



DEAR ALL,
VOLUME I

ΕΛΕΝΑ ΤΣΑΡΑ

Cover: In the foothills of Parnassos mountain, in that evocative natural scenery there is Delphi, the ancient Panhellenic centre, where the renowned oracle was operating. The oracle of Delphi was established already by the 8th cen. B.c. and maintained its importance until the end of the 4th century, when the Roman emperor, Theodosius, prohibited the free exercise of the ancient Greek religion, writing the sad epilogue of Delphi.

In the centre of Delphi, in the most prominent position, was the Doric temple of Apollo. In the deeper level of the temple was the inner sanctum 'adyton', where the process of divination was taking place and to which only the priests, who would interpret the predictions of Pythia, had access. Pythia was the highest priestess, who was widely credited for her equivocal prophecies uttered in an ecstatic state under divine possession by the god Apollo. The sculptures of the pediment were crafted in Parian marble by the Athenians Praxias and Androstenes and they were depicting Apollo and Dionysus. On the top of the east pediment opposite to anyone, who was approaching the central gate, there was the letter 'E', while on the bottom left corner was carved the statement 'Know thyself' and on the bottom right corner the statement 'Nothing in excess'. These were known as 'Delphic Maxims' and they were part of a long list of 147 moral rules and principles inscribed on the portico of the temple, a valuable legacy of knowledge and wisdom bequeathed to posterity by the ancient Greek wise men.

The letter E second in the alphabet, that has voice, ergo vowel, denotes the god Apollo, second in command after Zeus. It expresses in that way the Pythagorean thesis, that number is the cause of everything and god always geometrises. The philosopher and biographer Plutarch contributed further, that the numbers are divided in even and odd, while the monad (1) is common in both, as when it is added to a number, makes the even one odd and the odd even. The number 2 is the first even number, symbol of the female principle and the number 3 the first odd, symbol of the male. (number 1 was not considered to be a number, but rather it symbolised a unity and the origins of all things, since all numbers can be created from it, just adding enough copies of it, for instance $6 = 1+1+1+1+1+1$). Their sum (2+3) gives a number of high honour, as it is the first number, which consists of prime numbers and it was called 'Marriage' by the Pythagoreans, as it was representing the union of the female with the male. And precise the letter E, the 5th in the alphabet, depicts that marriage with its shape as a half-moon symbolising the fertile uterus - mother Earth, where the father Sun - seminal celestial force casts his ray, which is represented by the middle line of the letter E. Furthermore, number 5 is also called 'nature' because, when it is multiplied with itself, it always ends in itself, like the nature, that from seed through

various metamorphoses gives seed again, and when it is added to itself it gives indefinitely either itself or the ten, the perfect number. There are 5 cosmogonic elements, earth, wind, water, fire and ether, the quintessence, there are also 5 senses, 5 regular solids, 5 extremities of the human body and so on.

Furthermore, Apollo was the god of Light, thus the letter E as a symbol is associated directly with the Delphic rituals, i.e. the initiation of the man to the Light, the perfection and therefore indicates the illuminated. Apollo with his ambiguous messages incites people to use their reasoning and the Dialectic method to perceive, to realise the truth. He is not just a diviner, but rather an educator.

The Greek language is not just a language of communication. It is the derivative of a cosmic, universal geometrical matrix of codified conceptualisations. The Greek language is Logos, reason, and Logos is primarily an analogy, a ratio. And it is expressed in a polysemous way and in infinite levels from the most earthly to the most cosmic ones. For example, the letter 'Λ' is Logos and when it acquires a basis, it becomes 'Δ' it gains dimensions and gets activated. The 'Ο' represents the whole 'Ολον' and with its centre in the middle becomes 'Θ' the creator and the creation indivisibly together, 'Θεῖον' - divine. So, the letter 'Ε' depicts also a union of its three parallel lines symbolising the triune human, who comprises body, mind and soul. Together with the two statements 'Know thyself' and 'Nothing in excess' proclaims the belief of the ancient Greeks, that the human being can not achieve enlightenment without the deep, cognitive knowledge of the self, nor can he approach it through diffractive actions of hyperbole.

'When the life of the man on earth is a despicable fear crushed by the weight of the religion, whose face is hanging in all the heavenly places emitting hatred for the humanity, for the first time one Greek dared to stand up to it, fighting every day against it. He didn't submit himself to the noise of gods, neither to the thunders, nor to the roar of the angry sky, but rather these encouraged his noble mind, which wanted to break the gate of the depraved prison, of the fate of man...'

Titus Lucretius Carus, Roman poet and philosopher, 1st cen. B.c. 'De Rerum Natura'

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Thanks

I want to express my gratitude to all the scientists of all times for their dream to understand the world we live in and their pursuit to explain it logically. Without their restless, undying efforts this book wouldn't be possible. Furthermore, I would like to thank few great websites, that were invaluable tools in my endeavour such as wordreference.com, glosbe.com and thesaurus.com.

Finally, I hope, that more and more fellow humans will realise the importance of cultivating, educating and refining themselves, in order to assume responsibility, as cognitive beings. There are no excuses today to choose voluntarily ignorance, superstition and religious dogmas, instead of free and critical thinking, instead of reasoning. May the light be with you.

Elena Tsara

P.S. I

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P.S. II

The B.c. with small 'c' on the date indication means 'Before the curse' of the corresponding monotheistic religion, that wiped out the marvels of the human mind and plunged the world into the darkness. The dates after B.c. bare no prefix, as it is unnecessary.

P.S. III

The cover is designed by Simone Soerensen

Elena Tsara was born in Athens, Greece in 1974 and has travelled and lived in various cities in Europe, Africa, Asia and the U.S. She has completed her education in the Pedagogic University of Athens and since then she has focused primarily in the fields of history and philosophy. This is the first book of an upcoming trilogy. Copying and distributing is permitted.

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INTRO

Order and Chaos

Our Universe with its countless planets, stars and galaxies is with one-word spectacular. It is vast, possibly infinite, about 91 billion light years in diameter just the observable part at the present time, most likely with a beginning 13.7 to 15 billion years ago and maybe also with an end.

An infinitesimal dot in the Universe is our planet. With a little bit more than 510 million km² surface area is the only astronomical object known to harbour life with over 5 billion estimated species since life was initiated. How amazing is that? One little drop in the immense sea of the Universe. That is our home. A home to over 7.8 billion humans. How lucky are we? To be given the privilege to live in one of the most beautifully improbable spots in our galaxy. The Milky Way. A galaxy, that contains somewhat from 200 billion to a trillion stars and most likely at least 100 billion planets. One of these planets is ours. Earth. Have you seen pictures of the earth taken from the outer space? The colours, green and blue, turquoise and brown and white. Simply astonishing!

That is our world. A world full of colour and variety and diversity. You can see it, hear it, touch it, smell it, taste it. The sunrises and the sunsets, the oceans and the continents, the green fields and the desserts, the mountains and the valleys, the icebergs and the beaches, the lakes and the rivers, the forests and the flowers, the animals and the fishes, the birds and the butterflies and everything else small or big, that is our world. A small marvel.

And yet it seems, as we are facing numerous problems living in it. We don't give the impression, that we manage our life very well. Although it appears, that we are amongst the very few fortunate beings in our vicinity to exist, we do not seem to cope easily enough. As if we are lacking something, as if we don't really grasp it and we can't keep it together.

We don't look utterly happy about being alive, on the contrary we look rather inadequate in the whole art of living, confused, lost. Life is a gift, but we barely seem to appreciate it. We don't make the most of it, we do not enjoy it to the fullest, we do not cherish the moments, that are given to us, we don't seize the day, we don't find nor understand ourselves, we don't look after ourselves nor the others, in a few words

we do not deal very successfully with our existence. Why is that? Why can't we make it work?

That is a riddle, that has always puzzled me. For many years since I was a kid, I've been studying our history and trying to comprehend mankind with all the contradictions and imbalances, that demonstrates. It still comes as a surprise to me, how is it possible one species to be capable of the most incredible achievements, while at the same time to exhibit the most legendary stupidity. To present examples of the worst atrocities and simultaneously of the most extraordinary splendour.

As the years passed by that riddle, that wondering grew bigger and became a complain and then turned into anger and now it needs to come out and find its way to all of you, to be heard. Will it be original? No. Will it change the world? Definitely not. But it is my voice. A small voice at first, now a scream, a loud, blasting scream in my head, that rips the air and shouts, why? again and again and most predominately, what can we do? Me, you, all of us. For crying out loud we are almost 8 billion people, there must be something we can do. At least to try. That's the most important. To try. Even when you fail, don't give up, stand up and just move on. Always forward. Discover that remarkable force inside of you and go on. You will strike out many times. So what? Keep going. It is the effort that counts, not the victory. Is it difficult? So what? Keep going. There are no rewards for the easy stuff. And I'll tell you a secret. There are no prizes at all. Just the satisfaction, that you did it. That you rose to the occasion, you stood tall and honoured your name. You don't need rewards, you are not a puppet, you are a human.

PART 1

When it all started

“You need to know the past to understand the present”
Carl Sagan

Carl Sagan was an American astronomer, planetary scientist, cosmologist, astrophysicist, astrobiologist and author. An associate professor at Harvard and later at Cornell he published more than 600 scientific papers and articles and he was author, co-author or editor of more than 20 books.

CHAPTER 1

Astronomical Cataclysm:

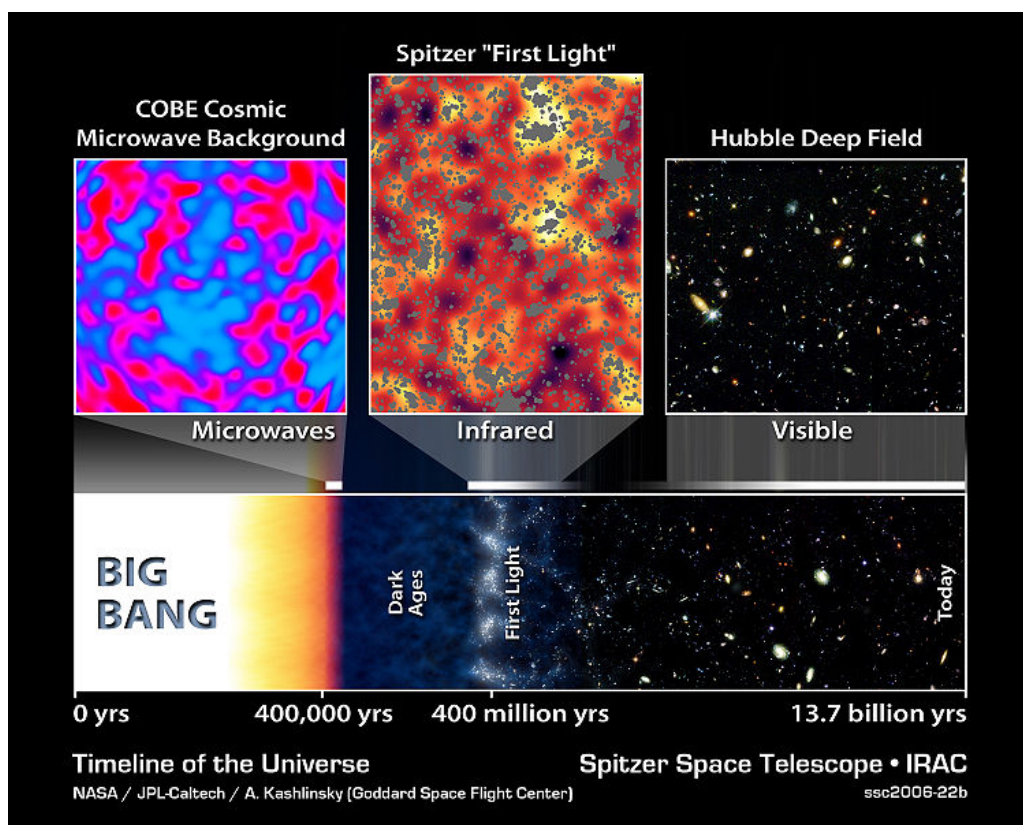
The origins of the human race

The Universe was born in a massive expansion. During that incredible burst of expansion, known as inflation, space itself expanded, possibly faster than the speed of light. As space expanded, the Universe cooled, and matter was formed. That is the Big Bang theory, the most popular and accepted theory, as it makes several predictions, many of which have been proven through observational data. It doesn't describe the origin of the universe, it only attempts to explain, how the universe developed from the time just after it came into existence. It doesn't explain, what initiated the creation of the universe, nor what came before. The laws of science start to break down the further back one looks. Eventually there can't be formed any scientific theory about the instant the universe came into being, as science itself does not apply. Instead we can look at the period immediately following the birth of the universe, where quantum physics, physics on a subatomic scale, apply.



Hundreds of thousands of vibrant blue and red stars blaze in this image taken by NASA's Hubble Space Telescope. Hot bluish-white clusters of massive stars are scattered throughout the galaxy, interspersed with numerous dustier, reddish regions of current star formation. Massive dark clouds of gas and dust are silhouetted against the starlight. NGC 4449 galaxy located about 12 million light-years away has been forming stars for several billion years, but currently it is experiencing a star formation event at a much higher rate. This unusually explosive and intense star formation activity qualifies as a starburst. It resembles primordial star forming galaxies and it is the ideal laboratory for the investigation of what may have occurred during galactic formation and evolution in the early universe. (created by NASA and ESA)

The earliest stages of the big bang focus on a moment ($t = 1 \times 10^{-43}$ seconds), where all the separate forces were part of a unified force, all of the matter, energy and space was compressed to an area of zero volume and infinite density, the singularity. In only a few fractions of a second the universe expanded rapidly and started to form out of a singularity, that stretched across space. At around $t = 1 \times 10^{-35}$ seconds matter and energy decoupled, called baryogenesis. During this stage the universe was filled with a nearly equal amount of matter and anti-matter and while most particles and anti-particles annihilated each other, some particles survived, that later would combine to form all the matter in the universe. The quantum age was succeeded by the particle period, which started at $t = 1 \times 10^{-11}$. Scientists can recreate this phase in lab conditions with particle accelerators. The unified force broke down into components and the four basic forces, electromagnetism, strong nuclear force, weak nuclear force and gravity were formed. Photons outnumbered matter particles, but the universe was still too dense for light to shine within it. The universe doubled in size several times in less than a second. Next came the period of standard cosmology at 0.1 second after the beginning of the big bang. From this moment on, scientists have a pretty solid idea of how the universe evolved.



This artist's timeline chronicles the history of the universe, from its explosive beginning to its mature, present-day state. Results from the Cosmic Background Explorer were honored with the 2006 Nobel Prize for Physics.

(source: NASA)

One second after the Big Bang, the Universe was filled with neutrons, protons, electrons, anti-electrons, photons and neutrinos. The light elements were born via a process called Big Bang nucleosynthesis, but the universe was still too dense and hot for electrons to join these nuclei and form stable atoms. After 100 seconds temperatures cooled from 100 nonillion degrees Celsius to 1 billion degrees Celsius and subatomic particles continued to combine. Electrons collided with positrons creating more photons, but still light was not allowed to shine. The universe went on expanding. After approximately 380.000 years since the initial event, the universe had expanded enough to cool down to 2.727 degrees Celsius. Finally, protons and electrons could combine to form neutral hydrogen atoms and the universe became transparent. Light could shine throughout the cosmos. For the next 100 million years, as the universe expanded and cooled further, small gravitational fluctuations caused particles of matter to cluster together. As gases contracted, they became more dense and hot. Hydrogen and helium began coalescing into giant clouds, which in turn collapsed into the first stars and galaxies. Gravity caused these new born stars to contract, heating their cores to temperatures high enough to ignite their hydrogen and trigger its fusion into helium. Depending on the size of the star and its fate we got a chain of thermonuclear reactions, that brought about the genesis of all the chemical elements. All of the atoms of carbon, iron, calcium, nitrogen and other elements required for life were forged in the core of the stars. These ingredients were only released upon the stars' death, when they exploded into a supernova and scattered the elements across the universe and eventually ended up as new stars, new solar systems, as me and you.

We and everything else around us comprises atoms, that originally arose during the Big Bang, and from millions of exploding stars far back in time. We live, because stars die.



The Helix Nebula
A gaseous envelope
expelled by a Dying
Star. (created by NASA,
STScI, ESA)

The Chronicle of Evolution

4.5 billion years ago our planet, Earth, was formed revolving around the young sun. Shortly after, according to the Giant Impact hypothesis, Earth and planet Theia collided forming the moon. The gravitational pull of the new moon stabilised Earth's axis of rotation and set up the conditions, in which abiogenesis occurred, the natural process of life arising from non-living matter, such as simple organic compounds.



Image source: astronomy and science, a Facebook group

A little later the first simple life started to exist.

4.1 billion years old remains of biotic life were found in western Australia.

3.9 billion years ago cells resembling prokaryote appear, microscopic single-celled organisms, that possess neither a distinct nucleus with a membrane nor other specialised organelles.

3.5 billion years ago the split between bacteria and archaea occurs. The bacteria developed primitive forms of photosynthesis without oxygen production.

2.5 billion years ago the Great Oxygenation event took place, led by cyanobacteria's

oxygenic photosynthesis. The oxygen concentration in the atmosphere rises.

1.85 billion years ago eukaryotic cells appear, which are far more complicated than the prokaryotic and they have a core. At the same time emerged the bacterial viruses.

1.2 billion years ago meiosis and sexual reproduction are present in single celled eukaryotes, while simple multicellular organisms start to evolve.

750 million years ago first protozoa appeared. They are single celled organisms with animal like behaviour.

600 million years ago the accumulation of atmospheric oxygen allows the formation of an ozone layer.

560 million years ago we have the earliest fungi and 10 million years later we find the first fossil evidence for jellies, sponges, corals and sea anemones.

530 million years ago the first known footprints on land happened.

434 million years ago primitive plants moved onto land, as they evolved from green algae living along the edges of lakes.

420 million years ago the earliest ray finned fishes came to life and the land scorpions.

410 million years ago we find the first signs of teeth in fish.

395 million years ago we have the first known tetrapod traces on land.

363 million years ago the earth began to be recognisable. Insects roamed the land and would soon take off to the skies. Sharks swam the oceans as top predators and vegetation covered the land with seed bearing plants and forests.

252 million years ago occurred the Permian Triassic extinction event, where up to 96% of all marine species and 70% of terrestrial vertebrate species became extinct. Because so much biodiversity was lost, it took more than 10 million years for life on earth to recover.

225 million years ago the dinosaurs appeared and the first mammals.

220 million years ago the seed producing forests dominated the land and we had the first flies and turtles.

155 million years ago the first blood-sucking insects came to life and the archaeopteryx, a possible ancestor to the birds.

130 million years ago the rise of the angiosperms started. The angiosperms, or flowering plants need insects to spread the pollen and are one of the major groups of

extant seed plants.

100 million years ago we have evidence of the earliest bees and about 20 million years later the first ants.

68 million years ago the Tyrannosaurus emerged, the largest terrestrial predator.

66 million years ago the Cretaceous Palaeogene extinction event took place, which was triggered by a comet/asteroid impact. The result was a mass extinction of some $\frac{3}{4}$ of plant and animal species including all of the dinosaurs. That event contributed to mammals becoming the dominant species. Fossil evidence suggests, that placental lineages emerged and diversified to fill niches left vacant after this catastrophe.

55 million years ago the first songbirds, parrots, woodpeckers, whales and armadillos appeared.

52 million years ago we had the earliest bats.

50 million years ago the camels came up in the fossil record.

40 million years ago the modern type of butterflies came around.

35 million years ago we had the first eagles and hawks.

30 million years ago the earliest pigs and cats appeared and 5 million years later the first deer.

20 million years ago we had the first giraffes, hyenas and bears.

15 million years ago the mammoth came to life and the first kangaroos.

10 million years ago the grasslands and the savannas were established.

7 million years ago the first hominins got separated from the apes.

4 million years ago we had the first modern elephants, zebras, lions, rhinoceros and gazelles.

2.4 million years ago the first members of the genus Homo came to life.

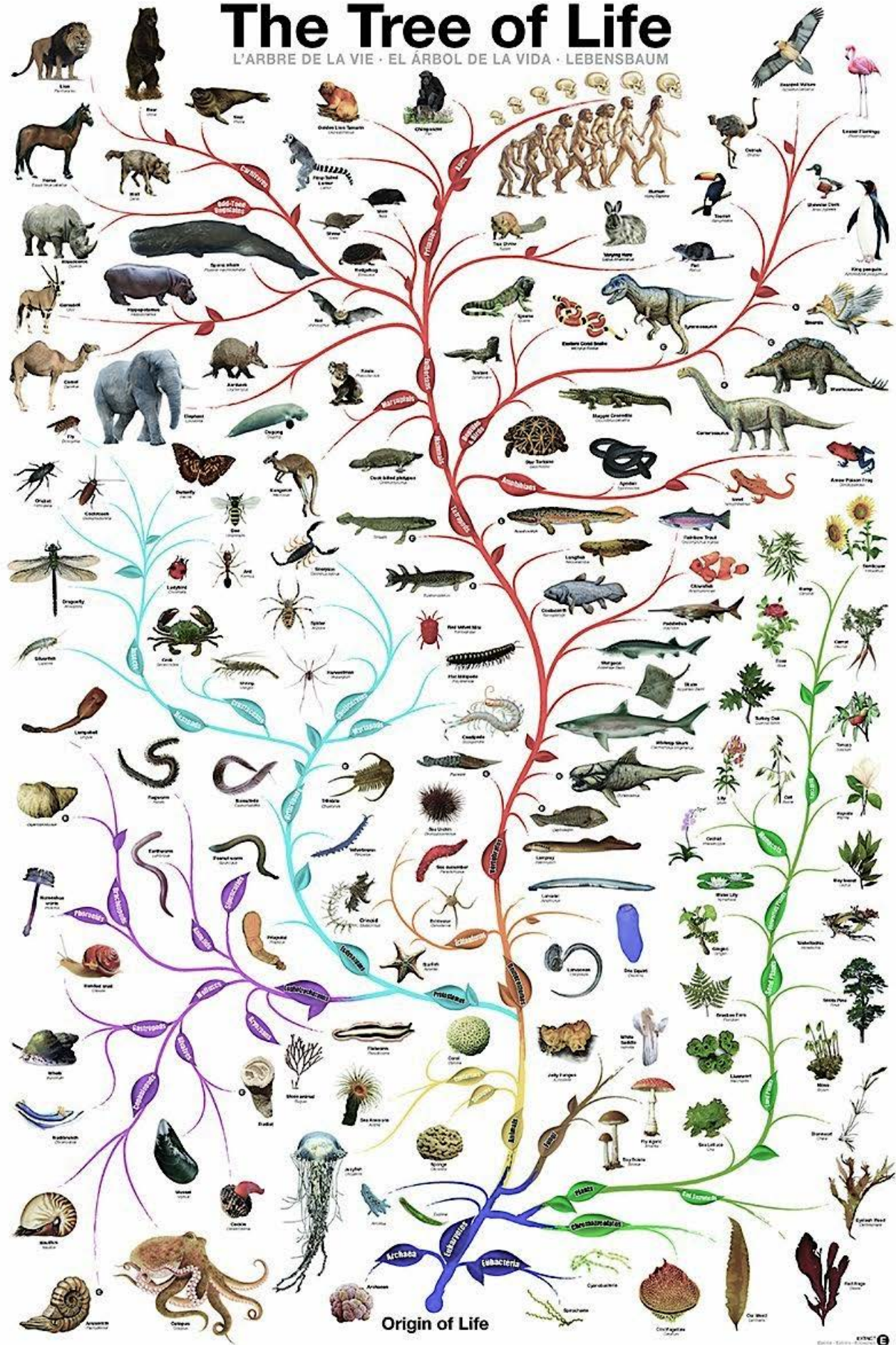
350.000 years ago, the Neanderthals rose and 300.000 years ago the anatomically modern humans inhabited Africa.

That is really something. The epic journey of evolution, of life creation upon Earth from one common ancestor, stardust!

Today we can trace the origin of everything known to us back to the first elements, to stellar roots. All the way from the first single-celled organisms to the most advanced species, ourselves.

The Tree of Life

L'ARBRE DE LA VIE · EL ÁRBOL DE LA VIDA · LEBENSBAUM



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