

# The Ages of the Earth



# The Ages of the Earth:

*A Journey from Theology  
to Geology*

By

J. Javier Álvaro

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*For Lucía, Matías  
and their endless whys*



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# I

## INTRODUCTION

If you are planning for a year, sow rice;  
if you are planning for a decade, plant trees;  
but if you are planning for a lifetime, educate people  
*Chinese proverb*

One of the first temptations that mothers and fathers feel when faced with the endless ‘whys’ of our children is to end them with a simple ‘because it is or because it isn’t’. Unfortunately, this becomes a terrible mistake because we soon receive what we deserve when they pepper us with the same answer. After several years, there is no better choice than measuring our words and trying to avoid the contradictions that appear sooner or later. Children are tireless, curious and capable of being surprised every day, qualities that disappear in adulthood. It is therefore sad to note that the skills and passions that characterise children's lives, and the indefatigably critical spirit of adolescents, disappear in the uniform and almost always boring ocean called ‘adult society’.

Studies of scientific culture conducted during the 2010s among the European adult population repeat the same mantra endlessly<sup>1</sup>: a population familiar with science and technology improves its ability to make individual decisions, as both patients and consumers, before daily life. Science and philosophy help to create a more tolerant youth, who are open to innovation and able to take advantage of the opportunities generated by global changes. What is obvious on the European level, however, is an exception in some countries, such as Spain, where 25% of citizens still believe that the sun orbits the Earth, 30% believe that prehistoric humans

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<sup>1</sup> In Spain, a survey carried out by the BBVA Foundation in 2006 is available at [http://www.fbbva.es/TLFU/dat/Cultura\\_cientifica\\_-\\_Nota\\_larga\\_-\\_07-05\\_2\\_FINAL\\_.pdf](http://www.fbbva.es/TLFU/dat/Cultura_cientifica_-_Nota_larga_-_07-05_2_FINAL_.pdf). The bi-annual polls carried out by the Spanish Foundation for Science and Technology (FECYT) on social perception of science ([http://www.idi.mineco.gob.es/stfls/MICINN/Prensa/NOTAS\\_PRENDA/2015/Dossier\\_PSC\\_2015.pdf](http://www.idi.mineco.gob.es/stfls/MICINN/Prensa/NOTAS_PRENDA/2015/Dossier_PSC_2015.pdf)) highlight that the responses of Spanish youths have improved since 2006, from an average of 50 to 70% of correct answers.

lived with dinosaurs (as in the cartoon series *The Flintstones*), 75% that only genetically treated tomatoes have genes, 70% that sunlight is monochromatic (as if rainbows were simply ornaments), 50% that antibiotics destroy viruses, 30% that the radioactivity of the planet is all generated by human beings, 27% consider homeopathy 'very or quite scientific' (despite it being a pseudoscience), 14% defend horoscopes and 11.5% still deny that human beings evolved from a different species. The result is alarming: the average Spaniard needs so much faith to believe in miracles as to publically defend the theories of evolution, plate tectonics, relativity or quantum mechanics, because the scientific training of our young Spanish people is, in this too, at the tail-end of Europe.

However, and despite the global economic crisis in which we find ourselves, never has so much money and effort been invested in scientific research. Technology is advancing by leaps and bounds, and the consumers are renewing annually their multimedia equipment, frequently coinciding with Christmas expenses. In the globalised world accessible through the internet, it is surprising that some people are able to use a mobile phone or a GPS and, at the same time, they proudly deny the principles of physics on which their electronic device is based. How can some of the most solidly established scientific theories continue to be questioned in modern Europe? Are we raising young people with their own intelligence or simply consumers? Nobody denies gravity – a tangible demonstration can be observed by jumping through a window – but there is still a component of society that denies the theory of evolution, the age of the Earth and the cosmos, and all their implications. It takes five minutes browsing the web to realise the number of pages that offer doubts about science and all kinds of mystical interpretations. Religious fundamentalism is still there, influencing the human collective behind the scenes, and offering an ambiguous alternative to scientific theories. Nothing is more absurd than crossing the street with a priest, talking quietly on the most recent generation of mobile: he believes in miracles, alterations to natural laws and supernatural intentionality in everything that happens, but if he needs to talk to someone, he will not use the miraculous ability that he defends from the pulpit. No. He will buy a mobile phone and will make use of science and technology.

It seemed that technology, space travel and the globalisation of information were going to stop humans doubting so many scientific advances, whose use we brag about on a daily basis, but it turns out that this is not the case. In the twenty-first century, believing is still more comfortable than thinking. Still worse, openly criticising religious beliefs and opinions that are clearly opposed to facts that have been demonstrated

for centuries is described, in some media or by some social groups, as ‘politically incorrect’ or contrary to the freedom of teaching or religion. Concepts such as ‘neo-truth’, ‘alternative truth’ and George Orwell’s disturbing ‘post-truth’ have become accepted in our society. Where do the right to freedom end and the right to ignorance begin? They seem to have very blurred limits. Deception and demagoguery are installed in our lives in such a way that it matters little if what is affirmed in public is meaningless, at least, while it is useful. In a country where popular wisdom says that journalists do not ‘report’ (all is opinion), politicians do not ‘manage public resources’ (they waste them on endless corruption and pork-barrel politics) and judges represent the most inconsiderate group in society, anyone can end up thinking that educating a child to think on their own is an impossible task.

What can scientists contribute to so much misinformation? We are one of the guilds most highly valued by society, although we are often criticised for living in ivory towers and using incomprehensible jargon. Hardly anyone talks about us except in electoral campaigns or as the culmination of the emigration of graduates, a bleeding that no country should allow. When investing almost one million euros per student for academic training, from childhood to the final degree as doctor or engineer, how can we afford to throw such investment away? Does anyone still believe that it is cheaper to import a vaccine than to manufacture and export it within the country? Neither education nor research projects are simply an expense, they are an investment for the future. After listening so much to our politicians, I do not know whether our country has the rulers it deserves, but it would be very risky to end up thinking as they do, and assuming that public education is a luxury that we can do without.

The straw that broke the camel’s back, and triggered the writing of this book probably appeared on a sunny spring afternoon, during emerged conversation between a girl fourteen years old and his brother of seven. The discussion was funny until they turned to me and the storm exploded: ‘Dad, in the natural science class, the teacher told us about the scientific method: doubting, experimenting, criticising and proposing hypotheses to reject falsified statements and all that. Afterwards, the religious education teacher came in and gave us a talk about faith, which turns out to be a gift that God gives to some people but not to others. And God? I mean... ours – where is he? Did Adam and Eve really exist? Did they live in a paradise thousands of years ago? But don’t you study fossils that are many millions of years old? Who is right?’

Yes, there comes a time when you decide to pause your daily routine and jump into the ring. This book is aimed at a young and curious public,

capable of being interested in the multidisciplinary subjects of high schools – such as philosophy, biology or geology – and still forging the basis for further studies, at university or as professional training. You will find nothing here that is not explained in a high school. Sentimentally it is addressed to two future adults who always manage to wear down my patience with their batteries of questions. This is why my writing style is not very academic and why I have tried to base it on the two jewels that we lose when we reach adulthood: a child's imagination and an adolescent's rebellious attitude. I will try to answer some of the questions that arose that afternoon, such as the headache that has inspired our ancestors to unravel the age of the Earth (the study of which earns my livelihood) and its inhabitants, as well as the effect that this adventure had on the God whose thoughts so many claim to know.

Take it easy... let's go there!

## II

### THE LEGACY OF ANTIQUITY

You may eat freely from every tree of the garden,  
but you must not eat from the tree of the knowledge of good and evil;  
for in the day that you eat of it, you surely die  
*Genesis, 2:16-17*

Imagine our ancestors in prehistory. Among the cyclical phenomena that attracted their attention was the movement of the sun through the sky and its immediate consequence, the alternation of day and night. The oral memory of the tribe would confirm the invariability of this alternation, which allowed them to foresee the time of the sun's departure and return. For nomadic peoples, hunters and gatherers, the need to predict the future is not banal. The fruits of the trees are collected and consumed according to the seasons. If the animals move in search of pasture, the tribe follows them. Everything comes down to living in the present and foreseeing the next season. As the inhabitants of the African Sahel know well, two consecutive years of drought or plagues imply disaster, death and the emigration of the survivors, if there are any. For a farmer, the situation is different: there are many months between planting and harvesting, during which the fields cannot be left, and the weather is capricious. Century after century, the nomadic lifestyle was slowly replaced by the sedentary, and people could no longer afford to ignore the atmospheric vagaries and the succession of seasons, and needed to understand the meaning of such an ethereal concept as chronological time. If a farmer sows before the proper time or sows too late they lose their harvest. They are also no longer solely responsible to their small family group: the lives of hundreds of neighbours, to whom they sell or exchange agricultural products, depend on their success or failure.

From the beginning of agriculture, the work of a single person could generate enough surplus to sustain a community. The nomadic tribal organisations were replaced by city-states, where work was divided and trades were specialised. In addition to the primary producers (farmers, fishermen, ranchers and miners) there were artisans (first potters and

blacksmiths, later metallurgists), merchants, defenders (soldiers) and, finally, the priestly class, intermediary between the citizens and the unknown forces that surrounded the community and threatened survival.

With the increase in complexity of social structures, it became important to know exactly the right time to sow a crop. A small miscalculation could be fatal for the community, but how would it be possible to recognise the precise moment when the weather was so unpredictable? It would be necessary to count days and it would not be enough to simply use the ten fingers on the farmer's hands, the decimal system. Very large numbers had to be counted, because the seasons are long and the annual cycle is huge. If only it was possible to find a chronological unit that exceeded the day, easy to compute and that allowed the succession of the seasons to be followed without making mistakes! Curiously, the solution was right there because, in addition to the sun, there is another light that stands out above the others: the moon. And just as the blinding focus of the sun always maintains its circular outline, the silver shine of the moon undergoes constant changes in shape, which we call 'phases'. These changes are perfectly regular and follow each other in the same order and with the same duration. The complete cycle, which is called 'a moon', extends over twenty-nine and a half days. A station thus lasts about three moons and the set of four stations comprises about twelve moons.

The Sumerian civilisation, which flourished in Mesopotamia (present-day Iraq) during the third millennium BC, developed one of the first known calendars based precisely on moon phases. They did not count in multiples of five or ten, but in multiples of six, influenced by the solar and lunar cycles. From them, we inherited the division of days, hours and minutes into multiples of six. The most important of its periodic feasts, the 'new year' day, was celebrated at the beginning, or solstice, of spring (the beginning of the agricultural year) and was made to coincide with a 'new moon' day. As a result, the solar and moon cycles would start at the same time. Twelve 'lunar months' are equivalent to 354.36 days, however, and one year contains twelve complete lunar cycles plus eleven further days. 'Divine nature' was not so perfect and, in the coming centuries, numerous solutions were sought to solve this apparent defect in the calendar of nature.

For the first civilisations, the cyclical phenomena observed in the sky were divine manifestations: both the sun and the moon were gods. Nature was then inexplicable: the stars, the wind, the fire, fertility, the tides and the rain were difficult to understand. How was it possible to explain so much mystery without appealing to divinities? Were these divinities

capricious or could their decisions be somewhat influenced? It is easy to understand why the task of observing the movements of the sun, the moon and the stars of the firmament, the origin of calendars, fell to the priestly caste, the connoisseurs of the hidden knowledge.

Predicting the future entailed an improvement in knowledge about the cycles of natural phenomena, which meant keeping a regular and accurate record of past events. The oral tradition could be very long, transmitted from parents to children and from priests to believers. The accumulation of past data was not limited to the movements of stars or the succession of seasons. As narcissism is one of the qualities of any self-respecting ruler, the first kings ordered that their biographies should also be noted, including their feats as warriors in more or less idealised chronicles. So history (written) was born, first in cuneiform impressions printed on clay tablets or sculpted in rock and, later, as symbolic brushstrokes on tree bark, papyrus or animal skin. Colouration came from substances as simple as charcoal (black), or as striking as copper minerals (green malachite and blue azurite) or iron (red hematite and yellow limonite).

Over the centuries, the setting of specific dates that marked past events built a staircase of milestones called chronology, although the starting point was always ambiguous. In order to explain the origin of each civilisation, specific dates were selected as the start of their time or 'era'. The origins were traditionally placed at the change of a dynasty, the foundation of a city (like Jerusalem or Rome) or an exceptional historical event. Some chronological systems were arbitrarily based on the supposed origin of the known world. In the absence of better estimates, myths and divine interventions were attributed to the deep past, to which a few enlightened minds had access through mystical spells (many caused by the ingestion of hallucinogenic mushrooms) or metaphorical stories. That world included all that was visible: the Earth, the sea, the sky and the bright spots of the night.

## **Myths and Cosmogonies**

Humans have always tried to find their place in the world we inhabit. Many questions are eternally human, such as... who am I? What is the origin of my family and tribe? What will the future hold? Why is there pain and death? How can I find comfort in the death of a family member? What makes us human surpasses the world of certainties and installs itself in networks of feelings and emotions. Although our logical minds suggest guidelines, we often opt for the uncertainty of feelings or, as we currently

say, let ourselves be guided by empathy or by the advice and teachings of those who love and care for us.

In a similar way, the myths about the origin of the world (cosmogonies) respond to a need to explain its beginnings and composition, as well as our place in nature. The world (or Greek *kosmos*) means, first of all, order, and the cosmogonies interpreted the origin of order in the world. Such an origin includes a chronological background, where time is considered as a linear (unidirectional) or circular (recurrent) process. Cyclic time is easy to understand if we observe the movement of the stars, the succession of seasons or the fertility of land. Numerous theogonies are included within the cosmogonies, where the birth of gods is described – a hierarchical birth, of course, because birth order is important (priority marks the hierarchy) – as well as their kinship relations and functions in the ordering of the world. It was extremely difficult to separate what we understand as the birth of celestial bodies and that of their corresponding gods, because the elements of nature (sun, earth or wind) are usually personified as divine beings. As we will see, each cosmogony starts in a state different from the current *kosmos*. The change begins in an initial, sacred time (the typical ‘once upon a time’ of children’s stories), which generates a cosmic order, often associated with the stability of real power. Stability is not free, however, and must be maintained with annual rituals. Every sudden break in the order of things (an earthquake, a volcanic eruption or a strong storm) is seen as an attempt to return to the original chaos; in some myths, cataclysms are interpreted as rebellions of monstrous beings against the deity. The Earth often appears personified as a feminine body who is able to mate with the sky and generate children. Our planet has always symbolised the concept of fertility.

The ancient myths probably derived from the opposition between two forms of thought, which the Greeks (such as Plato in his *Protagoras*) called *mythos* and *logos*. The first means ‘word’, and resembles the concept of idea. The second means ‘discourse’ or ‘study’ (from which the suffix *-logy* of scientific branches), but it differs from the *mythos* in its validity or truth, which must be demonstrated. While the former points to an idealised narrative that is free of any commitment or proof (and usually governed by creativity, desires and feelings), the latter is configured as a rational and verifiable argument. The struggle between *mythos* and *logos* perfectly embodies the absurd dispute between religion and science, whose confrontation, as we shall see, persists even nowadays. Myth should not blindly guide knowledge, nor knowledge oppose human imagination, the prelude to art. They are two different and compatible concepts, but rarely miscible.

In order to delve into the myths of the origin of the Earth and the universe, we must introduce the stories about creation that were inherited from the Judeo-Christian tradition and ended up being installed in medieval Europe. Understanding the origin of the *mythos* that led to monotheism, both in its Jewish aspect and in that of its Christian and Islamic successors, will immerse us in the marshy lands of the Egyptian, Mesopotamian and Persian mythologies, from which the Jewish tradition was inspired. The reason for this is simple: the ancient people of Israel suffered numerous exiles throughout their history, from which they always returned. The first led to Egypt, probably as a result of periods of famine and drought, and the subsequent *Exodus* has been dated to the thirteenth century BC. After their conquest by the Assyrian Kings Sargon II, Sennacherib and Nebuchadnezzar (between 722 and 587 BC), most of the Jewish people were driven to Babylon. Primitive Judaism absorbed Mesopotamian mythology until the fall of the empire, after the conquest of the capital by Cyrus the Great in 539 BC. The Persian Empire brought Zoroastrianism to the Middle East, from which Judaism absorbed another handful of myths. The final result is transcribed in the Jewish *Torah* and the Christian *Old Testament*, a compilation of tribal wars, genocides and betrayals, which include some chapters not suitable for children, and surpass sagas like *The Lord of the Rings* or *Game of Thrones* in their imagination. The cosmogony or creation recounted in the *Bible* is but a compilation and plagiarism of the myths developed by the empires that were related to the Semitic tribes who ended up forming the people of Israel. We shall consider some examples.

### *Egypt*

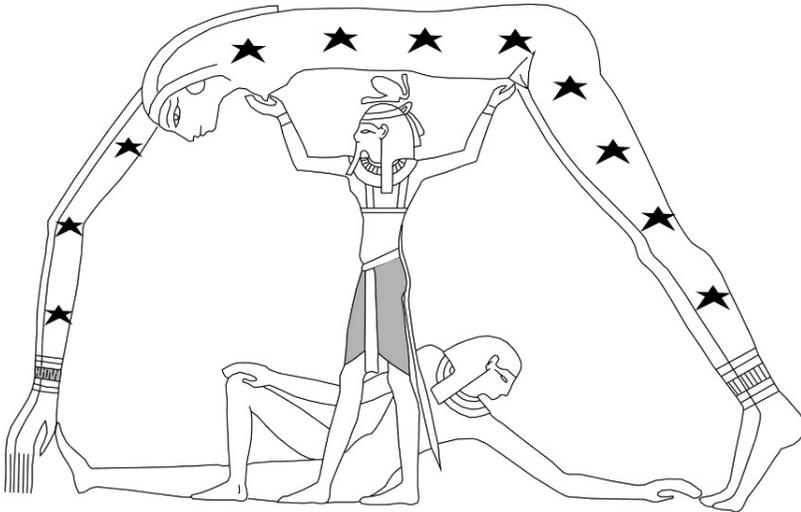
The Egyptian cosmogonies agree in starting with a primordial, unlimited and aquatic abyss, personified by the god Nun. A magical formula in the *Coffin Texts* defines it as ‘the infinite, the non-being, the nothingness and the darkness’. This image was derived from the geographical conditions of the Nile valley: a dry land crossed by the river and surrounded in turn by water (the ‘great circular ocean’ of the maps of the time), Nun’s work, from which he fed the Nile. The aquatic disorder represented by Nun generates, like the Nile, order and life: with its flood, the water erases boundaries and confuses land and water but, with its withdrawal, it propitiates the appearance of regenerating and fertile mud. The *kosmos* emerged from the primordial chaos shaping two identical lands that emerged as mounds. The second world (hidden from the one we know) was located beyond the western horizon. It was a land inhabited by spirits

or the resurrected dead, in which the sun shone during our night, after leaving the world of the living. During the twilight, those who had just died had to face the terror of entering that second kingdom and going to Osiris' hall, where each had to relate their actions in life. Even if their mouths lied, their hearts, perfectly embalmed in the first world, would recognise the truth. The heart was counterbalanced with Maat, the cosmic equilibrium. If it weighed too much, the deceased was quartered in the hereafter at the hands of a 'devourer of the dead' and became an evil spirit that carried disease and death to the world of the living.

Three cosmogonic systems were elaborated during the third millennium BC, named according to their cities of origin. Each version responds to the eagerness of the local Egyptian priestly caste to demonstrate that the god they served was the most important, insofar as that god was the creator of the others.

- In the city that the Greeks would call Hermopolis (Hermes' city, the Egyptian Thoth) the annual floods of the Nile favoured the image of a primordial ocean, from which the primitive and luminous hill of creation emerged. The four properties that characterised the primordial waters (depth, eternity, darkness and invisibility) were personified by eight 'creative gods': Nun and Naunet (initial water), Hu and Hauhet (infinite space), Kuk and Kakwet (darkness) and Amun and Amaunet (hidden). The eight gods remained united in a single body, but represented four entities composed of their masculine/feminine opposites. The first (Nun), associated with his female counterpart (Naunet), would engender the rest. The creative gods generated light after fertilising the lotus flower: when its petals opened, closed during the primordial darkness, the creator of the world, in the form of a beautiful child, emerged from the heart of the lotus. It was the sun (Ra), which immediately spread its rays of light throughout the world.
- The cosmogony of Heliopolis, city of the solar god Ra (Greek Helios), ended up commanding itself after institutionalising the Pharaoh himself as the personification of Ra. Contrary to the Hermopolitan synthesis, according to which the sun was generated jointly by the creative gods, in the Heliopolitan system the sun arose from Nun of its own will. Some texts speak of Atum as Nun's son, who emerged from the primordial waters on a hill, remembering the muddy mounds regularly supplied by the Nile. The origin of the first divinities, or the first physical elements symbolised by the *kosmos*, is conceived as a physical emanation

from a primordial god, who does not require a feminine counterpart (fertility) to create the first divine couple. In another later version, recorded in the *Book of the Dead*, a demiurge (secondary god) is described as naming the parts of his body, and ‘thus arose the gods that come after him’. Shu and Tefnut begot Geb (god of the Earth) and Nut (goddess of the sky). They were initially united in a close embrace, but their father Shu separated them, raising them into the air next to Nut to make up the celestial vault. Another version suggests Ra, irritated by the secret marriage of Geb and Nut, as the element that separates Geb and Nut through the force of Shu, forbidding Nut to engender more children in any month of the year. A third version, relayed by Plutarch in the second century AD, tells how the god Thot took pity on the fate of Nut. Playing a kind of game with the moon, he managed to separate the seventy-second part of the sun light, with which he formed five days. Since they were outside the official Egyptian calendar (with 12 months of 30 days, totalling 360 days, five less than full), Nut was able to generate five children during those five ‘lost’ days that precede the beginning of the following year. There are the protagonists of the Osirian myth: Osiris, Isis, Horus, Seth and Nephthys.



**Figure 1.** Egyptian representation illustrating the gods of the Earth (Geb), air (Shu) and celestial vault (Nut); modified after Erman, A. 1907. *A Handbook of Egyptian Religion*. Constable ed., London.

- Another cosmogony developed in Memphis, the capital of Egypt during the Old Kingdom (2700-2200 BC). A local god appears in this myth as the primordial deity. Ptah Ta-Tjenen ('the Earth that rises'), created everything through 'the knowledge and the word'. The world was created through an elevated form of thought, based on the combined action of conceiving through intelligence, whose seat is the heart, and of the word, whose seat is the language (Ptah's teeth and lips). This tradition established the chronological primacy of the Earth with respect to the sun.

All Egyptian cosmogonies agree on the pre-eminence of order over negative forces or initial chaos, which arises from a primordial aquatic abyss. The creator demiurge must constantly fight the negative forces that intend to decompose the cosmic harmony and the order, embodied in the pharaoh, to which every person must submit. There is thus a need for rituals to preserve that cosmic order, a function performed by priests. Every year, they solemnly tore the figure of Apesi, the dreadful dragon that daily threatened the creation by attacking the solar chariot that crossed the skies, between dawn and sunset, in their temples:

I am he that came into being [...] the creator of everything that came into being. Now the things that I created and which came forth from my mouth [...] were exceedingly many. The sky had not come into being; the Earth did not exist, and the children of the Earth [...] had not been made [...] I myself raised them up from out of Nu [the primordial waters] I worked a spell upon my own heart [...] and made everything that had form [...] I had union with my closed hand and embraced my shadow as a wife [and from this] sent forth issue in the form gods Shu and Tefnut [brightness and moisture], Shu and Tefnut brought forth Geb and Nut [Earth and sky]; and Geb and Nut brought forth Osiris [...] and Seth and Isis and Nephthys [Osiris is, among other things, the spirit of the Nile flood]<sup>1</sup>

### *Mesopotamia*

Although less known than the Egyptian civilisation, the Sumerians (around 4000 BC) invented cuneiform writing, built outstanding step pyramids and developed an impressive legislation, literature and mythology on the plain through which the Tigris and Euphrates rivers of present-day Iraq flow. After the Akkadian invasion, the immigrants adopted the Sumerian language and culture. Towards 2000 BC the

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<sup>1</sup> Wallis Budge, E.A. 2003. *Legends of the Egyptian Gods: Hieroglyphic Texts and Translations*. Dover Publications, p. 4-5.

Amorites managed to gain control of the Sumero-Akkadian civilisation, and established their capital in Babylon. About 500 years later, the Assyrians settled near Assur and conquered Babylon in the eighteenth century BC. They assumed that Babylon was a mirror of the heavens and that each temple was a copy of a celestial palace. This connection with the divine dimension was celebrated in the great feast of the new year. The king was solemnly enthroned and his reign extended for another year. His political stability depended on the submissive participation of the people in the eternal reign of the gods, who built order out of the primordial chaos. The seven holy days of celebration transferred the participants from secular time to the sacred and eternal world of the gods through ritual practices. A 'scapegoat' was sacrificed to erase the old year, which ended in the public humiliation of the king and enthronement of a 'carnival king'. A battle was simulated to symbolise again the struggle of the gods against destructive forces. The priests entered the temples singing the *Enuma Elish*, an epic poem that recounts creation as the victory of gods over chaos. The poem was not intended to describe creation literally, because nobody had witnessed those unimaginable events: myth and symbol were the only tools through which to approach such mysteries.

Myth, turned into history, began with the creation of gods. These arose in pairs from an aquatic and amorphous material. Their creation did not arise from nothing, because nothing and zero were concepts unknown in the ancient world. The sacred raw material had always existed and, when they tried to imagine it, they compared it to the mud of Mesopotamia, where the floods constantly threatened to destroy the fragile embankments. The original chaos (Apsu) was confusion, where everything lacked a limit or definition:

When heaven above had not yet been named, nor the Earth beneath, when [the primordial gods of the abyss] Apsu, their begetter [...] and Tiamat herself, she who gave birth to them all, still mingled their waters and no land was yet formed [...] then, within Apsu and Tiamat, the great gods were created [beings that embody the shore and horizon are born and from the latter was born the first sky god] Anu, fathers' rival [...] Anu begot in his likeness Ea [trickster spirit/water god] broad of understanding, greatly wise and mighty in strength [...] with no rival among the gods [these younger gods cause upheaval in the ancient Tiamat, like youngsters disturbing the peace of their elders, and aged Apsu declares:] 'by day I cannot rest, by night I cannot sleep. I shall destroy them' [...] Ea, supreme in knowledge, understanding all things, recognized the wicked plan and drew a magic circle against it, within which all took protection; then he composed a powerful incantation, which he recited over the water [and from this spell] sleep poured down upon Apsu and Apsu slept [Ea then

slew Apsu and built his palace upon his ancestor's body. Tiamat now rises up for vengeance and the other gods are cowed with fear. But Marduk, son of Ea and youngest lord of the gods, volunteers to do battle with her, entrusted with all the weapons of the older gods [e.g., storm and lightning] he defeats Tiamat and her demon brood] Returning to the carcass of Tiamat [...] with his merciless mace he smashed her skull. He cut the arteries of her blood [...] he split her like a shellfish in halves, and set one above as the vault of heaven, and assigned guards to watch that her waters above should not escape [he too establishes his palace above Apsu, and then divides the realms of the world - heaven, earth and abyss - among the other chief gods. But his work is not done: he then turns to the last husband of Tiamat, called Kingu. They bound him [...] slashed the arteries of his blood and with his blood created mankind<sup>2</sup>.

The *Enuma Elish* describes the primordial time, when the sky and the Earth were not yet named because they had not yet been differentiated, and were part of a uniform chaos. From them, a series of gods appeared, through a process known as 'emanation': the new gods emanated from each other, in male/female pairs, becoming a greater entity or specialisation. The first to appear were Lahmu and Lahman (their names mean 'sediment'), then Ansher and Kishar (the horizons of the sky and the sea, respectively) and Anu and Ea (the firmament and the Earth), but the successive creations were unstable and they could only be preserved if the destructive forces of the primordial chaos were controlled by endless struggle. The youngest and strongest gods rebelled against their progenitors and, although Ea defeated Apsu and Mummu, he could not beat the demonic goddess Tiamat, who created a generation of deformed monsters to defend her. Fortunately, Ea fathered a wonderful child, Marduk (the sun god), leader of the young gods who rode on a dragon and used wind and thunder as weapons. At a meeting of the great assembly of gods, Marduk promised to fight Tiamat on the condition that he would become their sovereign. After a long fight he managed to kill her, stood on the huge body and decided to create a new world or order. He split the body of Tiamat into two pieces. With the upper one he formed the vault of the sky, with its stars and planets. With the lower piece he created the Earth, the world inhabited by humans. Her numerous breasts shaped the mountains and from her eyes poured the Tigris and Euphrates rivers. Then, to ensure the maintenance of order, the sun was enthroned and a series of laws enacted that should keep each part in place. The victory was not definitive and had to be confirmed annually through an appropriate liturgy in which the people should participate. That is why the gods met annually in Babylon,

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<sup>2</sup> Campbell, J. 1964. *The Masks of God: Occidental Mythology* 3, 76-84. Arkana.

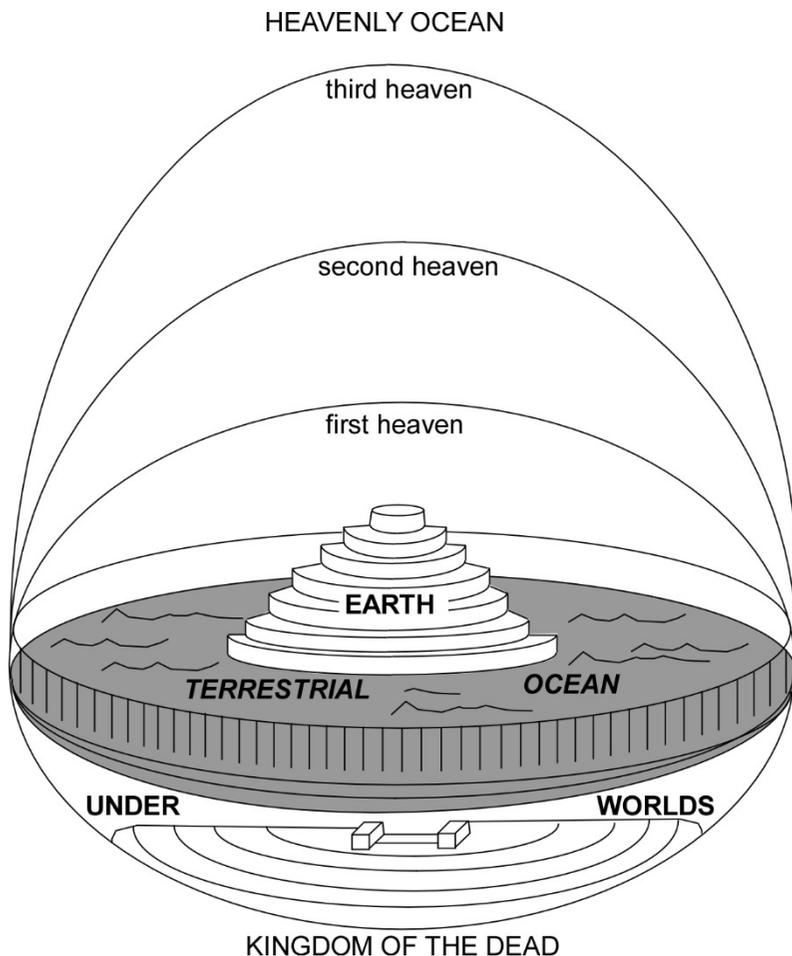
centre of the new Earth, where a temple was built to celebrate the celestial rites. The liturgy that was celebrated on the occasion of the 'new year' had begun before human beings began to exist: it was inscribed in the very essence of things.

Finally, Marduk created humanity. He killed Kingu (Tiamat's husband, created by her after the death of Apsu), and formed the first man by mixing divine blood with mud, a divine substance impregnated with the earth itself; some traditions speak of clayey figurines modelled by Ea/Enki, god of magic spells. There was then no separation between the divine and the human: both nature (including human beings) and gods came from the same divine substance. The gods also did not inhabit an external metaphysical sphere, and therefore daily life did not require any revelation from the gods, or divine law that 'descended' to Earth. The gods visited the Earth when they wanted, both in human (anthropomorphic) form and manifesting through natural phenomena. Encounters between humans and gods were common, so any stranger was welcome and treated with hospitality, in case they were a disguised god.

In Mesopotamia the inhabitants imagined the Earth (ki) as a flat disk, which ended up being the domain of Enlil, the most important figure in the Sumerian pantheon. There was a mass of drinking water under the earth, the domain of Enki (Ea in Akkadian texts) and source from which the fertilising waters of the rivers and springs that emerged from the inland ocean were fed; hence Enki's relationship with fertility and creation. The sky (an), located above the Earth, was the dominion of An (Anu in Acadian), nominal head of the pantheon and personification of the authority. The spirits of the dead dwelled in the infernal world (kur), which the texts always place underground. Concepts such as the creation of humans from clay, the flood with its ark of the almost exact dimensions that Jewish stories plagiarised afterwards (the Sumerian Noah is Utnapishtim, 'the far'), the ziggurat (stairway to heaven) of Babel and the paradise with its tree or fruit of immortality and the underworld of the dead<sup>3</sup> appear in detail in stories such as the *Epic of Gilgamesh*.

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<sup>3</sup> The Mesopotamian underworld was morally neutral and contained all the deceased. The Christian hell would modify it in order to include only evildoers, at least until the medieval invention of purgatory.



**Figure 2.** Babylonian representation of a hemispherical Earth with the sky (An), the terrestrial ocean (Absu) and the underworld (Kur); modified from Horowitz, W. 1998. *Mesopotamian Cosmic Geography*. Eisenbrauns, Winona Lake, Indiana, USA.

### *Persia*

Zoroastrianism was a philosophy established by the prophet Zoroaster or Zarathustra (628-551 BC). It was adopted as an official religion in the Persian Empire, under the hegemony of Cyrus the Great. Under his rule,

Persia conquered Babylon, where the Jewish remained captive. The subsequent invasion of the empire by Alexander the Great and the consequent Hellenisation of society supposed the almost disappearance of the Zoroastrianism, which, at present, survives as a residual religion in India and Pakistan.

The sacred book of Mazdaism, the *Avesta*, is a compilation of texts written in Persia from the fourth to the sixth centuries. Its two most important books, the *Book of Creation* and the *Anthology of Zādspram*, include three historical episodes: the creation, the revelation by Zoroaster and the final battle between the gods Ohrmazd (Ahura Mazda) and Ahreman. The history of the world is conceived as an unending battle between the two gods. In the beginning of time there was only them, each one eternal and infinite in himself. The emptiness stretched between them. Thanks to his omniscience, Ohrmazd (a name derived from Hormuz, the island and strait of the current Persian Gulf) knew of the existence of his opposite and decided to create the world as an instrument to defeat him. This god was the creator and the origin of all: sun, stars, humans, animals and light. He created the natural and spiritual worlds from his own essence, beginning with the sky, the water and the earth. He created a primitive tree (without bark or thorns), a white ox (from which would emerge all the cereals and medicinal plants, as well as all animal species), and Gayōmart, the first man. Gayōmart was killed in the first battle which good and evil faced. The first couple, Mashye and Mashyane, sprouted from their seed. The wicked Angra Mainyu perverted their thoughts, forced them to be unfaithful and even tricked them into pronouncing the first lie (or disobedience, if we compare it with Adam and Eve), assuming that the world had been created by an evil being. After the first sin, humanity lost many of the divine qualities that had characterised it, such as eternity.

Foreseeing the struggle against Ahreman, the demonic evil (Ohrmazd) resorted to the 'long sovereignty period', a limited chronological time span (9000 years) that he suggested to his enemy before a final battle. The god already knew that the first 3000 years would be of absolute dominion (a period of 'primordial creation' during which the beings and spiritual creatures were materialised), followed by another 3000 years of 'mixed state' or equalized struggle. The last 3000 years would lead to the total defeat of Ahreman, thanks to the revelation by Zoroaster, whose appearance marks the beginning of the last period.

The most influential Persian characteristics in the Jewish mythology were the hierarchy of benign and malignant beings, and the apocalyptic literature. Zoroaster established a dualistic religion of good and evil in the

*Avesta*, the origin of Manichaeism, which would extend from the mid-third century BC to the twelfth century, from China to Persia and the Roman Empire. The opposing gods, Ohrmazd and Ahreman, are accompanied by twin and antagonistic spirits, such as Spenta Mainyu (the good spirit) and Ahri Mainyu (the evil one). The first is accompanied by good spirits, the so-called Vohu Manah (good thought), Asha Vahista (just order of life), Kshanthra Vairya (right authority), Armaiti (obedience and humility), Haurvatat and Ameretat. They represent the archangels and personify the moral forces of light. The latter are grouped in a hierarchy of beings, such as the Yazatas (minor angels), the Fravashi (custodian angels) and the Kerubes (guardian angels), the prophet Zoroaster himself who would be born centuries later, the earth, water, fire, wind, stars and all consciousness, intelligence and cooperative human beings in the cosmic struggle between good and evil. The Yazata are angels who personify the virtues of nature, always assisting humans. The creation of the Fravashi (in singular, Arda Fravash) or custodian angels is emphasised: they are part of the human soul, acting as protectors from birth and would not be judged at the Last Judgment, unlike those with a human soul. There is also a malignant counterpart, the malevolent spirits allied with Ahri Mainyu, who are the spirits of evil thought or Daevas. Five are mentioned in the *Gathas* (hymns): Aka Manah (malefic mind), Drug (liar and impostor), Drug Nasu (filth of the body), Aeshma (demons of wounds in battle) and Azi Dhaka (diabolical serpent).

The origin of the Mesopotamian apocalypse was subsumed by Zoroastrianism, which considers the age of the world to be between 9000 and 12,000 years. This period was divided into three or four intervals of 3000 years: the first two would mark the battle between good and evil. After 6000 years, human beings were created, only to live perverted by evil. The arrival of the prophet Zoroaster in 9000 years would break the balance and, after another period of 3000 years (the period in which we find ourselves), good would triumph definitively. If we assume this scheme is literal, the world should have finished around the year 1500 AD, although the followers of Zoroastrianism considered the figure of 3000 years as symbolic. The use of precise numbers to express an abstract idea or an indefinite chronological period, as well as the hierarchy of angels and demons, was disseminated from the Zoroastrian writings.

## **The Mythologies of Canaan and Israel**

The *Torah* and the *Old Testament* place the origin of monotheism in Abraham, who left the city of Ur (Chaldea, in present-day Iraq) around

1870 BC to settle in Canaan. Although no documentation has been found to attest his existence, it is assumed that he was a nomadic leader who spoke a Semitic language, and guided his people from Mesopotamia to the Mediterranean Levant at the end of the third millennium BC. *Genesis* introduces Abraham as a subject of the King of Sodom, and describes his frequent conflicts with the authorities of Canaan and its surroundings.

The biblical account suggests that there were three waves of Jewish settlements in Canaan. One is associated with Abraham, who established in Hebron, in the current West Bank. The second migratory wave is related to his grandson Jacob, nicknamed Israel, who settled with his tribe in Schem (Nablus, in the West Bank). The *Bible* tells us that the sons of Jacob, the ancestors of the twelve tribes of Israel, were forced to migrate to Egypt by famine. The Egyptians ended up enslaving them, but they were liberated by a divinity, called Yahweh, who was the god of their leader, Moses<sup>4</sup>. After the precipitous flight from Egypt, at the beginning of *Exodus*, their leader claimed to have heard the voice of Yahweh on the sacred mountain of Sinai, with whom he established his covenant as an elected people, renewing that already made with Abraham<sup>5</sup>. Moses was not monotheistic, but practiced monolatry: he simply adored the god he believed most powerful and who had become obsessed with them<sup>6</sup>. After returning to Canaan they allied themselves with the Hebrews, with whom they mixed, thus founding Israel. The new country ended up splitting in two: Israel to the north and Judah to the south. The *Bible* states that the people known as ‘old Israel’ were a confederation of various ethnic groups, united primarily under their allegiance to Yahweh, Moses’ god. The biblical account was written some centuries later, around the eighteenth century BC, although it is based on very old narrative sources.

Numerous archaeological relics suggest the exile of Israel and Judah. In 722 BC, the northern kingdom was conquered by the Assyrian King Sargon II. The prophet Isaiah witnessed the destruction and deportation of ten of the twelve tribes. In 701 BC Sennacherib invaded Judah in command of another great Assyrian army. After several revolts, Nebuchadnezzar razed Jerusalem in 587 BC, and deported its population to Babylon. The exiles from Judah were not forced to practice the customs of the Babylonians, as

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<sup>4</sup> The Sumerian King Sargon of Akkad (2334-2279 BC), like Moses, was abandoned, after his birth, in a basket floating on the Euphrates river, from which he was rescued and adopted by a water carrier.

<sup>5</sup> Exodus, 19:4-6.

<sup>6</sup> Only in this way can be interpreted phrases like the triumphant Moses’ song: ‘who among the gods is like you, Lord?’; or that of Jethro, Moses’ father-in-law: ‘now I know that the Lord is greater than all other gods’; Exodus, 15:11; 18:11.

had been imposed on the northern tribes. They settled in two communities: one in Babylon, where the prophet Ezekiel lived, and another on the banks of the Kebar channel that led to the Euphrates, in a region that they baptised 'spring hill', the current Tel Abib. When Cyrus, King of Persia, conquered the Babylonian Empire in 539 BC, he did not impose his gods on his new subjects. An example of tolerance, Cyrus ordered that the statues of the gods of peoples conquered by the Babylonians be returned to their original sanctuaries. In 538 BC Cyrus issued an edict allowing the Jews to return to Judah and to rebuild their own temple.

The myths of the Mediterranean Levant that the people of Israel found in their successive returns to their promised land (both mixing with the natives and trying to exterminate them under the command of their warrior god) suggest clear oriental influences. They emphasise the influence of the myth of Marduk and Tiamat, which took up a story very similar to that of Baal-Habad, the god of storm and fertility, mentioned with unkind terms in the *Bible*. In the mythological *Texts of Ugarit*, the Semitic word *El* means 'god' and appears in the Biblical Elohim. He is called 'father of gods and men' and is the supreme Canaanite god. According to this mythology, Yam asked for the deliverance of Baal. Baal defeated Yam with two magical weapons and was about to kill him, when Asherah (his wife and mother of the gods) interceded for him, explaining that it was dishonourable to kill a prisoner. Baal was embarrassed and forgave Yam, who represented the hostile aspect of the seas and rivers that continually threatened to flood the fertile land, while Baal, god of the storm, fertilised it. Baal suffered a setback, however, died and descended to Mot's world, the god of death and barrenness. When the supreme god (El) found out about the fate of his son, he descended from his throne but could not save him. It is Anat, lover and sister of Baal, who went in search of her soul mate. When she found his body, she prepared a funeral party in his honour, slashed the guardian Mot with his sword, burned the body and grinded his ashes like grain of cereal. Similar stories were told about other great goddesses (Inana, Ishtar and Isis) who were looking for a dead god, a regenerator of life on Earth; the death of Baal may have symbolised the winter and his resurrection the spring. The victory of Anat also had to be perpetuated every year in a ritual celebration. The death of a god, the achievement of a goddess who searches for him, the triumphant return to the divine sphere and the struggle of the two sexes against sterility are recurrent themes in many religions of the time, and will reappear in the gods of monotheistic religions.