soft, hot, cold and gives the impression of some tangible object. Its element is what is translat-

ed as "air", and that really means energy that is perceived by touch impulse.[40]

Now, each element that appears here contains the qualities of the more subtler ones, so the element of air can both convey the sense perception of touch and that of sound.

Sight — fire

Next, the sense of sight enters. Its object is light, the element "fire", which means form that can be perceived by sight. For something to be seen there has to be light. Again, since each element contains the qualities of the subtler ones coming before it, on this level we have objects that can be touched, seen and heard — in other words, objects that appear rather real and substantial. Only two remain:

Taste — water

The sense of taste enters, with it's object that is the element "water". And yes, the tongue that tastes is watery. The *Bhāgavatam* explains: "By the interaction of fire and the visual sensation, the subtle element taste evolves under a superior arrangement. From taste, water is produced, and the tongue, which perceives taste, is also manifested."[41]

Smell — earth

And finally, the sense of smell and it's object which is described as the element of earth. And yes indeed, earthy things do smell. The *Bhāgavatam* explains: "Due to the interaction of water with the taste perception, the subtle element odor evolves under superior arrangement. Thence the earth and the olfactory sense, by which we can variously experience the aroma of the earth, become manifest."[42]

When we modern people talk about physical elements we probably either think of them in terms of the periodic table of modern chemistry, or the four elements of air, fire, water and earth which we find in the older European tradition. We may interpret the element "air" as gaseous substances, water as liquids in general, earth as solid form and so on, because we are used to seeing matter as an objective existence made by some "stuff". But this is actually not the way these *mahābhūtas* are described. As we have seen here, each element appears from sense perception (*tan-mātra*). For instance, "air" is about the sense perception of touch entering the scene. Then its object appears: form

that is invisible but can be touched. The element name "air" thus describes the very base characteristic of the objects of touch. In empty space there is no touch sensation (however, space can carry sound, for instance as radio waves). Remember that what is being described here is really how the dreamworld of the Cosmic Dreamer, *Mahā*-Viṣṇu, is developing.

So even the appearance and nature of what we perceive as physical matter is here actually described not as independently existing objects but as forms appearing in consciousness, much like the forms perceived in a dream. Or those in a virtual reality game, for instance. None of us would claim that the forms we dealt with last night in our dream, whether pleasurable or painful, do exist there somewhere on their own, independently of us dreamers. We are rather the "gods" of our dreams which are created by our deeper minds. So what is being described here in the *Bhāgavatam* is a similar process, taking place in the mind of God.

There we've got the basic cosmology of the *Bhāgavata Purāṇa*, at least the cosmogony for how the fundamental existence of this material world came about. In the next level of creation (*visarga*) we will look at the creation by Brahmā.

But before we move on to that, I think we need to take a break.

The second creation, by Brahmā, visarga

Here we are, with the Great God, Mahā-Viṣṇu, sleeping in the Causal Ocean, with His consort Lakṣmī (who is often shown sitting humbly by His feet but who in fact plays a major role in the creation, so we will learn more about Her later), on a bed that is the serpent Ananta Śeṣa. At this point in our creation story, Mahā-Viṣṇus dream has just begun, starting with the *mahat-tattva*, the dreamy consciousness, and the *ahaṅkāra*, the ego acting within that dream. (As we said before, Śiva is mentioned as representing the *ahaṅkāra*, the false ego[43], much like in a dream we act as someone who is not really ourselves.) Then, in the mind that starts to act within that dreamworld, forms begin to appear — so far only as the fundamental sense perceptions of *s*ound, light, touch, taste, smell and their objects (the *mahābhūtas)*. And behold, here is the stage whereupon the drama of material existence can now begin, and we, the sleeping *jīvātma* souls, can soon wake up into this dream too and get the action we desire.

But not yet. What we have now is just ... an egg.[44]

Three oceans with a serpent and a sleeping God

For a thousand years, this egg, shining like gold, lay there in the Causal Ocean (Kāraṇa), in an unconscious state, with no soul having entered into it yet.[45]

That egg was then fertilized, and within it another ocean appeared, called Garbha. On this ocean sleeps another form of God, also resting on the Ananta Śeṣa serpent: Garbhodakaśāyī Viṣṇu. Yes, another creator form of God, sleeping on another serpent, on another ocean.

From Him, a seed then gives rise to a golden, shining lotus flower, containing another ocean, called Kṣīra. Therein, you guessed it, we find the serpent again and another form of God resting on it. His name is Kṣīrodakaśāyī Viṣṇu.

So here we are, with three oceans contained within each other, each one featuring a serpent called Ananta Śeṣa, upon whom an incarnation of God — a *puruṣa-avatāra* — sleeps.

What in the world is all that about?

The oceans

So we've got the Causal Ocean (Kāraṇa), then the ocean in the golden egg (Garbha), and the ocean within the lotus flower (Kṣīra). We've already examined the first one a bit. It is, just as the name suggests, the original causal level. In fact it is compared to the stage of deep sleep (*suṣupti*), where no dreams yet exist but from where they appear, "bubbling up".

These "bubbles" then float on the surface of that ocean, and within each, described as golden eggs, another level of the creation process unfolds in another ocean. This one is called *garbha-udaka-śāyī*[46], where *garbha* is translated as "womb", *udaka* means "water" and *śāyī* means "resting, sleeping". This realm is sometimes referred to as Hiraṇyagarbha, which can mean "golden womb". In fact this is what is happening here: The Supreme Personality of Godhead impregnates this egg in the womb of material nature with His *vīrya*, likened to semen, and there appears Garbhodakaśāyī Viṣṇu on the "womb water" in this egg. It's a nice way of describing a creative process, and here again, in this cosmic mind, the dream of God continues.[47]

In fact, when we look deeper into this knowledge (which we will do in a later chapter), we find something interesting. While the first ocean represents the dreamless, causal stage (*suṣupti*), this ocean is where the forms of the dream start to appear. It is compared to an embryo starting to grow inside an egg

or womb. Again, the first stage of creation, *sarga*, was about consciousness getting touched by the material modes of nature (*mahat-tattva),* giving rise to a false ego (*ahaṅkāra*) and fundamental sensory forms (*mahābhūtas*) in this dream. And indeed, we find this second level of creation compared to *svapna*[48], the dreamworld.

Then, from the navel of this sleeping God, appears the lotus flower that is the entire gigantic universe, the *virāṭ*, containing all the fourteen worlds that we have already learned about from the very beginning of the Śrīmad-Bhāgavatam.[49] It is the reservoir of all the living beings that will take birth within this universe and wake up inside this dream as if it were real.[50]

In this lotus is another ocean, Kṣīra. *Kṣīra* is generally translated as "milk" but can also mean "the milky juice or sap of plants". How should we understand this third ocean? Well, at least to me, that role of Viṣṇu as nourishing and upholding us in this material nature would be rather beautifully poetically described in that way. And this is what is going on here: the stage of creation where this nature, with all of us in it, is growing and thriving.

It is rather common in older cosmology, especially the one from India, to compare the cosmos to a lotus. In fact, this is true not only for this material cosmos but for the entire existence, starting with Goloka, the highest realm of God, which is described as a lotus with thousands of petals.[51] And down here in the physical space that we find ourselves in now, the Earthly realm (*Bhūloka*) is likened to a lotus flower as well.[52] Even the microcosm of our bodies is described in terms of a "stem", the spinal column, with a serpent (*kundalini*) sleeping at its root and a thousand-petaled lotus flower on top of the head. That lotus flower represents Brahmaloka or Satyaloka, which the yogi will eventually reach after ascending through the inner "realms" of seven different levels of consciousness (actually fourteen, including the lower, darker side of our minds).

So a golden lotus and milk. Well, regarding gold, the Vaishnava *ācārya* Śrīla Bhaktisiddhānta Sarasvatī Thākura explains that "gold" here means "the dim reflection of pure cognition".[53] He also explains that this knowledge is rather esoteric. Thus, we might need to free ourselves from thinking of "milk" merely as the white liquid we get from our earthly animals. In a more metaphysical sense it can be seen as nourishment to life.

The stem of the lotus contains all the *lokas*, realms of the cosmos, and all the living beings who are about to appear in those worlds. If we then try and

picture a lotus stem and flower that somehow contain those seven higher and seven lower *lokas*, what picture do we get? Well, I would say we just look back at the first teachings from Sukadeva to Pariksit (image). Or we find another image showing a more pronounced lotus form.

Indeed, the abode of Kṣīrodakaśāyī Viṣṇu is said to be up there, on the head of the *virāṭ-rūpa* body. There He is resting on an ocean of milk, or perhaps an "ocean" created by that nourishing flow rising up through the lotus stem. In this way, it is described, Kṣīrodakaśāyī Viṣṇu, also called Paramātmā or Supersoul, nourishes and upholds the entire *virāṭ*, cosmos, being present in the hearts of each and everyone of us.[54]

So seen this way, these three "oceans", describe a process compared to fertilization, pregnancy, and birth. Or as the three stages of deep sleep, dreaming and wakefulness, which we will look more into later.

The sleeping God

Can God sleep? Well, again, what is described here is not the bewildered, snoring, dull state that we know as sleep. It is called *yoga-nidra*. As the Śrīmad-Bhāgavatam explains: "You do not sleep like an ordinary human being, for You are always in a transcendental stage, beyond the creation of the material world, and You always feel transcendental bliss. As Kāraṇodakaśāyī Viṣṇu, You thus remain in Your transcendental status, not touching material objects. Although You appear to sleep, this sleeping is distinct from sleeping in ignorance."[55]

Srila Bhaktivedanta Swami writes:

> The three puruṣas — Kāraṇodakaśāyī Viṣṇu, Garbhodakaśāyī Viṣṇu and Kṣīrodakaśāyī Viṣṇu — all have a relationship with the material energy, called *māyā*, because through *māyā* They create the material cosmos. These three *puruṣas*, who lie on the Kāraṇa, Garbha and Kṣīra oceans respectively, are the Supersoul of everything that be: Kāraṇodakaśāyī Viṣṇu is the Supersoul of the collective universes, Garbhodakaśāyī Viṣṇu is the Supersoul of the collective living beings, and Kṣīrodakaśāyī Viṣṇu is the Supersoul of all individual living entities. Because all of Them are somehow attracted to the affairs of the material energy, They can be said to have some affection for *māyā*. But the transcendental position of Śrī Kṛṣṇa Himself is not even slightly tinged by *māyā*. His transcendental state is called *turīya*, or the fourth-dimensional stage.[56]

The Serpent

The serpent, Ananta Śeṣa, appearing from the ocean, in all three cases, is no ordinary serpent either. He is Saṅkarṣaṇa[57], who is a direct expansion of God, Viṣṇu, but with a special mood of being a servant as a brother, Baladeva. He has his own story, that we may also get to later. For now, He serves as the "bed" for Viṣṇu, keeping Him dry and protected from the material ocean below, you could say. And he is beautifully described:

> Brahmā could see that on the water there was a gigantic lotuslike white bedstead, the body of Śeṣa-nāga, on which the Personality of Godhead was lying alone. The whole atmosphere was illuminated by the rays of the jewels bedecking the hood of Śeṣa-nāga, and that illumination dissipated all the darkness of those regions.[58]

Which introduces us to another important person in this story:

Brahmā — the first living being in this cosmos

Here we have a lotus, spread all throughout the space of the new cosmos.[59] It is dazzling, effulgent like a thousand suns, and it contains all the *jīvas*, us living beings who are about to wake up inside this cosmos and get into action.[60]

Then one of us wakes up, finding himself in the whorl of that lotus. This is the first *jīva* who appears in the cosmos, and he is called Brahmā. Just in case you didn't know, *jīva* or *jīvātmā* refers to us individual living beings, who are parts of the Supreme Being, God, same in quality but limited, like the rays of the sun or twigs of a tree. This entire dreamy material realm has been manifested by our desire, for us to play around in. Just as the world at large is really the *līlā,* playful pastimes, of God, so do we have that freedom to make up our own worlds to play around in. But since that is our fantasy world, it is described as a dream.

So Brahmā, although being the first living being and creator "god" of this cosmos, is not actually God but a *jīva* like you and me. And here he is, in what is likened to a lotus, which is really the collective aggregate of all the souls who are about to enter into this cosmic manifestation. It is shining brilliantly from the effulgence of all those souls.

Brahmā is called Svayambhū — "the self-born", and also *svarāṭ*, meaning "independent". Indeed, the *jīva* is sometimes described as the "separated part and parcel" of God, and thus, although of course fully dependent on God,

has a certain independence too. So here is Brahmā, finding himself as an independent god over his own world. And that's where the second level of the creation, *visarga*, starts.

At first he is bewildered, then he starts to explore all the four directions of this space he finds himself in, thus generating four heads. However, at first he has no idea what to do, or where he himself came from. Then he realizes he is not alone. And as we have already learned, inside the lotus flower that contains all the worlds of the cosmos, God has entered in His third *puruṣa* form, Kṣīrodakaśāyī Viṣṇu, present in the heart of every living being in the cosmos as Paramātmā, Supersoul.

The Supersoul in the Heart

In the Bhagavad-gītā, Lord Kṛṣṇa says to Arjuna: "I am seated in everyone's heart, and from Me come remembrance, knowledge and forgetfulness."[61] In the *Śrīmad-Bhāgavatam* this is further explained by a nice example:[62] The *jīva* soul (you and me) are likened to a bird sitting in a tree (our body) and enjoying its fruits — some sweet and some bitter. Together with us is another bird, our best friend. The two birds are of a similar nature, but the other, who does not eat the fruits, is Paramātmā, the Supersoul. He is there as our friend by our side, and gives us intelligence to do what we want to do.

Thus He gives intelligence to Brahmā to create a cosmos, and to you and me to create or accomplish what we want to do here. But when we, rather than acting on our independent whimsical desires, turn to Him for guidance, He gives us intelligence to return to reality again and wake up from the dream.

Brahmā then decides to start creating the different realms within the lotus flower, so he divides it into first three and then fourteen divisions of worlds, making up the fourteen *lokas* of the *virāṭ-rūpa*.[63] He proceeds to create, populating the cosmos with living beings residing in those different realms, each one made to correspond to certain *guṇas*, qualities, depending on the mind we develop by our activities (and thus what we call our *karma,* our work in those qualities).

At this point in this creation story, we notice something interesting: While religions often refer to God as the Creator, here we rather find that the world we live in now is not created by God, Viṣṇu, but by Brahmā, a limited *jīva* soul like you and me. We find this in other parts of the world as well. Plato and Gnostic Christianity, for instance, speak about the *demiurge* — an artisan-like

figure responsible for fashioning and maintaining the physical universe, although not being the Supreme God. In Egypt there is the god Ptah, who creates the world, and so on.

Thus in a way we can say that this world is created by us, not by God. The old question, "Why does a benevolent God create a world with so much suffering in it?" is thereby answered. God doesn't. We do, by using our independence to create according to our own desires. But since we are not omnipotent and omniscient, our creations are more like dreams, and as we know, dreams can turn into nightmares. Still, although nightmares may seem very real and scary, they are nothing but dreams, and after we wake up we don't take them seriously — what to speak of blaming God for them.

Brahmas creation

So here is Brahmā, the firstborn and creator of the material cosmos. Brahmā is described as having a body of pure intelligence, and in him lies the potential for all creation in the material cosmos. This of course spans from the brightest, most elevated level that Brahmā himself is on, all the way down into the deepest darkness of consciousness covered by *tama-guṇa*, the mode of ignorance. *Remember, we are in a realm controlled and characterized by those three guṇas, or modes of nature: sattva, rajas, and tamas.*

That is indeed what Brahmā soon finds out, being in such a powerful position that anything he thinks of may take form. This is how the story goes: Brahmā noticed a shadow in himself. From that shadow, five forms of ignorance were created: *tāmisra* (forgetting oneself to be a part of the Supreme Soul and thinking oneself to be like an independent god), *andha-tāmisra* (thinking of oneself as a material being and thus death being the ultimate end), *tamas* (forgetting ones own soul), *moha* (the illusion of the bodily concept of life) and *mahā-moha* (being mad after material enjoyment).[64] Thus night was created.

Brahmā, disgusted with that dark shadow, threw it off.[65] It was then taken over by low-minded living beings who were drawn to darkness. As such beings generally are, they were lusty to enjoy by eating and drinking. So they decided to eat Brahmā. Which he did not like. Therefore he created a realm of shining light, which became populated by *devas*, the gods, bright and good ones. Thus day was created.[66]

Then other beings appeared from Brahmā — lusty ones, who started chas-

ing him for sex. At first, he just laughed at them, but they eventually got so annoying that he had enough and prayed to God, who advised him to cast off his body again. That body, in the mode of passion, *rajo-guṇa*, became twilight and appeared like a beautiful woman who started seducing those lusty fellows.[67]

In this way it went on, what could be called Brahmās night- and daydream. The story continues with all kinds of beings appearing from Brahmā, as the *jīva* souls who had entered the new cosmos gradually woke up into the dream, trying to enjoy it depending on their natures *(guṇas).*

So what really happened here is that, as it is stated, "Brahmā first created the nescient engagements like self-deception, the sense of death, anger after frustration, the sense of false ownership, and the illusory bodily conception, or forgetfulness of one's real identity."[68] In other words, he created the conditions under which a living being in the material world lives. As Bhaktivedanta Swami Prabhupada comments, "Unless a living entity forgets his real identity, it is impossible for him to live in the material conditions of life. Therefore the first condition of material existence is forgetfulness of one's real identity."

However, as you can probably understand, Brahmā was not very happy with his creation work so far. Okay, now even the darkest corners were in place. But there is another purpose to this creation: to help those in it to enjoy life and then eventually wake up again and return to their real selves.

So he decided to create four enlightened sages as his sons. They are called the four Kumāras. *Kumāra* means "child", and there is a reason why they are called so. Their father Brahmā wanted them to beget children and populate the worlds. However, they did not want to do that. They were fully awake and enlightened, clearly understanding that the entire world they are in is but an ignorant, dreamy illusion. So they refused to grow up and beget wives. Instead, they remained like children, innocently detached from everything going on in these worlds. They rather dedicated their lives to traveling around and spreading enlightenment to those living in this creation.

By now Brahmā had had enough. He grew angry. After all, he was the supreme being of the entire cosmos, and here were these impudent sons daring to disobey him by not fulfilling the purpose for which he had created them!

At the same time, he could understand that those four persons standing before him were themselves far above the lower qualities such as passion (*rajas*) and ignorance (*tamas*) that he was now himself influenced by. Therefore, he

did his best to hide his anger.

He tried, but couldn't. He is very powerful, after all. His anger came out from between his eyebrows, in the form of ... a small child, colored red and blue. That child was Rudra, the anger form of Śiva. The child immediately cried out, asking what he was supposed to do. And well, he got his job: to handle anger in the world.

Brahmā continued his creation work. Having created both the lower beings in the mode of ignorance and darkness, and the elevated ones in the higher worlds, he also created those in between, such as us humans. And thus his basic creation work was done.

What is going on here?

That was quite some creation story, wasn't it? Well, it is not over yet, but before we continue, let's look at what we've got so far. We have now dived fairly deep into the creation story of the Bhāgavata Purāṇa. I would say this gives a fairly representative picture of ancient Indian cosmology in general, from the Vedic age.

Just before that, we looked at other older models of the cosmos from different cultures on the planet, and those of the founders of quantum physics, which share similarities with them. The cosmos is not perceived as an objective space with inert matter, existing independently, as commonly believed by our modern materialistic cosmology. Instead, it is seen as emerging from a conscious, living being. We also discussed how this view, which in philosophy is called idealism (as opposed to materialism), has been prevalent worldwide throughout history. It forms the basis of religious worldviews and is inherent in the traditions predating the formal emergence of religions.

If you followed the intricate creation story of the Śrīmad-Bhāgavatam, as we just swiftly swept through it, you should have noticed that it primarily involves developments in consciousness. First of all, the cosmos is the dream of God, with us as dreamers within that dream. Even when we discussed how Brahmā began creating the actual worlds of this cosmos, it wasn't about him assembling piles of clay into planets and bodies. Instead, he created different modes of life, which the souls of the cosmos gradually adopted and lived by as they awakened. The physical forms where that life goes on are simply objects for the five senses (*mahā-bhūtas*).

I would say it's important to notice because it presents a viewpoint entirely

different from that of materialistic cosmology, which only considers the formation of energy and matter in physical space. Even at this point of Brahmās creation of the physical realm, the focus remains on the life within the cosmos rather than the matter comprising it.

During my own research through the years, I eventually concluded that it is this very shift in perspective that makes the pieces of this cosmological puzzle starting to fall into place. I just hope this gets clear throughout this book.

The places to live in the cosmos

We explained before that the Purāṇas deal with five general topics, but the Śrīmad-Bhāgavatam, called the *mahā-purāṇam*, deals with five more, making a total of ten topics.[69]

The first two we have essentially covered: *sarga* and *visarga* — the primary and secondary stages of creation. The next three are *sthānaṁ*, *poṣaṇam* and *ūtayaḥ.* They are about the abodes and places where the residents of the cosmos can live (*sthānaṁ)*, find shelter (*poṣaṇam*) and act (*ūtayaḥ*).

Throughout this book we have repeatedly mentioned the three worlds, as well as the fourteen worlds (seven upper and seven lower). This is the basic structure of the cosmos as described in most ancient cosmologies, and as we remember, it is indeed where the teachings of the Śrīmad-Bhāgavatam start. And it is within these three worlds that we currently reside.

The three worlds that Brahma made

We have already learned how Brahma created living beings in three worlds: the lower, darker regions; the enlightened, heavenly realms; and the humans and others in between. He then created places for each of those beings to inhabit.

Sometimes those worlds are described as the lower subterranean regions (*patala*), earth (*bhū*) and heaven (*svarga*). Sometimes they are called *bhūr*, *bhuvaḥ* and *svaḥ* — the earthly realm, the intermediate realm, and the heavenly realm. In any case, they are divided into higher realms of the *devas*, the earthly realms lit by sunlight, and then darker realms below the earthly realms. When rather divided into fourteen, seven of them constitute the higher realms, with the lowest two of those being the *bhuvaḥ* and *bhūr,* and the seven lower realms are below that.

If we look back at where Śukadeva Gosvāmī begins speaking the Śrīmad-Bhāgavatam to Mahārāja Parīkṣit, by describing the fourteen different worlds, lokas, this is how they comprise three worlds::

Seven higher
Satya-loka
Tapo-loka
Jana-loka
Mahar-loka
Svar-loka
Bhuvar-loka
Bhur-loka
Seven lower
Atala
Vitala
Sutala
Talatala
Mahātala
Rasātala
Pātāla

As we see there, when we say *bhū*, *bhuvar* and *svaḥ*, referring to the three worlds, we are actually talking about divisions of the seven higher worlds. The lower worlds, the talas, are rather perverted reflections, so to speak, of the seven higher worlds, characterized by lower modes of consciousness. For instance, when we chant the Gāyatrī mantra, starting with the invocation "*om bhūr bhuvaḥ svaḥ*...", it would not make sense to include the lower *talas* in such a mantra.

(This could be further researched.)

In any case, these are called *lokas*. What then are *lokas*?

The lokas — the cosmic locations

Loka is sometimes translated as planet or planetary system — whatever that means, as we asked ourselves during our work with that planetarium exhibition. When we say "planet" a Westerner would probably think of those round lumps flying around out there in space. But if you sift through the fifth canto of the Bhāgavatam, for instance, and examine all the occurrences of the English word "planet" in the translations, you will find that the Sanskrit mean-

ings and word-to-word translations rarely, if ever, refer to the planets that the astronomers see in the sky.

The Bhāgavatam describes the seven *lokas* as precisely what we mentioned earlier: distinct realms for individuals at various stages of consciousness and development. This concept is found all over the world, appearing in Christianity, Islam and Judaism as the seven heavens, where the wisest and most elevated angels reside. In other cultures there are nine or some other number.

The word "*loka*" — and I am no Sanskrit expert but from what I could find — is related to the Latin word "locus" which means a location, a realm. So loka-location-locus kind of makes sense, doesn't it.

In other words, a *loka* is a general realm to live in, more specifically, those seven levels of existence of this world.

We have already spoken about those seven *lokas*, where the upper five constitute S*vargaloka*, and then below them *Bhūvarloka* and *Bhūrloka*. So let's start from the bottom — or rather from the middle, since that is where *Bhūrloka* is, with another seven lokas below it, the *Pātāla-loka*, which we will get to a little later.

Bhūrloka – the physical world

Bhūrloka means "The world of bhū". That word *bhū* relates to the word *bhūta*, which means "becoming", "being", "material elements", "body", "creation". Taking on a material form. Based on the information that we have looked at so far, *bhūrloka*, the base level of this cosmos of ancient India, refers to the space where we move around in our gross physical bodies, made of the mahābhūtas. In other words what we call the physical world, which we experience through the senses of our bodies. It can be compared to Gaia in Greek mythology, Midgard in Norse cosmology and so on.

Bhū-maṇḍala – the Earth far and wide

There is, among some students of *Purāṇic* cosmology, an attempt at understanding something called *bhū-maṇḍala*, which appears as a disc of some sort, containing concentric circular oceans made of different fluids, seven islands dividing them, also ring-shaped and called the *dvīpas*, which are then divided into *varṣas*, and that is the geography of the cosmos, or the solar system, or what is it now again?

If I, as I sometimes find wise to do, simply search for the word *bhū-maṇḍala* among the Sanskrit verses of the Śrīmad-Bhāgavatam, I get 9 hits, out of the 18,000 verses of the Śrīmad-Bhāgavatam:

> 3.13.41: Varāhadeva lifting the earth (*bhū-maṇḍalena*) on the edge of His tusks.
>
> Śrīmad-Bhāgavatam 4.12.16: Dhruvas kingdom extended all over the earth (*bhū-maṇḍalaṁ*).
>
> Śrīmad-Bhāgavatam 4.18.29: The whole earth (*Bhū-maṇḍalam.* Mahārāja Pṛthu leveled the land).
>
> Śrīmad-Bhāgavatam 5.16.1: This verse says, "...the radius of *bhū-maṇḍala* extends as far as the sun spreads its light and heat and as far as the moon and all the stars can be seen."
>
> The word used here is *āyāma-viśeṣaḥ*, which means "general extension". So it says that *bhū-maṇḍala* is the realm lit by the sun and the moon. Which can be understood to mean all that we see around us.
>
> 5.21.19: Here is an occurrence, not directly of the word *bhū-maṇḍala* but of the words "*parimaṇḍalam*" and "*bhū-valayasya*". The first one means "circumference" and the other one means "of the earthly sphere", or the roundness of earth in general, which can also mean the disk of the earth's surface we see around us.
>
> Śrīmad-Bhāgavatam 9.19.23: Yayāti enthroned his youngest son, Pūru, as the emperor of the entire world (*bhū-maṇḍalasya*).
>
> Here we see the expression *bhū-maṇḍala* often used as a general word that seems to say "the surface of the Earth, far and wide".
>
> Three more of those verses (Śrīmad-Bhāgavatam 5.17.21, Śrīmad-Bhāgavatam 6.16.48 and Śrīmad-Bhāgavatam 10.68.46) explain how Ananta Śeṣa holds the *bhū-maṇḍala* on his head(s).

So here in the actual verses of the Śrīmad-Bhāgavatam, including the fifth canto, this is all we have about the *bhū-maṇḍala*. Not some hyperstructure in outer space or in some mythospace with oceans of milk and honey and liquor

and all that. What we find here is simply "the surface of the Earth". Not a mathematical/geometrical construction representing the planets orbiting in our solar system. It rather sounds like "as far as we can see in each direction." or even "the whole world", as we may say in a general sense. Or maybe also, on a bit higher abstraction level, "the Earthly realm we are in now, that is lit by the sun and the moon."

Sometimes the word *bhū-tale* is used, as it seems synonymous.

As we will soon see, the movements and positions of the heavenly bodies are in the Purāṇas described from the perspective of the viewer – i.e. as they move along the ecliptic with the zodiac around the pole star, the way we see them up in the sky. It might then be reasonable to try a similar perspective when understanding the *bhū-maṇḍala*. So let's try this:

Here we stand on the surface of the earth as it stretches into each direction around us, as actually seen through our eyes (rather than from some imaginary point of view far out in space looking down at the solar system, which is often used by modern astronomy). We see a horizon around us, as the periphery of a round earth disc (which is the literary meaning of the word *bhū-maṇḍala*).

That is simply the direct experience of our world here on earth. A disc, you could say. But sometimes the word *bhū-gola* is used, where the Sanskrit word *gola* means "ball" or "globe". As Śrīla Bhaktivedanta Swami Prabhupada points out, this indicates that people back in the Purāṇic age were aware of that earth is a globe (which is actually not that hard to figure out, although the more primitive people in Europe didn't seem to understand that until Galileo came.).[70]

The lokāloka

The edge of this *bhū-maṇḍala* "disc" is called *lokāloka*, which is sometimes translated as being a mountain, but the word used, *acala*, can also mean "immovable, fixed". The *lokāloka* can thus be understood as "the fixed and immovable border between the visible and the invisible."

This fits very well with the definition we are proposing here for the word *bhū-maṇḍala*, using the natural viewpoint of us standing here and looking around. We see the Earth's surface stretching out in all directions. It is limited by a periphery, which is essentially the edge of what our eyes can see, that which is illuminated by the sun and the moon. And if we were to simply describe the world we see from where we are, that's the best way to do it — an

earth disc with a sky dome above it. Then beyond the world that is visible to our earthly eyes lies a*loka,* "not this world" (in the Sanskrit dictionary, the word a*loka* is translated as "not the world", "the end of the world", "the immaterial or spiritual world" or "not having space, finding no place").

When we give up our modern Western conditioning and the imaginary viewpoint of "looking down upon the world from above," but instead see our world as it directly appears to us, these concepts like *bhū-maṇḍala* and *lokāloka* not only make sense but also offer an interesting perspective. The *bhū* realm is then simply the world that we can experience around us with our physical senses. It appears as a dome above us and a surface beneath us. And beyond this realm, there are other realms, the *Bhuvarloka* and *Svargaloka*, which we will soon explore.

Mount Meru

In the middle of the *bhū-maṇḍala* disc that surrounds us and upon which we stand is a rotation axis. We can observe this by noticing how the starry sky appears to rotate around us every night. Its pole is not directly above us but rather to the north (if we are in the northern hemisphere). This rotation axis is referred to in Latin as the *axis mundi*. In the Wikipedia[71] we read:

> In 20th-century comparative mythology, the term *axis mundi* – also called the cosmic axis, world axis, world pillar, center of the world, or world tree – has been greatly extended to refer to any mythological concept representing "the connection between Heaven and Earth" or the "higher and lower realms" ... *Axis mundi* closely relates to the mythological concept of the omphalos (navel) of the world or cosmos. Items adduced as examples of the *axis mundi* by comparative mythologists include plants (notably a tree but also other types of plants such as a vine or stalk), a mountain, a column of smoke or fire, or a product of human manufacture (such as a staff, a tower, a ladder, a staircase, a maypole, a cross, a steeple, a rope, a totem pole, a pillar, a spire). Its proximity to heaven may carry implications that are chiefly religious (pagoda, temple mount, minaret, church) or secular (obelisk, lighthouse, rocket, skyscraper). The image appears in religious and secular contexts. The *axis mundi* symbol may be found in cultures utilizing shamanic practices or animist belief systems, in major world religions, and in technologically advanced "urban centers". In Mircea Eliade's opinion: "Every Microcosm, every in-

habited region, has a Centre; that is to say, a place that is sacred above all."

Meru is likened to a mountain, as we also find with Olympus and similar "holy mountains" in other cultures. Why a mountain? Well, a mountain leads up towards the sky. Especially if the mountain is north of your location, it truly seems to ascend toward the pole star, thus connected to the rotating *axis mundi.*

If we travel north in India, we reach the Himalayas, and especially Mount Kailash up there is likened to Meru. So, indeed, if you were to journey toward the Northern star, you would ascend those mountain areas, and you would find villages up there with very different people, in celestial-looking realms. (In fact, those regions up beyond the Himalayas are in India called *bhū-svarga*, "heaven on earth". Bhaktivedanta Swami mentions the area from Kashmir to central Asia,[72] and we have seen pictures from China, showing gracious people living in celestial mountains, which still exist. I myself had an amazing experience of such places when once walking up Mount Emei in Sichuan.)

The dvipas

This *bhū-maṇḍala* is divided into *dvīpas.* What then are *dvīpas*? They are ring-shaped mountains surrounded by ring-shaped bodies of water or other liquids, right?

Well, to put it short, there are descriptions in the fifth canto of the Śrīmad-Bhāgavatam (chapter 20) of these *dvīpas* as islands surrounded by water and having characteristic vegetation and inhabitants, living in different tracts of land (*varṣas*), with names of major mountains. The islands themselves are named after characteristic trees (banyan tree, fig tree etc.) and the waters around those islands are named after different liquids, such as saltwater, sweet water, wine, butter and so on.

When we travel in some direction on Earth's surface (*bhū-maṇḍala*), we will, of course, reach different bodies of water and other tracts of land with other kinds of people and vegetation. It may be as simple as that.

Can it really be as simple as that? I don't know. But remember, these lands are very briefly mentioned by the way in a few verses among the 18,000 verses of the Śrīmad-Bhāgavatam, and their geographic information is given just in a few words, while those verses mainly give genealogical and cultural information about the inhabitants of those regions, their ways of worship and their social orders. This is more in line with the topics characterizing the *Purāṇas*.

Again, when Westerners try to understand the Śrīmad-Bhāgavatam, being conditioned by the materialistic understanding of cosmology that they grew up with (the cosmos is only a physical space with matter in it), they look for spatial knowledge about planets in space and so on, thinking that if such information is there in these old scriptures, then this may make them respected by "scientific" people. But again, such mundane knowledge is not what the Śrīmad-Bhāgavatam is about, and by trying to squeeze out such meanings of it one may rather obscure the actual cosmology of the Śrīmad-Bhāgavatam.

I am aware of that in these last few paragraphs, I am basically going against other common interpretations of this geographic information. So just take it for what it is: one theory among others.

Ok, is it about cosmology or astronomy?

"Now stop and behold!", I hear someone saying. "Mister author, you have journeyed pretty far out there into some metaphysical multiverse — maybe a bit too far — but you know, there *is* science in the *Purāṇas* — good scientific science. This cosmos is not just a flimsy dream but solid stuff, and the *Bhāgavatam* deals with it in that way too. There is astronomy, about planets and orbits and stars and solar systems, and after all we are building a planetarium! There are measurements given, numbers, *yojanas* and all that. Yet you say that the *Bhāgavatam* is about some esoteric mythical consciousness cosmology and not science and astronomy, but now let's get back to reality, please!"

This is where I step up on my soapbox and shout, for everyone to hear: Cosmology is not astronomy! The *Bhāgavatam* is about cosmology, of the kind we have spoken of so far (which you can see, from my many footnotes, is basically just taken from the direct text of the *Bhāgavatam*). It is not a book about astronomy (such more mundane topics are discussed in other parts of the Vedic scriptures, called the v*edangas*). This cosmology is not just about places and spaces and things in this physical world. It is bigger than that. *It is about the total life and existence of this world and all worlds*.

Our upset *Bhāgavata Purāṇa* pundit then picks up one part of that book, the Fifth Canto. Naturally so, since he has learned in school that cosmology is about studying the physical world, so it's about all that stuff flying around in space here. Sure, in the fifth canto of the *Bhāgavatam* there are references to stars, planets and all that. Some then assume that the scientific strength and validity of the *Bhāgavatam* is found there — how it shows people back then

having very advanced knowledge about astronomy and material science. Maybe they even built *vimānas* — flying vehicles!

Alright, there is some astronomy in the *Bhāgavatam*. But it is a different kind of astronomy. It is quite straightforward and empirically valid, in spite of sometimes appearing strange to us modern folks. So to satisfy our astronomy nerds and science buffs, let's look at a couple of examples of that, before proceeding with our creation story. I recommend it for you others too, because it can help us to understand the reason why astronomy is there in the *Bhāgavatam* in the first place, and that is actually pretty interesting, so please stay with us.

The Orbits of the Planets

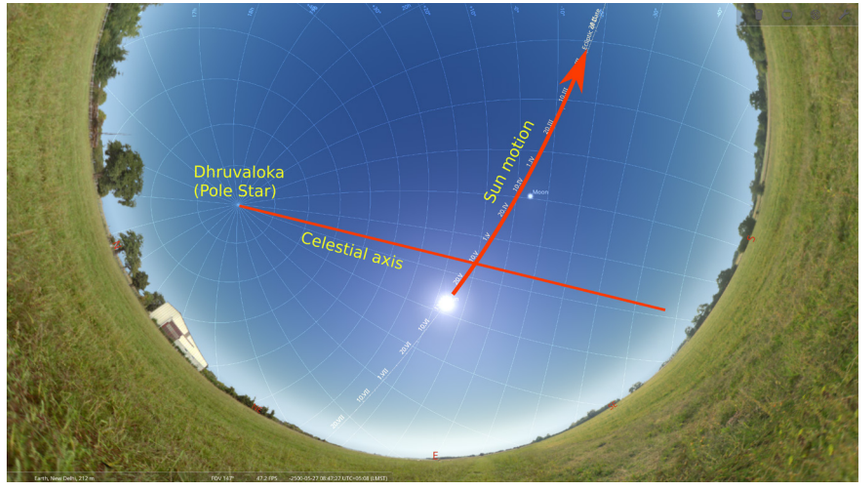
In the fifth canto of the *Bhāgavata Purāṇa* there is a chapter sometimes translated as "The Orbits of the Planets"[73]. It starts by describing the movement of the sun, and King Parīkṣit asks Śukadeva Gosvāmī an interesting question:

> You have already affirmed the truth that the supremely powerful sun-god travels around Dhruvaloka [the pole star] with both Dhruvaloka and Mount Meru [the cosmic axis] on his right. Yet at the same time the sun-god faces the signs of the zodiac and keeps Meru and Dhruvaloka on his left. How can we reasonably accept that the sun-god proceeds with Meru and Dhruvaloka on both his left and right simultaneously?[74]

I chose this verse because it is a good example of how the *Bhāgavatam* deals with astronomical topics. As strange and contradictory as it may seem, it is actually quite straightforward. It describes how the sun travels across the sky on a daily basis, as seen by us. If we look up into the sky and imagine the celestial axis and the ecliptic, we see the sun rising in the east and traveling clockwise around that axis (Meru), keeping both it and the pole on its right side.

However, the question then arises: why does the sun simultaneously appear to move counterclockwise?:

> When a potter's wheel is moving and small ants located on that big wheel are moving with it, one can see that their motion is different from that of the wheel because they appear sometimes on one part of the wheel and sometimes on another. Similarly, the signs and constellations, with Meru and Dhruvaloka [the Pole Star] on their right, move with the wheel of time, and the ant-like sun and other planets move with them. The sun

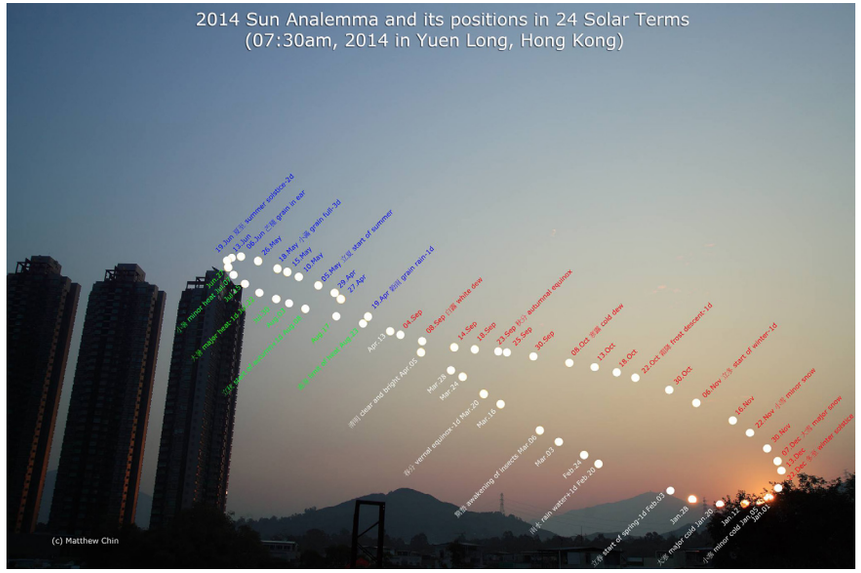


The movement of the sun on a daily basis, with the Pole Star and celestial axis on its right side.

> and planets, however, are seen in different signs and constellations at different times. This indicates that their motion is different from that of the zodiac and the wheel of time itself.[75]

Another mouthful. But again it is quite simple. Indeed the sun is seen in different zodiac signs at different times. That is what makes up a year. The photo below shows the position of the sun at the same hour of the day, repeated for multiple days of a year. It forms a curve that is called the Analemma of the sun. And it is going counterclockwise, just as that *Purāṇic* verse said.

What is described here and in the following verses is how the sun represents Nārāyaṇa, God, who divided into twelve parts to create seasons, in order to benefit those living in this world. It describes how the sun passes between the signs of the zodiac, and also how months are formed by the movements of the moon. It stays within the major cosmology theme of the *Bhāgavatam*, about the life of the cosmos rather than the matter. The astronomical reference here differs from that of modern astronomy. It simply describes the luminaries the way they are seen with our eyes. And just briefly so, as part of the more important — and I'd say beautiful — statement that the seasons is the presence of God to nourish us. Then the chapter goes on to describe other planets in that same personal way.



The movement of the sun on a yearly basis, showing the analemma — the apparent counterclockwise movement of the sun through a year.

So, as is the case with most if not all astronomical references in the *Bhāgavata Purāṇa*, this is a way of placing even the world visible to our senses inside this bigger Cosmic Model that we are looking at, which has God — the Cosmic Being — at the center.

In another verse there is a line that may also seem curious: "The sun-god, who is Nārāyaṇa, or Viṣṇu, the soul of all the worlds, is situated in outer space between the upper and lower portions of the universe."[76] I remember reading this and wondering, did it mean that the sun is located in the middle of the universe which is like an egg half filled with water and all that? Well, let's look a bit closer at this verse, which is at least to me a good example of how our modern understanding of things may color our interpretations:

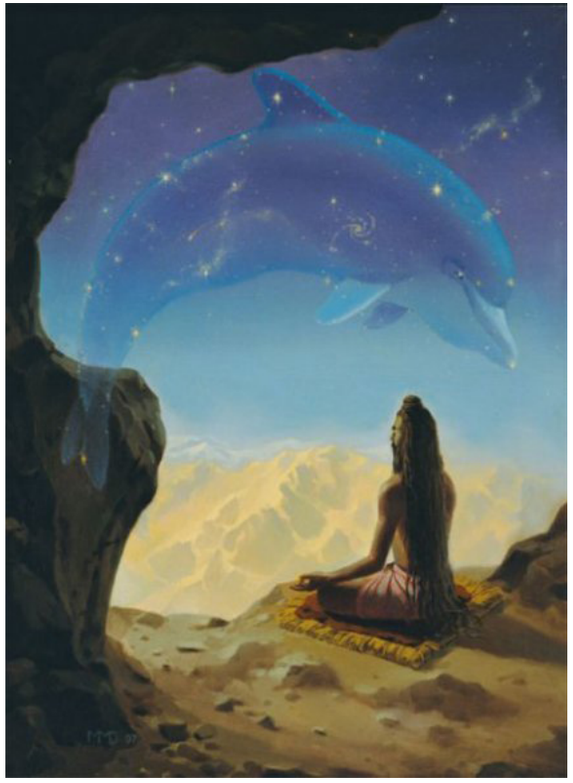
"Between the upper and lower portions of the universe" is a translation of the Sanskrit *dyāv-ā-pṛthivyoḥ antareṇa*. *Dyāv* refers to the sky or heaven, *Pṛthivyoḥ* refers to the earth. *Antareṇa* means "in between" or "within the space." So the most direct translation is simply "between heaven and earth". Then what is translated as "outer space" are the Sanskrit words *nabhaḥ-valayasya*. *Nabhaḥ* refers to the sky or the overarching canopy of the heavens,

and *valayasya* means "expanse" or "region." So what we have here are a couple of words that simply describe the location of the sun as seen up there in the sky. If you rebel against such a simple interpretation, expecting some advanced deep space information in those words, then look at the overall content of that verse. It is not really talking about the location of the sun in the universe but about the yearly movement of the sun throughout the zodiac, and the division of that into twelve months.

We can continue to examine all the astronomical references given in the *Bhāgavatam* and we will find that they all concern the movements of celestial bodies *as they appear in the sky from our perspective, in relation to the ecliptic and the pole star*. The movements of the Moon are described in relation to the *nakṣatras* — the lunar mansions — which are the 27 star constellations along the ecliptic that the Moon, from our point of view, appears to pass through in a month. Just as with the Sun, the *Purāṇa* does not describe the *objective* movement of the Moon through space but rather its apparent movement across the sky on a daily or monthly basis, as seen by us.

It's important to understand that ancient astronomy was primarily focused on observing and comprehending celestial bodies as they appear in the sky, rather than studying their locations in three-dimensional space as modern astronomers do. The ancients observed the motions and patterns of stars, planets, the Sun, and the Moon, developing methods to track and predict their movements based on their positions in the sky. Astronomy served practical purposes such as timekeeping, navigation, astrology and the formulation of agricultural calendars. For these purposes, the most straightforward and practical approach was to adopt an "observer-centric" point of view, focusing on how things appear from our perspective. This is what we still find in astrology for instance, where the observer is in the center of the charts, and the planets, including the sun, are plotted according to their positions and apparent movements along the periphery, representing the ecliptic. In fact, astronomy and astrology were essentially part of the same science in those times. Even as late as the 17th century, European astronomers like Galileo Galilei, Johannes Kepler and Tycho Brahe also practiced astrology.

If you go through all astronomical references in the *Bhāgavatam* one by one and try to see them from this point of view, you may find that they start to make sense. In Appendix Xx we do just that, in case you are interested and don't want to go through that nerdy work yourself.



However, if we look even a bit closer, for instance in this chapter "Orbits of the Planets" of the *Bhāgavatam*, we find that it is not about astronomy. It is rather about describing the celestial bodies as representing different divinities and how they are all partial representations of the Supreme Being, Nārāyaṇa. So the brief astronomical references are just there as part of a larger cosmological context, which again is the topic of the *Purāṇas*.

The Dolphin in the sky

In another chapter of the fifth canto of the *Bhāgavata Purāṇa* there is a description of a dolphin, extending from the pole star and curving through space. I had seen different creative paintings of that dolphin, called *Śiśumāra*, sometimes spiraling down through the axis of the cosmos as if being the force that makes the world rotate. It seemed like yet another mythological esoteric item. But then I found this verse:

"On the right and left sides of where the loins might be on the Śiśumāra-cakra are the stars named Punarvasu and Puṣyā. Ārdrā and Aśleṣā are on its right and left feet, Abhijit and Uttarāṣāḍhā are on its right and left nostrils, Śravaṇā and Pūrvāṣāḍhā are at its right and left eyes, and Dhaniṣṭhā..."[77], and so on.

Most of those words are Sanskrit names of existing stars. The Śiśumāra is a star constellation, imagined as a dolphin. One star in the tail of that dolphin was said to be Dhruvaloka — the Pole Star.

I checked out the sky again and found that the same constellation is there

in western astronomy. It is called Draco, likened to a dragon rather than a dolphin, but containing basically the same stars. And just like Śiśumāra, the Dragon had the Pole Star (Thuban or Alpha Draconis — in India called Dhruvaloka) in its tail.

Had is the word, because it doesn't anymore. Just in case you didn't know, due to the axial precession of Earth, the pole moves around up there, slowly but still. The star Dhruva/Thuban there in the tail of the dolphin/dragon used to be the pole star — around 5000 years ago. Then from the Mesopotamian era and at the time of Christ there was not really a pole star at all. Only around 1000 CE or so did Polaris, our current pole star, actually take that seat.

It appears that astronomers in both Mesopotamia and Vedic India were well aware of the axial precession of Earth and thus understood that the pole is not a star but rather the point around which the celestial dome appears to rotate. This made nightly navigation tricky for the people during the thousands of years without a pole star, but they managed anyway by developing sophisticated systems involving star constellations. (By the way, the fact that the *Bhāgavata Purāṇa* mentions Dhruva/Thuban as the Pole Star, which it has not been for at least 4000 years, supports the case for the stories in the *Bhāgavata Purāṇa* being 5000 years old as its own tradition tells us.)

Another thing to note here is this statement: "The coiled body of the Śiśumāra-cakra turns toward its right side, on which the fourteen constellations from Abhijit to Punarvasu are located. On its left side are the fourteen stars from Puṣyā to Uttarāṣāḍhā."[78] Those 28 stars are the *nakṣatras*, or lunar mansions — star constellations along the zodiac. (Another interesting fact: Originally, there were 28 *nakṣatras* in India, but this number was reduced to 27, likely around the time when the astrological system in India was being formalized in the first millennium BCE. The fact that the *Bhāgavata Purāṇa* lists 28 *nakṣatras* is another indication suggesting that the *Purāṇas* may be older than modern scholars believe.) So the descriptions of the Śiśumāra extend into a good part of the rotating celestial sphere in general, and they are meant to explain how this entire *kāla-chakra*, wheel of time, represents God. It also refers to the story of the great devotee Dhruva, which is told elsewhere in the *Bhāgavata Purāṇa*.

In any case, the importance here is, and that is what I am trying to establish, that the cosmos of the Bhāgavatam is a multiverse and contains several different realms, gross and subtle. So let us continue looking at the *lokas*, shall we?

Yep, this is what we've got so far. Thanks for reading, and if you want to give feedback, this is where you get in touch with me:

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Signal: 0709922559

Per/Priyavrata

Endnotes

1 As told by Harikeśa das in relation to the cosmology issue.

2 "Hällbilder och samiska trummor". University of Umeå 2010

3 Layton, 2000:1

4 Woodhouse, 1989:17

5 Putova, 2013:4

6 Lewis-Williams, 2004:136-139

7 Irsyad Leihity & Raden Decep Eka Permana, Kapata Arkeologi — Scientific Journal of Archeology and Cultural Studies 14(1) 2018, 15-26

8 Rozwadowski, 2014: 1

9 (Das Wesen der Materie [The Nature of Matter], speech at Florence, Italy (1944) (from Archiv zur Geschichte der Max-Planck-Gesellschaft, Abt. Va, Rep. 11 Planck, Nr. 1797)

10 Addressing the British Association in 1934.

11 Eddington: The Nature of the Physical World (1928), Ch 12

12 Schrödinger: My View of the World (1931)

13 Stacey, B. C. (2016). "Von Neumann was not a Quantum Bayesian". Philosophical Transactions of the Royal Society A. 374: 20150235. arXiv:1412.2409. Bibcode:2016RSPTA.37450235S. doi:10.1098/rsta.2015.0235.

14 God Is Not One: The Eight Rival Religions That Run the World and Why Their Differences Matter". Book by Stephen Prothero, April 20, 2010. And: Niels Bohr. source: Indian Conquests of the Mind, Saibal Gupta. Quoted from Gewali, Salil (2013). Great Minds on India. New Delhi: Penguin Random House.

15 Pride of India (2006) by Samskrita Bharati. p. 56 (It may rather be: "After the conversations about Indian philosophy, some of the ideas of Quantum Physics that had seemed so crazy suddenly made much more sense", but this quote is common so...

16 https://en.wikipedia.org/wiki/Kālacakra

17 Śrīmad-Bhāgavatam 2.1.25, Śrīmad-Bhāgavatam 2.5.36

18 Śrīmad-Bhāgavatam 2.5.37

19 Śrīmad-Bhāgavatam 2.4.6

20 Or if you want to dive deeper into that, I recommend the paper "There are no particles, there are only fields", by physics professor Art Hobson: https://arxiv.org/pdf/1204.4616.pdf

21 Śrīmad-Bhāgavatam 2.5.11

22 Chāndogya Upaniṣad 3.14.1

23 Śrīmad-Bhāgavatam 3.26.15

24 Śrīmad-Bhāgavatam 2.10.3

25 Śrīmad-Bhāgavatam 2.1.39

26 Bg. 14.6

27 Śrīmad-Bhāgavatam 2.5.19

28 Śrīmad-Bhāgavatam 3.10.11

29 Śrīmad-Bhāgavatam 3.11

30 Śrīmad-Bhāgavatam 3.11.38

31 Śrīmad-Bhāgavatam 2.1.35

32 Śrīmad-Bhāgavatam 2.5.33, purport by Śrīla A.C. Bhaktivedānta Swami

33 Śrīmad-Bhāgavatam 3.5.27, purport

34 Śrīmad-Bhāgavatam 3.5.28, purport

35 Śrīmad-Bhāgavatam 2.5.30

36 Śrīmad-Bhāgavatam 2.5.31

37 Śrīmad-Bhāgavatam 2.5.25

38 Śrīmad-Bhāgavatam 3.26.33

39 Śrīmad-Bhāgavatam 3.26.33

40 Śrīmad-Bhāgavatam 3.26.35-36

41 Śrīmad-Bhāgavatam 3.26.41

42 Śrīmad-Bhāgavatam 3.26.44

43 Śrīmad-Bhāgavatam 3.26.61

44 Śrīmad-Bhāgavatam 3.20.14

45 Śrīmad-Bhāgavatam 3.20.15

46 CC Madhya 20.292

47 Śrīmad-Bhāgavatam 3.8.12

48 Śrīmad-Bhāgavatam 3.8.12

49 Śrīmad-Bhāgavatam 3.28.25

50 Śrīmad-Bhāgavatam 3.20.16

51 Śrī brahma-saṁhitā 5.2

52 Śrīmad-Bhāgavatam 5.16.5

53 Śrī brahma-saṁhitā 5.18
54 Śrīmad-Bhāgavatam 3.8.15
55 Śrīmad-Bhāgavatam 7.9.32
56 CC Ādi 2.52
57 Śrīmad-Bhāgavatam 10.1.24
58 Śrīmad-Bhāgavatam 3.8.23
59 Śrīmad-Bhāgavatam 3.10.7
60 Śrīmad-Bhāgavatam 3.20.16
61 Bg. 15.15
62 Śrīmad-Bhāgavatam 11.11.6-7. A similar verse is found in the Śvetāśvatara Upaniṣad, 4.6
63 Śrīmad-Bhāgavatam 3.10.8
64 Śrīmad-Bhāgavatam 3.20.18
65 Śrīmad-Bhāgavatam 3.20.19
66 Śrīmad-Bhāgavatam 3.20.22
67 Śrīmad-Bhāgavatam 3.20.29
68 Śrīmad-Bhāgavatam 3.12.2
69 Śrīmad-Bhāgavatam 2.10.1
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74 S.B. 5.22.1
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76 S.B. 5.22.5
77 S.B. 5.23.6
78 S.B. 5.23.5
79 Śrīmad-Bhāgavatam 5.1.22
80 Śrīmad-Bhāgavatam 5.1.25
81 [J. Simpson & S. Roud, "Dictionary of English Folklore," Oxford, 2000, p.254]
82 Śrīmad-Bhāgavatam 4.29.83
83 Śrīmad-Bhāgavatam 4.29.Text 29.2b

84 Śrīmad-Bhāgavatam 2.9.34
85 Śrīmad-Bhāgavatam 2.9.1
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90 Śrīmad-Bhāgavatam 4.29.83
91 S.B. 5.23.1
92 Śrīmad-Bhāgavatam 2.2.25
93 Letter to: Krsnadasa, Dated: Nov. 7, 1972, Location: Vrindaban
94 Śrīmad-Bhāgavatam 2.5.18
95 Śrīmad-Bhāgavatam 2.5.25, purport
96 Śrīmad-Bhāgavatam 3.5.33
97 Śrīmad-Bhāgavatam 2.5.25
98 Śrīmad-Bhāgavatam 3.5.33
99 Śrīmad-Bhāgavatam 3.5.34
100 Śrīmad-Bhāgavatam 3.5.35
101 Śrīmad-Bhāgavatam 2.9.33-36
102 Śrīmad-Bhāgavatam 2.10.1
103 Śrīmad-Bhāgavatam 2.10.3
104 Śrīmad-Bhāgavatam 2.10.3
105 Śrīmad-Bhāgavatam 2.10.4
106 Śrīmad-Bhāgavatam 2.10.5
107 Śrīmad-Bhāgavatam 2.10.6
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110 Addressing the British Association in 1934.
111 Śrī Brahmā-saṁhitā 5.43
112 Bg. 14.6
113 Śrīmad-Bhāgavatam 3.10.14
114 Śrīmad-Bhāgavatam 3.20.14-15
115 Śrīmad-Bhāgavatam 3.20.15-16

116 Śrīmad-Bhāgavatam 3.12.2, 3.20.18
117 *As You Like It. Act 2, Scene 7, line 146*
118 Śrīmad-Bhāgavatam 3.26.52
119 Śrīmad-Bhāgavatam 3.26.52
120 As told to me by Harikesa dasa, who was personally told that by him.
121 Śrīmad-Bhāgavatam 3.6.6
122 Śrī brahma-saṁhitā 5.12
123 Niels Bohr, Discussion with Einstein on Epistemological Problems in Atomic Physics in P.A. Schilpp (ed.), Albert Einstein: Philosopher--Scientist (1949), p. 236.
124 Śrīmad-Bhāgavatam 2.1.39
125 Śrīmad-Bhāgavatam 3.5.29
126 Śrīmad-Bhāgavatam 3.6.26
127 Śrīmad-Bhāgavatam 2.1.23-38
128 Śrīmad-Bhāgavatam 2.5.11
129 Śrīmad-Bhāgavatam 2.5.14, Śrīmad-Bhāgavatam 2.5.21
130 Śrīmad-Bhāgavatam 2.5.14, Śrīmad-Bhāgavatam 2.5.21
131 Śrīmad-Bhāgavatam 2.5.18
132 Śrīmad-Bhāgavatam 2.6.32
133 Śrīmad-Bhāgavatam 2.5.19
134 Śrīmad-Bhāgavatam 2.5.24
135 Śrīmad-Bhāgavatam 2.5.25-29
136 Śrīmad-Bhāgavatam 2.5.30
137 Śrīmad-Bhāgavatam 2.5.31
138 Śrīmad-Bhāgavatam 3.5.29
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140 As told by Harikeśa das in relation to the cosmology issue.
141 "Hällbilder och samiska trummor". University of Umeå 2010
142 Layton, 2000:1
143 Woodhouse, 1989:17
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148 (Das Wesen der Materie [The Nature of Matter], speech at Florence, Italy (1944) (from Archiv zur Geschichte der Max-Planck-Gesellschaft, Abt. Va, Rep. 11 Planck, Nr. 1797)
149 Addressing the British Association in 1934.
150 Eddington: The Nature of the Physical World (1928), Ch 12
151 Schrödinger: My View of the World (1931)
152 Stacey, B. C. (2016). "Von Neumann was not a Quantum Bayesian". Philosophical Transactions of the Royal Society A. 374: 20150235. arXiv:1412.2409. Bibcode:2016RSPTA.37450235S. doi:10.1098/rsta.2015.0235.
153 God Is Not One: The Eight Rival Religions That Run the World and Why Their Differences Matter". Book by Stephen Prothero, April 20, 2010. And: Niels Bohr. source: Indian Conquests of the Mind, Saibal Gupta. Quoted from Gewali, Salil (2013). Great Minds on India. New Delhi: Penguin Random House.
154 Pride of India (2006) by Samskrita Bharati. p. 56 (It may rather be: "After the conversations about Indian philosophy, some of the ideas of Quantum Physics that had seemed so crazy suddenly made much more sense", but this quote is common so...
155 https://en.wikipedia.org/wiki/Kālacakra
156 ŚB 2.1.25, ŚB 2.5.36
157 ŚB 2.5.37
158 ŚB 2.4.6
159 Or if you want to dive deeper into that, I recommend the paper "There are no particles, there are only fields", by physics professor Art Hobson: https://arxiv.org/pdf/1204.4616.pdf
160 ŚB 2.5.11
161 Chāndogya Upaniṣad 3.14.1
162 ŚB 3.26.15
163 ŚB 2.10.3
164 ŚB 2.1.39
165 Bg. 14.6
166 ŚB 2.5.19
167 ŚB 3.10.11

168 ŚB 3.11
169 ŚB 3.11.38
170 ŚB 2.1.35
171 ŚB 2.5.33, purport by Śrīla A.C. Bhaktivedānta Swami
172 ŚB 3.5.27, purport
173 ŚB 3.5.28, purport
174 ŚB 2.5.30
175 ŚB 2.5.31
176 ŚB 2.5.25
177 ŚB 3.26.33
178 ŚB 3.26.33
179 ŚB 3.26.35-36
180 ŚB 3.26.41
181 ŚB 3.26.44
182 S.B. Fifth Canto, Chapter 22
183 S.B. 5.22.1
184 S.B. 5.22.2
185 S.B. 5.22.5
186 S.B. 5.23.6
187 S.B. 5.23.5
188 ŚB 3.20.18
189 ŚB 3.12.2
190 ŚB 3.20.29
191 ŚB 2.1.23-38
192 ŚB 2.5.11
193 ŚB 2.5.14, ŚB 2.5.21
194 ŚB 2.5.14, ŚB 2.5.21
195 ŚB 2.5.18
196 ŚB 2.6.32
197 ŚB 2.5.19
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200 Letter to: Krsnadasa, Dated: Nov. 7, 1972, Location: Vrindaban
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202 ŚB 2.5.18
203 ŚB 2.5.25, purport

204 ŚB 3.5.33
205 ŚB 2.5.25
206 ŚB 3.5.33
207 ŚB 3.5.34
208 ŚB 3.5.35
209 ŚB 2.9.33-36
210 ŚB 2.10.1
211 ŚB 2.10.3
212 ŚB 2.10.3
213 ŚB 2.10.6
214 ŚB 2.10.7
215 ŚB 8.13.5
216 SB 9.16.24
217 [J. Simpson & S. Roud, “Dictionary of English Folklore,” Oxford, 2000, p.254]
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