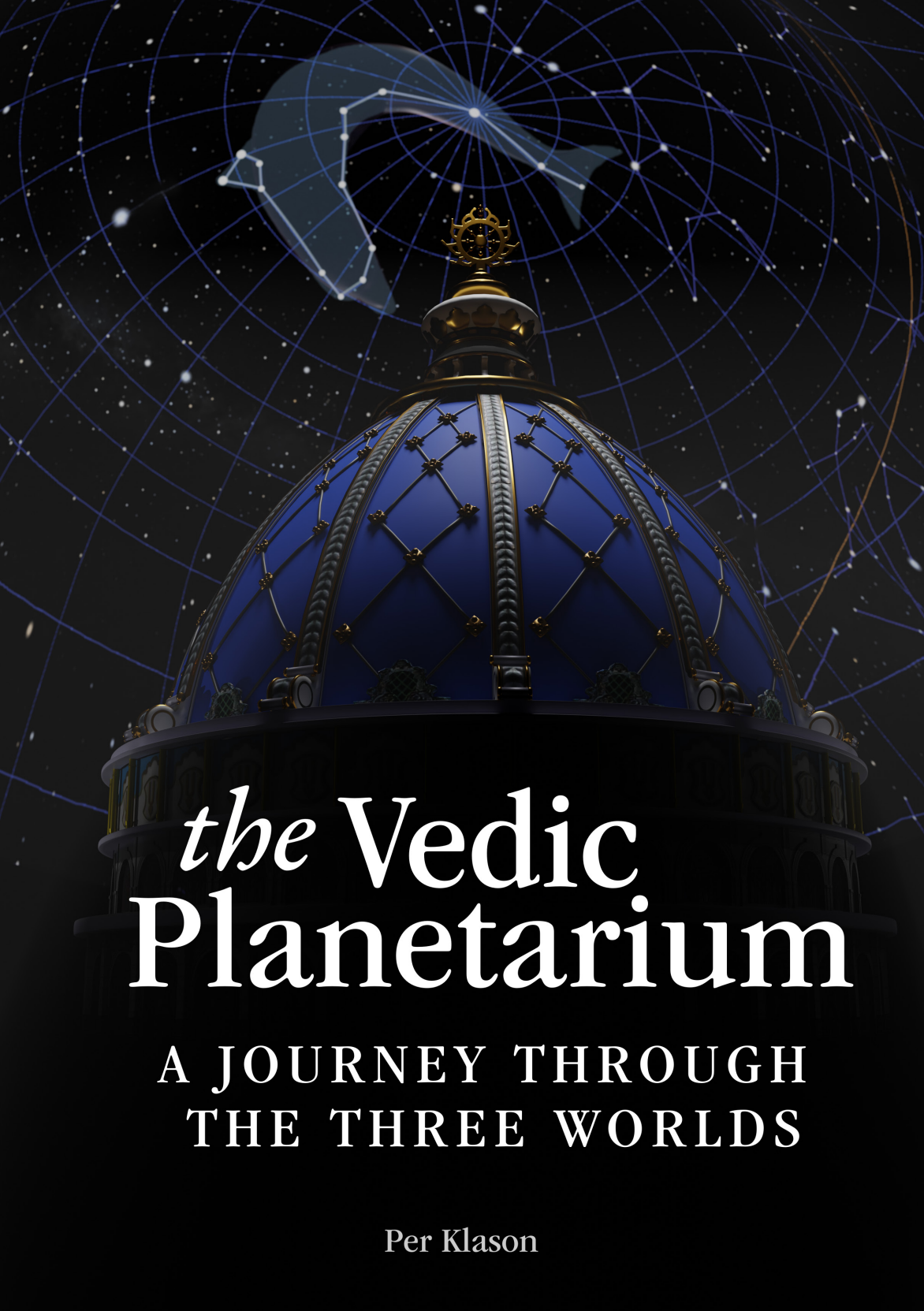

the Vedic Planetarium

A JOURNEY THROUGH THE THREE WORLDS

Per Klason

The Vedic Planetarium

By Per Klason (Priyavrata das)
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NOTE: This is an early revision that contains only part of the complete book. It is only being released to a selected few who are involved with this actual topic and project. Please don't spread it wider than that, thanks.
/The Author

It does not matter how slowly you go as long as you do not stop.
Confucius

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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

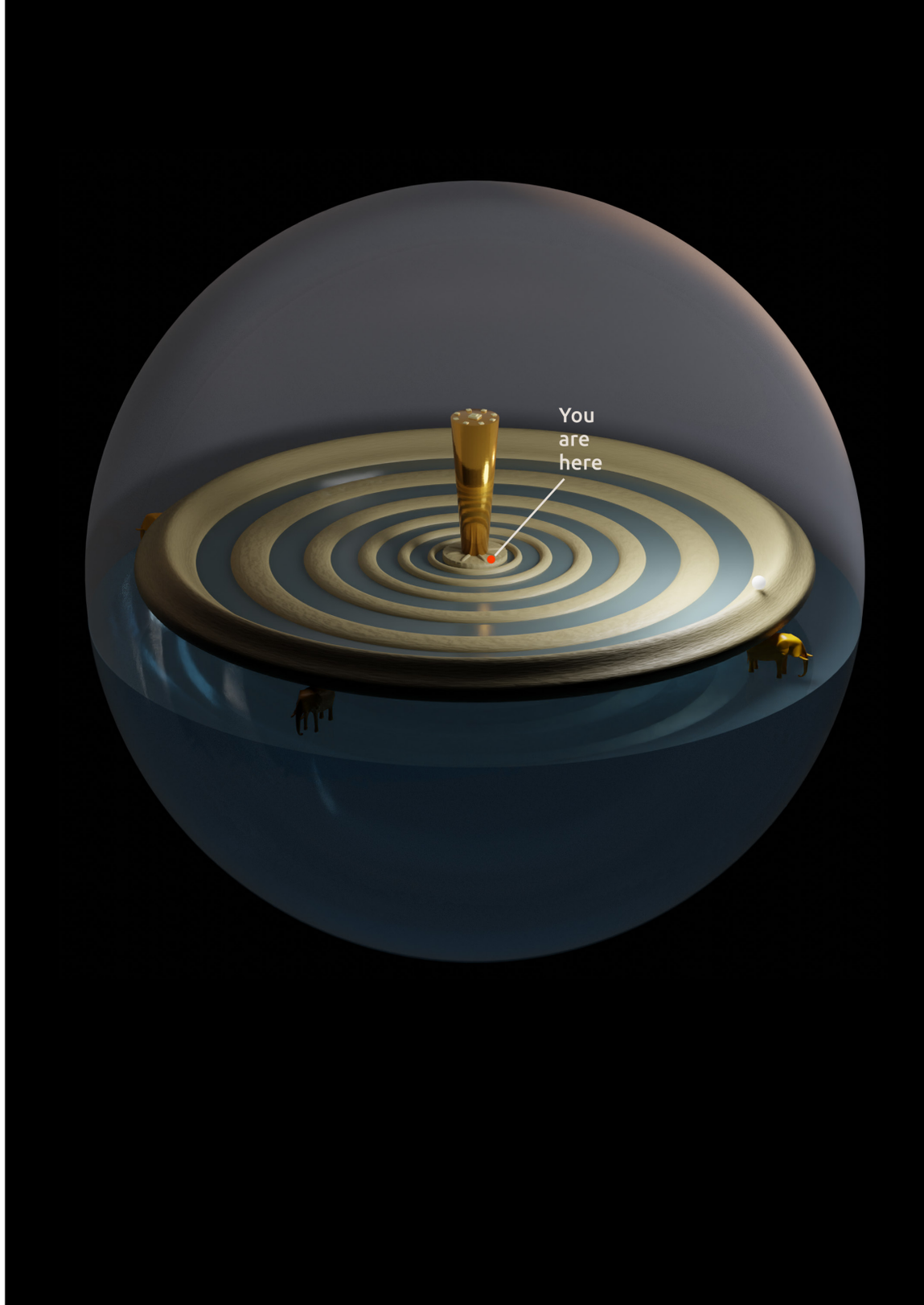
lights of Navadvīpa, a small town that used to be an important cultural and historical site in West Bengal. A steady stream of pilgrims was still passing by on the dirt road outside the wall.

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?

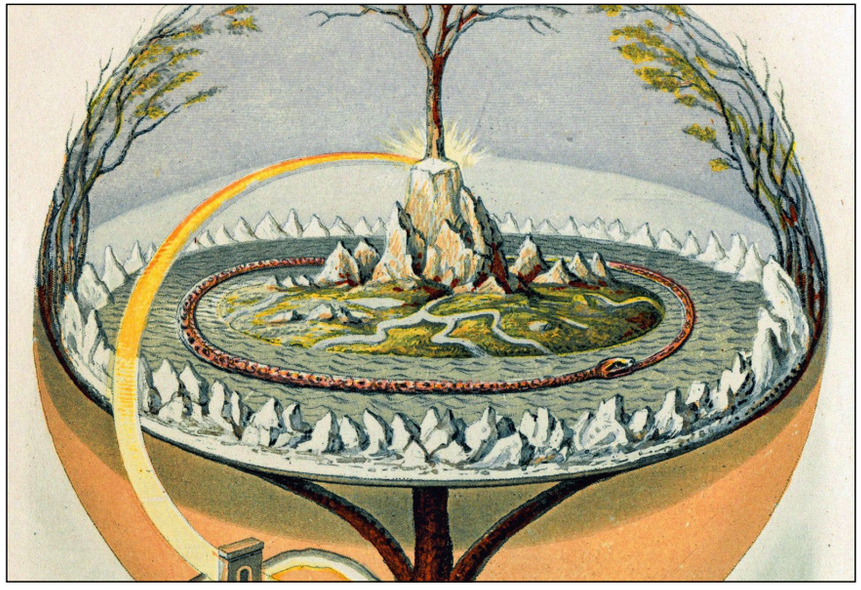
Well, a cosmos is a space, some planets, galaxies, and all of that, right? And there is something called cosmology, which is, according to Wikipedia, "a branch of physics and metaphysics dealing with the nature of the universe."

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

> **Physical cosmology** 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** 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.

"Please Engage Me In Your Service"

It was January 1997, and we stepped out into the taxi lot in front of the Calcutta International Airport. It was past 1 a.m. and we were already jet-lagged.

"Taxi to Mayapur?! 1,000 rupees only"

Well, it became 2,000 as soon as we had packed our luggage into the car, but what the heck? It's the cost of a Stockholm airport cab for a 108 kilometer ride, and we're tired!

Three hours later, we checked in at the reception of the Sri Caitanya Candrodaya Mandir guesthouse, got a bit settled in our room, and ... well, it's almost seven o'clock, so we might as well go down for Deity Greeting in the temple.

I stood there with folded hands as the altar curtain opened. There they were, Śrī Śrī Rādhā-Mādhava and the *aṣṭa-sakhīs*. Goddess and God who love each other and us, and from whom this entire existence emanates. Yes, again this cosmology. And that's how it works in India: God is everywhere, of course, so when you make a form like this in marble in a temple, then that is especially where God is. And this was about personalism—real, deeply personal relationships with the Supreme Personality of Godhead and each other. The next level beyond the *advaita* impersonalism that was otherwise so common in India these days. This couple, living as simple cowherds in the pastoral landscape of Vrindavan, is the very source of that Divine Brahman Light.

I just stood there, looking at the beautiful *mūrtis*, the fatigue from the night flight forgotten for the moment. Yes, the first time I was here was in spring 1980, and I happened to arrive just the day before these two, Rādhā-Mādhava,

were installed. But that is another story. I said my little prayer, as I usually do:

"Please engage me in Your service."

Then, deep sleep, here we come!

But the jet lag! After a late breakfast, I walked around doing my *japa* meditation in the Lotus Park. Ah, like arriving in heaven! Dark, cold, hard winter Sweden was like a lower, almost forgotten world now.

At one point, I found myself standing looking at the Expo. The Expo was a humble and unobtrusive building, a couple of hundred square meters or so large, just adjacent to the park. Inside, someone had made a simple exhibition, diorama style, illustrating the philosophy of the Bhagavad-gītā. I had always liked that place, but...

"...it could be made much bigger and more developed!" came the thought.

Wow, that would be a nice project. I had heard that Caitanya Candrodaya Mandir attracted around 3,000 daily visitors – after all, this Navadvipa/Mayapur is a major place of pilgrimage in India!

I continued my *japa* meditation, laying thoughts to rest. Now finally, I would get a month of simple life, studies, and meditation. I would be cooking my *kitchari* on the gas stove in my simple room on the ground floor of the Lotus Building, and I would sit there doing my *japa* meditation, looking out over the little straw hut guest village which I had stayed in last time I was here.

Yes, here life was simple and free from the stressful and complicated life in the West. There could be a world war and you probably wouldn't even notice it here out on the Bangla countryside. The farmers grew their rice next to Mother Ganga, the *daaber walas* always had the pile of fresh coconuts in their shed every morning for breakfast, and ah, there was plenty of locally grown veggie food. And that amazing temple...

The next thing I remember is standing at the same place in that park again, now in the afternoon, still trying to finish my daily *japa* meditation. A young Bengali *brahmacārī* came running out from the long building. Toward me. He shouted, as the locals here often do.

"Priyavrata das?"

"Yes!" How could he know my name?

"You've got a phone call. It's up here in the director's office. Hurry up!"

Bewildered, I followed him and stepped into the office of Jayapataka Swami, the director of this entire project. It was in the usual simple Indian office style, but luxurious because it had A/C.

"You can take the call now on this phone."

It was from Sweden, where an important meeting was going on. It was the SMPDC—Sridham Mayapur Development Committee—having a management meeting in New Radhakunda, Korsnäs Gård, south of Stockholm.

They were the leaders of the Temple of Vedic Planetarium project that was being developed here in Mayapur—that big mystical planetarium that I had heard about the first time I was here.

The guy on the phone, my old friend Paramananda das, who I had understood was working for that project, spoke on their behalf.

"They sit here and just asked me to call you."

"Ok?"

"I gotta save phone money, so I'll make it short. You know the Temple of Vedic Planetarium? They want to make a huge exhibition there."

"Wow! That sounds great. You know, I just thought this morning about..."

"And they need a production manager for that Exhibition Development Department. They want you!"

I just sat there for some moments, baffled. I remembered the first time I came here to Mayapur and Vrindavan in India, back in 1980. Someone had said, "Careful with what you desire in the holy *dhāmas*, because here wishes tend to come true."

"No, no way! Try someone else! I just gave up one management position, I'm a useless manager, and now I came here to just study and write!"

But someone on the other side was rather persuasive, and they assured me that it was less about management and more about conceptual development, so I surrendered. What else could I do?

Just a few hours later, I had been briefed, equipped with a good pile of informational material, the address to an apartment outside London, which was now my home. Goodbye Sweden. And on the table was a pile of air tickets for going around and studying some important exhibitions and temples all over India. "While you are there anyway", as one enthusiastic director put it.

I entered a different cosmos, you could say. One where there was money and resources. The Planetarium project was now financed by Alfred Ford (the great-grandson of Henry Ford, who is a Gauḍīya Vaiṣṇava and a disciple of Śrīla Bhaktivedanta Swami Prabhupāda), fundraising among wealthy Indians, and ... yes, some smart financial investment work in Russia... So it was not just another one of those zero-budget projects I was used to. But I also literally entered another cosmos: that of ancient *Purāṇic* India. Most importantly, there were some pretty interesting concepts and visions at the roots of this project, and I eagerly started reading the pile of papers with the instructions given by the founder of it all, Śrīla Prabhupāda.

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.

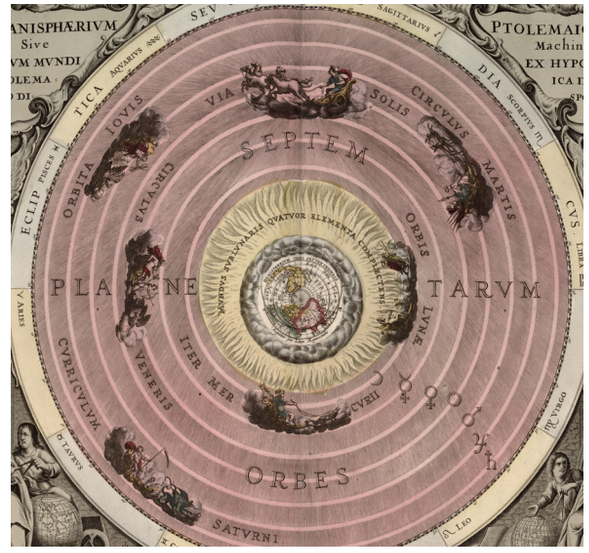
So there we are again, old gods and fantastic realms from a bygone age. How in the world would you make science out of that? And how should that frickin' Planetary Model look?

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.

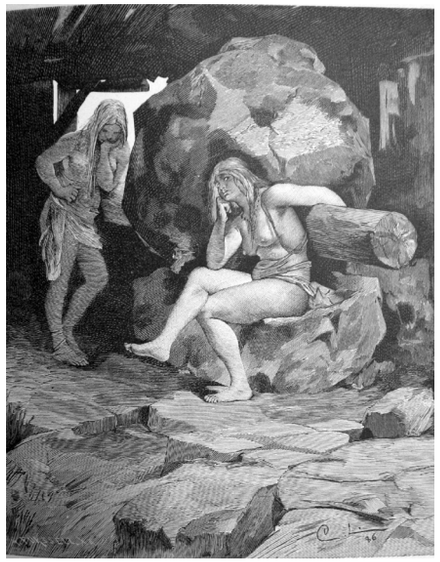
He was trying to "crack the code". The old display panels with the golden ice cream cone mountain surrounded by seven islands were still there on the wall, but after all these years Richard had more to say about what they actually meant, and it started to make a little more sense—well, kind of.

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



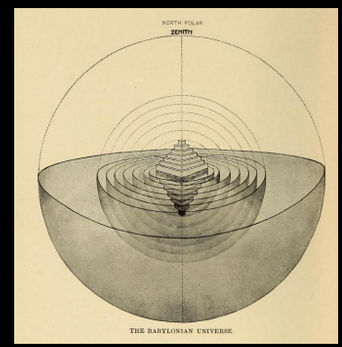
Fenja and Menja churning the mill.

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.*

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

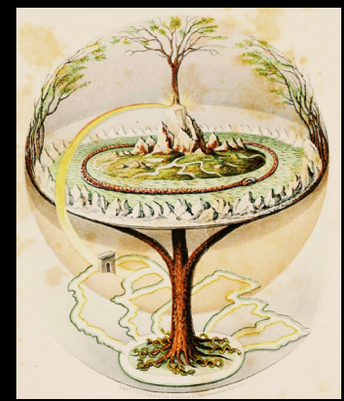


Babylonian cosmos
Seven upper and lower worlds.

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

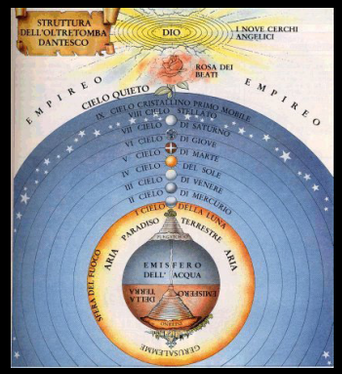
Hebrew cosmos

Chinese cosmos
With Mt. Meru (Yuan dynasty).



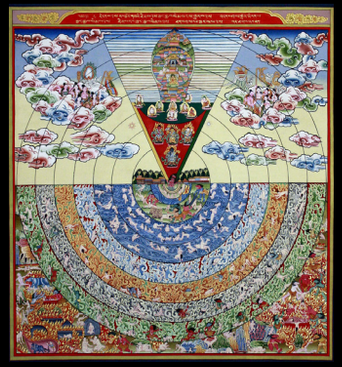
Scandinavian cosmos

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



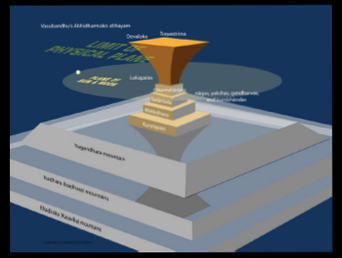
Dante's cosmos
From Divina Comedia.

Greek cosmos
Mt. Parnassus with God on top.



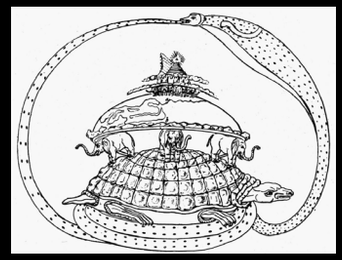
Tibetan cosmos
The Kalachakra depiction of the cosmos with Mt. Meru at the center.

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

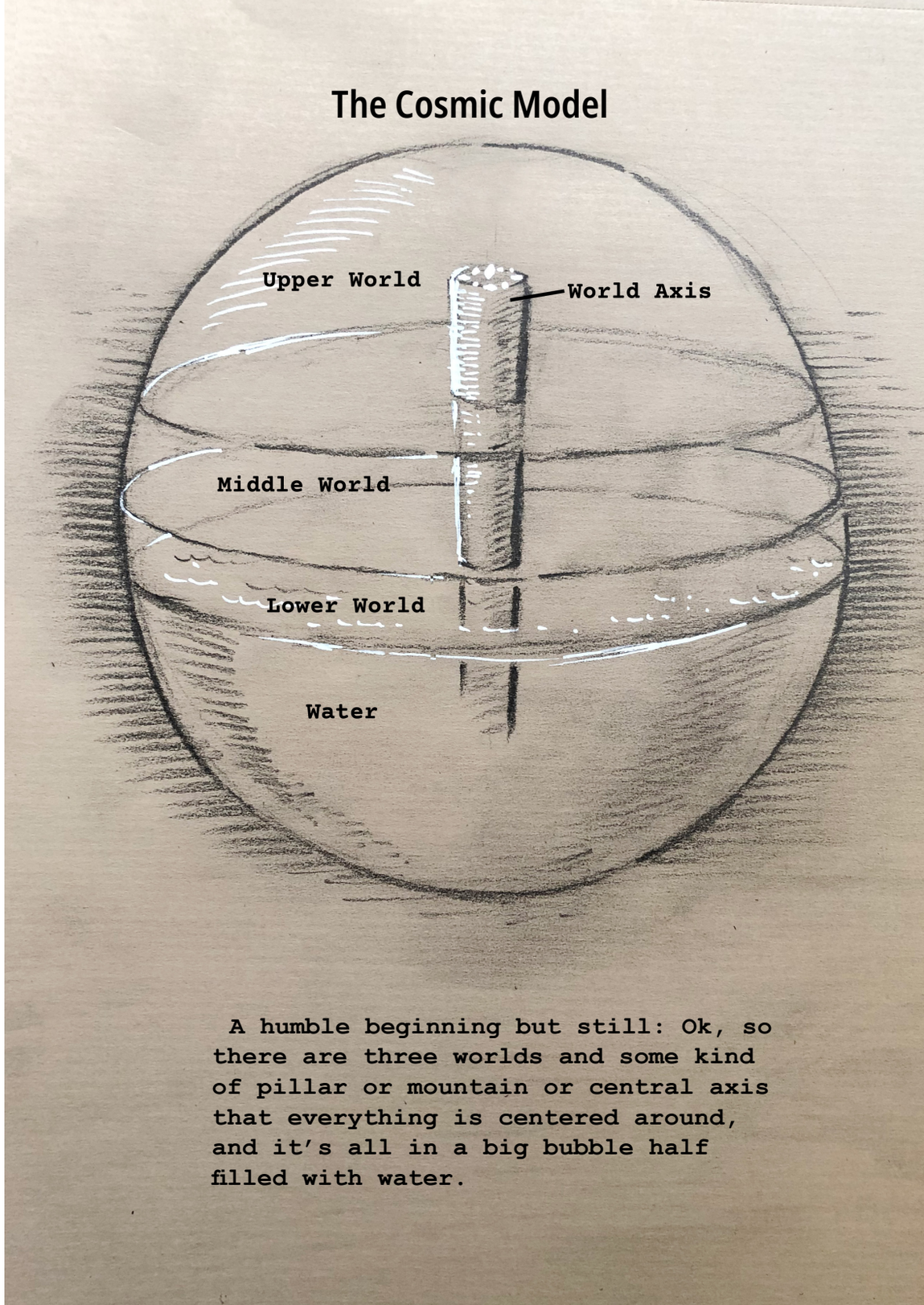
Under the Manichaean view of the universe, originating in Persia and spread as far as to China and Britannia during 300–500 CE, the world is formed by ten layers of heaven and eight layers of the Earth. The separated top section depicts paradise, below it are the sun (right) and moon palaces, which are 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

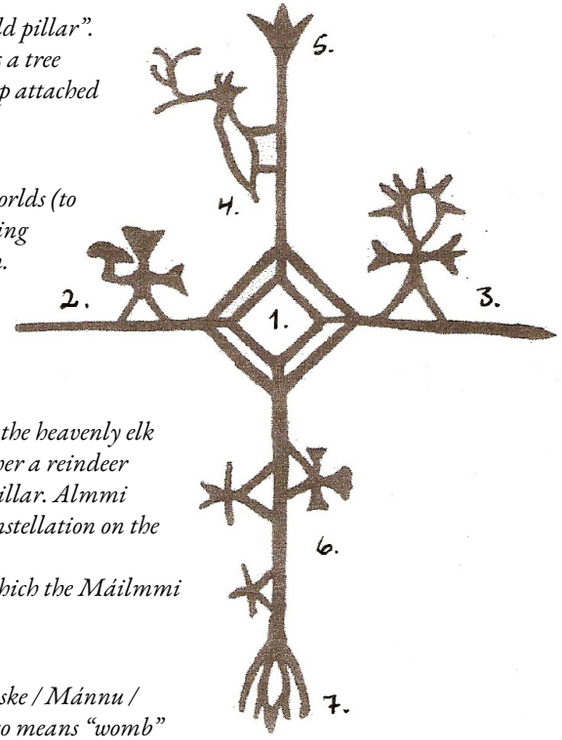
There were people living in northern Scandinavia during the late ice age, probably around 10,000 years ago, and we can still find rock art they created in Sweden, Norway, and particularly in Finland. In other parts of the world, such as Germany, Spain and Indonesia, such rock art has been found from 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.

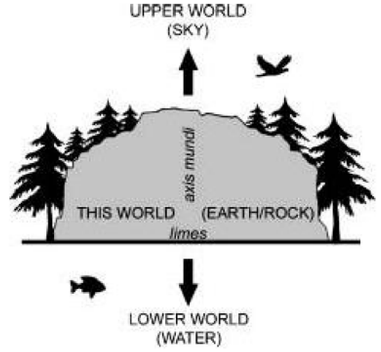
Why and when did such a concept develop among humans, and how come it was there all over the world thousands of years ago among tribes that could hardly have had any contact with each other?

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 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 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)

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.)

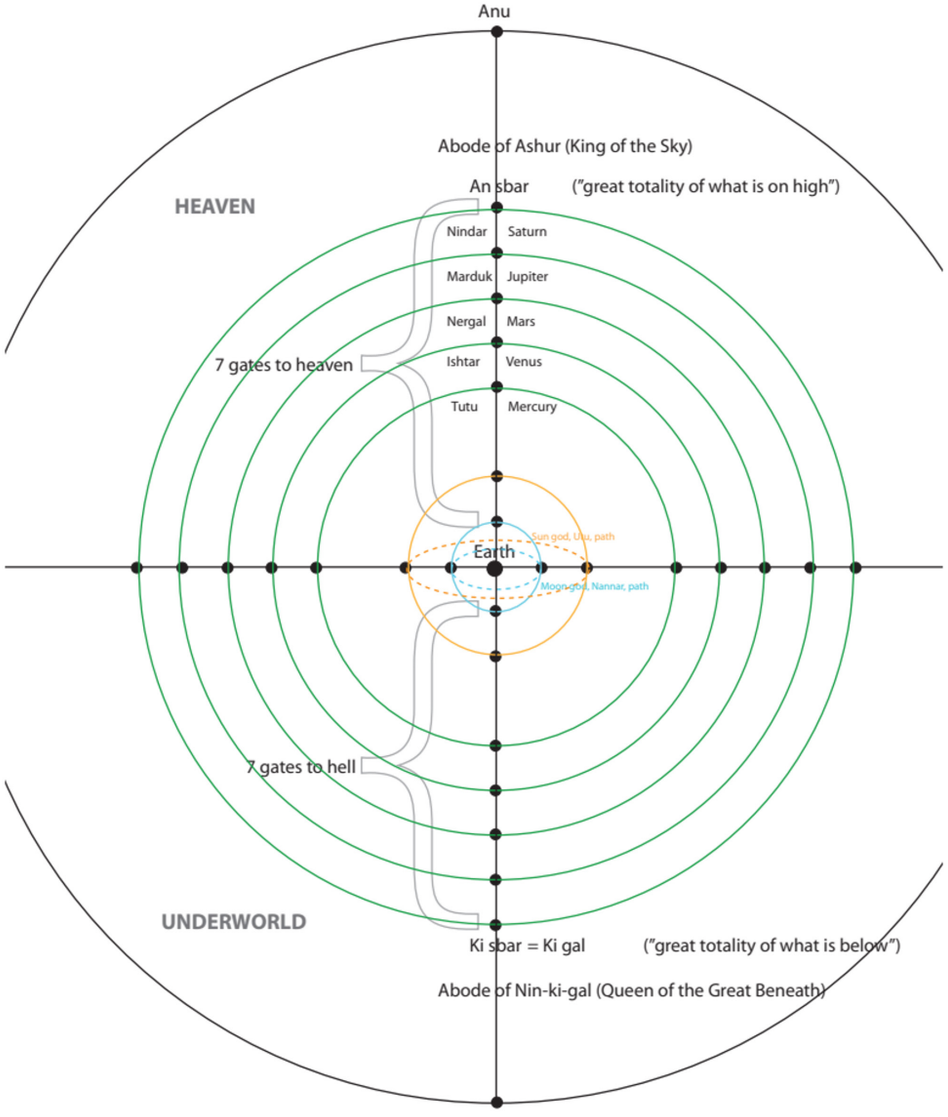
It seems that the Tower of Babel actually did exist. In the area that the Biblical story refers to there were several major temples, called *ziggurats*, which you can still see ruins from if you go there. Those buildings are interesting in themselves, apart from the fact that they may be around 6000 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.

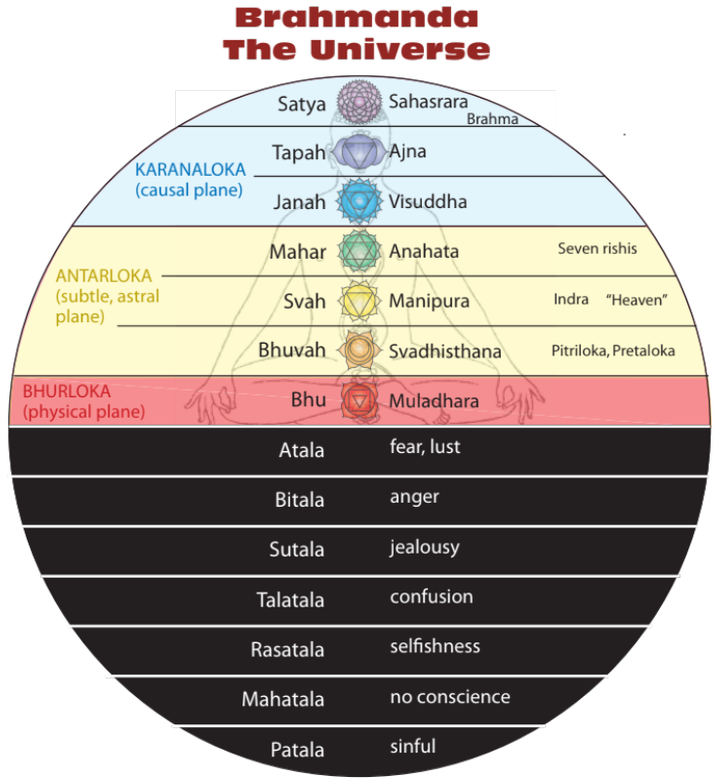
The *ziggurat* was also seen as a sacred mountain, and its tiers were sometimes compared to the terraced slopes of a mountain. The ascent of the *ziggurat* was therefore seen as a symbolic journey up the mountain to the realm of the gods. In some interpretations, the *ziggurat* was also seen as a symbol 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, embedded 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.

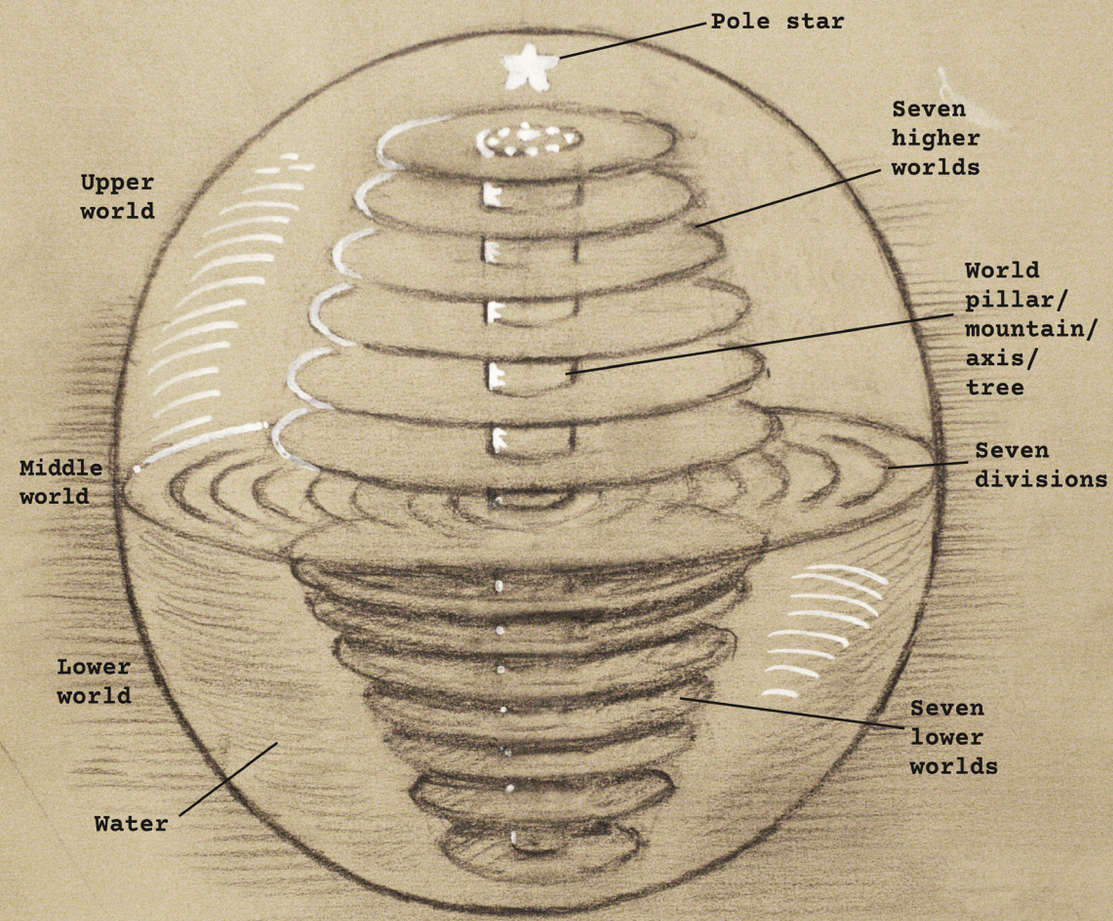
All of this divided into three worlds.

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 *Vedāntic* 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.

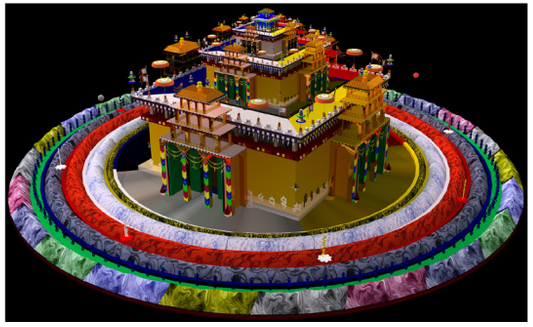
At the end of the day, this was not a dramatic change in the worldview of humans. For thousands of years, until the rise of materialism, that outlook had dominated all over the world—in the religions, in Eastern and indigenous worldviews, and in philosophies based on idealism: All existence is ultimately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



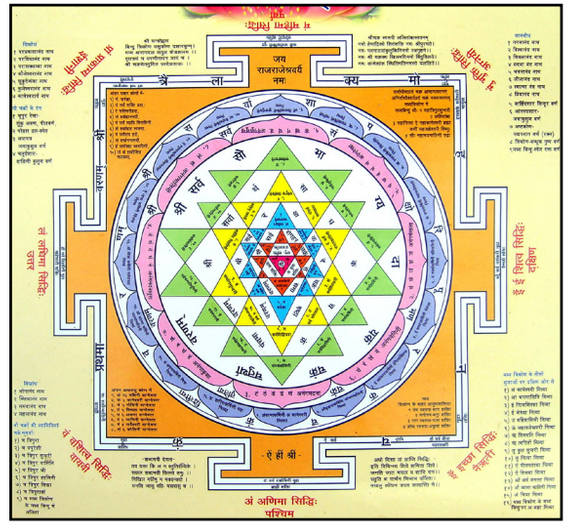
First of all the *Kālacakra* is more than what we see there in the sand. It should actually be understood as three-dimensional, and you can find it made like that in Tibetan temples.

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 outermost 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

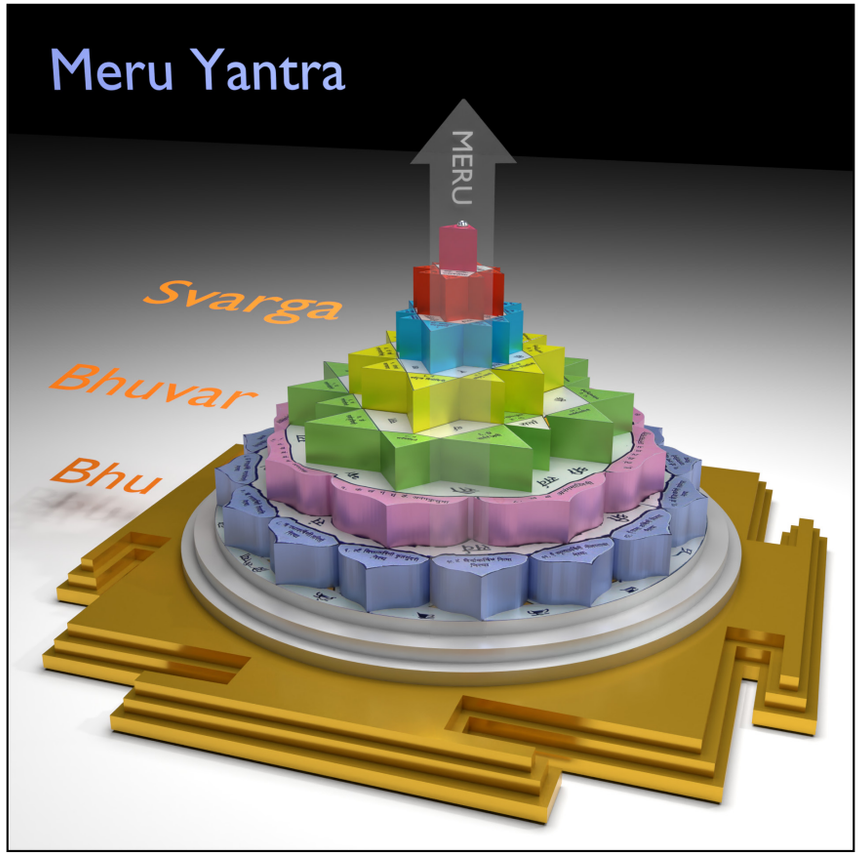
that too. It is then called the *Meru Yantra*. Its central peak is Meru, ascending through the three worlds of the cosmos: *bhū*, *bhuvar* and *svarga*. We also find, represented in the system of triangles, the seven levels leading upwards from the gross physical plane to the highest realms of consciousness.

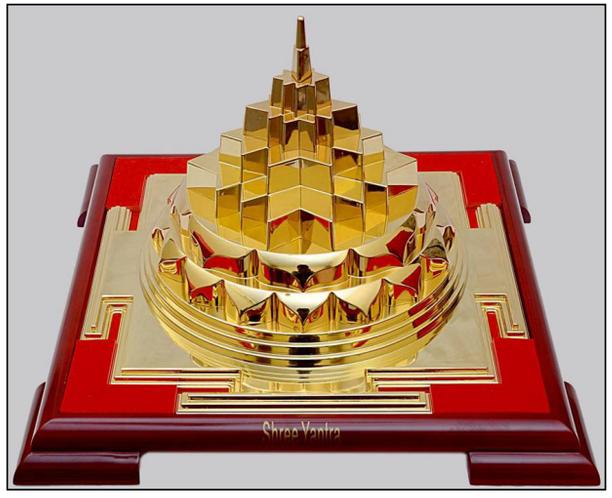
On a macrocosmic level, the *Śrī Yantra* represents the *virāṭ-puruṣa*, which is the cosmic form or the universal Divine Being. It embodies the manifestation of the entire universe and symbolizes the interconnectedness of all existence. Furthermore, the *Śrī Yantra* also has a microcosmic significance, 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.

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.

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 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 everyone 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 influenced by time (*kāla*), takes on 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—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

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

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:

Maha Viṣṇu—the Cosmic Dreamer

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 dreaming up the material world, worshipped in Indian temple.

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:

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

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 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. 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

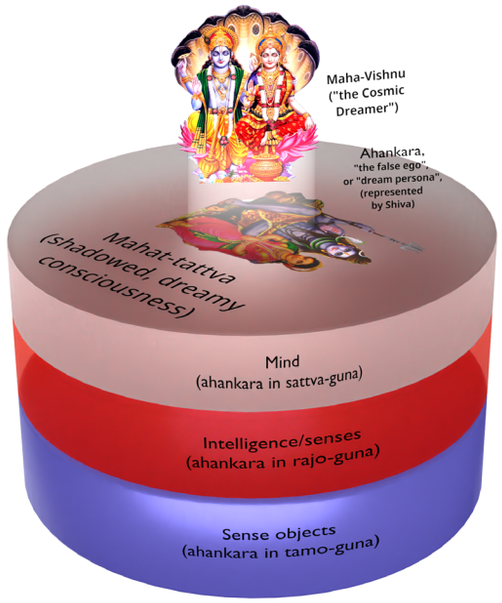
When the *mahat-tattva* has appeared as consciousness influenced by the *guṇas* and time, something interesting happens. The False Ego appears. *Ahaṅkāra*. This word deserves more explanation. The word *ahaṁ* means "I", and *kāra* means "making". So what it means is just that: When the "I", meaning the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

When Mahā-Viṣṇu "dreams" the creation, there is first the shadowy consciousness (mahat-tattva) under the material modes (guṇas). Therein the "false ego" (ahaṅkāra) appears – the "dream persona" – represented by Śiva.

Then that ahaṅkāra, in the mode of sattva ("goodness") develops the mind. In the mode of rajas ("passion") the intelligence and senses start acting in that mind, to fullfill desires. Finally, in the mode of tamas ("ignorance"), the mahā-bhūtas, sense objects or material elements appear.



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.

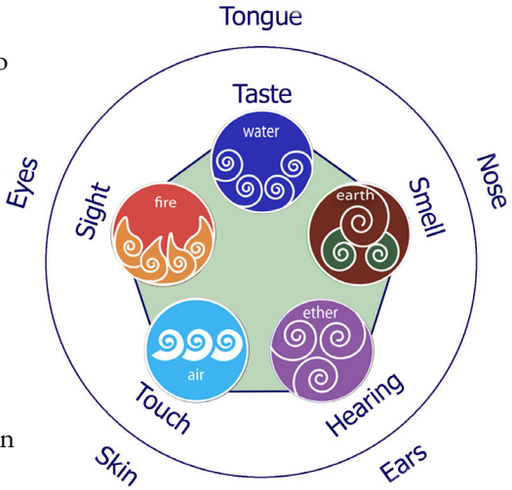
More specifically, that material mind appears through the *ahaṅkāra* in *sattva-guṇa*, the mode of goodness. It is just clear, still consciousness, the space where the activities of our senses and intelligence can take place. That action starts as the *ahaṅkāra* continues into *rajo-guṇa*, the mode of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

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, but there is vibration that can carry sound.

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.

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 sound, 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 yet 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 *mahat-tattva,*

consciousness getting touched by the material modes of nature, 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*)

From the navel of this sleeping God appears the lotus flower that is the entire gigantic universe, the virāṭ, containing all the fourteen worlds.

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.

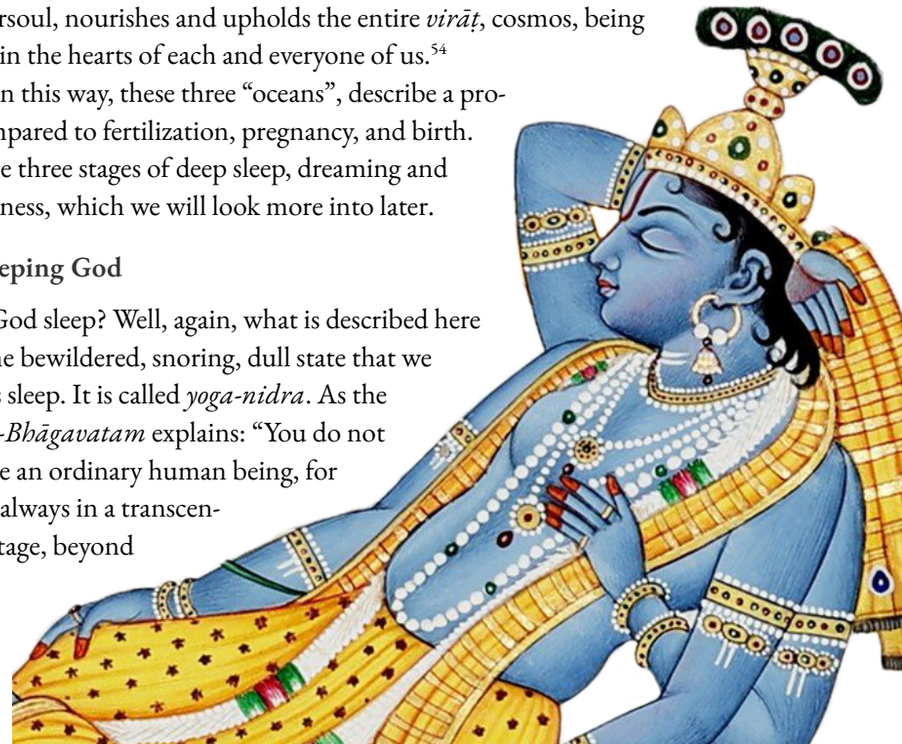
The stem of the lotus contains all the *lokas*, realms of the cosmos, and all the living beings who are about to appear in those worlds. If we then try and picture a lotus stem and flower that somehow contain those seven higher and seven lower *lokas*, what picture do we get? Well, I would say we just look back at the first teachings from Śukadeva to Parīkṣit.

Indeed, the abode of Kṣīrodakaśāyī Viṣṇu is said to be up there, on the head of the *viśva-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 cre-



ation 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 seven higher and seven lower lokas contained in a lotus stem correspond with the visva described in the first teachings from Śukadeva to Parīkṣit.

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:

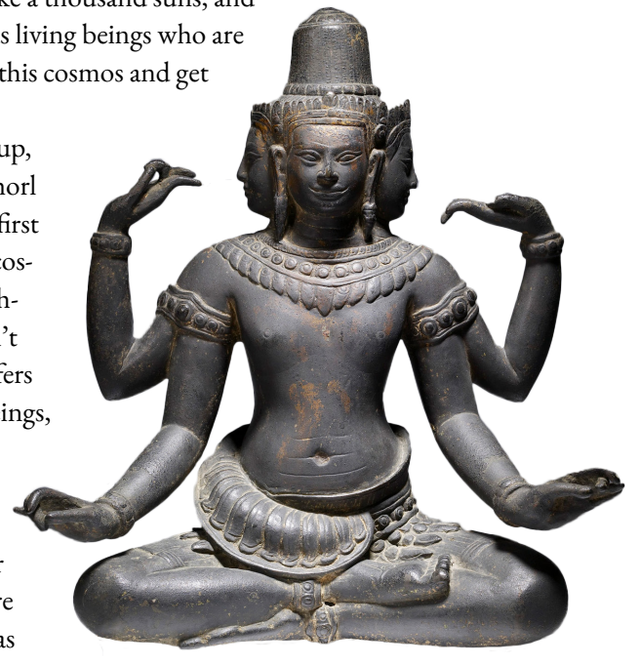
> Brahmā could see that on the water there was a gigantic lotuslike white bedstead, the body of Śeṣa-nāga, on which the Personality of Godhead was lying alone. The whole atmosphere was illuminated by the rays of the jewels bedecking the hood of Śeṣa-nāga, and that illumination dissipated all the darkness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



Brahmā, the first jīva in the cosmos, is generally shown with four heads, representing him exploring the four directions after appearing.

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 compared to 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 *svarāt*, 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.

Kṣīrodakaśāyī Viṣṇu, 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 bright-

est, 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 chasing him for sex. At first, he just laughed at them, but they eventually got so annoying

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.

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 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 decently 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 how they share surprising similarities with some conclusions that the founders of quantum physics arrived at. The cosmos is not perceived as an objective space with matter existing independently, as commonly believed by our modern materialistic cosmology. Instead, it is seen as emerging from consciousness. 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 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*).

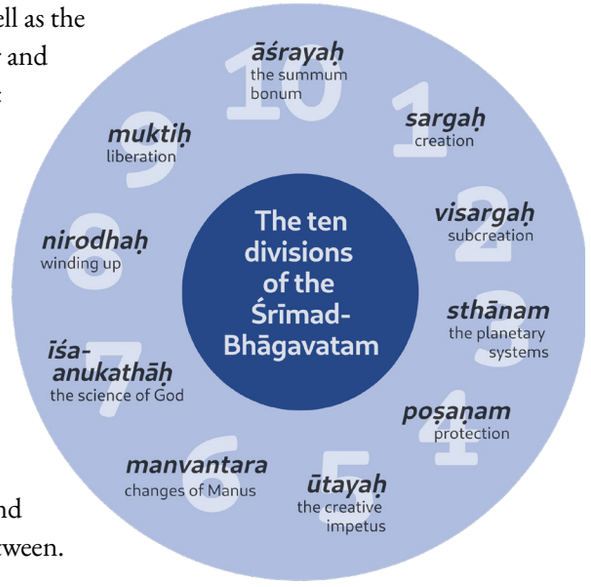
This is important to notice because it presents a viewpoint entirely different from that of materialistic cosmology, which only considers the formation of energy and matter in physical space. During my own research through the years, I eventually concluded that it is this very shift in perspective that 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 about the abodes and places where the residents of the cosmos can live (*sthānaṁ)*, find shelter (*poṣaṇam*) and act (*ūtayaḥ*).

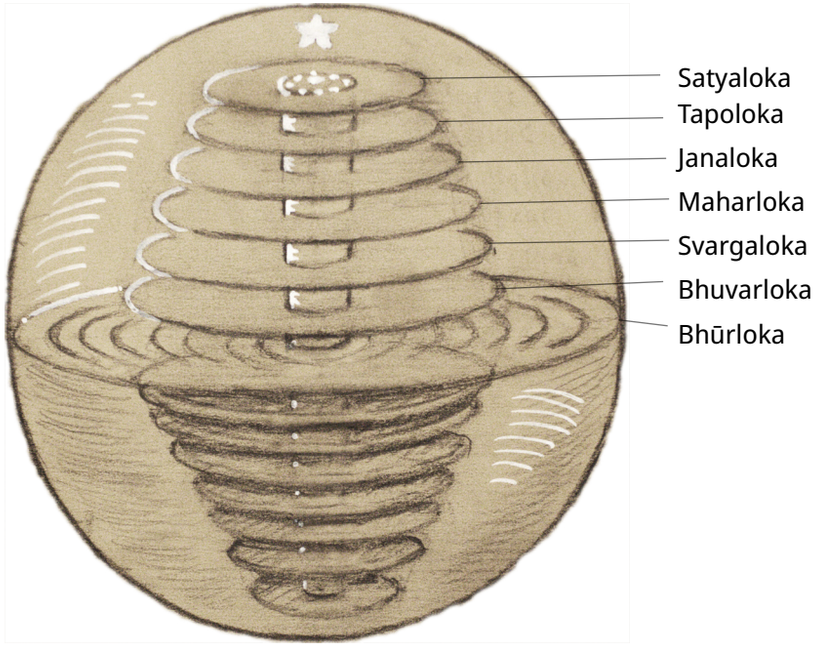
Throughout this book we have repeatedly mentioned the three worlds, as well as the fourteen worlds (seven upper and seven lower). This is the basic structure of the cosmos as described in most ancient cosmologies, and as we remember, it is indeed where the teachings of the *Śrīmad-Bhāgavatam* start. Now we have 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 (*sthānaṁ)* for all of them 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 the higher realms of angelic *devas*, the earthly realms lit by sunlight, and then darker realms below. 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 below that.

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 person today would most 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 meanings and word-to-word translations rarely, if ever, refer to the planets that the astronomers see in the sky.

The most common of those Sanskrit words that get translated into "planet" is *loka*. The *Bhāgavatam* describes the *lokas* as what we mentioned earlier: distinct realms for individuals at various stages of consciousness and development. The word *loka* is related to the Latin word "locus" which means a location, a realm. So a *loka* is a realm to live in. This concept is found all over the world, appearing in Christianity, Islam and Judaism as the seven heavens. In the Norse cosmology there are nine worlds, along a cosmic tree, Yggdrasil. And here we have our *Purāṇic* cosmology with seven worlds along a cosmic lotus flower.

Those seven worlds, where the upper five constitute S*vargaloka*, and then below them there are *Bhuvarloka* and *Bhūrloka,* are mentioned just briefly in the *Śrīmad-Bhāgavatam*. The reason may be that they are well-known in the Indian knowledge tradition and already included in introductory studies. In fact, I just found such an introductory book online, *Sanatana-dharma – An Elementary Text Book Of Hindu Religion And Ethics*, published by The Board Of Trustees, Central Hindu College, Benares in 1902.[70] It has a chapter named "The worlds—visible and invisible", which explains the three *lokas* so clearly and nicely that I decided to include it here in Appendix YYY. But I will now also try to explain it in short.

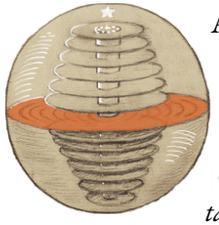
There are some Sanskrit words and concepts introduced here that actually describe much of the *Purāṇic* cosmology in a nutshell, so I thought it may be worthwhile to take a look at those words. Here is a table for now, which we will try to figure out bit by bit. (If I got something wrong here then just let me know.)

Kośa (sheath)	Śarīra (body)	Loka (realm)	Avasthā (state)
ānandamaya-kośa	kāraṇa-śarīra	Satyaloka	suṣupti (deep sleep)
		Tapoloka	
		Janaloka	
vijñānamaya-kośa		Maharloka	
manomaya-kośa		Svargaloka	svapna (dreaming)
prāṇamaya-kośa	sūkṣma-śarīra	Bhuvarloka	
annamaya-kośa	sthūla-śarīra	Bhūrloka	jāgrat (waking)

First of all, there are three words here that we need to explain: *Śarīra* basically means "body", and we've got three bodies: the physical body (*sthūla-śarīra*), the subtle ethereal and mental body (*sūkṣma-śarīra*), and what is called the "causal body" (*kāraṇa-śarīra*), which is described as the seed of the other bodies. *Kośa* refers to the "sheaths" that those bodies are made of: The physical one (*annamaya-kośa*) is built by food, *anna. T*he energetic one (*prāṇamaya-kośa*) consists of the life-force, *prāṇa/chi*, that drives the body. Then there is the mind (*manomaya-kośa*), the intelligence (*vijñānamaya-kośa*) and the causal sheath (*ānandamaya-kośa*). (I also added another column to the table: *avasthā*, "state of consciousness"—waking state, dream state and deep sleep. You don't have to bother with those now, but they can be good to keep in mind when we will look closer at those states in a later chapter.)

Each one of these bodies exists in the *loka*, realm, that corresponds to their nature. The physical body (*sthūla-śarīra*) exists in the physical world (Bhūrloka), the subtle body (*sūkṣma-śarīra*) exists in the higher *lokas* starting with Bhuvarloka, and the causal body (*kāraṇa-śarīra*) exists in the Satyaloka or Brahmaloka, the level of Brahmā, who we just read about.

Bhūrloka – the physical world



Again we notice, just as we have seen in the *Śrīmad-Bhāgavatam*, that the *lokas* are not described in terms of geographic locations but of levels of consciousness and their corresponding realms. When my consciousness is directed through the senses of a body made of the *mahābhūtas*—the earthly body I have now—I am on the *bhū* level and thus find myself in that realm, Bhūrloka, the physical world.

Bhūrloka means "the world of bhū", where *bhū* relates to the word *bhūta*, which means "becoming", "being", "material elements", "body", "creation". In other words, where material forms appear. Bhūrloka thus refers to the space where we move around in our gross physical bodies (*sthūla-śarīra*). It can be compared to Gaia in Greek mythology, Midgard in Norse cosmology and so on.

But we have more than this physical body. We also have a mind. And just as the physical body has a realm to exist in, so does the mind, and it is called:

Bhuvarloka—the astral world

When ones consciousness is rather directed into the subtle level of life force (*prāṇamaya-kosa)* and mind (*manomaya-kośa*), one is connected with Bhuvarloka—the world beyond this physical realm.

Bhuvarloka relates to the "denser part of the mind-sheath", *manomaya-kośa (*see appendix YYY, page ZZZ*).* What does that mean? *Sūkṣma-śarīra* means the "subtle body"—the invisible body that can not be seen by physical senses. It includes the energy body (*prāṇamaya, chi/qi* in China*, pneuma* in Greece etc.), the mind (*manomaya*) and the intellect (*vijñānamaya*). Of these, the two latter exist in this realm outside of the physical. In India it is Bhuvarloka; in the west it is generally called the "astral world" (defined in the dictionary as "consisting of a supersensible substance ... next above the tangible world in refinement"[71]).

When we die, as we call it, we cast off the gross physical body (*sthūla-śarīra*) and remain in our subtle, astral body (*sūkṣma-śarīra*). We then find ourselves in Bhuvarloka, which is divided into two realms, the *Pretaloka* and the *Pitṛloka*. Let's take a look at those:

Pretaloka

After having just left the earthly realm, still conditioned by it and needing to gradually settle into the new world one just entered, one first remains in this denser part of the *manomaya-kośa* (the mental body). One is then called a *preta*, and is an inhabitant of *Preta-loka,* which is generally translated as "the world of the dead".

The word *preta* is sometimes used as meaning "ghost", but originally, and in older Vedic literature, it means "departed, deceased" in general. It is where you first go when you die, and it is sometimes said to be an astral duplicate of the earthly Bhūrloka realm.

So there you are, having left your earthly body behind and unable to enjoy it anymore. What to do then? Well, if you are still very attached to the earthly pleasures, you will be frustrated and may even suffer—especially if your pleasures were obtained by causing others suffering. So yes, it will be judgment day, and thus the governor of this realm is Yama, the god of death and justice. That experience may be nice or hellish, depending on our *karmic* reactions from the life we just lived. We will remain in that realm for some time, still

rather close to earthly life. That is also where those remain who become ghosts, not having a physical body anymore but still being earthbound.

Then, "after a shorter or longer time—according to the strength of these cravings and the consequent length of time needed for their exhaustion", that "dense" part of the mental body (*manomaya-kośa*) is cleared and one goes to the higher level of the Bhuvarloka, namely:

Pitṛloka

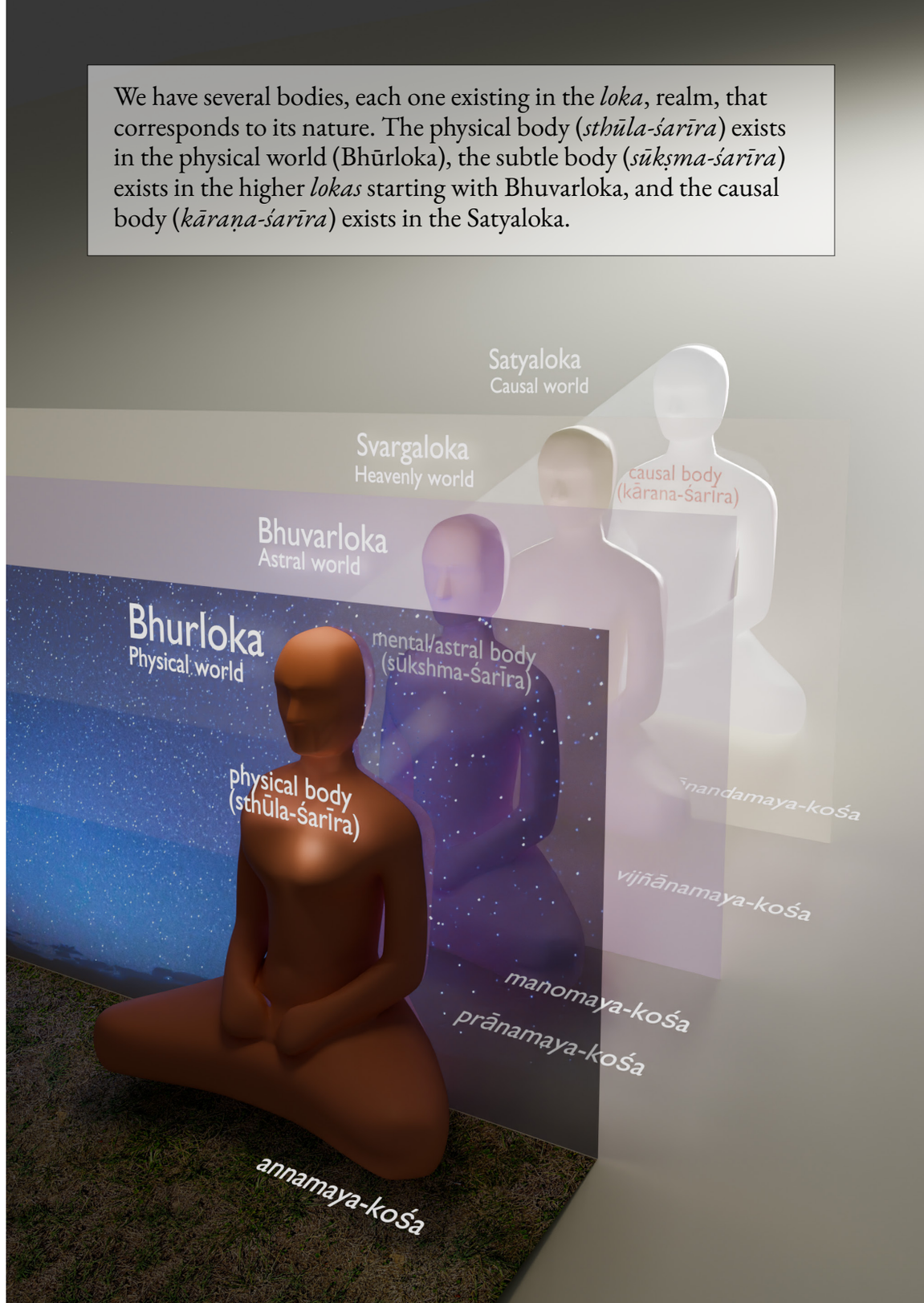
Pitṛloka is described as the "world of the ancestors", in the *Bhagavad-gītā*[72]. People who leave this earthly realm go there and stay there as long as their children remain connected with them, by for instance performing memorial services. Such understanding and practice is found in practically all original cultures of the world.

I once had the opportunity to attend a family ceremony at a cemetery in northern China. Some family members had gathered in honor of their departed parents/grandparents. I believe it was the yearly memorial day called *Qingming*, when Chinese families visit the tombs of their ancestors to make ritual offerings to them. They spoke to them, offered food, alcohol, incense and sheets of paper symbolizing money. I asked if they actually believed that the ancestors were present, hearing them and receiving their gift gestures. They answered that yes, the traditional understanding in China is that the deceased ancestors live in the invisible world beyond this one. This is a way of staying in contact with them and receiving help and guidance from them, from the otherworld. I remember finding it interesting that this practice had survived even during the rather materialistic era of communism in China.

In Europe we have All Souls Day in the beginning of November. The Catholic Church teaches that "the purification of the souls in purgatory can be assisted by the actions of the faithful on earth".[73] (That is also where Halloween comes from.) We find its pagan roots in different parts of Europe, such as the Gaelic festival Samhain, celebrated November 1, which was seen as a "liminal time, when the boundary between this world and the Otherworld thinned".[74] And yes, it is there all over the world, such as The Day of the Dead in Mexico, the Obon festivals in Japan and among native people in Africa and North America.

Common among them is the understanding that beyond this visible earthly world is the invisible world, the Otherworld. In her book *Bilden av universum bland folken i norr* ("The view on the universe among the people of the

We have several bodies, each one existing in the *loka*, realm, that corresponds to its nature. The physical body (*sthūla-śarīra*) exists in the physical world (Bhūrloka), the subtle body (*sūkṣma-śarīra*) exists in the higher *lokas* starting with Bhuvarloka, and the causal body (*kāraṇa-śarīra*) exists in the Satyaloka.

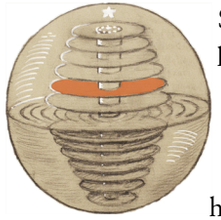


north."), the Swedish scholar Kerstin Kuoljok writes about the old Nordic people: "I have not found any information from the peoples of the north that death was considered the end of life. ... The dead move and live much as before, hunting, fishing, tending reindeer, traveling, and visiting each other, and they can also visit the living on earth, for example, in their dreams. But it is a different life than that on earth." The deceased person was not "gone" but had simply entered the invisible world, where you can to some extent interact with them if you master the art.

As we know, it is also quite common among people who have Near Death Experiences (NDE) to find themselves leaving this world, traveling through some kind of tunnel, and then entering a nice world on the other side where they meet their deceased relatives and friends. Such accounts, which are common and very similar during NDE experiences, seem like direct descriptions of Pitṛloka.

The functions of the mind—thinking, feeling and willing—will then direct ones actions and location. If there are desires for enjoying through the senses of a physical body in Bhūrloka, one stays in touch with the physical world and will eventually enter into it again, by returning to that physical (*sthūla-śarīra*) body or taking birth on Earth again. When that desire and attachment is cleared away, one is directed by higher thoughts and feelings, and will be on the level of:

Svargaloka



Svargaloka is the realm that we also call "heaven". It is the level where the mind is free from the modes of *rajas* ("passion") and *tamas* ("ignorance" or "darkness") and is rather in the mode of *sattva* ("goodness"), which in the *Bhagavad-gītā* is characterized by enlightenment and happiness.[75] Indeed, that is how life in *Svargaloka* is, we learn. There are plenty of stories in the Vedic literature describing life in Svarga, which is highly elevated and enjoyable. In fact, it may be fair to say that this is a goal often found in religions: you perform pious activities (good *karma*) and then earn a place in heaven where you can enjoy high class life for a long time.

Then if there are still earthly desires bubbling up from deep within, one is drawn to take birth on Earth again to try another life here, acting in a new role.

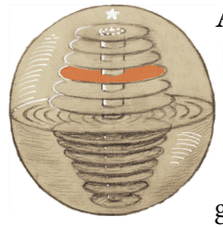
In the *Bṛhad-bhāgavatāmṛta* by Śrīla Sanātana Gosvāmī there is a nice

description of Svarga, spoken by the main character in the story, Śrī Gopa-kumāra. Here is a shortened version:

> That heaven, magnificently decorated with rows and rows of celestial airships, is free from all defects, such as fear, distress, old age, disease, and death. That Svarga, which is pervaded by the greatest happiness, can be attained only by exceptionally pious deeds. It is ruled by Indra-deva. There I saw the very same Śrī Viṣṇu. Surrounded by the demigods in every direction and sitting on the charming throne of Garuḍa's shoulders, the Lord manifested Himself as the concentrated embodiment of knowledge, bliss, and eternity. I was then given a residence in the Nandana forest, where they offered me heavenly nectar and all the other celestial refreshments that they enjoy. Partaking of these heavenly pleasures filled me with delight and left me feeling completely satisfied. I noticed that this realm was free from fear, distress, disease, old age, death, bereavement, and so on.[76]

The finer part of the *manomaya-kośa* (mind), ruled by the emotions and thoughts, is connected with Svargaloka. I guess you could say that when you have a pure mind you will go to heaven.

Maharloka



Although Svargaloka is often referred to as "heaven", those living there are still not free from from selfishness, greed, envy and other unwanted qualities, and in the old stories the gods and *devas* sometimes quarrel, are proud and mess up a bit. But there are other higher levels above Svarga. Next *kośa,* that we just read about, is the *vijñānamaya-kośa*, the knowledge-sheath. You reach that level of consciousness when you not only live a pious, *sattvic* life but have a purified, enlightened intellect and are truly learned. You are then connected to Maharloka, also called *ṛṣi-loka*, the realm of enlightened saints and sages.[77] In the yoga teachings, Maharloka is related to the *anāhata-cakra* (heart center), which is associated with love, compassion, empathy and forgiveness. (The Vaishnava *ācārya* Śrīla Viśvanātha Cakravartī Ṭhākura explains that the *prāṇa* is situated in the *ādhāra-cakra*; the mental level is situated in the area of the navel, on the

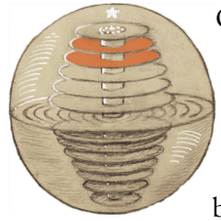
maṇipūraka-cakra, and the intellect is situated in the heart area, in the *anāhata-cakra*.[78])

Śrī Gopa-kumāras story continues:

> Then one day, unexpectedly, Bhṛgu and other great sages from Maharloka mercifully stopped in Svarga on their way to earth. I was astounded to see everyone worship those *maharṣis* with great reverence, and asked who are these great sages whom even you worship? Why are they so glorious? Where do these powerfully effulgent *maharṣis* live?" They replied: "Radiantly situated above Svarga is Maharloka, which is attained by those who perform pious deeds. Only those who are qualified to receive liberation reside there. As the happiness here in Svarga is millions of times greater than that of Earth, so the happiness in Maharloka is millions of times greater than here. Those who are wise have understood this. Endowed with such immense pleasure, Bhṛgu and the other great sages reside in Maharloka, where at every moment they relish directly worshiping Yajñeśvara Prabhu, the Lord of sacrifice, by performing various sacrifices."
>
> I was transported to Maharloka, where I witnessed the wonders of that realm. The faultless and indescribable happiness, opulence, and worship I witnessed there are not to be found anywhere else in the three worlds. Thereafter, I also resided in Maharloka, enjoying boundless happiness as they did. Maharloka is free from even a trace of the defects found on Svarga, such as lamentation and fear. There, for the pleasure of Śrī Yajñeśvara, only grand festivals of fire sacrifice are celebrated. No other sense enjoyment exists. [79]

We do find people who go to church or mosques, or engage in other pious activities, in order to get benefits for a higher level of enjoyment. Then I have personally lived among people who choose a simple life and are satisfied by cultivating wisdom, serving God and doing good to others. Or as Krishna says in the Bhagavad-gītā, *yajñārthāt karmaṇo 'nyatra*, you should simply work for the satisfaction of God. I guess that kind of describes the level of Maharloka.

Janaloka and Tapoloka



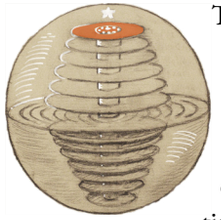
Our Gopa-kumāra story continues by saying that Maharloka and Janaloka are practically the same, but there are some differences, Janaloka being even more above problems such as destruction. It is said that at the time of the cosmic annihilation, the *maharṣis* of Maharloka, gripped by the fear of being burned, strive to go elsewhere. The residents of Janaloka, on the other hand, are not forced to seek refuge elsewhere. (I guess it could be likened to when your consciousness is so elevated that you may sit there in some mountain temple or cave, not even being disturbed by a nuclear holocaust.)

Our cosmic story continues:

> "Once, a dazzlingly effulgent person arrived from a higher planet. He appeared like a completely naked five-year-old boy. Seeing that great personality, who was absorbed in meditation, the *maharṣis* abandoned their sacrificial rituals and prostrated themselves before him. After the departure of that child, who wanders at will, I asked the great sages, "Who was that boy? Where does he live? Why did you worship him?" They replied, "His name is Śrī Sanat-kumāra, and he is the eldest and most exalted of all of us. He is the original preceptor of those who are self-satisfied (*ātmā-rāma*) and those whose desires have been satiated (*āpta-kāma*). Above this Maharloka is Janaloka, and above that is Tapoloka. It is there that he resides with his three brothers, who, like him, are masters of *yoga*. Tapoloka is attained only by observing a vow of lifelong celibacy, and it is a realm that is always full of auspiciousness, tranquility, and bliss. The happiness that the lifelong celibate residents enjoy in Tapoloka is billions of times superior to the happiness of Maharloka."
>
> I began to chant my mantra with one-pointed attention. By the potency of *japa*, I also became as supremely effulgent as Sanat-kumāra and swiftly reached Tapoloka. I saw that the residents of Tapoloka were honoring Sanat and his brothers, who were happily conversing among themselves. However, ignorant as I was, I could not understand that blissful discussion. Still great euphoria spontaneously filled my heart whenever I saw them. Although the sages would occasionally have loving discussions with one another or would worship Bhagavān, they were virtually always

absorbed in *samādhi*. They were wholly self-satisfied with all their desires fulfilled, and they were served by mystic perfections like *aṇimā*.

Satyaloka



The story continues:

Once, Śrī Brahmā, mounted on a swan, visited Tapoloka. He resides in Satyaloka, which is located above all other worlds. Those who faultlessly execute their prescribed occupational duties (*sva-dharma*) for one hundred life-times attain this planet. Within Satyaloka is a Vaikuṇṭha planet where the Lord of the universe, Śrī Jagadīśvara, resides eternally as Sahasra-śīrṣā, the thousand-headed Mahā-puruṣa. After hearing this from Sanaka and the other Kumāras, I resolved to go to Satyaloka to see that Supreme Personality of Godhead. Therefore, I began chanting my mantra and entered deep into *samādhi*. After a moment, I opened my eyes and found myself in Satyaloka, face-to-face with Śrī Jagadīśvara. His form was an ocean of brilliance, and His navel was the resting place of a fully blossomed lotus. Reclining on the bed of Śeṣa-nāga, He was delighting the eyes and minds of everyone. The Lord performed the pastime of sleeping. Factually, though, Śrī Bhagavān, who is the embodiment of consciousness, never sleeps. The lotus emanating from the navel of the Lord contains the fourteen planetary systems in their essential forms.

As we see here, both from *Sanatana Dharma—an Elementary Textbook* and the story from *Bṛhad-bhāgavatāmṛta,* the *lokas* are about different levels of consciousness, from the base earthly level where life is just about eating and surviving, to the highest level of enlightenment. Right now my consciousness is on the level of Bhūrloka, and so I share this world with you who are on that level too. Then there are other *lokas* for other people on a different level of consciousness. In this life our consciousness may be located on different *lokas,* you could say: some are largely on the bodily platform seeking sensual pleasures, others are on the mental platform seeking fulfillment on a more refined level, then others cultivating knowledge and wisdom, meditating and so on. Those *loka* levels are represented by the *chakras* that we find in the *yoga* system, which in itself is often described as a ladder for climbing to a better life. Then when we leave this current body, we will go to a realm, *loka*, populated

with those sharing the same mentality.

And thereby we have understood the *lokas*, haven't we?

Ok, is it about cosmology or astronomy?

"Hey stop and behold!", I now 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 going on in different levels of consciousness, but it's 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 (basically taken, as you can see from my many footnotes, directly from the 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 all that stuff flying around in space here. Sure, in the fifth canto of the *Bhāgavatam* there are references to stars and planets. Some then assume that the scientific strength and validity of the *Bhāgavatam* is found in that—showing how people back then had advanced knowledge about astronomy and material science. Maybe they even built *vimānas*—flying vehicles!

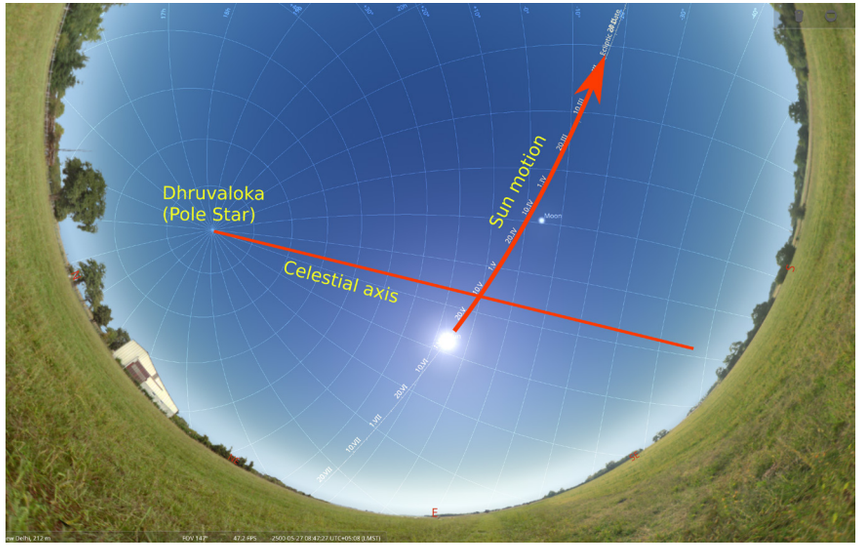
Alright, there is some astronomy in the *Bhāgavatam*. But it is a different kind of astronomy. It is quite straightforward and empirically valid, in spite of sometimes appearing strange to us modern folks. So to satisfy our astronomy nerds and science buffs, let's look at a couple of examples of that, 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* at all, which is actually rather 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"[80]. 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?[81]

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.

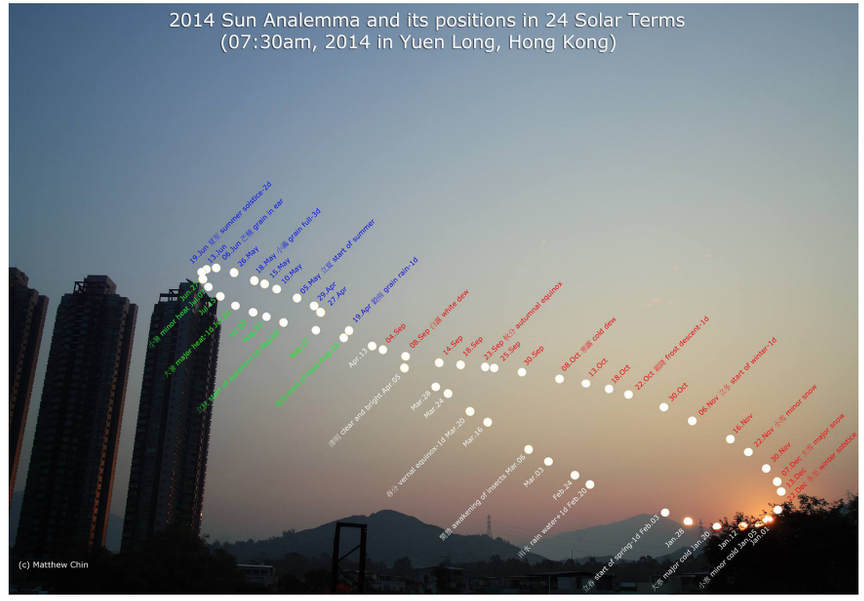


The movement of the sun on a daily basis, with the Pole Star and celestial axis on its right side.

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

> 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 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.[82]

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.



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

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 references here differ from that of modern astronomy. They simply describe 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 represent the presence of God to nourish us. Then the chapter goes on to describe other planets in that same personal way.

So, as is the case with most if not all astronomical references in the *Bhāgavata Purāṇa*, this is a way of viewing even the physical world within 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."[83] 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" is the Sanskrit expression *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.

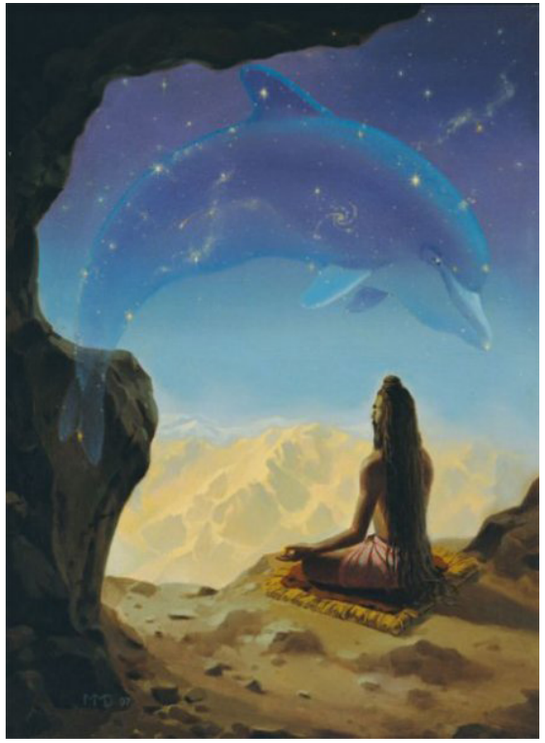
We can continue to examine all the astronomical references given in the *Bhāgavatam* and we will find that they all concern the movements of celestial bodies *as they appear in the sky from our perspective, in relation to the ecliptic and the pole star*. The movements of the Moon are described in relation 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/subject is in the center of the charts, and the planets, including the sun, are plotted according to their apparent positions and 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..."[84], 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.[85]

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

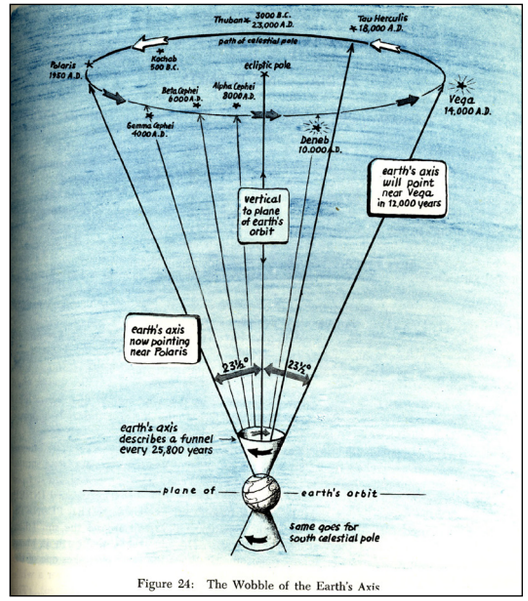


Figure 24: The Wobble of the Earth's Axis

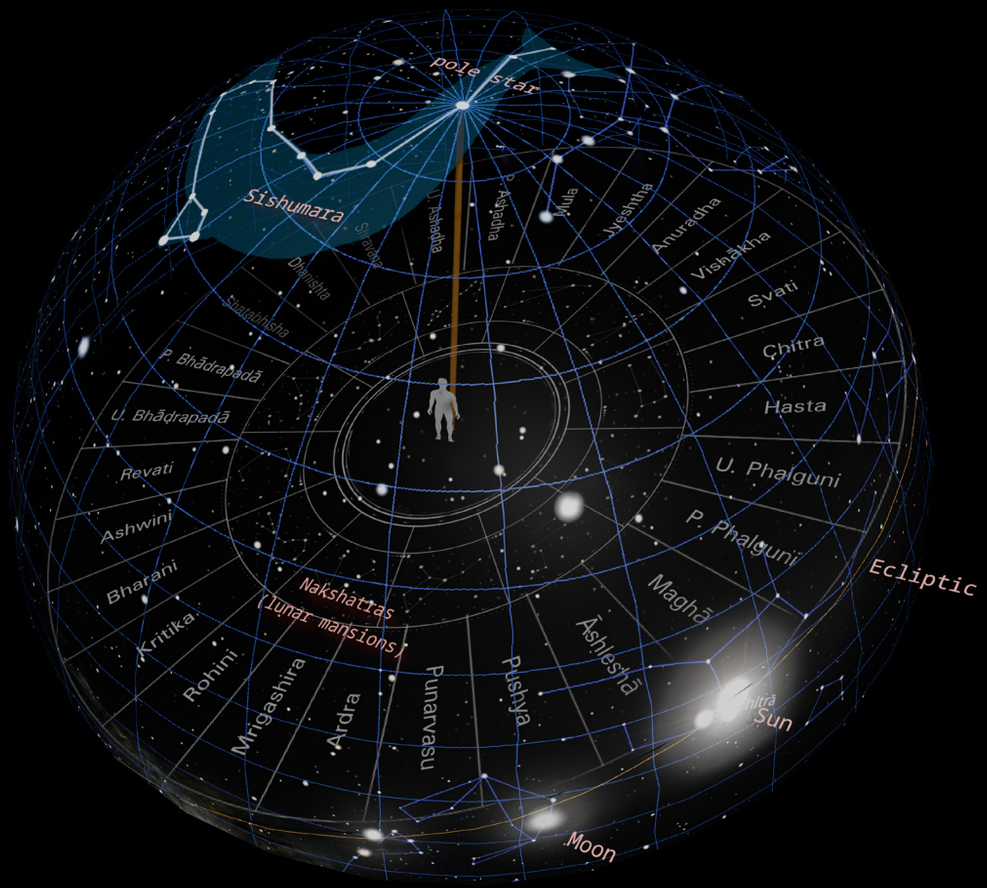
The Earth's axis "wobbles" like a spinning top, taking 25,800 years for each rotation. This means that 5,000 years ago, the star Thuban (in India called Dhruva) was the pole star, and now it is Polaris.

(H.A. Rey, "The Stars: A New Way to See Them," 1952, Houghton Mifflin, Boston)

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 has been named Dhruva in modern times, since it represents the pole and the word "dhruva" itself means "fixed", but the current Dhruva is different from that of the *purāṇic* age.)

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 or so, 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."[86] 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



The astronomy in the ***purāṇas*** deals with the phenomena seen in the sky from our earthly viewpoint. The movements of the sun and the planets are described in relation to the ecliptic. Here we see the Śiśumāra constellation and the ***nakṣatras*** – the 27 (previously 28) lunar mansions (the divisions of the ecliptic that the moon appears to travel through in a month).

Ancient astronomy was based on this view. It was used for practical purposes, such as creating calendars, farming, navigating etc. The Bhāgavata Purāṇa thus beautifully describes this Śiśumāra "dolphin" rotating around the fixed pole, carrying with it the ***nakṣatras*** and the zodiac as the ***kāla-chakra***, wheel of time.

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, what is important 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 we are looking at the *lokas*, and now we found ourselves back in Bhūrloka, the Earthly realm.

Bhū-maṇḍala – the Earth far and wide

There is, among some students of *Purāṇic* cosmology, an attempt at understanding something called *bhū-maṇḍala.* (If you are one of those, then this section may be for you, otherwise never mind.) *Bhū-maṇḍala* is often pictured as a disc of some sort, containing concentric circular oceans made of different fluids, divided by seven ring-shaped islands (*dvīpas*), which are then further 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 it wise to do, simply search for the word *bhū-maṇḍala* among the 18,000 Sanskrit verses of the *Śrīmad-Bhāgavatam*, I get 9 hits:

- Varāhadeva lifting the earth (*bhū-maṇḍalena*) on the edge of His tusks. (3.13.41)
- Dhruva's kingdom extended all over the earth (*bhū-maṇḍalaṁ*). (4.12.16)
- "The whole earth" (Mahārāja Pṛthu leveled the land, *bhū-maṇḍalam.*). (4.18.29)
- "...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." (5.16.1) 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 of the Earth that we see around us."

- There 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. (5.21.19)
- Yayāti enthroned his youngest son, Pūru, as the emperor of the entire world (*bhū-maṇḍalasya*). (9.19.23)

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

The "bhū-maṇḍala" is sometimes interpreted to refer to some complex astronomical or metaphysical structure, but in the observer-centric view generally used in the Śrīmad-Bhāgavatam, it may simply refer to the "disc" of the earth surface we see around us.

As we have already mentioned, the movements and positions of the heavenly bodies are in the *Purāṇas* described from the perspective of the viewer. And yes, here we stand on the surface of the Earth and see it stretching out into each direction. 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. And sometimes the word *bhū-gola* is used[87], where the Sanskrit word *gola* means "ball" or "globe". As Śrīla Bhaktivedanta Swami Prabhupāda points out, this indicates that people back in the *purāṇic* age were aware of that Earth is a globe.[88]

The dvīpas

The *Śrīmad-Bhāgavatam* describes the *bhū-gola* as resembing a lotus flower. Its pericarp (seed pod) is Meru, and its whorl consists of seven *dvīpas*.[89]

What then are *dvīpas*? Well, to put it short, in the fifth canto of the *Śrīmad-Bhāgavatam* (chapter 20) there are descriptions of these *dvīpas* as islands surrounded by different kinds of oceans and having characteristic vegetation, mountains and inhabitants, living in different tracts of land (*varṣas*). The islands themselves are named after 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.

A common interpretation of this is that these simply describe lands and water here on Earth. And yes, here we stand on *bhū-maṇḍala,* the surface of Earth. When we travel in some direction, we will, of course, reach different bodies of water and other tracts of land with different characteristics, people and vegetation. It may be as simple as that.

Can it really be as simple as that? I don't know. But anyhow, these *dvīpas* are just very briefly mentioned in the *Śrīmad-Bhāgavatam.* Their geographic information is given in merely a few words, among mainly 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 of the *Bhāgavatam* — such as *sthānaṁ*, the abodes and places where the residents of the cosmos can live, find shelter (*poṣaṇam*) and act (*ūtayaḥ*). In fact, the first half of this fifth canto up to this point is basically all about kings in the dynasties coming down from Manu, which goes under another such topic, *manvantara*.

The lokāloka

The edge of this *bhū-maṇḍala* "disc" is called *lokāloka*[90], which is also sometimes described as 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, seeing Earth's surface stretching out in all directions. It is limited by a periphery, which is ultimately the edge of what our eyes can see—that earth disc and sky dome that is illuminated by the sun and the moon. Then beyond the world that is visible to our earthly eyes lies a*loka,* "not this world". There we find the other worlds of Bhuvarloka and Svargaloka that we just looked at.

The bhū-maṇḍala "disc" can be understood to mean "earth as far as we can see in all directions". The lokāloka can be understood as "the border between the visible and the invisible." That is then the border between the physical realm perceived by our gross (mahābhūta) senses, and the subtle, astral realm of Bhuvarloka that lies beyond.

Mount Meru

In the middle of the *bhū-maṇḍala* is a peak called Meru. We have already seen it in old cosmological images and spoken a bit about it. But what is Meru actually?

The Sanskrit word *meru* means "peak" or "high". Meru is often likened to a mountain, as we also find with Olympus and similar "holy mountains" in other cultures, for instance Mount Mashu from the Epic of Gilgamesh, Adam's Peak which is a sacred mountain in Sri Lanka, Mount Qaf in Islamic and Arabic cosmologies and the mountain Harā Bərəz in Zoroastrian cosmology. That meaning is metaphysical, referring to a central cosmic "axis" leading through the different *lokas* or heavens beyond this earthly realm. This axis is found in many cultures, as we already saw when we looked at old drawings of the ancient cosmos. It is called the *axis mundi*. In the Wikipedia[91] 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

The towers of Angkor Vat in Cambodia represent Mount Meru with its five peaks.

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".

Then there is the more astronomic understanding of Meru, as the center around which the stars and planets appear to rotate. And of course, in the middle of the earthly surface that we stand upon is a rotation axis, which points up towards the pole star. That is the direction of the peak of Meru. Thus, when you stand in India, for instance, and look up towards the "top of the world", the direction is not vertical to Earth's surface (straight up) but rather closer to the northern horizon. Now think about that: if you use that as the reference point for "up" and look at it that way, then Earth's surface would appear as tilted up towards north. So maybe that is the reason why Meru is likened to a very large mountain: It is really describing the surface of Earth leading up towards the north pole. I am just suggesting that as a possibility, that here Meru simply refers to the earthly surface bent around the polar axis.

There are in fact indications supporting that, Meru is considered the pericarp of the lotus-like Earth and is partially *āntaḥ-bhūmyām*, "within the earth". The Śrīmad-Bhāgavatam also states that the sun and moon orbit around Meru, causing day and night for those living on each side of it.

There are also mountains on Earth that are considered representing Meru—such as the Pamirs in Kashmir, the Himalayas, Mount Semeru in Java, and Mount Meru in northern Tanzania.

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.* In a way it could be natural to see it that way. When you have a huge mountain next to you, or if you travel north in India to see where this axis is that the world seems to rotate around and what's up there, then you find these huge mountain walls. We reach the Himalayas, and especially Mount Kailash is sometimes

Mount Meru appears in art and sculpture all throughout Asia, and in other parts of the world as well, under different names. It is the axis or "pillar" leading up from earth to heaven.

said to be Meru. If you were to journey toward the Northern star, you would thus ascend those mountain areas, and you would find villages up there with very different people, in celestial-looking realms. Interestingly, 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,[92] 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.) This is just a possible interpretation of the descriptions we find of Meru as a mountain leading up towards the pole star and having different "villages" along its side, as we sometimes find it illustrated.

However, there is more to Meru than that, and we will dive deeper into that mystery in a later chapter here, because Meru is rather central to this ancient cosmology, as we have seen.

This was a rather sketchy possible understanding of the *bhū-maṇḍala* and its features. There are of course other interpretations of what *bhū-maṇḍala, dvīpas* and Meru may refer to, so just take this for what it is: one theory among others. But please note that this is a theory that is built upon minimal interpretation and reliance on sources outside of the p*urāṇic* teachings themselves. In fact it is basically built on the direct text of the Śrīmad-Bhāgavatam, in accordance with its general cosmology and topics.

And yes, I repeat myself: geography and astronomy are mundane sciences, but the *purāṇic* cosmology goes way beyond that, into much more important levels. So I won't go deeper into this topic. If some scientific mind out there finds this interesting and wants to do more research into it, I would be curious to hear about what you come up with. And that goes for everything I write in this book.

Now let's return to the big and wonderful multiverse of the *Purāṇas*.

The Cosmic Dream

During our exploration of the *purāṇic* cosmos, we kept hearing that this cosmic manifestation is a dream. While this may sound like a poetic expression, it is really, as I hope we have seen so far, how the cosmology of the *Śrīmad-Bhāgavatam* describes this material existence. We will soon also look at how compatible this is both with the actual ontology of idealism philosophy and with some developments in modern science.

But let's stay with the *purāṇas* for a little while more. We have already learned that this cosmic manifestation is the dream of Mahā-Viṣṇu, a form that God takes for the manifestation of this creation we are in. In his purports to the *Śrīmad-Bhāgavatam*, Śrīla Bhaktivedānta Swami writes, "This material creation is the spirit soul's dream. Actually all existence in the material world is a dream of Mahā-Viṣṇu, as the *Brahma-saṁhitā* describes: *yaḥ kāraṇārṇava-jale bhajati sma yoga-nidrām ananta-jagad-aṇḍa-saroma-kūpaḥ.* This material world is created by the dreaming of Mahā-Viṣṇu. The real, factual platform is the spiritual world, but when the spirit soul wants to imitate the Supreme Personality of Godhead, he is put into this dreamland of material creation. After being in contact with the material modes of nature, the living entity develops the subtle and gross bodies. When the living entity is fortunate enough to associate with Śrī Nārada Mahāmuni or his servants, he is liberated from this dreamland of material creation and the bodily conception of life."[93]

So this is a dreamworld.

The *Śrīmad-Bhāgavatam* is often said to essentially build upon four verses, called the *catur-śloka*. Those verses in themselves contain that dream cosmology, for instance this one:

> O Brahmā, whatever appears to be of any value, if it is without relation to Me, has no reality. Know it as My illusory energy, that reflection which appears to be in darkness.[94]

So there is darkness (*tamaḥ*) wherein an illusion (*māyāṁ*) appears like a reflection (*ābhāsaḥ*) of reality. As we remember from reading about the first stage of creation, the darkness refers to consciousness clouded by the material modes (*guṇas)*. So a consciousness in darkness that experiences images merely resembling reality but being illusions, well that pretty much describes dreaming, doesn't it? If you are still not sure, take a look at the very first verse of that same chapter:

> Śrī Śukadeva Gosvāmī said: O King, unless one is influenced by the energy of the Supreme Personality of Godhead [*māyāṁ*], there is no meaning to the relationship of the pure soul in pure consciousness with the material body. That relationship is just like a dreamer's seeing his own body working.[95]

Again, Srila Bhaktivedanta Swami, on behalf of the Gaudiya Vaiṣṇava scholars, gives some very interesting commentary to that specific verse. First of all in the purport to his translation of it:

> As a person thinks of becoming a king without possessing the necessary qualifications, similarly, when the living entity desires to become the Lord Himself, he is put in a condition of dreaming that he is a king. Therefore the first sinful will of the living entity is to become the Lord, and the consequent will of the Lord is that the living entity forgets his actual life and thus dreams of the land of utopia where he may become one like the Lord. The child cries to have the moon from the mother and the mother gives the child a mirror to satisfy the crying and disturbing child with the shadow of the moon. Similarly the crying child of the Lord is given over to the shadow of the material world to lord it over as a *karmī* and to give this up in frustration to become one with the Lord. Both these stages are dreaming illusions only.[96]

(For the students of the *purāṇas:* He also spoke about this verse in a lecture in Tokyo 1972, where he repeatedly emphasizes how important this understanding is. You'll find an excerpt of that lecture in Appendix XXXX. Also, a friend of mine did extensive research on this topic, collecting a mass of quotes in support of this "dream theory" from Śrīla Bhaktivedanta Swamis translations and commentaries on the *Śrīmad-Bhāgavatam* and other Vedic literature. You find it in Appendix YYY if you are interested.)

The *Śrīmad-Bhāgavatam* itself states it succinctly in a verse:

> Everything happening within time, which consists of past, present and future, is merely a dream. That is the secret understanding in all Vedic literature.[97]

Now, you may ask what is so important about this? Why do I keep pushing this after all rather odd idea that this world is merely a dream, as if it is actually true and not just a figure of speech? That is what we are going to look at now. In fact I would say that this dream analogy is the key to unlocking the secrets not only of the *purāṇic* cosmology but of the consciousness-based cosmology in general. So bear with me if it seems we're going down some rabbit hole, and who knows, we may find the opposite: that we come out the rabbit hole instead.

The God who enters his own dream

In his book, *More Than Allegory*, Bernardo Kastrup mentions a couple of interesting stories from the original people on this planet:

> The Arandan indigenous people from Australia believe that Karora, the creator, dreamed the world up in his sleep. As he lay in darkness on the ground, a kind of tree grew from his head all the way to the heavens, its roots planted on Karora's head. The thoughts, wishes and desires in his head then became real as Karora dreamed them: animals and men sprung from his navel and armpits.

> Eventually, when the sun rose, Karora awoke. ... Now awake, Karora lost his magical powers and, to his own surprise, met the animals and men that he had dreamed into existence the previous night. He even cooked and ate some of the animals, for without his magical powers, he felt hungry. Over a series of subsequent nights, Karora again fell asleep and dreamed more creatures into existence, coming in contact with them upon awakening the next morning.

Kastrup gives an apt interpretation of this story:

> Clearly, the myth evokes the notion that the world is a mental creation of a deity who dreams it into existence while lacking lucidity. In the stupor of the dream, this deity has the magical power of bringing things forth into existence; the freedom unique to the imagination to concoct images without being bound by logic, resource constraints, ordinary causality or consistency. In other words, during his dream the deity doesn't know what is supposed to be impossible and, therefore, nothing is impossible.

And yes, that's how dreaming is, and it's the nice thing with imagination, isn't it? We can imagine and dream about just anything we want, and in the dreamworld anything is possible. But it lacks lucidity; it's like a draft or a script, for something we would like to experience "for real". However...

> ... he can also enter the dream, as it were, by waking up in it. When this happens, the deity gains the ability to self-reflect but loses his magical powers, for he is now a participant in his own dream, subject to its constraints and internal logic like the rest of his creation. In other words, by waking up he becomes aware of, and subject to, what is supposedly impossible. Yet, it is this act of waking up inside the dream that gives his creation concreteness and solidity, for only now creation is experienced in the state of lucid self-reflection that fixes it in place, as opposed to the ever-flowing slumber of sleep. The idea built into this religious myth is sophisticated and striking.

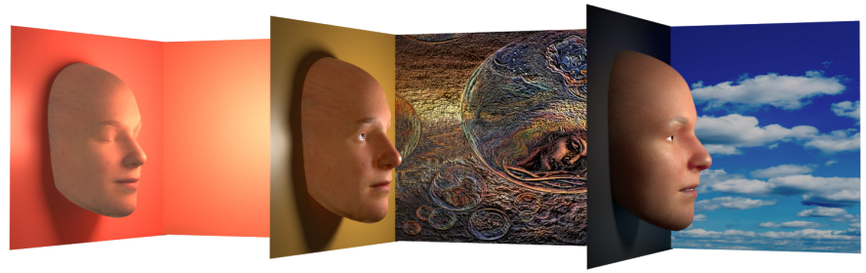
This dream cosmology is there in other original cultures as well:

> On the other side of the planet, in the Amazon jungle, the Uitoto tribe has a mind-bending myth of their own. According to it, a creator deity, Nainema, also created the world by imagining it while in a state of slumber. Initially, his imaginings were a tenuous and evanescent illusion, which could easily be lost and forgotten. However, Nainema held on to the illusion by the thread of a dream, not allowing it to escape him. He tied the thread with magical glue and then proceeded to stamp on the illusion until he could, as it were, break into it, so to sit down on the earth he was imagining. Now inside his own dream, he spat on the earth, thereby sprouting the jungle from his saliva. At last his original, tenuous illusion had become the actual, concrete world of the Uitoto.

A god caught in his own dream? Being subordinate to ones own dream does not sound like something that would happen to almighty God, does it? Is God then imperfect and subject to illusions, even ending up struggling in this world as we do here?

One interesting philosophical statement I heard from the Indian *vedāntic* school is that God is perfect and complete, but to be complete, God must also include the imperfect. The perfect, omnipotent and omniscient aspect of God is called *viṣṇu-tattva* and is God as we know Her/Him. The limited aspect is called *jīva-tattva,* and that is us.

This is in fact how the *Śrīmad-Bhāgavatam* explains it: In the story of the *purāṇas* that we just looked at, God, as Mahā-Viṣṇu, dreams this world and then enters into it, not by being caught in it but as a pastime, while remaining transcendental to it. Then there is Brahmā, the demiurge creator born inside this cosmos, who is a limited *jīva* soul just like us and gets bewildered by his own creation. So the "god" that "wakes up" inside his own dream is you, and me. And oh, this world looks very real, doesn't it?



Deep sleep, dreaming and wakefulness

You are now awake, as we call it. What this really means is that your consciousness is directed through the senses of your physical body, and thus you

experience the realm of that body. However, just a little while ago you were in another world. We call it the dreamworld. Whatever you remember of it may now seem unreal, but when you were there, it was your world, and you were doing things, going places and meeting people. You then considered that dreamworld to be reality. You had forgotten the world that you are in now, or at least it was just dim in your memory, much like the dreamworld appears to you now.

Then sometimes you are neither awake nor dreaming. We call it deep sleep. When you are there, you experience neither the physical wakefulness world nor the dreamworld. You rest.

These three (actually four, as we shall soon see) are explained in an interesting way in the *Māṇḍūkya Upaniṣad* (one of the primary scriptures in the Indian Vedic tradition. It is short, so I include it in Appendix ZZZ here). We also find these four mentioned in the *Śrīmad-Bhāgavatam*.[98] They are described as "residences" or "quarters" for the self. And now we need another little Sanskrit lesson, with a couple of new words to learn. Can get a bit tricky, but it's worth it, so hang in there.

The first one of those "quarters" is called *jāgrat,* wakefulness, and belongs to the external (*bahir*) realm of *viśva*, the physical world. This is where the conscious self enjoys *sthūla,* "gross objects". (You may remember this from when we spoke about the physical body as *sthūla-śarīra*, while discussing the *lokas.*)[99]

The second "quarter", dream (*svapna*) is called *taijasa*. This is the mental realm where one enjoys subtle objects (*pravivikta-bhuk*).[100]

The third quarter is deep sleep, *suṣupti*. This state is described in an interesting way, with the word *prājña*—"intelligent, wise". Here there are neither subtle nor gross objects, and no desires for them yet. The word *ānanda* is used, meaning bliss or happiness.

First of all, let's look at those three as we find them in our own daily lives. They are of course quite obvious. We have a physical body with senses that connect us to the physical world. Then we have a mind, where dreams, imagination, thoughts, desires, memories, feelings and so on exist. You can close your eyes right now, turn inwards, take a pause from the outside world and be there for a while in that mental realm. You can go even deeper in there by hypnotic trance, meditation and similar practices.

Then we have what we call the unconscious or the subconscious mind. But that third one, here called deep sleep, is not really described as some unconscious, dull state but rather a more enlightened level. And indeed, even our modern science understands that deep sleep is rejuvenating and healthy. This level is here named "intelligence" (*prājña*), which makes sense too. The physical and mental consist of forms, but intelligence can act on the abstract plane. No form, just awareness. When that awareness is clearer and approaching the real truth, it is wisdom, and it makes us healthy and happy. So the *Upaniṣad* tells us.

There is a fourth quarter (*caturtham* or *turya*). It is described as neither physical (*bahir*, wakefulness/outer) nor mind (*antaḥ*, inner) nor the intellect (*prajña*) or subconscious but the transcendental level, which really is the presence of the *ātmā*, the true self and conscious observer that is you. The even more conspicuous presence here is *Paramātmā* (*Antāryami* or Supersoul), whom the *ātmā* is like a little ray from. This quarter then represents Satyaloka, because that is where *Paramātmā,* also named Kṣīrodakaśāyī Viṣṇu, resides. You may remember the story about Śrī Gopa-kumāra who ascended through the *lokas* and shared his experiences from visiting them. When reaching Satyaloka he found himself in the presence of *Paramātmā*, Supersoul resting in the milk ocean in the cosmic lotus. This is what we also find here in the *Māṇḍūkya Upaniṣad*.

Looking at these four—the physical world, the mental world, the intellectual world and the transcendence beyond them—does anything come to mind that we just read about here? Well, let's look again at the table from page 85 that describes the *lokas* and different bodies, but just a bit differently.

Śarīra (body)	Kośa (sheath)	Loka (realm)	Avasthā (state)
Transcendental reality			turya (atma)
kāraṇa-śarīra	ānandamaya-kośa	Satyaloka	suṣupti (deep sleep)
sūkṣma-śarīra		Tapoloka	svapna (dreaming)
		Janaloka	
	vijñānamaya-kośa	Maharloka	
	manomaya-kośa	Svargaloka	
	prāṇamaya-kośa	Bhuvarloka	
sthūla-śarīra	annamaya-kośa	Bhūrloka	jāgrat (wakefulness)
Material existence			

There you've got the cosmos we live in. At the base is the physical world (Bhūrloka), where we are in our gross (*sthūla-śarīra*) bodies made of food (*an-*

namaya). That is the world we now experience when we are "awake" (*jāgrat*), meaning our consciousness is focused on the physical (*bhū)* realm. Then there is the mental/astral level (Bhuvarloka) which corresponds to the "dreamworld" (*svapna*). The realm of the intellect (*vijñānamaya*) is the level of Maharloka, and *suṣupti* (beyond both the gross physical and the subtle forms) is in Satyaloka. Then beyond them all is *turya*, the transcendental reality of the *ātma*.

This is where it gets interesting. So the *Māṇḍūkya Upaniṣad* describes these three "quarters" of wakefulness, dream, deep sleep and then the transcendental self, we *ātmas* who wander between these on a regular basis. That is the microcosmic level that we find in our own daily lives.

Then the same is valid on the macrocosmic level. On that level, according to the general interpretation of this *upaniṣad,* wakefulness is called *viśva*, the dreamworld is called *hiraṇyagarbha* and the deep sleep, *suṣupti*, is called *kāraṇam.* What do those mean? Well, they refer to the three worlds of the macrocosm we just read about in the *Śrīmad-Bhāgavatam*, those of Kāraṇodakaśāyī Viṣṇu (*kāraṇam*), Garbhodakaśāyī Viṣṇu (*hiraṇyagarbha*) and Kṣīrodakaśāyī Viṣṇu (*viśva*). The three oceans, the golden egg and all that, remember?

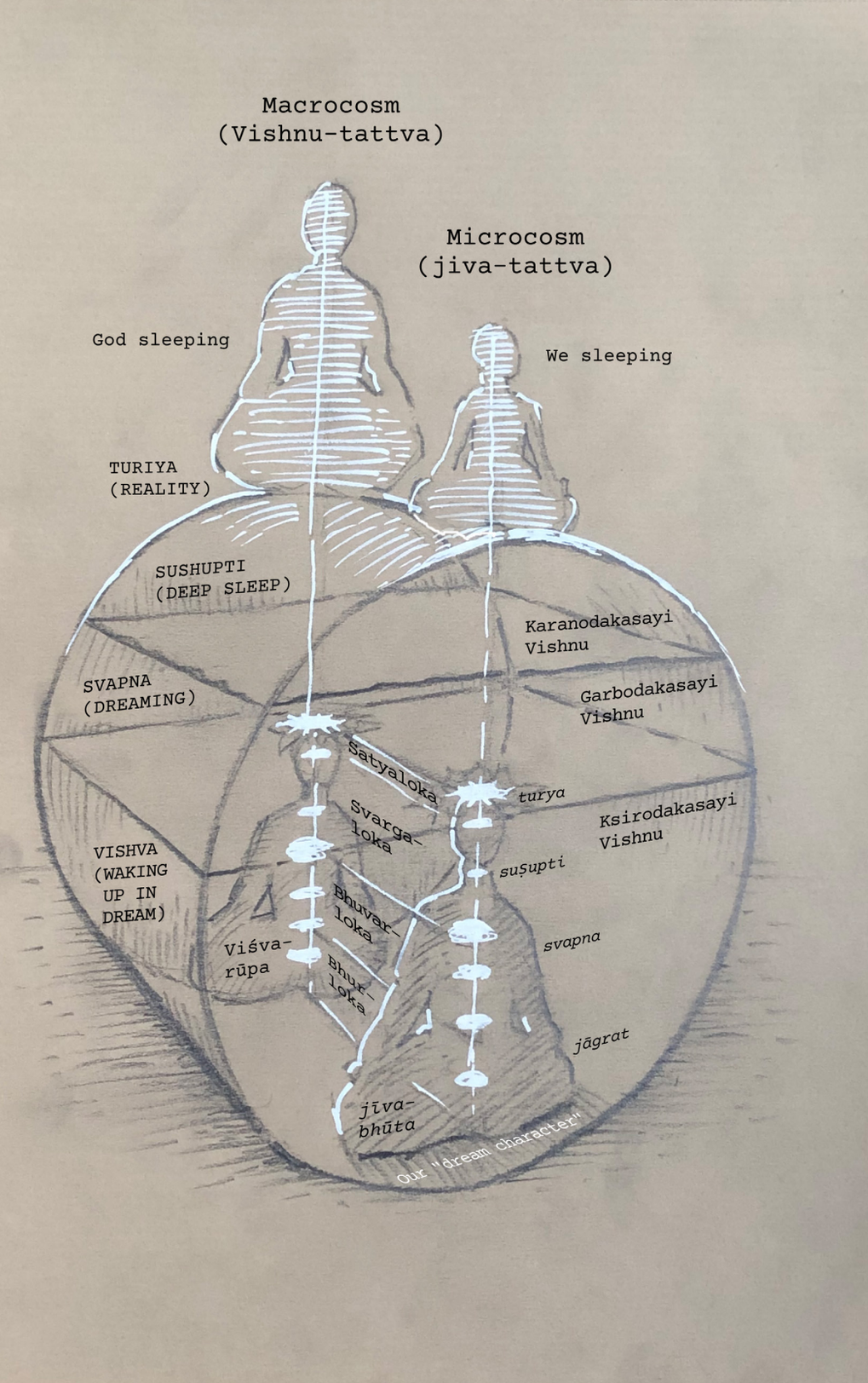
In Mahā-Viṣṇu we are in *suṣupti*. Then in the *hiraṇyagarbha* realm we are in *svapna*, sleeping in the lotus stalk coming from Garbhodakaśāyī Viṣṇu, dreaming about experiences we want to have. That dream is the subtle realm of Bhuvarloka. Then we enter into that dream and wake up in it by taking birth in Bhūrloka, the physical realm.

There I sat looking at what I just wrote, trying to make sense of it myself. I took up my pen again and did my best to illustrate the rather amazing picture that starts to emerge from this *purāṇic* story. Well at least the way I understand it so far.

Yes, there you basically have the *purāṇic* cosmology in a nutshell, I would say.

In short, it goes like this: existence is a living being (not dead matter). A really incredible creative living being. That full being is who we call God, Bhagavan, Allah, Krishna, the Supreme Being etc. Sounds too fantastic? Well, then just look at yourself. *You* are an incredible creative living being, and you exist, whether you believe it or not. It then also makes sense that your source is an incredible creative living being too, doesn't it?

So God, or Bhagavan here, can of course do anything, fulfill any desire and make it real. And does so, by expanding into countless friends of all kinds living in countless wonderful places. Doing what? Having fun and living in love.



Yep, that's what existence is about, says the *Śrīmad-Bhāgavatam*.

We, then, are such expansions of Bhagavān, but like the little rays of the sun. So here we have the macrocosm and microcosm.

It is said that everything we find in our current world exists in the real world, just as a reflection in water, although an illusion, still borrows all its objects from those on land. Plato's cave, you know. Even sleeping and dreaming exist in the real world too, as the Śrīmad-Bhāgavatam tells us. It is of course something far beyond the kind of sleeping and dreaming that we do in this body. But this *turiya-suṣupti-svapna-jāgrat* cycle repeats all the way through creation, from the very top down to our day and night.

Sometimes we don't have any need to do anything at all. We are just in a peaceful, bright existence (*vāsudeva*). Then sometimes we get creative. That creative nature is a fact, and we only have to look around us to see it everywhere in our society. That's how we are.

Is this material world that I experience around me then just produced by my own imagination? Well, that would seem to lead to the strange philosophy of solipsism. Are you then merely a product of my imagination, or am I a product of yours and not actually real? Well, the answer is basically given here: the Dreamer is the *puruṣa,* Kṣīrodakaśāyī Viṣṇu from whom the *viśva*, the material cosmic manifestation manifests. The collective of all of us souls enter here to act out our dreams. The appearance of an objective reality here that we all share is then due to it resting in the mind of God, of whom we are all parts.

So just as Mahā-Viṣṇu dreams sometimes, we also do. We enter into that dreamworld that has been created for us, desire things, imagine them, plan, and then here we are, in a world that just seems so real.

So again, the initial level of the creation is that of Kāraṇodakaśāyī Viṣṇu, called *kāraṇam*, the causal level, where Maha-Vishnus dreaming starts but still is in the state of *suṣupti*. The second level is the dreamworld itself (*hiraṇyagarbha*), and the third level (*viśva*) is inside the dream. Then when we "wake up" inside that cosmic dream, this world that we are in now appears as our reality. We call it "taking birth". Then after a while, we "die", leaving this world and returning to the subtle Bhuvarloka "dreamworld" again, and so on, in what we call *saṁsāra*, repeated reincarnation. And during a lifetime, we go through that cycle on a daily basis, when we go to sleep, dream and wake up again. (Maybe that's why they sometimes call sleep "little death".)

So this quadruple of *suṣupti* (deep sleep), *svapna* (dream), *jāgrat* (wakefulness) and the transcendental Self above them (*turiya*), is recurring all the way through the different layers of worlds described in the *Śrīmad-Bhāgavatam*, from the very highest level down to our individual lives. It's as if it was the very formula or basic form upon which the entire existence is built. That mystery is revealed to us through four fascinating personalities: the *catur-vyūha*.

The Fantastic Four

This pillar is called the *Viśākhayūpa*. You see four figures on each level, colored white in the east, red in the south, yellow in the west and blue (or black) in the north. The levels are also, seen from the top, colored white, red, yellow, and blue. I have not seen this sculpture anywhere, so this is a virtual model I made according to a text from the *Vaiṣṇava tantras*. I am not sure that it is correct, but I thought it was a nice way to explain what follows.

This pillar is described in a fascinating book called the *Lakṣmītantra*, which is part of the so-called *Pāñcarātra* texts. There, Mother Lakṣmīdevī speaks, and it includes the same cosmology as the *Śrīmad-Bhāgavatam*, just from a slightly different point of view—that of Mother

Lakṣmī, rather than Father Viṣṇu, which makes it very interesting in itself. In it I read[101]:

> Viśākhayūpa is a great, brilliant column divided into four sections. Each section is allocated to one of the Vyūha deities, but also contains all four of them, respectively occupying the four points of the compass. This symbolizes the uninterrupted continuity of Vyūhas through all the four states of consciousness, namely: Vāsudeva's domain *turīya*, where there is no polarization; Saṃkarṣaṇa's domain *suṣupti*, where the first signs of polarization are faintly discernible; Pradyumna's domain *svapna*, where consciousness is subtly polarized; and Aniruddha's domain *jāgrat*, where consciousness is fully polarized and limited. These four deities, Vāsudeva etc. being identical with God, each incorporates all four Vyūha deities and hence in each state all four are present. In each successive state they become more and more distinct to tally with the distinctive character of the main deity of the section. The entire column thus represents the one and single deity (Viśākhayūpa).

The four states I have described, starting with the *turya* state and ending with the *jāgrat* (waking) state, are represented by the *vyūha* forms of God, originating with Vāsudeva and ending in Aniruddha.[102]

These four are also mentioned in the *Śrīmad-Bhāgavatam*.[103] They are:

Vāsudeva	white	*turya*	*original consciousness*
Saṅkarṣaṇa	red	*suṣupti*	*kāraṇam, causal*
Pradyumna	yellow	*svapna*	*hiraṇyagarbha, creative*
Aniruddha	blue/black	*jagrat*	*viśva, creation*

Together they are called the c*aturvyūha*. In His teachings to Sanātana Gosvāmī[104], Śrī Caitanya Mahāprabhu mentions the first c*aturvyūha* at the very top level of existence (Mathurā and Dvārakā), as Kṛṣṇa (Vāsudeva), Balarāma (Saṅkarṣaṇa), Pradyumna and Aniruddha. Then from them appears the next level of existence, the Vaikuṇṭhaloka, with Viṣṇu as Nārāyaṇa[105], from whom another instance of the *caturvyūha* appears.[106] The next *caturvyūha* is the creation of the material world, when Nārāyaṇa expands into Kāraṇodakaśāyī Viṣṇu (Mahā-Saṅkarṣaṇa) and the two other *puruṣa-avatāras*, Garbhodakaśāyī Viṣṇu (*hiraṇyagarbha,* representing Aniruddha) and Kṣīrodakaśāyī Viṣṇu (*viśva, representing* Pradyumna). Then at the bottom level, we find the *caturvyūha* as our own private microcosms of deep sleep, dreamworld and wakefulness in the material world.

So yes, there we've got the full existence—both the physical world and that beyond it—described in essence, through this mystical fantastic four of *caturvyūha.* And to me this Viśākhayūpa pillar nicely illustrates that.

But then, how can a quadruple of consciousness in deep sleep, dreaming and wakefulness describe all of existence? Well, there is a creation dynamic going on here. Let me try to explain it, and pardon me if I repeat myself, but we are now quite at the root of the cosmology we are talking about here, so let's make sure we get it clear: Here is God, completely perfect and self-satisfied. How would it feel to be God? You need nothing more, you don't need to do anything. That is God as Vāsudeva, which generally is translated as "pure, still consciousness, no need for any activity". But God can, of course, also do *everything*—create anything, have fun in any way possible, with no limits. So Viṣṇu, God, gets into a creative mood, and thus appears as Saṅkarṣaṇa. No creation has begun yet, but the desire is there that puts something into motion. That is *kāraṇam*, the causal, and *suṣupti*. Then the creation work begins,

the dreaming up (*svapna*) of wonderful things, represented by Pradyumna, and the resulting final creation, which God then enters into to have fun, represented by Aniruddha. This is called God's *līlā*, pastimes, and that is what existence is about and what we are also parts of.

Then, because we, like rays of the sun, are parts and parcels of God—small but of the same quality—we also have the freedom and ability to dream up our own worlds like that, to have fun in our ways. And that is what this world is that we find ourselves in now. It is a collective dream of some sort, with us as co-dreamers. And evidence for this very cosmological principle is clear to see in how we act here: We make plays, stories, theater, movies, games—starting basically from birth, as kids in the sandbox. That's what we do, and our entire lives are about us playing the roles that we choose or have been born into (by our own desires, on that higher, mental plane, and by our *karma*).

All this, from the highest level to our individual daily lives, is then ultimately part of God's pastimes. So is our current life in this world, but still, this is a dreamworld that we have entered into. Our own dreams. And dreams are imagination and illusions, so when we get lost in them and start playing gods to control and enjoy in selfish ways, well, then we can only expect the world to become the way it is around us these days.

There are two sides that sometimes argue, one saying that we fell down into this material world from the Kingdom of God, and another saying that we never fell because no one falls from there, and so we were never with Krishna/God but came from some *taṭastha-śakti* in Brahman or something like that. Then the other version is the one we have found here in the *Śrīmad-Bhāgavatam*: you are always in your *svarūpa* in the real world, Vaikuṇṭha, because that is your eternal and constitutional position, but you can dream sometimes, and this is the dream. We never "fell" anywhere but remain where we always are but got a bit carried away into our fantasies.

Then arguments follow from each side. But I personally think we can safely say that we most probably can't—at least not with our current minds and intellects, and maybe not at all due to us being limited *jīvas*—really comprehend what that high ontological situation actually is like. Any analogy, metaphor, or logic we try, based on our current consciousness is utterly insufficient. So take the word "dream" like that—a metaphor. As we learn from knowledge such as that of the *Śrīmad-Bhāgavatam*, the only way to actually understand our original position is to return to our original position.

Anyhow, what is important here—and that's what the cosmology of the *Śrīmad-Bhāgavatam* is about—is for us to understand that the world we now appear to be in is not reality, and this sometimes rather strange dream simply fades away when we wake up. That is the purpose of this knowledge: to help us understand the world as it actually is, and how to practically live to make our lives real, bright, and happy.

If you still ask how this dream cosmology can explain the existence of all this heavy, solid, real matter that we find in this world (which material science is mainly preoccupied with), then let's talk reality for real! I mean, whatever God desires to exist, exists, right. As real as anything could be. And when God dreams, that is real too. But temporary. That's what the *guṇas* that define the material world are about: creation, sustenance and destruction (represented by the *guṇa-avatāras*). Things appear, stay for a while and are then gone. That which is temporary is not really real, because it ceases to exist at a point. This is rather what defines a dream.

Again, anything God thinks of becomes real, so He thinks up a dreamworld for us. It is like when a game developer creates a virtual reality game that others can enter and play in. But if you, when we say "God's dream" think of dreams such as those we have at night, and then feel that this world we are in is much too concrete for being a dream, remember: It's God's dream. It's a bit different from ours. How different? Well so different that it appears as real and concrete as this world is. We share it—so we call it objectively existing and therefore real.

But it will disappear in due course of time. We will wake up from it in due course of time. And when you think about it, isn't that as much the sign of a dream as anything? You could say well, I can distinguish between dream and reality because now when I am awake it is evident to me that this world is substantial while the dreamworld was just flimsy, with forms that changed all the time and so on. Yes, sure. But the thing is that we see it that way when in the dreamworld too. We take it for real. Sometimes we don't even want to wake up because we have something important or desirable to do that we want to continue with. So I think it is fair to say that the main sign of a world being dreamy and unreal is that it will disappear at one point.

Yes, here we can get deeper into these topics, on a more philosophical level, which is what you find in the *Vedānta* of India. But then, the *Śrīmad-Bhāgavatam* is said to be "the natural commentary on the *Vedānta*", so for you who

want to continue deeper into this topic I can recommend you to study the *Śrīmad-Bhāgavatam* (well, read the *Bhagavad-gītā* first if you haven't, since the *Śrīmad-Bhāgavatam* is a kind of *Vedic* postgraduate study).

This kind of sums up the cosmology of the *Purāṇas*, and now it is time to move on. Because yes, you may still be sitting there with a question ringing in your mind: Okay, okay, that was an interesting and cute theory, about dreams and playful souls and God and all that. But now let's turn back to our real, concrete world here, with science and technology and things made of cells, molecules, atoms, elementary particles, and ... well, "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." Oops, who said that again? Oops, Max Planck, the founder of quantum theory, remember? Well, this all leads us back to the here and now. Let's roll up our sleeves and get ready.

The Cosmos of Quantum Physics

Now, how much do we really know about our world?

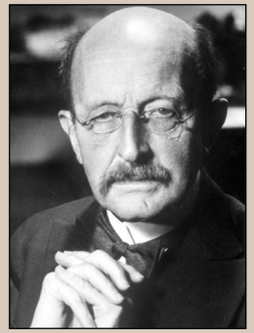
Here we are, in the 21st century, and we may seem far from the worldview of the ancients. We have our science and our fine academia, where some smart and learned people conduct cutting-edge research to understand the world we're in. So let's look at the situation here and now. What do we actually know, with science and all that, about this world? And how, if at all, does this ancient cosmology we just looked at fit into that?

Yes, here is a material world, with planets, made of rock and metals, water and minerals. We have our bodies, made of fantastically complex cells, like microscopic cities with factories, sustaining and running bodily organs that are equally sophisticated. Is it all a machine or what? What is all this, really?

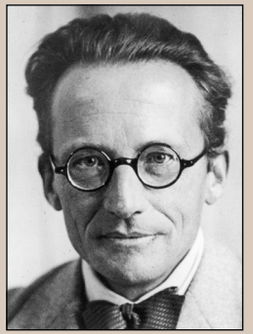
Do atoms exist at all?

It's all made of atoms, right? Well, I guess that's what you still learn in school, but as you go deeper into the inner chambers of physics, that neat image of little balls starts to dissolve into ... well, not an image at all, but something entirely different. The quantum physicist David Bohm explains: "It is rather widely believed nowadays that science, at least physics, does not give much scope to imagination. Various imaginative pictures are used, like "wave" and "particles," but they are in no sense regarded as a real description of what we are talking about. They are merely aids to calculation; we deploy our imaginative pictures so that we can calculate more efficiently."[107]

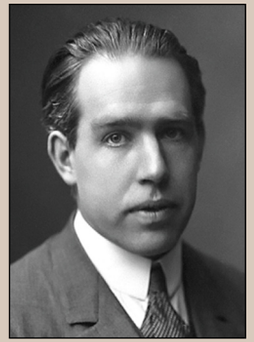
Niels Bohr put it similarly: "We must be clear that when it comes to atoms, language can be used only as in poetry. The poet, too, is not nearly so concerned with describing facts as with creating images and establishing mental connections.[108] And in the words of Werner Heisenberg: "I think that modern physics has definitely decided in favor of Plato. In fact the smallest units



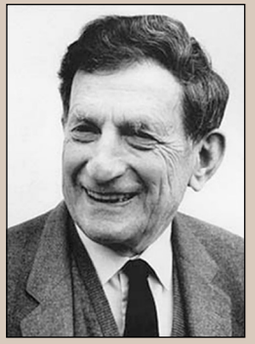
Max Planck, German physicist, originator of quantum theory and one of the founders of modern physics. Received the Nobel Prize in Physics in 1918.



Erwin Schrödinger, Austrian quantum physicist, famous for the Schrödinger equation, and his cat. Nobel Prize 1933.



Niels Bohr, Danish physicist who made foundational contributions to understanding atomic structure and quantum theory, for which he received the Nobel Prize in Physics in 1922.



David Bohm, American physicist, known for the interpretation of quantum theory, the De Broglie–Bohm theory.

of matter are not physical objects in the ordinary sense; they are forms, ideas which can be expressed unambiguously only in mathematical language."[109]

In other words, it is now accepted among physicists that the little colored balls with tiny specks orbiting around them in neat elliptical curves—the atoms we think of and make plastic models of—are just imagined. They don't exist. Something else exists. What is it?

The Energy

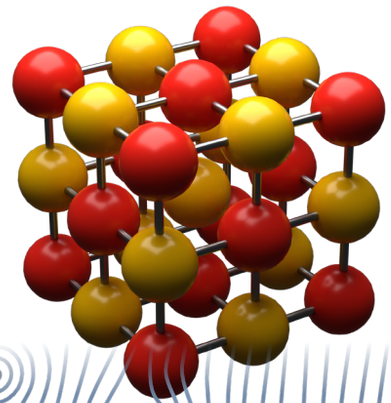
We already quoted Max Planck saying, "I can tell you as a result of my research about atoms this much: There is no matter as such. All matter originates and exists only by virtue of a force which brings the particle of an atom to vibration and holds this most minute solar system of the atom together." David Bohm writes:

> What is needed in a relativistic theory is to give up altogether the notion that the world is constituted of basic objects or 'building blocks'. Rather, one has to view the world in terms of universal flux of events and process-

> es. ... A more vivid image of the sort of thing that is meant is afforded by considering wave forms as vortex structures in a flowing stream ... Relativity theory calls for this sort of way of looking at the atomic particles, which constitute all matter, including of course human beings, with their brains, nervous systems, and the observing instruments that they have built and that they use in their laboratories. So, approaching the question in different ways, relativity and quantum theory agree, in that they both imply the need to look on the world as an undivided whole, in which all parts of the universe, including the observer and his instruments, merge and unite in one totality.[110]

So this view is shared by both relativity theory and quantum theory: what we call atoms are more like vortices in a flow of energy, like whirlpools in a water stream, appearing to be located at fixed points but actually existing as forms within the energy flow. Werner Heisenberg gives another example to show this:

> The elementary particles are certainly not eternal and indestructible units of matter, they can actually be transformed into each other. As a matter of fact, if two such particles, moving through space with a very high kinetic energy, collide, then many new elementary particles may be created from the available energy and the old particles may have disappeared in the collision.



With relativity theory and quantum theory, atoms were not anymore seen as structures of particles but more as "vortexes" in a flow of energy, just like in a water flow there may be whirls that appear as static structures.

> Such events have been frequently observed and offer the best proof that all particles are made of the same substance: energy."[111]

So here is some kind of energy, we know that much. It can appear in different forms, including matter (which, of course, is right there in Einstein's famous $E=mc^2$ formula). It is often acting in a dual way (plus-minus, yin-yang, north-south etc.), with a vibration between the two. Sometimes that energy appears to flow in a specific direction, such as sound and light. Sometimes it acts denser as gas, liquid, the flow getting more inert and even appearing rigid. There is a lot of rotation and spiraling going on in this world, and then sometimes that energy appear as static forms of matter.

So a new view of the world emerged, and we now begin to see how different it is from the classical physics. What we have here is a cosmos that is a complete wholeness. Physics got slightly metaphysical at that point, you could say.

The Holistic View of the cosmos

An artist in China once said to me (interestingly enough while showing his art in a gallery), "We Chinese don't see this world as a machinery, as you Westerners tend to do, but as a flow of energy." And yes, those quantum physicists understood that energy flow as something going on in a wholeness or oneness, that everything—the physical world as well as we conscious beings—is part of. Bohm continues: "The new form of insight can perhaps best be called Undivided Wholeness in Flowing Movement. This view implies that flow is, in some sense, prior to that of the 'things' that can be seen to form and dissolve in this flow ... quantum concepts imply that the world acts more like a single indivisible unit, in which even the 'intrinsic' nature of each part (wave or particle) depends to some degree on its relationship to its surroundings."[112] Or as Heisenberg puts it, "There is a fundamental error in separating the parts from the whole, the mistake of atomizing what should not be atomized. Unity and complementarity constitute reality."[113]

Waves and Vedanta

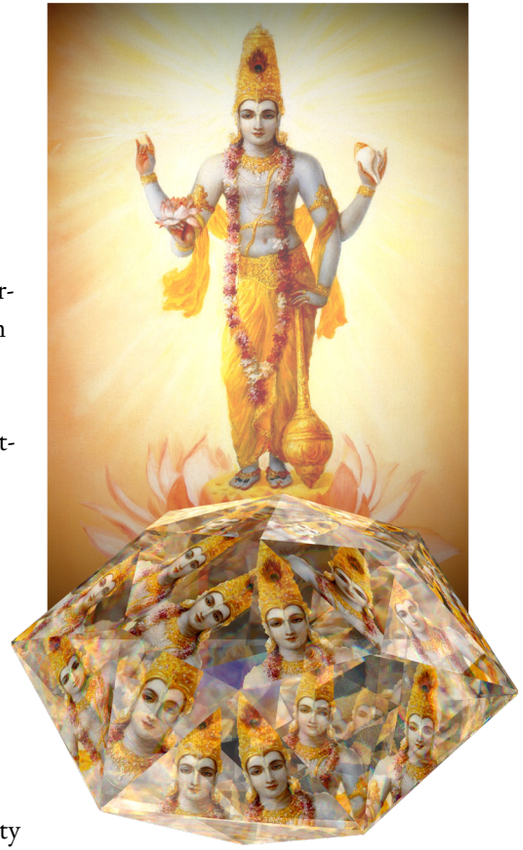
So, we've got little waves that may sometimes appear as what we call "particles", as if they were distinct little units, though in fact they are part of this vibrating energy wholeness. And indeed, this material world is pretty wavy—sound waves, light waves, brain waves, and yes, "atom waves".

We just looked at the Purāṇic cosmology, which speaks about this undivided wholeness energy as "Brahman", and the creation starting with a primal vibration—AUM (or "the sound of Krishnas flute"). Is it strange then that the founding fathers of quantum physics got interested in the Vedantic teachings from India? Schrödinger, for instance, writes about this view that the world, although appearing fragmented, is actually a oneness:

> The plurality that we perceive is only an appearance; it is not real. Vedantic philosophy ... has sought to clarify it by a number of analogies, one of the most attractive being the many-faceted crystal which, while showing hundreds of little pictures of what is in reality a single existent object, does not really multiply that object...[114]

Schrödinger goes further into the Vedantic view by mentioning that this energy of Brahman encompasses not only the world but also the consciousness within it, of which we are all a parts:

> In itself, the insight is not new. The earliest records, to my knowledge, date back some 2500 years or more... the recognition ATMAN = BRAHMAN (the personal self equals the omnipresent, all-comprehending eternal self) was in Indian thought considered, far from being blasphemous, to represent the quintessence of deepest insight into the happenings of the world.[115]



Quantum physicist Erwin Schrödinger drew from Vedantic knowledge, likening the cosmos to a single object appearing as many facets in a jewel. This aligns with the view in physics of an undivided wholeness—what India calls Brahman. The Purāṇas describe Brahman as the energy of the Puruṣa, who, as Paramātmā (Kṣīrodakaśāyī Viṣṇu), exists 'in every atom and heart'—one, yet appearing as many. Through Vedānta, Schrödinger appreciated a sophisticated explanation of an undivided oneness that appears as separate parts and particles.

Schrödinger was apparently mainly familiar with and influenced by the *advaita-vedānta* school, which at that time was the most well-known in Europe due to teachers such as Vivekananda. This is considered the first stage of understanding existence: Brahman as a oneness rather than a fragmented energy. Then the *Purāṇas* state, "Learned transcendentalists who know the Absolute Truth call this nondual existence Brahman, Paramātmā or Bhagavān."[116] This Brahman energy has, as energy does, a source—Paramātmā (remember Supersoul, there at the highest of the lokas?), who in turn is one of the expansions of the Supreme Personality of Godhead, Bhagavān. We are all one, in the sense of being rays of the same sun or twigs of the same tree, so to speak, while remaining individuals who can have nice relationships, which is what makes life enjoyable. You can learn more about all that in Indian philosophy books such as the *Bhagavad-gītā* and the *Śrīmad-Bhāgavatam*, if you're interested.

The Return of Consciousness to the Cosmos

Many of those founders of quantum theory did what they found natural and unavoidable: they accepted consciousness as a natural part of this cosmic flow of energy. David Bohm writes: "In this flow, mind and matter are not separate substances."[117] Max Planck, when talking about how atoms are about the dynamics of a cosmic force, ended that statement with the words, "...we must assume that this force that is active within the atom comes from a conscious and intelligent mind. That mind is the ultimate source of matter." Elsewhere he says, "I regard consciousness as fundamental. I regard matter as derivative from consciousness. We cannot get behind consciousness. Everything that we talk about, everything that we regard as existing, postulates consciousness."[118] The English physicist Arthur Eddington agrees: "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."[119] You hear the same from some modern physicists, such as Sir Roger Penrose: "Consciousness is a fundamental aspect of the universe, and there is no way to explain it away as an artifact of complex computation."

Science rests on philosophy (and, in fact, what we now call *natural science* used to be called *natural philosophy)*—in other words certain basic assumptions

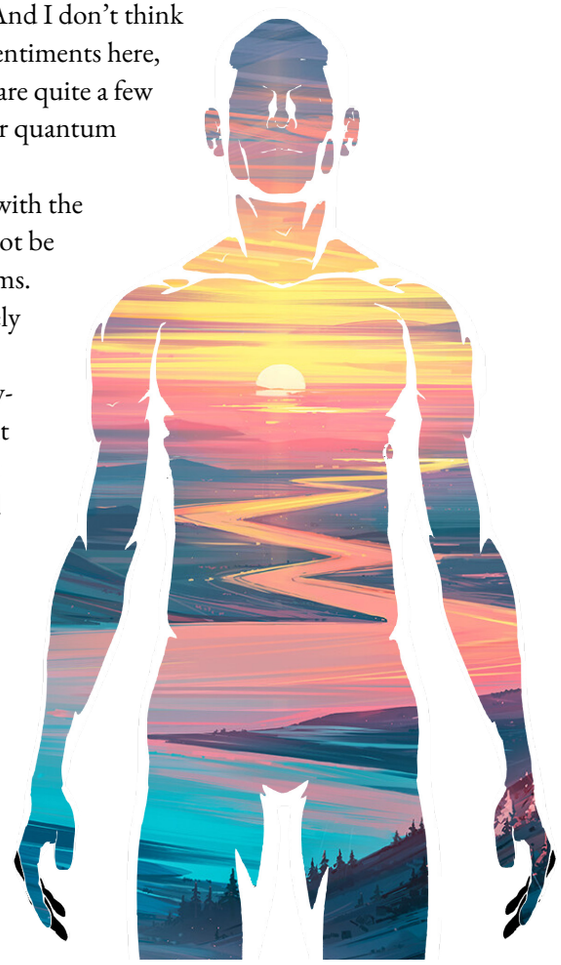
that influence the ways that scientific studies are carried out. The general underlying philosophy of science used to be the one called *idealism*, which, in short, assumes that the cosmos originates with and rests upon consciousness (thus compatible with the religions, where this consciousness is that of God and us souls emanating from God). Then the philosophy of *materialism* entered and somehow became dominant within academia in the late 19th century. Thus what we then learned to call science was largely built on the *physicalism* philosophical assumption that only the physical world exists and nothing outside of it.

According to the philosophy of *idealism*, existence originates in and is sustained by consciousness—as *ideas* in the mind of an original consciousness or God. This view traces back to Plato and finds roots in Indian Vedanta, Buddhism, and Confucian thought, underlying theistic religions in general. It later emerged in European philosophy through thinkers like Kant, Berkeley, Schopenhauer, and Hegel, and also among the founders of quantum physics, who saw it as a natural explanation for what their research uncovered.

This assumption has been challenged more and more by modern consciousness studies and within philosophy, since it ultimately denies the very existence of *us*, as factually existing conscious living beings, and dismisses us as mere robots. There are thus significant trends within contemporary science seeking to re-establish idealism as a philosophical foundation, including in physics and cosmology—in other words, to allow consciousness proper to be included in the fundamentals that make up the world. As philosopher David Chalmers puts it: "We are used to the idea that some features of the world are fundamental: in physics, features such as spacetime, mass, and charge, are taken as fundamental and not further explained. If the arguments against materialism are correct, these features from physics do not exhaust the fundamental features of the world: we need to expand our catalog of the world's basic features ... First, it could be that consciousness is itself a fundamental feature of the world, like spacetime and mass."[120]

If all that sounds strange to a modern mind steeped in materialism, it was apparently less so to people a hundred years ago—even for scientists. 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."[121] And I don't think he expresses some religious sentiments here, because as we just saw, there are quite a few similar statements from other quantum physicists.

Erwin Schrödinger agrees with the others: "Consciousness cannot be accounted for in physical terms. For consciousness is absolutely fundamental. It cannot be accounted for in terms of anything else."[122] Then he takes it one step further: "We do not belong to this material world that science constructs for us. We are not in it; we are outside. We are only spectators. The reason why we believe that we are in it, that we belong to the picture, is that our bodies are in the picture. Our bodies belong to it."[123]



"We do not belong to this material world that science constructs for us. We are not in it; we are outside. We are only spectators."

— Erwin Schrödinger

We exist independent of matter

Here we are, conscious living beings. We exist independently of these temporary physical bodies. There

"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."

— Physicist Sir James Jeans, founder of British cosmology

is plenty of research into this—studies of testimonies by many people who have memories of previous lives, which could be verified, and lots of reports from people having NDEs (Near Death Experiences) and OBEs (Out of Body Experiences), accurately reporting what happened in their environment while their bodies and brains were shut off and sometimes clinically dead. (If you doubt the viability of such testimonies, I strongly suggest that you study some of the books written by distinguished researchers, doctors, psychiatrists, etc. who have studied this field rather thoroughly and convincingly by now, with proper scientific methodology.[124]) We existed before we were born here and will continue existing after leaving these bodies.

We have minds, also existing independently of our physical bodies. In our minds we first create forms that then become physical—we imagine things and then build them. We are now learning more and more about "mind over matter" (which people of the East seem to have known all along); that the mind

actually controls matter to a much larger extent than we (at least modern Westerners) may have believed.

I would say that today we actually do have substantial scientific evidence, I dare call it proof, in support of this: we exist beyond these physical bodies. (I also dare saying that the reason this understanding has not been generally accepted by mainstream modern science, is because of biases upheld by people in the academic community that are staunch believers in the philosophy of materialism. But for now, I presume that you, the reader of this, are not stuck with such a bias, which is more a matter of denial than healthy scientific skepticism.) I think that most people today can relate to such a world view. Once you can, it is really quite easy to accommodate a cosmology such as the one we just now looked at, from India and elsewhere, that the quantum physicists also started looking into. The cosmos is a force in action, making up forms, but then somehow all based on mind and consciousness. Several of them speak about the cosmos as "looking more like a great mind." That step was obviously too hard to take for most physicists. But some did and still do, not only a hundred years ago but increasingly today. The rest of us may stand here shrugging our shoulders and wonder what is going on. "The Matrix?" someone then says, others nod and that's it.

What is then the relationship between that consciousness/mind and the forms that we experience around us? And how on earth do we fit all this into a working cosmology that makes sense to scientists and to the rest of us too?

The Holographic Cosmos

In modern physics there is something called the *holographic principle*. It's about string theory and black holes and multidimensional stuff, in what seems like a rather mathematical cosmos. Maybe it's about something real, maybe not, but in any case, they say things like "the way that spacetime and quantum gravity convey information or hold information is not different bits or qubits for quantum information at every point in spacetime, it is something holographic".[125]

In fact, some quantum physicists, and even neurologists, began believing—and even providing evidence suggesting—that the world we experience with our senses is more like a hologram. If you don't know what that is, just stay tuned.

One of the major contributors to quantum theory is David Bohm. He is also known as the originator of one of the main interpretations of quantum theory, which gives a "holographic" understanding of the world.

David Bohm is an interesting person. He was a top-level nuclear physicist by the end of World War II, and Oppenheimer asked him to work on the Manhattan Project (the development of the atom bomb), but since Bohm had friends who were accused of being communists (which he himself also got accused of later on), he did not get the high security clearance needed. Ironically, Bohm produced calculations deemed useful for the Manhattan Project, so they were immediately classified—meaning Bohm was denied access to his own work! Anyway, as an assistant professor at Princeton University, Bohm worked closely with Albert Einstein, and he wrote the book Quantum Theory (1951) which became a standard university textbook. In 1958 he was nominated for the Nobel Prize but was kicked out of the game due to being a suspected commie (the McCarthy era had begun). In fact he had to leave Princeton (although supported by Einstein) and went into exile in Brazil where he became a physics professor at the University of São Paulo. Due to all this he got less fame than he deserved in the quantum physics scene, and his rather remarkable theory for solving the problems with the "standard" Copenhagen

David Bohm saw the importance of this understanding of a Oneness in nature, to "bring to an end the fragmentation", within science and also between us humans and our environment. Here seen with the Indian Vedantic philosopher Jiddu Krishnamurti.

Interpretation of quantum theory has probably been recognized less than it deserves, due to such reasons.

Bohm explains how he saw a weakness in the standard quantum theory proposed by Niels Bohr, which held that "all we can discuss is our knowledge of reality"[126] (You know, quantum theory concluded that physical form can only be described as a set of probabilities, until it is being observed by a conscious person—the famous "collapse of the wave function"—so our "reality" is our perception and knowledge about it.) It did not give any clear concept of reality, as an existence independent of being known by us. He explains his own approach, which developed into one of the main interpretations of quantum theory (De Broglie-Bohm theory):

> Now, I tried to get some idea, what might be the process, which was implied by the mathematics of the quantum theory. And this process is what I call "enfoldment". That the mathematics itself suggests a movement in which everything, any particular element of space, may have a field, which unfolds into the whole and the whole enfolds into it. So you have this movement and I call this the "implicit" or "enfolded order"

> which unfolds into the "explicit order", where everything is separate. Now, in the implicit order everything is internally related to everything, everything contains everything.[127]

Bohm gave a nice little example to explain this. It is about the fish that you see at the top of this page. There are four of them, probably happily swimming around in an aquarium somewhere. But when we see the actual aquarium (shown below), a higher reality is revealed: There is only one fish, and the four images above are shot simultaneously with four cameras from different angles. When the fish moves, the images will change correspondingly in the four cameras, depending on each other.

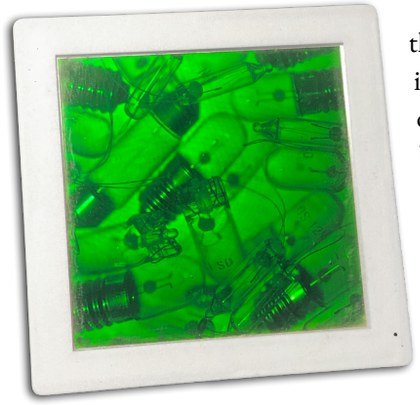
Bohm writes:

> We know that the images do not refer to independently existent though interacting actualities (in which, for example, one image could be said to 'cause' related changes in the other). Rather, they refer to a single actuality, which is the common ground of both (and this explains the correlation of images without the assumption that they causally affect each other).

> This actuality is of higher dimensionality than are the separate images on the screens; or, to put it differently, the images on the screens are two-dimensional projections (or facets) of a three-dimensional reality. In some sense this three-dimensional reality holds these two-dimensional projections within it. Yet, since these projections exist only as abstractions, the three-dimensional reality is neither of these, but rather it is something else, something of a nature beyond both.
>
> That is to say, we may regard each of the 'particles' constituting a system as a projection of a 'higher-dimensional' reality, rather than as a separate particle, existing together with all the others in a common three-dimensional space. For example, in the experiment of Einstein, Podolsky and Rosen, which we have mentioned earlier, each of two atoms that initially combine to form a single molecule are to be regarded as three-dimensional projections of a six-dimensional reality.[128]

What does Bohm mean by that, and what does it have to do with what we are talking about? Well, the forms that we experience around us are then understood as "surface" manifestations of an underlying implicit order. To explain that further, he compares it to the way holograms work.

Ok, what is a hologram, really?



You have probably seen holograms—those neat little greenish or reddish 3D images that seem to pop out of a surface or exist in space behind it. They look a bit like magic, don't they? But why do quantum physicists like David Bohm talk about them? To understand that, we need to take a little look at what holograms really are.

Holography is a technique for recording and reconstructing light fields. What is a light field? Simply put, it is all the light existing in a space, such as in the room where you are now.

In school, you may have learned about light as rays—streams of photons emitted from sources, bouncing off objects, entering the lens of your eye,

and focusing on your retina. And that is, of course, one way of describing it. Another way of looking at light is as a field that exists throughout the room, carrying visual information from the light sources and reflective surfaces in the room. That is what is called a *light field*.

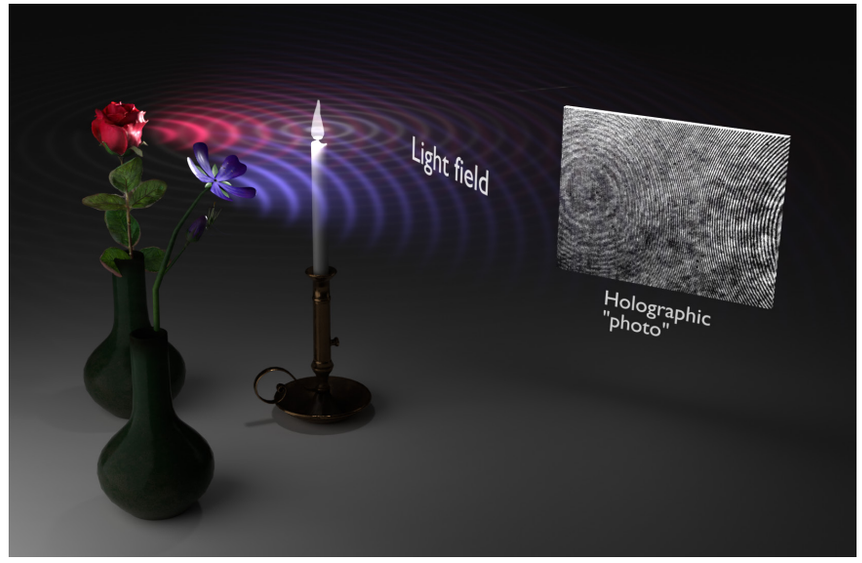
Each object in a room reflects or emanates light waves that spread out into the room, from different directions and with different frequencies and strengths. As those waves meet each other, there is interference between them. It's like dropping pebbles into water. Waves spread out, and when they meet, they form more complex patterns. That's interference.

The room you are in now is filled with such a light field consisting of an interference pattern of all the light waves in the room, from all directions. Each point in the room contains the visual information of the entire room from that point of view, stored in the interference pattern.

When you take an ordinary photograph, you are basically sampling the light in one such point and projecting a 2D image from it. The simple principle for that is the *camera obscura*—a dark room or box with a small hole in it (that only lets through the light at essentially one point in the room), which is the most basic principle for a camera. The light coming in through that hole falls upon the back wall of the box, where it can be captured on a light-sensitive film or sensor. And you've got a photograph. So you are kind of "cutting" a 2D image out of that light field.

A hologram, though, essentially means that on your light-sensitive film or sensor you directly capture a part of that interference pattern of waves in the light field of the room. Since you then sample not just one point of the light field but an entire plane of it (the size of the film or sensor), you have the visual information about the room as seen from different points of view. Then using smart mathematics (called Fourier transforms) and technology generally involving lasers, you can save that interference pattern on a film and retrieve a 3D image from it. That is what a hologram is, in a nutshell.

A camera obscura is a dark room or box with a small hole, which 'samples' the light at a single point in the light field—the most basic principle of a camera.



The light waves from objects in a room blend into a light field that fills the room's space, consisting of interference patterns between all these waves. A hologram is essentially a 'slice' of this interference pattern recorded on film, which can later be used to reconstruct the light field, creating virtual 3D images of the objects.

Yes, but what can we learn from holograms?

This simple explanation of holography should be sufficient for now. But again, what does the hologram have to do with understanding the nature of this world? The point is that the light field is holistic: each part of the field contains the information of the entire room. Behind the 3D images created by a hologram and in our brain, there is a higher form containing the room as seen from all directions—the light field (which is basically a 4D form, as I understand). It's as in the example with the fish, where behind those four 2D camera images of seemingly different fish there is a higher dimensional 3D form of which those images are simply surfaces.

So what Bohm contributed to quantum theory was to add something important: an underlying reality. In other words, the world does not only exist in my mind (and/or yours, and/or ... well, solipsism gets strange). There is an underlying, *implicit* information structure containing all the forms that then become *explicit* when observed by us. So, behind it all, there is not just nothingness but a vibrating energy matrix carrying (extremely sophisticated) information, which is a sign of intelligence. And, as Bohm and others like him opined, consciousness is included in this energy field that the world consists of, since intelligence is a property of consciousness.

So we've got a field of energy wherein a pattern of waves exists. And this is, as we just saw, much how both relativity theory and quantum theory started understanding the world. Even atoms should be thought of as something like vortices in this energy field. And in this example of light, we have a light

Both relativity theory and quantum theory started understanding the world as a field of energy wherein a pattern of waves exists. Even atoms should be thought of as something like vortices in this energy field.

field—vibrating energy that we call "electromagnetic"—that accounts for the forms we perceive with our sense of sight. For our sense of hearing, there is the corresponding *audio field* which works much the same as the *light field*. And that basically goes for our other perception as well. Our senses pick up touch sensations, taste, and smell in the form of electric signals that are sent through the nervous system into the brain. So for all our senses, the input comes as some kind of wave form. Then inside the brain, that signal is somehow again recreating the perception that the sense organ picked up—a visual image, a sound, a touch sensation, a taste or a smell. Which ultimately appear as forms in my mind.

But how does that happen in the brain?

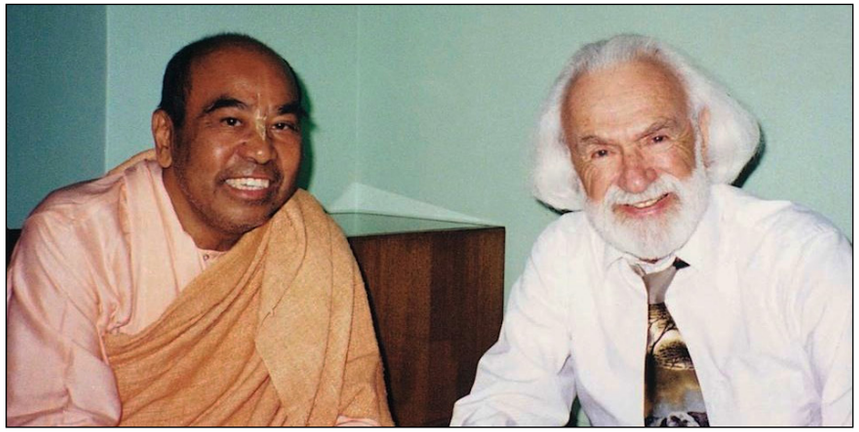
The Holographic Brain

So far, we have basically looked at what modern science, including both relativity theory and quantum theory, actually knows about this world (and we looked a little at Bohms implicit/explicit order, which is a theory among others, albeit, as I am trying to show here, probably better than many realize). But then, how much do we actually know about our own brains, where this whole image of a world that we perceive is formed?

Let's continue using our sense of sight as an example. From our eyes, a bunch of nerve impulses flow as electric signals into the brain, where an image appears that is somehow perceived by our minds. How is that image formed there in the brain?

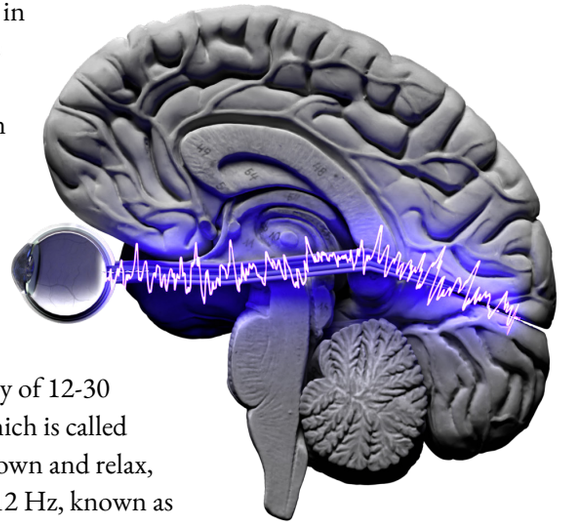
Scientists used to believe that this image in the brain is neatly stored as electric states in neurons, brain cells. Then as computers arrived, some thought that the brain is like a computer that stores information as bits and bytes there in those cells. And yes, doctor Frankenstein could create life from electricity, and in the science fiction movie labs they can store you on a computer chip and download you into another body. However, we now know enough about the brain to tell that no, something else is going on.

Karl Pribram was a psychologist, psychiatrist and neurosurgeon, well-known for his *holonomic* brain model and the theory of *holographic consciousness*. His theory suggests that our brain processes perception in the form of waves mixed together. (Pribram's writings are on the technical side, but I recommend his book *Languages of the Brain* if you want to explore his theory more deeply.)



Professor Karl Pribram with Dr. Thoudam Damodara Singh (Svarupa Damodara Swami) from the Bhaktivedanta Institute.

When you look at something, electric waves from your eyes pass through the optic nerve and activate the visual cortex in the back of your brain. This is well known and measurable. There is constant electrical activity in the brain, which generates an electromagnetic field around it. This is what can be measured with EEG, and it vibrates at different frequencies depending on the activity of the mind. When our minds are strongly active, the field vibrates at a frequency of 12-30 Hz (cycles per second), which is called *beta waves*. When we sit down and relax, the frequency drops to 8-12 Hz, known as *alpha waves*. When we fall asleep and dream, or enter a meditative or trance-like state, the frequency drops further to 4-7 Hz, producing *theta waves*. In deep sleep, it slows down to *delta waves*, at 1.5-4 Hz. These waves contain a spectrum of other frequencies, so in a way, you could compare them to carrier waves (which you electronic buffs know well).



How, then, is this electromagnetic vibrating field created? By countless electrical discharges in brain cells, the neurons. But if you're looking for orderly little bits and bytes in there, like in a computer, well, you won't find them. Rather, there's a multitude of electrical oscillations happening in neurons, at different frequencies, often interacting and interfering with each other. It is mainly these that create that electromagnetic field in and around the brain.

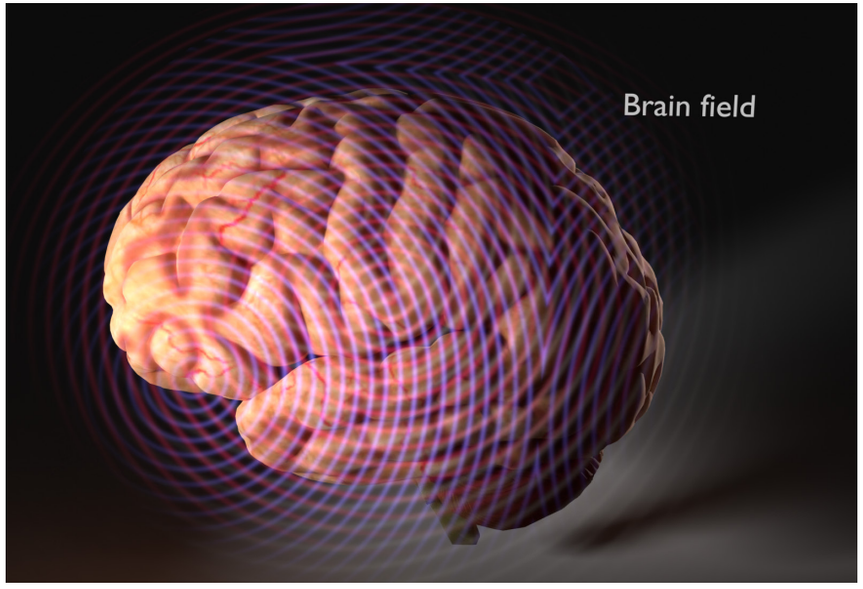
Karl Pribram realized that while it's often thought that each neuron is specialized for a specific function, there's substantial evidence that brain processes are not dependent on fixed, permanent connections between neurons. The brain operates in a more dynamic and distributed manner, involving complex interactions across networks of neurons.

For example, there is something called *neuroplasticity*, which means that if a part of the brain is damaged, the specific cognitive functions that normally occur there may move over to another part of the brain. Pribram mentions several laboratory experiments producing evidence for that: "Extremely large holes can be made in the brain with very little effect on just that highly complex behavior which one would expect to be especially sensitive to disruption if integration depended entirely on the presence of permanent associative connections."[129] Which, yes, means that some researchers sat there in their labs cutting away pieces of animal brains and then noticing that those rats or monkeys could still perform functions that are considered to be located in those missing parts of the brain. He mentions Karl Lashley, who in 1929 "removed 80-90 percent of the striate cortex of rats without impairing their ability to discriminate patterns. Robert Galambos cut up to 98 percent of the optic tracts of cats and the animals could still perform skillfully on tests necessitating the differentiation of highly similar figures (Galambos, Norton, and Frommer, 1967)."[130] And he goes on listing several such gory experiments, which like other such treatment of animals are highly questionable ethically. But you get the point. So he concludes that this neural plasticity means that the information is not stored in the physical brain only. Where is it stored then?

When Pribram studied brain waves, focusing on the neurons at a cellular level, he noted larger wave patterns flowing through the tissues of the brain, corresponding to brain activity involving cognition. His theory suggests that information, like that of an image, is not just passed along fixed brain cell connections like electrical wires, but might be encoded in a higher structure, as waveforms in the brain's electromagnetic field. These waves in the brain create

interference patterns, much like waves in the light field of a room. Pribram used Fourier transforms to study them, and since Fourier transforms are also there in the mathematics behind holography, he started looking into that as well. There he found David Bohm already working on much the same theory but on a more cosmological level. Bohm was studying the external holographic information field, while Pribram focused on the internal brain field. The two seemed similar. So Bohm and Pribram started collaborating.

Bohm was studying how the information making up the forms we perceive in the sensory world can be described *holonomically*, like the hologram. This holographic principle applies not only to our sense of sight, but to all our senses, since they all send electric waves into the brain. Pribram then proposed that the same holographic principle could be involved in creating the image in the brain that we then perceive with our minds. The holonomic principle is



Pribram describes a "wholeness" within the brain field. This is measurable with EEG and has been studied in neurology, with different brain wave frequencies being associated with mental activity. The image in the brain field could be of the same nature as the image in the light field outside the person. In the external light field, the information about the object is present "holographically" at every point, and in the brain field, the image is reconstructed similarly—just like how a camera captures an image, but far more advanced, since it's three-dimensional.

thus there behind the manifestation of the sensory world, all the way from the "outside world" to the "inside world" of our brains and minds.

When you look at an object, the brain's electromagnetic field contains an image of that object. This image could then exist as a holographic form in the brain field. The mind connects to this field and thus perceives an image of the physical world as received through the eyes and other senses. When we are what we call awake, that connection is there. During sleep, we disconnect mentally from that brain image and set out on our adventure in the astral dreamworld, or disconnect from that too and just rest.

To me this makes sense. There is verifiable science behind most of it, and to my understanding there is ongoing research in this field. But here we are talking cosmology, not physics or neurology, so I leave the rest for you experts to investigate further if you like. The reason I got into all this was that it makes some pieces of the cosmic puzzle fall into place, at least for me. It opens a connection between ancient and modern cosmology, and gives more clues to why those fathers of quantum theory became so interested in the Indian Vedāntic teachings.

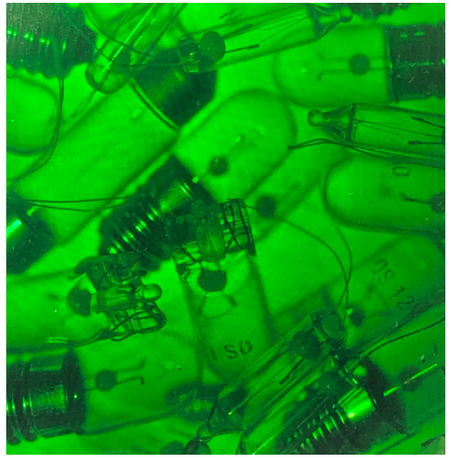
In fact, this fits the understanding we just got from the *Purāṇas* quite well: The sense organs and nervous system (including the brain) is *annamaya-kośa*, physical; that electric field wherein the sensory input is manifest into an image, stored in that holonomic field, is the *praṇāmāya-kośa*, the "energy body" (prāṇa/chi/mana etc). Then that image is perceived by the mind (*manomaya-kośa*) and so on. And as we have now seen, what happened there with quantum theory and this holonomic theory is that the "fabric" of the cosmos moved more over into the realm of the mind and consciousness. The forms we experience as "physical" are perceived in mind, arising from an information "matrix" in a vibrating energy. And what that means, we will now try to understand.

The Virtual Cosmos

Let's now see what we have so far. You remember, we started with those mysterious old models of the cosmos, with the three worlds along a cosmic pillar, found in different cultures. Then the discovery journey led us to an understanding of those three worlds as referring to this physical earthly realm, the subtle mental/astral realm and the "causal" realm. All of these realms, *lokas* as they are called in India, are existing based on consciousness. How? Well, as a dream. Thus the *Purāṇas* describe this existence as the dream of God (Mahā-Viṣṇu).

In this world view, surprisingly common in most original cultures on the planet, the world does not exist on its own as some structure made of "material particles", but in a cosmic mind. Then we saw a similar, consciousness-based view appearing with quantum physics and continuing to develop in modern science. The material world is rather seen in terms of our perception of it, and people like Bohm anchored that in a higher, implicit order that included consciousness.

So it got rather consciousness-centered, where the forms perceived are dependent on us conscious observers rather than the other way around. While this may seem odd to people raised in countries where the philosophy of materialism is still dominant, it is quite in line with the other, historically more widely accepted, philosophy of idealism.

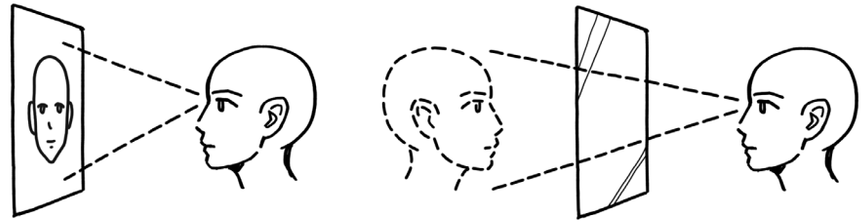


The 3D image seen in a hologram is a virtual image.

The hologram example given by David Bohm and Karl Pribram is good for illustrating this. In the

little hologram I have on my desk, the 3D light bulbs seem to hang there in the room, as if I saw them through a tiny window. However, that light bulb does not exist there as an object at all. It is a *virtual image*.

In physics class, our teacher explained that an image on a surface, like a photograph or a painting, is a *real image*, but the image we see when looking at an object in a mirror, for instance, is a *virtual image*. A "virtual" image exists in our perception—in fact it exists in the mind of the conscious observer.



An image on a surface, like a photograph or a painting, is a real image, but the image we see when looking at an object through a mirror, or a hologram, is a virtual image. It exists in our perception.

The 3D image we see when looking at a hologram is a virtual image. That form of a light bulb I see doesn't exist "out there". What exists is an "implicate order" made up of waves in the light field, which enter the eyes and cause electromagnetic activity in the brain, giving rise to the image in the mind—which is what we actually perceive. Such a virtual image exists in relation to the conscious observer only, who is then, as some quantum physicists also expressed it, fundamental.

So my claim here is that this understanding of consciousness as fundamental and the physical world as existing "in consciousness", can be found in both ancient cosmology and in this modern science that quantum physics opened up. You could call it a *virtual cosmology*.

If this all sounds strange, yes, it's a bit about twisting your mind inside-out, you could say (rather than "outside-in", where you look at everything as seen "out there" through the physical senses). And I hear someone saying, "Hey mister, are you really, really suggesting that all this heavy and solid and colorful matter we have around us has no real existence but is simply imaginary forms in a mind?! If so, then give us at least a plausible theoretical model for how this could work."

Yes, how does this energy that we find around and in us turn into all this that appears as such a concrete world? More precisely, those little atom whirl-

pools (or however they are pictured nowadays among physicists) of energy that the objects around us consist of, how do they appear, how do they create these forms we perceive, and how is this all controlled by mind?

I then found another interesting and surprisingly similar theory that had started spreading among some prominent intellectuals in the early 21st century. Fasten your seatbelts, 'cause we are now entering the *virtual world*.

The VR Game

Some years ago I started a small animation studio, learning 3D animation and a little bit of 3D game creation. Then one day, a dental supply company I worked for wanted me to create a VR (Virtual Reality) game for them, for use at a trade fair.

So there I am, in a big headset, in another world. I stand there in a room, and I can walk around and look at things. A woman guide welcomes me to this world. An empty bottle stands on a table. I take it in my hand, feel the touch of it, lift it and throw it into the wall, with the glass splinters bouncing

You put on that virtual reality headset and there you are, in another world. You can walk around in there, pick up things and feel the touch of them in your hand. Your mind quickly gets used to this virtual world, and when you take off the headset it takes a little while to get used to the other world—the real room you are in. Or is that a virtual world as well?

and tinkling towards me on the stone floor. Gosh, how quickly you get sucked into that world, accepting it as real!

If you have ever had that VR experience, you know what it's like. If you have ever created a VR game yourself, you know the bewilderment caused by spending hours moving in and out between two worlds. Yes, there I was, in a real size dentist treatment center just the way you see it when sitting in the chair, in a room like any room but brighter and clearer. A room that I was building, right there from inside it. Then I took off my goggles and entered some gray, dull room, sitting next to a computer in my apartment. It took a few seconds to adapt to the new world.

Yes, I got more and more amazed at how quickly the mind gets used to that other virtual world and accepts it as real. I learned from other VR game developers that when programming such a game, it's best to avoid moving the player around too much within the game world, as this can cause them to lose balance or experience motion sickness.

But it is still a virtual world in there, meaning that those things you see and pick up in there merely exist as electromagnetic vibrations, which through your senses enter your brain and create that spectacular world in your mind. There was no dentist treatment center there; it existed only in the form of electric signals.

Still, even though that was just a limited resolution visual image, stereo sound and some very crude touch sensations through the controllers held in my hands, I got lured into it—even to the extent that at one point I lost my orientation in the "outside world", pushed the laptop into the floor and broke it.

The power of the mind, yes. I remembered discussing with my own (real) dentist about hypnosis, which dentists sometimes use for anesthesia. He explained that even physical pain is actually in the mind. You can use hypnosis to remove that pain from the mind, and it's gone. So yes, the mind plays a much more prominent role in this world than we may be aware of.

The word "virtual" is from the 14th century and means "influencing by physical virtues or capabilities, effective with respect to inherent natural qualities," from Latin *virtus* "excellence, potency, efficacy", and it is related to the Sanskrit word *vīrya,* which means "energy". Later, in the 15th century it came to mean "being something in essence or effect, though not actually or in fact". So you can take it to mean just that, something that arises through some energetic structure or matrix of information if you prefer, as an image in our mind, but which has no independent, objective existence as "stuff".

The Simulation Theory

Then one day I read an article about a new scientific theory. It first appeared as some cool speculations among intellectuals in Silicon Valley—Elon Musk one of them. The reasoning went something like this: We humans are now into creating simulated realities, such as we do with our VR games. If we continue at this pace of technical development, we will within a not-too-distant future be able to create a simulated reality that involves all the senses and is virtually indistinguishable from "real" reality.

Then came the twist, where it started to sound a bit trippy, I thought—but good for a science fiction movie if nothing else: Maybe we already invented such a perfect simulation—or someone did. And we are in it right now.

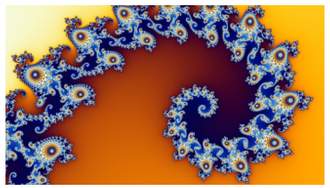
Get it? In other words, we are not in this world that we see around us. We are in a civilization that is much more developed, possessing the technology of creating an almost perfect make-believe virtual reality world that we have then entered into as gamers or whatever, and that's where we seem to be now. In the actual Second Life, you could say.

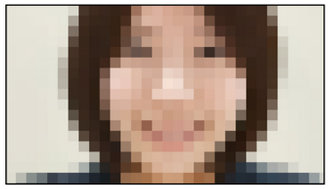
Okay, I think I know what you think. To me it was kind of interesting and amusing, but then I looked a bit closer into it, and found there is actually science behind it. Some scientists in good standing were writing serious theory papers about it in respectable scientific publications. They even claimed to have come up with some evidence, suggesting that this world we are in or think we are in is actually a simulation. As far as I know, the idea came from Oxford philosopher Nick Bostrom. In 2001 he published a paper titled "Are You Living in a Computer Simulation".[131] (Actually it originated with Konrad Zuse, who invented the first digital computer in 1939.) And beyond that stimulating tea table topic of us being *avatars* in a computer game, they list some features of nature that could actually suggest that this world is a simulation, such as:

- The physical laws are very fine tuned, and if they were just a little bit off, there would be no universe. This implies intelligent design, which could be the work of programmers who thus coded the cosmos to be what it is.

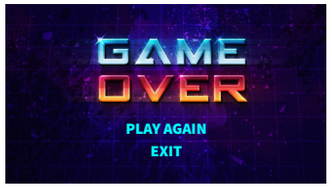
- Quantum physics tells us that the forms in this world are only "rendered" when perceived by a conscious observer (the "collapse of the wave function"). This is similar to the programming technique used for computer games (called "on-demand rendering"), where the objects inside the game world are only rendered when looked at by the player.

- The nature we find around us can be described mathematically, and some mathematicians even talk about the "code" that underlies it. You can, for instance, describe the movements of all the planets in our solar system with an algorithm in a computer program. This suggests some coding (and coders) behind this world.





- Some say this spacetime can be "quantized", meaning it is composed of discrete, finite units. For instance, they say there is an ultimate "pixel size" ("Planck length" the smallest size considered possible), a smallest time unit ("Planck time"), a smallest quanta of energy and so on.



- The "Game Over". The very fact that our adventure here lasts only for a limited amount of time can also lead one to suspect that this is indeed not real reality, but more like a "game level".

Some proponents of this theory, believing in the possibility of AI-generated consciousness, tend to propose that our sense of self may come from being simulated characters within the game. But this is of course a speculation based on that materialist belief that consciousness can be generated from matter, which has never been shown possible, neither by experiment nor even in theory. And of course, it makes no sense to make a game that just "plays itself" through simulated game characters. Games are made for us to have fun with. So the natural role of us in this proposed simulated reality would of course be as the "gamers".

Yes, this theory can be seen as a fun thought experiment, but then when you think further about it, in the light of what we have discussed so far in this book, it gets very interesting. Of course, we are familiar with computers made of copper and silicon, so we may tend to think of this simulation as us sitting somewhere else in another realm, being connected to some supercomputers with headsets or body suits or brain implants or whatever. However, I think we should expect that the far more advanced technology we would use then could be of an entirely different kind—not using primitive physical machinery, goggles and computing machines made of circuit boards and monitors, but a higher form of technology. It could very well use mental or other subtle techniques for projecting a world into our minds. In fact, that only makes sense, doesn't it?

Then it struck me that this is what we are looking at here, in this virtual cosmology that we find in the *Purāṇas* and elsewhere from ancient times, still permeating many cultures on the planet, and that even started appearing with

quantum physics. This view that we have so far likened to a cosmic dream. Well, another analogy that is maybe even easier to relate to for us today, and makes it all clearer, is to see this as a virtual cosmos, a virtual reality.

In other words, we are actually situated in another, higher reality, hopefully *the* reality, where we have, just as we have here, the ability and freedom to create our own adventures, by entering into this game, this pastime play, where we get a game avatar (and the word *avatar* is even Sanskrit and comes from this *Purāṇic* knowledge, and means just that: specifically when God takes on a form within this world and acts with it, and also, you could say, when we do so. Again the *vedāntic* knowledge sneaks in here.)

Let's try, for instance, to explain the *Purāṇic* cosmology, that we just described, in terms of this simulation metaphor:

Here we are, a whole bunch of us, who want to enjoy life. And we have a lot of creative freedom to do so—in fact the entire world we live in is flourishing through the creative freedom and blissful being of Brahman—the Supreme Personality of Godhead—in *lila*, pastime. We thus have that ability ourselves, to create whatever we want (just as we have when dreaming night- and daydreams where we are now). You could compare that to a game, or role play, as we also like to do here on Earth. But it's a very good one, very real, very fun, a real adventure where we can be whoever we want to be and do whatever we want to do. For a limited time, of course, the way games are. Then back to reality, otherwise we may forget ourselves and get lost in there. Then if we want we can play again, another *avatar* in there, or the same. Another lifetime in the repeated cycle of reincarnation.

Just as with all multiplayer games, there are game developers, game leaders, admins and so on. This game is created by those who are very good at it—who know how to make a real massive adventure game. Well, if we want to, we can work in the game developer team as well, but come on, this game is for us to enjoy in and play our roles in.

So we connect to it. We enter into that game world, which seems so real but is really a world of illusion, *maya*. We have a mind that seems just normal, but as if being somewhere else, someone else. Yes, the *ahaṅkāra*, false ego, kicks in, we get sucked into it. Then a space, forms, and wham! We pop into that world, in a body. A strange body, but you'll get used to it. Yes, you just took birth, as we call it, and you are in the game. Good luck, and have a nice life! And be nice to the others in there, please!

And so on, the rest of the story belonging to some book of wisdom. Here it's about cosmology. And this little story can both describe the world according to the Purāṇas and this Simulated World we just looked at. And a VR game. What we can call the Virtual Cosmos.

Yes, but really, how can this concrete world be explained as just forms in the mind?

Ok, let's now get down to earth. How do we explain the very factual existence of, for instance, hitting our foot into a hard rock? If that rock is not a real object, then let's see what you, mister author, say when you hit your foot into it. Yes, it feels very real, doesn't it? And that's what matters to us, isn't it—how it feels when we touch it, how it looks, how it sounds, how it tastes and how it smells. If I would say, here is a nice, valuable gift that I give to you, but you can't touch it, see it, hear it, taste it or smell it, then well, what do you say? So what matters to us is our perceptions. If we can all perceive a form consistently, then we accept it as real, don't we? Who cares what it's "objective" existence is outside of that?

So we can construct an amusement park out of earthly materials to enjoy ourselves in. But we could also, with some perfect VR creation, construct one out of direct sense perceptions—sound, vision, and touch, which, when made realistic enough with taste and smell added would make our VR amusement park indistinguishable from the other park. So which one is most real?

It is an interesting thought experiment, isn't it—for instance, how would we perfectly simulate touch? After all, when I hold what I call a "rock" in my hand, the weight and structure of it—which makes me consider it a real, solid thing—is simply about my touch sensation related to it. If we want to perfectly simulate that touch perception, we need to include feelings of pressure, texture, temperature and motion energy. If I could plug you into a machine I made that perfectly controls those touch experiences for you, added to the audio/visual experiences, then I pretty much own you. Add to that taste and smell, and that world would soon be your new reality. If I would then enter that new reality of yours as my own *avatar*, telling you that the forms you experience are merely virtual, mental forms that have no objective existence, you would probably just laugh at me, as you may have been doing when reading here that the world you are in now is just a virtual reality.

I guess little thought experiments like this may be popular in tea house discussions among the Simulation Theory adherents. But, thinking deeper about it, I would say that this virtual understanding of the world can explain and account for all the phenomena we find here. Whether this world is real or not is only a question of how persistent and convincing our perception of it is for us. Remember those quantum theory founders who spoke like that, how our "reality" is our perception and knowledge about it, and that Purāṇic cosmology telling us that this world is a dream—the illusion of maya.

End words

(May appear at the end of this book. Still a bit rough and sketchy, but included just to convey the objective and conclusion of this book, as it stands when this is written.)

Returning to the enigmatic images of the cosmos from the past, we need to take into account that people in those cultures may have an entirely different point of view or outlook on the world. While we modern people are often very much focused on the physical forms of the world "out there", influenced by physicalism, people with this world view that we have now looked at would naturally describe the cosmos from that "conscious centered" point of view. When looking at their images of the cosmos, we may habitually try to place the objects in those images within the world of some kind of physical space, and when we can't, we reject them as primitive ideas. However, to those who made those images, they may rather describe realms "within". A resident of traditional Vedic India, for instance, would say that we are now in bodies located in Bhūrloka, but when we close our eyes and meditate, that is in Bhuvarloka. Thus our story of Śrī Gopa-kumāra visiting the different *lokas* may simply describe that person being on a journey in consciousness, so to speak, in deep meditation. And the *shamans* and *yogis* are said to be able to travel between the worlds, not by material vehicles but by "moving through inner space". It is a journey on the chariot of the mind, you could say, and where we are now is simply one of those realms—the realm of wakefulness, Bhūrloka.

You may remember that when we looked closer at these images, some of them, like the *Kālacakra* of Tibet and *Śrī Yantra* of India, are to be understood just in that way: describing levels where the Bhūrloka, earthly physical

realm is at the bottom, and then the mental, intellectual and on top the *ātmā*, the soul/conscious observer.

Okay, so what difference does this cosmology make for our lives here and now? We talk about philosophy, science and all these things, but in the end, it's all about finding reality—actual reality. And according to, for instance, Indian *vedānta* philosophy, actual reality is really nice. It's about having a loving, fulfilling relationship with God and with each other as we truly are: beings that transcend material existence, which sometimes feels more like a dream, sometimes even a nightmare.

This cosmology means that all the mess, misery, and chaos we see in the world right now—this "reality"—is actually just like a dream. A dream that can be bright and happy, mixed struggle, or not so nice at all—all depending on which modes of nature we live, think and act in. Then we are lead to conclude that on a deeper level things are ultimately good. We are good, and life, in its essence, is wonderful, joyful, and full of love.

When I say this, some might respond, "Oh, you're such a romantic dreamer!" They have accepted the opposite view, consciously or unconsciously. They believe that the chaos and suffering of the material world—death, old age, and the eventual disappearance of everything—is all there is. They see this material existence as the only reality, where everyone is ultimately only concerned about personal survival and pleasure.

But that is the illusion. And, as you might understand when you read this, there's a significant—very significant—difference between these two world views. Not just a difference in the mind and intellect, but in the entire resultant experience of life.

As you perceive yourself from the inside, you tend to treat yourself and others around you. So, what we're talking about here is not only important, but the most important thing when it comes to our life and the world. This isn't just about some self-improvement exercise—it's about the real life issues that make a difference. If we want to change the world, we need to start by changing ourselves. And that's the essence of it.

My goal in writing this book is to try to fit pieces together into a holistic, working cosmology that can withstand both scientific scrutiny and spiritual exploration, while also being practical in how it applies to our lives.

This knowledge, especially in a cosmological and scientific context, is interdisciplinary. As Pribram noted, we need knowledge that integrates all aspects

of life—social sciences, economics, natural sciences, etc.—instead of fragmenting them into isolated disciplines. In ancient cultures, and still today in places like India and China, knowledge is more holistic. In India, for instance, "veda" means "knowledge", not separated into various disconnected departments but seen as a unified whole. This is also what we're talking about here: different people, from various cultures and disciplines, looking at the same reality, sharing experiences and finding common ground. Rather than fighting over their differences.

I leave this book to all of you; you may agree with some parts and disagree with others. If you have insights or think you could explain something better, then write your own book or share your thoughts. Let's help each other grow in wisdom.

Yep, this is what we've got so far. Thanks for reading. Feedback is very welcome. Did you find this book possible to understand at all, or do you have tips for how to explain it better? How did you like the content? And so on.

This is where you get in touch with me:
Mail: per@transparentmedia.se
Phone: +46 70 99 22 55 9
Per/Priyavrata

Endnotes

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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
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11 Eddington: The Nature of the Physical World (1928), Ch 12
12 Schrödinger: My View of the World (1931)
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19 Śrīmad-Bhāgavatam 2.4.6
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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 Bhagavad-gītā. 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 Bhagavad-gītā. 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
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80 S.B. Fifth Canto, Chapter 22
81 S.B. 5.22.1
82 S.B. 5.22.2
83 S.B. 5.22.5
84 S.B. 5.23.6
85 Śrīmad-Bhāgavatam 5.23.5
86 S.B. 5.23.5
87 Śrīmad-Bhāgavatam 5.16.4
88 Morning Walk, Dec. 9, 1973, Los Angeles
89 Śrīmad-Bhāgavatam 5.16.5
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95 Śrīmad-Bhāgavatam 2.9.1
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101 Lakṣmītantra 11.11-12, notes
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