

# Astrological Darwinism

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## Abstract

Astrological Darwinism centers around two axioms. The first is the axiom of 'chosen wave function collapse' and its subset of 'chosen mutations'. It is the Bersonian 'élan vital' of the soul that makes the choices by quantum looking and thus acting as a metaphysical or vital 'hidden variable' causing genetic mutations. The second axiom is that the capacity of complex, multi-cellular life forms to apply the 'chosen mutations' is cyclic, following the 26.000 year precession of the equinox. Astrological Darwinism's Cycle of Life can be projected upon the Zodiac of Dendera, as it can be found in the book of Schwaller de Lubicz. During the Age of Leo, the capacity to produce 'chosen mutations' is at its peak and during the Age of Aquarius this capacity is at its minimum. The evolution of humanity is cyclic and can be characterized by Great Years of cyclic appearance of creative genetic boosts and subsequent expansion of the fittest. The most obvious example is the Upper Paleolithic Great Year. The present one started with the Neolithic agrarian revolution and will have its expansionist peak during the upcoming Age of Aquarius. Astrological Darwinism will be put in contrast to Neodarwinism in its twenty first century version of the Everett Many Worlds Darwinism scenario, the last being part of the Anthropic/Multiverse narrative. Astrological Darwinism needs Quantum Biology and ultimately Quantum Gravity Biology as its natural environment. Astrological Darwinism is a metaphysical narrative with implications for biology and evolution but without any implications for physics because it strictly follows Bohr's Copenhagen Interpretation in combination with his concept of complementary principles for animate and inanimate matter.



Figure 1: The Zodiac of Dendera.  
(Schwaller de Lubicz, 1961, [1], p. 178)

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# 1 The Age of Aquarius in human evolution

The precession of the equinox is the gradual shift of the orientation of the earth's axis of rotation. It has a period of 26.000 years and in astrology, this period is divided in twelve parts of each about 2170 years. The astronomical constellation in which the sun is located in at the beginning of spring, the vernal equinox, determines the astrological age we are in. At the moment, the vernal equinox is leaving Pisces and entering Aquarius, see Fig. 3. About 12.000 years ago we were in the middle of the Age of Leo. These 26.000 years of the voyage of the vernal equinox through the constellations of the zodiac represents the *Great Year* of astrology. It is my strong conviction, my belief actually, that this is also a crucial cycle in human evolution.

The Great Year of Astrological Darwinism is divided in twelve Ages each carrying the name of the it's zodiacal sign. Each Astrological Age imprints a unique character on humanity, produces a specific 'condition humaine' during its two millennia. The theosophist Schwaller de Lubicz described it as: "During the long period of a precessional month, the dominant constellation influences life on earth on a universal scale, just as spring or another season does for our short annual year." [1] For skeptics towards astrology this is of course a complete non-issue, because from their perspective the correlation is non-existent. But as I will explain later, the skeptic cannot use science to falsify the first principles of Astrological Darwinism. The science needed to falsify the proposed holistic influence of the orientation of the earths axis relative to the planets and the stars on biology, Quantum Gravity Biology, doesn't exist yet. Lacking the science to falsify it, all the skeptic can do is to ridicule the paradigm. This implies that all the skeptic can do relative to Astrological Darwinism is to firmly *believe* in his presumptions.

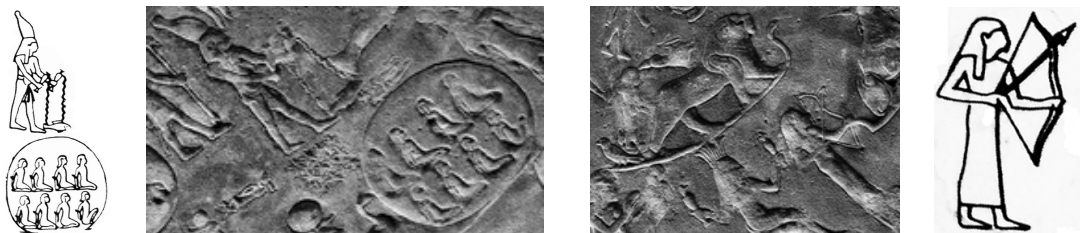


Figure 2: Details from the Zodiac of Dendera. Trapped souls at peak dualism in the Age of Aquarius and a female shooting an arrow from her womb into the future at peak immanence in the Age of Leo. The two key moments in Astrological Darwinism, also the triggers of the paradigm.

In this book I present the belief that the Astrological *Great Year* is fundamentally a *Cycle of Life* in the Darwinist evolution of humanity. In the Age of Aquar-

ius, the evolution of humanity follows the principles of Neodarwinism, meaning that only ‘random mutations’ and ‘natural selection’ act as driving forces. Humanity in the Age of Aquarius is at the peak of objective science and correlated absence of consciousness of magic. In our age, Neodarwinism rules because we are at peak dualism of body and soul. In the Zodiac of Dendera, these souls are depicted as men imprisoned in a bubble. See Fig. 4, left. Because the very large majority of random mutations are detrimental to mankind, creative genetic evolution comes to a near halt in that half of the Great Year that is dominated by Aquarius. Only natural selection is effectively at work during that part of the Cycle of Life.

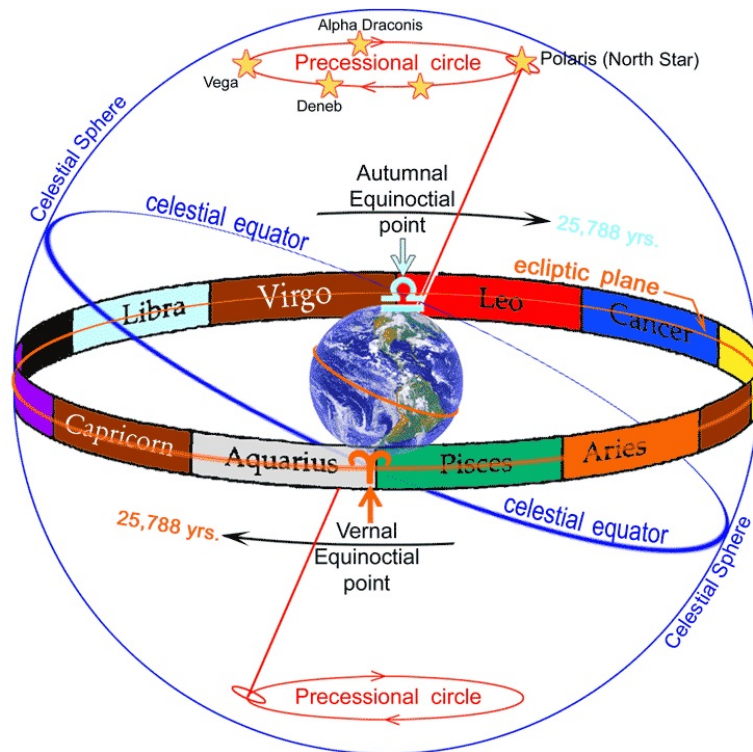


Figure 3: The Cycle of Life as the holistic locking onto the precession of the equinoxes by the “élan vital” or life water of the soul. The Age of Leo coincides with the immanence maximum, the peak of the Goddess Principle. The Age of Aquarius is the peak of transcendence, producing the temporary exclusive reign of the Neodarwinist principles.

Opposite to Aquarius we have the constellation of Leo and during the Age of Leo, Magical Darwinism is at its peak. In the Zodiac of Dendera, this idea can be read into the picture of the woman shooting an arrow, in a rather clumsy fashion, from her womb towards the constellations that lie ahead in the future. This

picture represents the key idea of creative Darwinism in that half of the Great Year dominated by Leo. Women are the principle active agents of genetic human evolution and Magical Darwinism could also be called Pro-Choice Darwinism. At the peak of Magical Darwinism in the Age of Leo, women do not just procreate, they create their offspring. Whereas during the Age of Aquarius, ‘random mutations’ are the only source of fundamental change in the human gene, in the Age of Leo women have the magical capacity to produce ‘chosen mutations’ in their offspring. Compared to desired ‘chosen mutations’, ‘random mutations’ mostly have a neutral or negative effect for the affected organisms. ‘Chosen mutations’ on the other hand are mostly producing the desired result. As a consequence, mankind’s genetic evolution is strongly boosted around the Age of Leo and severely halted around the Age of Aquarius.

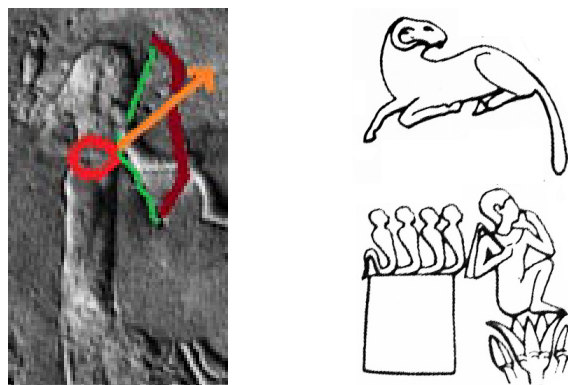


Figure 4: The arrow is directed at the symbol of ‘seeds beginning to sprout’, right under the sign of Aries. Next to it, the infant Horus on a papyrus.

At the peak of Magical Darwinism, ‘chosen mutations’ and ‘natural selection’ are the two driving forces of human evolution. Chosen mutations of the genes of women’s offspring during pregnancies are possible because body and soul are completely immanent during the Age of Leo. Body and soul are one and as such the Age of Leo is the true opposite of our present Age of Aquarius with it’s peak dualism or transcendence of the soul relative to the body.

The capacity to produce ‘chosen mutations’ during pregnancy has it’s roots in the combination of quantum mechanics and the soul as ‘life water’. During the Age of Leo, the soul acts as the hidden variable of ‘Bohmian’ Quantum Mechanics [2], producing chosen collapses of the wave functions in genes, which produce the ‘chosen mutations’. The power of the soul to act as the hidden variable of quantum mechanics is what I call the ‘Goddess Principle’. The soul has this principle all the time, but during the dualist Ages, transcendence brings this capacity in an unconscious state. During immanent Ages, the melting of body and soul adds





Figure 5: Part of the Zodiac of Dendera at the Louvre, ambiguous ‘source of inspiration for’ and ‘object of projection of’ the paradigm of Astrological Darwinism.

consciousness to our capacity to apply the ‘Goddess Principle’.

The Magic part of Darwinism around the Age of Leo is restricted to the conscious use of being the hidden variable of quantum mechanics and thus being able to chose the way and the moment a wave function in the organism collapses. In this quantum mechanical way, *random* transforms into *chosen*, without manipulating any (other) law of physics. The magic during the Age of Leo is a restricted magic, limited to being like a Bohmian hidden variable on the nano scale of quantum mechanics. In my view, the ‘Bohmian like’ hidden variables are present in living organisms only, giving a ‘Bohmian quantum biology’. At the highest level of the complexity of life, the hidden variables are manifest as free will, with all the moral dilemma’s that go with it. A consequence of this *quantum biology* perspective is that living stuff and non-organic matter are complementary domains, as already stated by Niels Bohr [3]. In the words of Davis: *Bohr believed that the distinction between living and non-living systems was fundamental, and actually a manifestation of his principle of complementarity* [4]. The difference between ‘random mutations’ in the Age of Aquarius and ‘chosen mutations’ in the Age of Leo has its roots in quantum biology and the cycle of transcendence  $\Leftrightarrow$  immanence of the soul as the carrier of the ‘quantum-bio hidden variables’ or Goddess Principle.

The ongoing cycle of Neodarwinism  $\Leftrightarrow$  Magical Darwinism is what I call As-

trological Darwinism. It produces cycles of boosts and halts in human evolution, but it also results in contrasted cycles of contraction and expansion of populations. During the Magical part of the Great Year of human evolution, the species tends to contract its population and boost itself genetically. During the Scientific part of the Great Year, the species tends to expand its population and come to a halt genetically. It is also a cycle of immanence and transcendence of the soul or 'life water' relative to the body and all matter around. When the soul goes transcendent, matter becomes transparent and science is possible. When the soul goes immanent, matter becomes opac and and magical consciousness flourishes. Every Age of the Zodiac has its specific distance from and direction to the two peaks of the cycle, Leo and Aquarius, and thus its own 'condition humaine'. In this way, the influence of the Great Year of the Zodiac on humanity is a result of Astrological Darwinism.

## 2 Predicting the future of humanity

Astrology is partly about predicting the future. Thus, astrology on the level of the Great Year is about interpreting the past and predicting the future of mankind. The Cycle of Life of 26.000 years, as I just described, gives us a pattern that should be recognizable in our past and expected to continue in our future. Alternating periods of boosts and stagnation of our genetic evolution, around the Age of Leo and the Age of Aquarius, should be manifest. Together with periods of maximum expression/expansion of the human self and or the human species during periods of genetic stagnation. Periods of let go of the past and searching for new ways of expression and problem solving during periods of genetic boosts. All this in cycles of 26.000 years.

Looking for such a pattern has not been done before. But some have stumbled upon it without realizing it. If we look at Constance Tippett's Timeline of the Goddess, going back 32.000 years, at first we see just what the title announces, lot's of goddess symbols on a timeline. It is an interesting info-graph, also from what is missing in it. We observe the relative absence of a God related to procreation and fertility. During the longest period on Tippett's chart, from 32.000 years ago until at least 5.000 years ago, all fertility related issues were female and goddess related.

Only in the last 5000 years or so has the male gender discovered that having sex and donating sperm had something to do with pregnancies and procreation. Theologians, but also philosophers, as for example Aristotle, sized the moment and exaggerate the male role in reproduction by declaring the role of the male as donating the active seed and the role of the female as the passive and unintelligent soil in which the smart seed was planted. The mentality of this male reversal of



Figure 6: Constance Tippett's Timeline of the Goddess going back 32.000 years.

the 30.000 Goddess years before the invasion of the fertility domain by the God concept is still at work in Neodarwinism today.

Science, of which Neodarwinism is a part, has taken over the never substantiated claim of the theologians regarding the all knowing capacity of their God Principle. Present day experimental science cannot realize that claim either, but for the speculative theoreticians among them, developing a Theory of Everything (TOE) as a replacement of the God Principle has become a major research project. This exaggerated claim regarding the capacity of male dominated science, as a replacement of the similarly exaggerated claim of the theologians regarding the capacity of their God, dominates the usual visions of the future of mankind. For a long time, visions of the future of humanity have been all about either optimistic or pessimistic science fictions, extrapolated male expectations of the continuing exponential development of science and technology. The foundation of all these visions are the non-substantiated claims of Science and Technology on its manic way to a TOE as replacing a evenly manic God concept. Theosophist as Schwaller de Lubicz represent the intermediary practice, looking for the divine knowledge of the all seeing Eye of the Illuminati using a mixture of science, theology and spiritualism. Critique on the scientific/theological hubris has a marginal status.

In my view, there is wisdom in the tradition of the Goddess that visually started in the paleolithic some 40.000 years ago with the fertility figurines. Fertility and the related future of the genetically determined part of human evolution is predominantly a female affair, a Goddess Principle domain. Males can theoretically claim what they want, whether as theologians or as scientists, the secret of life and fertility will for always remain out of their experimental reach, beyond their

practical control. In my view, Magical Darwinism or Pro-Choice Darwinism based on the Goddess Principle is manifest, on multiple levels of analysis, in the pictographic Goddess figurines timeline of Tippet. It presents women as the active agents, with their own free will, relative to human fertility as creation, not just passive procreation. It fuses fertility with artistic creation and the divine, as it is intended in Magical Darwinism, which in principle is just a post-scientific version of the Cult of the Goddess.



Figure 7: The cycle of the Great Year projected upon Constance Tippet's Timeline of the Goddess.

In Tippet's Timeline of the Goddess, two Great Years and the creative discontinuity between them are visible for the eye that is searching for a specific pattern (Fig. 7). According to my ideas, Magical Darwinism in the Age of Leo around 10,000 BC caused the end of the Upper Paleolithic and the subsequent Neolithic Revolution. The Neolithic Revolution is the first manifest beginning of our present Great Year, but it had its cause in the peak of the genetic creative window in the 6,000-8,000 years around the middle of the Age of Leo. This is approximately from 13,000 BC to 7,000 BC, coinciding with the Natuf culture in the Middle East [5]. As should be expected in the context of my theory, the Upper Paleolithic completely coincides with the previous Great Year. The Upper Paleolithic had its peak around 25,000 before present (BP), so around 23,000 before Christ (BC). This fits with the peak of Cave Art in Europe and coincides with the previous Age of Aquarius. The Upper Paleolithic started in Europe with the Aurignacian culture, from 42,000 BP to 34,000 BP, with its peak around 38,000 BP [6]. This utterly coincides with the peak of the Age of Leo at 38,000 BP and the creative window of 6,000-8,000 years around it. The Upper Paleolithic is the

Astrological Great Year from Age of Leo at 38.000 BP to Age of Leo at 10.000 BP, it is literally squeezed in between two windows of Magical Darwinism. During those creative windows, human evolution got a genetic boost unexplained and unintelligible by Neodarwinism alone. In Tippet's Timeline of the Goddess we see the Goddess Principle and Astrological Darwinism at work.

If we look at the present Great Year and the pace of past human development, it should have been an agricultural-pastoral era, with agricultural villages surrounding cities dominated by guilds and trade where the surplus of agriculture was collected, traded and consumed. Greco-Rome, Middle Age China and the Maya's should have been the peak accomplishments of our Great Year, which then should have continued for the next 10.000 years until the next creative window in the way the culture of the Upper Paleolithic maintained its basic character and presence. But the industrial-scientific revolution in Europe changed that course, partly due to freedom of time created by and for the elite of the guilds and the aristocracy in the Renaissance cities and the subsequent cumulative effects of education and systematic research. The freedom created inside the cities and its institutions gave room for unexpected levels of innovation, which then triggered more freedom of time and subsequent additional innovations. Which eventually brought us in the present with its exponential pace of progressing science and technology. But the Cycle of Life will continue anyway, which allows us to predict peak scientific consciousness to happen in about 1000 years, at the middle of the Age of Aquarius. After peak scientific consciousness, which will also be peak dualism of body and soul, immanence will slowly return. When the body gradually will be filled with the soul's 'life water', the transparency of matter for the soul and our consciousness will slowly fade away. With it will fade the desire for science and industrial research into nano- and pico-technologies.

This prediction of Peak Science, actually peak scientific consciousness, 1.000 years after present (AP) and the gradual fading interest of mankind in science afterwards is independent of events that might speed up the downfall of the present scientific-industrial world-culture. Environmental catastrophic events might bring with it the end of our present day culture, after which it will continue at a lower intensity and scale. Say somewhere in between present day complexity and the level of complexity of the Roman Empire. Environmental events and the Great Year can independently influence the evolutionary course of humanity. Thus, at whatever level our industrial-scientific culture will continue for the next thousands of years, as a state of mind it will reach a peak thousand years from now. Afterwards it will conservatively continue its course for thousands of years, gradually turning from scientifically into magically focused. Mankind will simply lose interest in science as an effect of growing immanence of the soul and connected fading dualism and transcendence. Then, 10.000 years AP, a new creative window will start and a new

genetic evolutionary boost will be produced by matrilineally connected successive generations of women. The next genetic creative peak at the Age of Leo will happen 14.000 years in the future.

What might happen during that creative peak is that women will adapt mankind psychologically and emotionally for a harmonious life in cities. But that is an expectation without certainty, because of the free will connected to the Goddess Principle and of the way Pro-Choice Darwinism works during those creative windows. The women of that era will decide for themselves in which new and unexpected direction they want to (pro)create humanity. Then, 20.000 years AP, a new Great Year will manifest its first accomplishments and yet again revolutionize human existence. By then, the Agri-Industrial Great Year we are in today will have become but a memory from a distant past.

The impossibility to predict the direction and content of the upcoming genetic boost is related to the concealed nature of the Goddess Principle. As a consequence, during the next genetic boost something really new will be created, something fundamentally unexpected. So instead of spending pages speculating the content of the next genetic boost during the Age of Leo, I prefer to apply Wittgenstein's seventh proposition in the 'Tractatus Logico-Philosophicus' here: *Whereof one cannot speak, thereof one must be silent.* [7] Wittgenstein's proposition applies because the Goddess Principle presents a limit to experimental scientific knowledge. We can study phenomena it produces but we cannot research its content before manifestation, its essence, in an attempt to predict the outcome of future expressions.

We can also relate the Goddess Principle to Heidegger's two versions of truth, truth as faithful representation (*homoiosis*; *adequatio*) and truth as revelation, authenticity or unconcealment (*aletheia*; *veritas*). Scientific truth is all about truth as adequate representation of facts whereas artistic truth is all about authenticity and revelation of the work as produced by the artist. In the first kind of truth, two things which both lie in the open can be compared to each other and the degree of resemblance can be objectively judged using transparent criteria. In the second kind of truth, only one part lies in the open to be studied and the other part is essentially hidden. The Goddess Principle lies essentially concealed and cannot be forced out in the open, partly due to its free will character. All we can do to get to know it is to wait for it to come in the open and then observe its unconcealment or *aletheia*, its authenticity.

As such, the Goddess Principle is also related to Bergson's view on the 'élan vital' as being beyond both theist finalism and scientists mechanicism, in modern terms beyond both Creationism (or Intelligent Design) and Neodarwinism. The really new cannot be predicted; the 'élan vital' creates the new, which is beyond our understanding. Life as essentially becoming doesn't copy the pre-existing plan

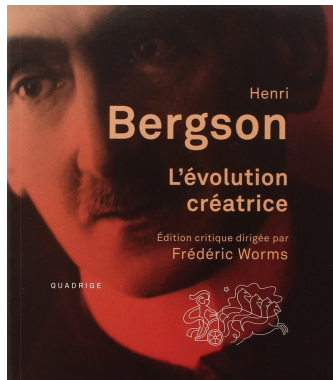


Figure 8: Henri Bergson

or blindly acts out the pre-existing law but creates the really new. In Bergson's view, both Intelligent Design (as a finalism) and Neodarwinism (as a mechanism) lacked the capacity to explain the unpredictability of the evolution of life, which constantly creates new species. Translating Bergson: *In short, the rigorous application of the principle of finalism, as with the principle of mechanical causality, leads to the conclusion that "everything is given". The two principles tell the same thing in their two languages, because they respond to the same need. ([8], p. 61)* Now, theism in the modern variant of Intelligent Design or Creationism, is a finalist conception and Neodarwinism works as a causal mechanism. They represent two variants of determinism, the one as pulling towards a definite end and the other as pushing along the pre-calculable lines of mathematical laws. Against these deterministic approaches he proposed the 'élan vital'. *This élan ... is the deep cause of the variations ... that create new species. ([8], p. 101)* And the new in Bergson's view, must be really new, as in never seen before, never planned somewhere before, never calculable somewhere before [9]. The really new is not the pseudo-new as they are in finalism (=already designed in advance) and mechanicism (=already calculated in advance). According to Bergson, *the role of life is to insert indeterminism in matter. ([8], p. 137)*

The Goddess Principle as the cause of the really new is fundamentally concealed from theologians and scientists alike before apparition and therefore a surprise to all of them during moments of creation as her unconcealment or moment of truth as aletheia/veritas. Predicting the future in Astrological Darwinism cannot go beyond forecasting the phases of the Cycle of Life. It cannot predict the unpredictable manifestations of the Goddess Principle. The Goddess Principle on itself is the hidden, the concealed, by its very nature or essence. Its manifestation or unconcealment/aletheia/veritas/revelation is life itself and as such unpredictable. This guarantees women, who's soul carries the individuated Goddess Principle, the freedom of will to realize a genetic boost of their own choice during the Age

of Leo. The freedom to chose a *really new* genetic boost for humanity.

The present day mentality of instant gratification will have a hard time accepting the concealment of the Goddess Principle and especially the long duration of the Great Year, its cyclic renewal and revelation. Heidegger in his later years wrote about the concept of *Seyn*, in contrast to *Sein* or *Being*, as the fundamentally hidden and talked about the task of modern man to learn to endure this hidden essence of *Seyn* or *Beyng*. He contrasted this to the drive of Modern Man, as explorer and scientist, to discover and uncover everything, everywhere, every time, all the time. For Modern Man, the awareness of something concealed or hidden or unexplored acts like a red flag, even an insult, and an invitation bordering towards obligation and obsession to bring it into the open. The Goddess Principle as the truly hidden and the realization of the Great Year as its long term untouchable cycle of unconcealment is unacceptable to Modern Man, who will react to it as to an unprecedented insult, whether as a scientist, because it is beyond experimentation, or a theologian, because it is designed to be beyond the grasp of the God Principle. The hidden aspect of the Goddess Principle as the *Seyn* or *Beyng* of life's essence has to be endured and revered for many, many thousands of years to come. And then, it will be women's role to bring it, in its individuated form as their immanent soul, into appearance during the next genetic boost creative window around the magic Age of Leo. With an unpredictable outcome. That is as far as Astrological Darwinism can go in predicting the future of human evolution.

### **3 A timeline of Great Years in human evolution**

In the last section we looked at the the previous, the present and the future Great Year. We went back 42.000 years and looked 20.000 years into the future. Due to the Pro-Choice and free will aspect of 'chosen mutations' in the Magical era of Astrological Darwinism, it is impossible to predict the content of the genetic boost humanity is in for from 10.000 to 18.000 years from now, with its peak in the Age of Leo at 14.000 years AP. All that can be predicted is that this phase is going to arrive. We cannot foresee what the women of that era will create.

In this section I will look at the 'recent' past of humanity, the time frame of modern homo sapiens. This goes back some 150.000 - 200.000 years. Before that time, archaic homo sapiens lived in Africa and some parts of Eurasia. The further we go back, from the present to 200.000 BP, the more scarce the archaeological evidence is going to be. Due to the many archaeological finds dating back to the Upper Paleolithic, it is rather straightforward to identify this era as a Great Year. But further back in time, finds are scarce and evidence is vague. Nevertheless, it still is possible to recognize precious Great Years due to events indicating sudden boosts in the capacities of modern homo sapiens.



The following list gives the Great Years of the future, the present and the past of modern homo sapiens. The list starts with 40.000 years after present time (=40 ky AP) and ends at 220.000 years before present (= 220 ky BP). The Great Years before 142.000 years ago cannot be connected any more to a specific boost in the capacities of modern homo sapiens.

- 14 ky AP → 40 ky AP; First Great Year that is totally in the future; with its Aquarius peak at 27 ky AP.
- 12 ky BP → 14 ky AP; Present Agricultural→Industrial or Agri-Industrial Great Year, which is about to peak in its expressionistic/expansionist phase during the coming Age of Aquarius.
- 38 ky BP → 12 ky BP; Upper Paleolithic or Cave Art Great Year, with its Aquarius peak around 25 ky BP; peak coincides with expansion into the America's from Siberian plains.
- 64 ky BP → 38 ky BP; Into Eurasia or Boat Great Year; River, Coastal and Sea crossing expansion with boats; with its Aquarius peak around 51 ky BP when modern homo sapiens reached Australia by deep sea boat fairing.
- 90 ky BP → 64 ky BP; First Symbolism Great Year with expansion into Greater Africa; with its Aquarius peak around 77 ky BP which is marked by the first clear signs of symbolic markings and the use of complex fishing tools.
- 116 ky BP → 90 ky BP; Sub-Africa expansion Great Year
- 142 ky BP → 116 ky BP; East African Genetic Bottleneck Great Year;
- 168 ky BP → 142 ky BP; Disperse slow development; Bottleneck preparation; too far in the past, lack of indicators.
- 194 ky BP → 168 ky BP; Disperse slow development; Bottleneck preparation; too far in the past, lack of indicators.
- 220 ky BP → 194 ky BP; Disperse slow development; Bottleneck preparation; too far in the past, lack of indicators.

To summarize the recognizable Great Years: the Agri-Industrial Great Year; the Cave Art Great Year; the Boat Great Year; the First Symbolism Great Year; the Sub-Sahara Great Year; the Genetic Bottleneck Great Year. From there on, things become too vague for recognizing specific genetic boost events, indicating start, peak and end millennia.

From a paleo-anthropological point of view, the periods of genetic boosts creative windows are more interesting than the complete Great Year cycles themselves. These windows mark sudden changes on an innovative level after a long period of relative stagnation. The concept of a periodically recurrent ‘genetic boost creative window’ can solve the ‘sapien paradox’ as formulated by Renfrew [10]:

*[...] in biological, i.e. genetic, terms the evolution of our species must have been effectively accomplished by the time of the out-of-Africa dispersals. [...] there is no reason to suggest that the human genome 60.000 years ago differs significantly and systematically from that of today. What we may term the speciation phase of human evolution, the period when biological and cultural coevolution worked together to develop the human genome and the human species, as we know it, was fulfilled already 60.000 years ago. This implies that the basic hardware - the human brain at the time of birth - has not changed radically since that time. [...] That brings us to the sapien paradox. [...] The life of the hunter-gatherers who left Africa some 60.000 years ago does not appear to have differed very significantly from those remaining in Africa, and indeed from their predecessors. [...] It was not until towards the end of the Pleistocene period that, in several parts of the world, major changes are seen. They are associated with the development of sedentism and then of agriculture and sometimes stock rearing. [...] Although the details are different in each area, we see a kind of sedentary revolution taking place in western Asia, in southern China, in the Yellow River area of northern China, in Mesoamerica, and coastal Peru, in New Guinea, and in a different way in Japan. [...] It was then that patterns of living changed directly and trajectories of development were initiated which in some areas soon led to the rise of urban life and of state societies and indeed to the rise of literacy. [...] Why did it all take so long? If the sapien phase of human evolution was accomplished some 60.000 years ago, why did it take a further 50.000 years for these sapien humans to get their act together and transform the world? That is the sapien paradox. [10]*

Renfrew calls it a paradox because paleo-anthropology doesn’t have an answer to it. And in the quote above, he only refers to the Neolithic Revolution. But elsewhere in the paper he also mentioned the Cave Art Revolution at the beginning of the Upper Paleolithic.

*The discovery of clearly intentional patterning on fragments of red ocher from the Blombos Cave (at ca 70 000 BP) is interesting when*

*discussing the origins of symbolic expression. But it is entirely different in character, and very much simpler than the cave paintings and the small carved sculptures which accompany the Upper Paleolithic of France and Spain (and further east in Europe) after 40 000 BP. [10]*

One can apply the concept of ‘the sapient paradox’ also in this earlier context. Using red ocher and carving of geometric patterns on ostrich shells dates back 77.000–70.000 years BP. Then why took it another 26.000 years ‘for these sapient humans to get their act together’ and create art at the level of the Upper Paleolithic Cave Art creative revolution?

There are also other ‘sapient paradox’ moments regarding the question ‘Why did it all take so long?’. If homo sapiens could cross the deep open sea between the land mass of Indonesia and Australia around 50.000 years ago, why did it take another 25.000 years to cross the much shorter Bering Sea, and colonize the America’s? The Bering Sea is about 50 miles wide in the midst of our inter-glacial and the distance to cross should have been much less in the midst of a glacial period. Why didn’t they do this for another 25.000 years after they proved to have the technological capacity to cross wider stretches of deep ocean? Why did humans colonize Australia around 50.000 years ago and then wait another 25.000 years to enter the America’s? They clearly didn’t need land bridges any more to cross 50 miles of deep open sea, see Fig. 13.

The question Renfrew poses isn’t a new among scientists. Sterelny in 2011 refers to it as humanity taking a long time for becoming ‘behaviourally modern’ in a paper which she contributes to :

*a debate in the palaeoarchaeological community about the major time-lag between the origin of anatomically modern humans and the appearance of typically human cultural behaviour. [11]*

But Renfrew’s formulation is exceptionally to the point. Due to the excellent observation skills of Renfrew and his sharp formulation of his intuition as ‘the sapient paradox’, we can be present our paradigm with more precision. First of all, the paradigm of Astrological Darwinism doesn’t agree with the premises of Renfrew, that the human hardware, our genome, was finished 60.000 years ago. According to Astrological Darwinism, humanity experienced two successive subtle genetic boosts creative windows. The first of those, the Upper Paleolithic genetic boost, around 38.000 years ago, had as a direct result the colonization of the harsh winter climate zone of Eurasia and the related Aurignacian artistic explosion. It had a further indirect result, because modern man could now go deep into Siberia and thus reach the Bering Sea. This barrier which was then easily crossed because the boat technology was already part of the human repertoire. The second genetic boost, the ‘Natuf’ around 12.000 years ago, created the agricultural revolution.

I do agree with Renfrew that our *basic* genetic hardware was finished around 60.000 years ago, but that one genetic boost can produce *subtle* differences, explaining his ‘sapient paradox’. Because of the subtlety of a single genetic boost, genetic mixing also easily spreads or shares these subtleties among populations. Thus in the context of Astrological Darwinism, the answer to Renfrew’s ‘sapient paradox’ is clear: it took a subtle genetic boost creative window of 6-8 ky around the Age of Leo to ‘get their act together’. This last genetic boost from 16.000 to 8.000 years ago created the agricultural, sedentary revolution. The genetic boost might have been a subtle one, the consequences weren’t subtle at all. It resulted in our agri-industrial era.

In the paradigm of Astrological Darwinism, women were the active agents during these genetic boost creative windows. These matrilinearly connected generations of women, in a Pro-Choice free will environment, created these new capacities because they envisioned and desired them. These women didn’t ‘get their act together’, they spontaneously created something really new, in the way Bergson intended the new. What they achieved was out of the ordinary, unexpected, never seen before. They realized a wow event.

In the two quotes from Renfrew’s 2008 paper regarding the ‘sapient paradox’, we recognize three genetic boost creative windows: the one that resulted in the Out of Africa event; the Cave Art one of the Upper Paleolithic and Agrarian one of the Neolithic. Every Great year starts with such a creative periode in the evolutionary DNA sense that lasts about 6 - 8 ky around the start of the Great Year; 3-4 ky before and 3-4 ky after the beginning of that New Great Year. This represents the creative window around the Age of Leo, producing a genetic boost. These Age of Leo centered genetic boost windows can be dated also, as in the following list.

- 10 ky - 14 ky - 18ky AP; Next window of genetic boost
- 16 ky - 12 ky - 8 ky BP; Last genetic boost of modern humanity leading to the Neolithic agri-industrial revolution; peak coincides with Clovis culture in North America and full period with Natuf culture in the Levant; genetic boost that had multiple centers; continuation of subtle differentiation but followed by global genetic mixture.
- 42 ky - 38 ky - 34 ky BP; Genetic boost related to Cave Art explosion; full period coincides with calibrated Aurignacian era in Europe; first genetic boost that had multiple centers; start of subtle genetic differentiation or divergent genetic developments.
- 68 ky - 64 ky - 60 ky; Genetic boost leading to boat fairing technology and lifestyle and and Out of Africa or Into Eurasia and Australia expansion; last possible genetic boost shared by all present day people.

- 94 ky - 90 ky - 86 ky BP; Genetic boost leading to clear use of symbolism and complex fishing tools; first temporal appearance in the Levant.
- 120 ky - 116 ky - 112 ky BP; Start of South Africa arrival of Bottleneck Modern Man.
- 146 ky - 142 ky - 138 ky BP; Start of East African genetic creative event called the Bottleneck; possibly last of a series of genetic boosts related to the capacity of learning complex language.

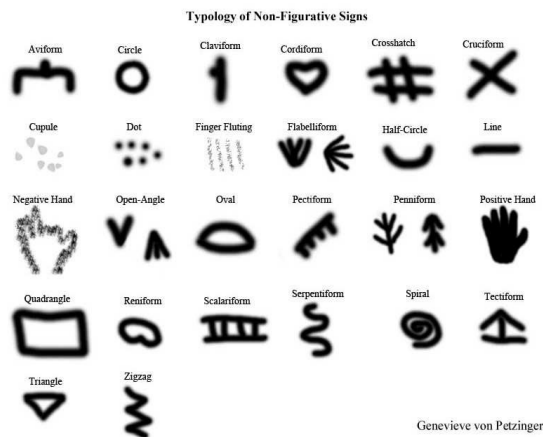


Figure 9: Symbols of the Upper Paleolithic are found all across the globe, a strong indication that symbolism is a pre-dispersal capacity. Figure by von Petzinger.

According to Astrological Darwinism, the windows of genetic boosts happen globally. And not just for humanity, but for all living creatures. As a consequence, populations that are isolated from each other during these periods develop independently; realize their own local genetic boost in their own environment with its unique challenges, opportunities and desires. All clues indicate that the last window of human genetic boost that was restricted to Africa, the one around the age of Leo of 68 ky - 64 ky - 60 ky BP, is the last genetic boost that could have been shared genetically by all of mankind. Because those who left took the genes with them and those who stayed could have spread those genes over the African continent again. This means that the windows of genetic boosts at the beginning of the Paleolithic, 42 ky - 38 ky - 34 ky BP, and at the beginning of our own time, 16 ky - 12 ky - 8 ky BP, have to be characterized by a certain degree of ‘local taste’. But because the human genetic pool has been thoroughly mixed on a global scale since the beginning of agriculture [12], any possible subtle differentiation due to these two multi-centered genetic boost windows should have become almost untraceable.



Figure 10: Harpoons from the Upper Paleolithic. Source: Nature.

The most observable trace might be the phenomenon of a local differentiation of natural talents, with the ‘Picasso or Cave Art talent’ as the most obvious.

To summarize, we can recognize several Great Years in human evolution of the last 150.000 years. We can characterize them by their most outstanding indicator. The Great Year of agriculture and industry; the Great Year of the Cave Art symbolic artistic explosion; the Great Year of boat fairing expansion; the Great Year of first symbolism and complex fishing technology; the Great Year of Sub-African expansion; the Genetic Bottleneck Great Year. From the Great Year of first symbolism backwards, identifying Great Years becomes extremely vague if not simply impossible due of lack of detailed archaeological finds that have precise dating. But it might be clear that the paradigm of Astrological Darwinism allows for a periodization of recent human evolution, say the last 100.000 years with four identifiable Great Years. It’s periodic discontinuous genetic boosts gives a solution to the ‘sapiient paradox’ as formulated by Renfrew, something Neodarwinism with its slow and continuous ‘random mutations’ mechanism is incapable of.



Figure 11: Bradshaw boat cave art from Australia.

The periods categorization beyond the Great Year of the Upper Paleolithic is too subtle to count as a experimental verification of the paradigm of Astrological Darwinism. But it is strong enough to count as an indicator in favor of the paradigm. The proof of the paradigm of Astrological Darwinism should come from the prediction regarding the future of humanity, the arrival of Peak Science and the fading of interest for science afterwards, eventually leading to a magical, immanent consciousness around the next Age of Leo. But the verification or

falsification of this prediction will not be possible any time soon. We are in lack of a time machine.

Due to the vagueness of many indicators backing the periods categorization, falsifying Astrological Darwinism will also be very difficult. But because Astrological Darwinism produces more structure and predictions regarding past, present and future, it is a stronger paradigm than Neodarwinism alone and thus more interesting from a skeptical experimental scientist point of view. Falsifying it will produce quite a challenge. In my experience, up until now, all research thus far just strengthens my, prior, belief in its correctness.

## **4 The rhythm of change in human culture and technology**

Until the growth of cities in the Neolithic, the speed of change among human populations followed the 26.000 year cycle. The clans of hunters and gatherers were so conservative in their lifestyle that the concept of growth could not have existed outside of the growth of their children and the flora and fauna around them. The clan didn't grow, the clan was. It comprised a relative stable number of people, somewhere between fifty and hundred and fifty for the average clan, confined by the amount the environment would provide for, given the hunting and gathering economy. These numbers had been stable for many millions of years and are similar to those of chimpanzee groups and baboon troops. A certain number of clans formed a tribe and at regular intervals the clans met in a tribal gathering, behavior unknown to chimps and baboons. The duration of these gatherings couldn't be too long because they had to bring their food with them for the time of the gathering, as the environment couldn't sustain that many people for long. On rare occasions, a clan became too big compared to the environmental capacity and a split was necessary. Those who left the known area had to search for new land outside the territory of the tribe. In this way, it could take thousands of years to occupy new lands like South-East Asia, even if that part of the Eurasian continent could be completely explored in a single lifetime. In its innovative development, modern homo sapiens followed the rhythm of the Great Year, the Cycle of Life.

The Great Year from 90 ky BP to 64 ky BP is characterized by the development of complex fishing technology, with the development of harpoons made out of bones. During these 26.000 years, there is no indication of boat use, although they were catching fish. The implication is that they were fishing in shallow waters, where they could wade through and harpoon the fish using spears. It also means that the open waters were a frontier they didn't cross, a territory they couldn't expand into as fishermen. But they must have known that there was a lot of fish

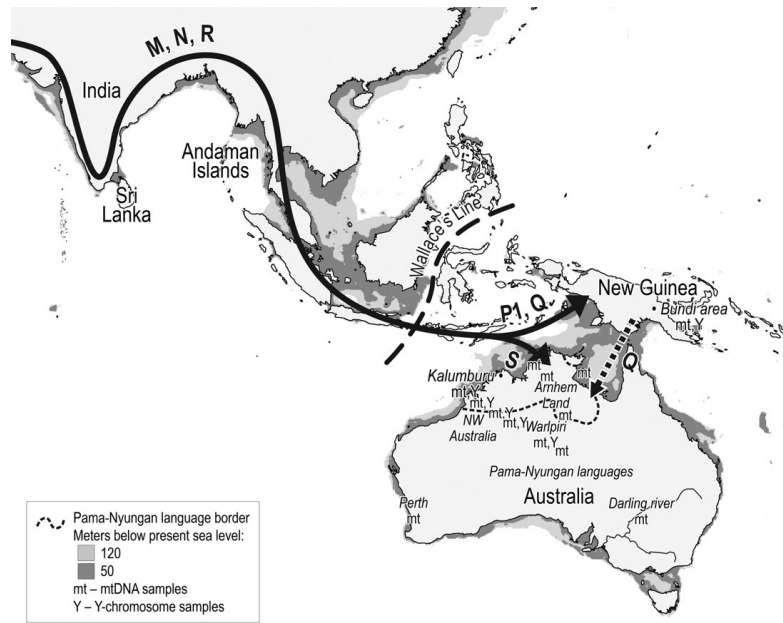


Figure 12: Coastlines of Australia and NG  $\approx$  50,000 years ago. The Wallace Line acts as an ecological barrier between Asia and Australia and had to be crossed by boat. Hudjashov, [13]

in those open waters of lakes, rivers and coastal waters.

The next Great Year from 64 ky BP to 38 ky BP is connected to the invention of boats, eventually complex enough to cross the sea from Indonesia to the Sahul, the continent of New Guinea and Australia when it was connected by a land bridge, see Fig. 12. It took a genetic boost creative window of many thousand years to push fishermen to invent boats and to acquire a mind-set to use those boats to venture on the open waters of lakes, rivers and along coasts. From there on, they improved boat technology for ten to twenty thousand years without the intervention of yet another genetic boost window. Around 55 ky BP, that technology had improved to such a degree that they could cross a hundred miles of deep open sea. In that Great Year, they managed to occupy Australia, but didn't manage to enter the America's although they had the technology to cross the Bering See, which is about 50 miles wide in our warm inter-glacial.

The reason for this, is that they didn't make it into the cold winter climate zone of northern Eurasia until the next Great Year. During the Great Year from 64 ky BP to 38 ky BP, modern homo sapiens expanded into the tropical and the moderate climate zones of Eurasia and Australia, but not into the harsh winter climate zones. This also prevented them to reach North America in that Great



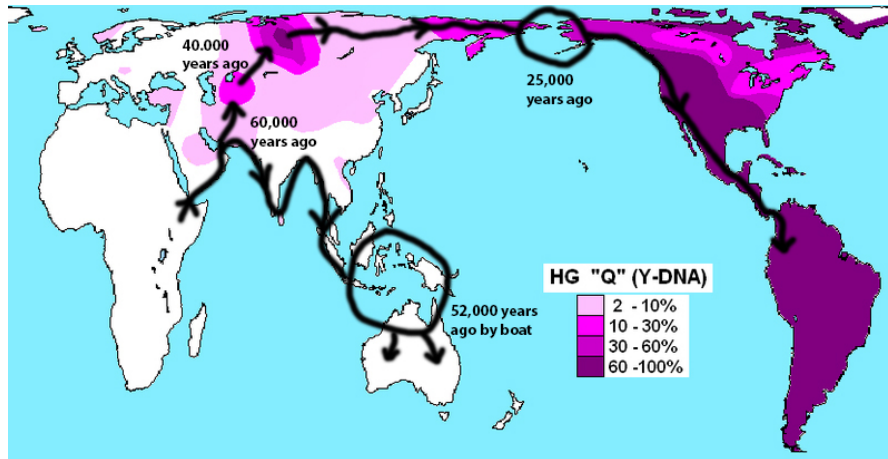


Figure 13: DNA evidence that modern humans first made it into the northern zones in Eurasia and only then managed to enter the America's through the Bering Sea. This map shows the Siberian connection. Similar evidence exists for the Solutrean connection through the Atlantic Ocean: first expansion into northern zones of Europe and then into the America's [14]. A Beringia landbridge can't be the issue because of the Australian crossing using boats and a coastal route 25.000-35.000 years before. Source: Wikipedia; Para América, basado en Bortoloni 2003, Zegura 2004, Bolnick 2006 y Malhi 2008.

Year. In order to achieve that, they needed a new genetic boost creative window, the one from 42 ky to 34 ky BP, the 'Aurignacian' genetic boost creative window. During and after the 'Aurignacian' genetic boost they expanded into the harsh winter zones [15], replaced the Neanderthal [16] and Denisovan [12] and entered North America around 25-20 ky BP, at or not long after the Aquarius peak of that Great Year, from the northern Siberian plains [12] and possibly also from the European North Sea Plateau [14].

In places that had been occupied already well before the 'Aurignacian' boost, as for example the Levant, modern humans already reached such population densities at the peak of the Upper Paleolithic Great Year that they started to collect seeds from wild wheat on a more systematic scale than just opportunistic gathering. But they didn't make the step from systematic gathering of wild wheat to actually farming it until the next genetic boost creative window, the one from 16 ky - 8 ky BP. This genetic boost creative window can be called the 'Natuf' genetic boost, after the people that lived in the Levant during that time and made the move from gathering wild wheat to farming it. These people already lived in larger communities at the start of this boost, but their villages grew considerable during this creative window. It seems that a genetic boost was needed to implement the innovation of agriculture and the life in permanent villages of more than 300 inhabitants. All the ingredients for this innovative boost were already there around

23 ky BP, see [17], but it took another 10.000 years to actually make the move. Once the initial innovation set foot, developing improvements went much faster. It seems that a change of mind-set was the hardest part of that innovation.

So it took a genetic boost to go from fishing in waters they could wade through to using boats in deeper water and then the rest of the Great Year to improve the technology of boats. At the Age of Leo they invented the boat lifestyle and at the Age of Aquarius they had improved it to such a degree that they crossed hundred miles of deep water that brought them to Australia. Then another genetic boost was needed to be able to enter the harsh winter climate zones of Eurasia, the territory of the Neanderthal and the Denisovan and the rest of that Great Year to improve on the winter climate technologies to such a degree that they managed to enter North America. Again, at the Age of Leo they adopted/innovated a harsh winter climate lifestyle and at the Age of Aquarius it got improved to such a degree that they entered North America, after which they quickly spread over the entire America's.

When the clans couldn't grow by spreading out any more, due to the fact that now all continents were occupied, the pressure was on improving the use of their territories without moving further. In some places, systematically collecting wild wheat was developed already half way the Upper Paleolithic, 23.000 years ago [17]. But a new genetic boost creative window was needed to make the shift from collecting wild wheat to sowing and harvesting it. It seems that a shift of mind-set was needed and this shift of mind-set was realized by a genetic boost during the creative window from 16 ky - 8 ky BP, the 'Natuf' genetic boost. The agricultural lifestyle in permanent settlements sharply increased the population densities, from less than one hunter-gatherer per square mile to 20 or more agriculturalists [18]. This was a revolutionary change in the history of modern homo sapiens. Until then, all innovations were directed to occupy more diverse ecological niches, on the conservative foundation of the average hunter gatherer clan size, varying from 60 to 140 individuals.

If we compare this to the primates, the average baboon troop consists of about 40-100 individuals, but troops up to 200 also exist. An average chimpanzee troop also consists of around 40-100 individuals. In the semi-open savanna, the baboons have their habitat and the chimpanzees avoid those environments due to lack of dense enough tree safety. The Australopithecus, our apelike predecessor, lived in the East and South African forest patches, in group sizes similar to the chimpanzees from 4 million years BP. Homo hunter gatherer groups for two million years lived in groups or clans that were in between 60 and 120. This implies that basic group size and environmental resource pressure was relatively stable for millions of years, until the end of the Upper Paleolithic. And then it exploded, went into a mode of exponential growth. According to Weisdorf:

the number of humans on the planet 300,000 years ago is estimated to be a total of one million. At the time of the Neolithic Revolution, some 10,000 years ago, there was an estimated 5 million people. At the time of the Roman Empire, roughly 8,000 years later, there were 133 million people worldwide. This implies that the population grew 70 times more rapidly during those 8 millennia than the previous 300,000 years. If we include the 2 millennia taking us to the present day, the average annual growth rate over the past 10,000 years has been more than 123 times that prior to the Neolithic Revolution. [19]

The twenty fold increase of population density of early agrarians compared to hunter gatherers directly indicates the revolution that took place at the genetic boost creative window at the Age of Leo at the end of the Upper Paleolithic and the beginning of the Neolithic.

Interestingly, the two regions that were still unoccupied by homo sapiens at the end of the Upper Paleolithic, the arctic zone in the North and the Polynesian Islands far into the Pacific Ocean, which includes New Zealand, both became occupied not long after the ‘Natuf’ or Mesolithic genetic boost creative window. The Proto-Inuit adapted to life in the Arctic zone’s, originally in the northern zones of Siberia and from there expanded into the entire arctic region some 5.000 years BP [12].

and the Polynesians acquired the navigation skills and the mind-set needed for colonization of Polynesia. This indication that the genetic boost creative window is a global phenomenon but that the specific contents created by the boosts are happening in response to the local context, in which this context has to be understood as a mixture of cultural and natural factors. One single genetic boost creative window might lead to subtle differences in specific very conservative ‘mind sets’ created during those boosts.

Once the ‘Natuf’ shift of mind-set towards agriculture and sedentary life was realized, improvements on that basis proved incredibly successful. There are subtle indicators that this shift of mind-set was definitely connected to a distinctive genetic boost. After the agrarian permanent village lifestyle was established in the Fertile Crescent of the Middle East, it took three to four thousand years for this innovative lifestyle to establish itself in Europe. In the words of researcher Pinhasi:

*It is worth noting how slow the rate is on the ground (that is, in terms of a human generation). Although there is a tendency to imagine the spread racing across the map of Europe, it actually took more than 3,000 y (or 100 human generations) for the Neolithic transition to reach north-west Europe [20].*

This innovation spread into Europe genetically, the agriculturalist people moved into Europe [20]. But they moved in very slow, which indicated that they had to

adapt their lifestyle and the farming techniques to the winter climate of Europe. In Europe, they genetically mixed with the Upper Paleolithic Cave-Art people. Pinhasi noted that

*many genetic studies tend to support the idea of demic diffusion at some level, but there is still a lack of consensus with regard to the percentage of the contribution of early Near Eastern farmers to the European gene pool [20].*

Eventually, a culture of farming in the winter climate zone of Europe developed. I have the impression that the subtle genetic boosted mindset for a lifestyle in a winter climate mixed with the subtle genetic boosted mindset for an agricultural lifestyle. According to DNA studies the genetic input of the Fertile Cressent gene pool into Upper Paleolithic gene pool is in between 20% and 60% .k][20]. An indicator for this kind of gene mixing process is the fact that once this genetic mixing was accomplished, further innovations from the Middle East followed the cultural dissemination path into Europe, meaning that these additional agricultural innovations from then on spread by exchange of ideas and not any more or solely by exchange of genes. As Pinhasi explained in a 2005 paper, when comparing genetic or demic (from demos=people) spread with cultural dispersal:

*In fact, the slowness of the overall spread and its essentially linear character, as shown by the present analysis, may offer one of the best lines of argument for demic diffusion. Cultural diffusion can, and probably should, go faster. An excellent example is pottery, which appeared after the aceramic Neolithic and spread more rapidly than early farming. [20]*

To summarize, untill the end of the Neolithic, modern homo sapiens innovated in the rhythm of the Great Year. Each major innovation started with a genetic boost creative window around the Age of Leo. The content of the genetic boost innovation was related to local pressures and desires. Then followed a period of improvement and consolidation of this new technology, which peaked at the Age of Aquarius. Modern homo sapiens then remained in a conservative mode for approximately 10.000 years, until the new creative window around the next Age of Leo. A genetic creative window of 6 to 8 thousand years followed by approximately twenty thousand years of first expansionist and then conservative consolidation of the acquired mindset and lifestyle.

Would we have continued this pace after the Neolithic revolution, then the innovation towards use of metals and living in large cities should have waited for the next Age of Leo, 14.000 years into our future. From the perspective of the innovative rhythm of the Great Year, humanity has become quite manic, which

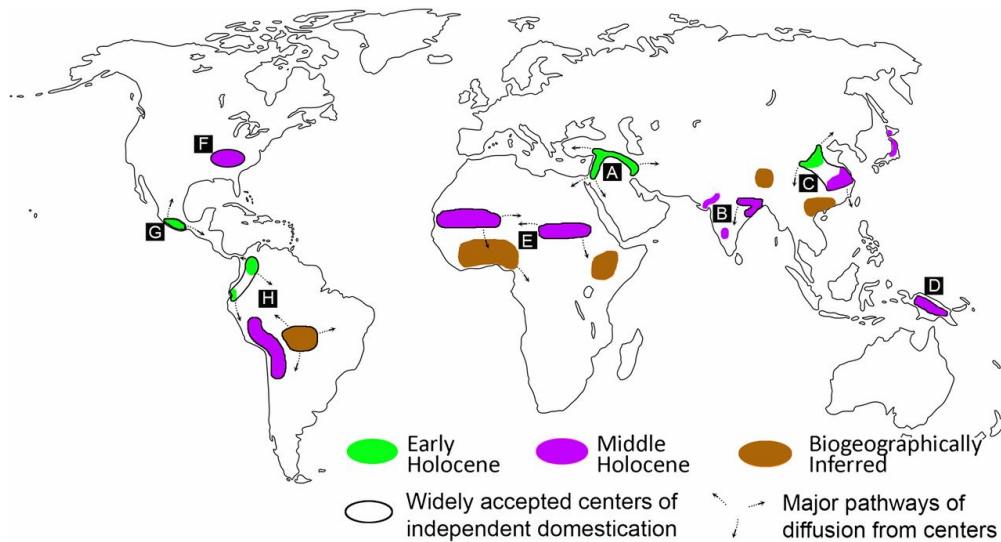


Figure 14: A map depicting likely centers where the domestication of at least one plant or animal took place. Sources of major diffusions of domesticates are indicated by arrows. Late Pleistocene to early Holocene transition: 12,000 – 8,200 B.P.; middle Holocene: 8,200 – 4,200 B.P. Source: Larson et al. PNAS 2014 [21]

seems an appropriate description for a society in a permanent mode of exponential growth. In today's society, politicians, planners and economists tend to panic if the economy and human activities do not grow every year with two percent to seven percent, implying exponential growth with a doubling time of thirty to ten years. Our 'normality' is unsustainable for another hundred years, let alone for the next thousand years to peak scientific consciousness or for the ten thousand years to the start of the next genetic boost creative window. But modern man urgently needs the next genetic boost creative window in order to match our genetic makeup with our live-style again. Unfortunately, we have to wait for the upcoming Age of Leo for this really urgent period of genetic maintenance based upon body-soul immanence. My diagnosis is that we urgently need a genetic fix, effecting us socially and psychologically, and the astrological prediction is that this fix won't begin for another ten thousand years.

The fact that humanity managed the move from villages to cities to megacities in a single Great Year is simply amazing, mind-blowing. The modern mind is simply flabbergasted by the conservatism of paleolithic culture, is astonished by the observation that technical styles and/or artistic preferences of craftsmen remained the same over tens of thousands of years. We live in an exponential era, a time where everything grows and changes in an exponential rhythm. In a decade, many things in our world can change drastically. How can we imagine a world where cave art remained essentially the same for 20,000 years? A world

in which the Great Year of 26.000 solar cycles dictated the speed of change, on artistic as well as technological levels? We should realize that genetically, we have a mind-set and lifestyle adapted to the rhythm of the Great Year. The modern lifestyle is the out of the ordinary. An experiment without precedent. Humanity has become a run out of control organism, literally scorching the surface of the earth, transforming the entire biosphere.

In this context I would turn around the question magnificently formulated by Renfrew, which I will repeat first: *Why did it all take so long? If the sapient phase of human evolution was accomplished some 60,000 years ago, why did it take a further 50,000 years for these sapient humans to get their act together and transform the world? That is the sapient paradox [10].* I propose to turn it around and ask the intriguing question: ‘How on earth did it go so fast?’ How did we realize all of this in less than half a Great Year? How did humanity get into this exponential mode and thus run out of control? And then there is the more urgent challenge: ‘How do we get back into the innovative rhythm of the Great Year?’ How do we get back from exponential to sustainable growth and then into a steady pace again in order to manage to survive the second half of our Great Year? How can we, as humanity, survive our present agri-industrial explosion until the next Age of Leo, where women might infuse a genetic fix?

## 5 Gendered Darwinism

Neodarwinism is firmly rooted in the male biased gender perception of classical philosophy, from Aristotle to Kant and beyond. The theologies rooted in the still existing God Religions of the Fertile Crescent and its periphery, Judaism, Christianity and Islam, share this biased gender conception with philosophy. It uses dualisms as active-passive, mind-body, ‘res cogitan’ - ‘res extensa’, master-slave, to structure the male-female social and psychological organisation. Neodarwinist’s idea of life as a product of ‘random mutations’ and ‘natural selection’ follows an identical gendered dualism.

‘Random mutations’ are workings in and of matter and act without any intelligence, but nevertheless create the genetic code of every (new) species. It is the prototype of mindless matter at work. In classical dualism, this is the feminine role. In contrast to this, ‘natural selection’ basically is the pastoral warrior’s smart way to act. In the literature of for example sociobiology or evolutionary psychology, ‘natural selection’ at work is all about strategies carried out in order to be the fittest and sexually the most reproductive. Those living beings who acquired an interesting ‘random mutation’, but live and act without a keen strategy, die out and the others survive in a winner takes all narrative. This ‘survival of the fittest’ narrative is as if intelligently designed for maximum male identification. In

the words of feminist philosopher Grosz:

*In shorthand, Darwin's is a theory of 'winners and losers', of the dominating and those who have succumbed to domination or extinction, a theory that, on the face of it, seems to provide a perfect justification for the relations of phallogentric and racial domination that constituted Eurocentric, patriarchal culture in his time as much as in ours. [22]*

The model of 'random mutations' and 'natural selection' follows the passive-active dualism, which inherently and unconsciously projects it on the female-male gender roles. But due to the biochemical and biophysical nature of 'random mutations', no women on earth can identify with this 'feminine' part of Neodarwinism. And 'survival of the fittest' clearly is a male narrative, unsuited for the traditional female role. In my view, this puts the following observation of Grosz regarding the attitude of feminists towards Darwin in perspective:

*It seems remarkable that feminists have been so reluctant to explore the theoretical structure and details of one of the most influential and profound theoretical figures of the modern era, Charles Darwin. For the last two decades or more, there has been an increasingly widening circle of male texts that have enthralled and preoccupied the work of many feminist theorists: Hegel, Nietzsche, Spinoza, Heidegger, Derrida, Lacan and Deleuze are just some of the more recent and philosophically oriented additions to this ever-expanding pantheon. This makes the virtual ignorance and neglect of Darwin's work even more stark and noticeable. It is not clear why Darwin – whose enduring impact on knowledge and politics is at least as strong as that of Hegel, Marx or Freud – has been left out of feminist readings. [22]*

In my opinion, this is because even the traditional feminine role has been written out of the passive part of the dualism of Neodarwinism. Attempts to repair or criticize Neodarwinism from a feminist perspective do exist, see [23]. Such attempts remain within the 'random mutations' and 'natural selection' premises and they all leave the 'random mutations' part untouched, see for example the already quoted Grosz. And according to Grosz, *it is significant that the bulk of feminist literature on Darwinism is devoted to a discussion, usually a critique, of Darwin's account of sexual selection [22]*, with sexual selection as a (sub-)branch of 'natural selection'. What feminists then do for example is add sexual partner selection narratives from the female's perspective to the reproductive aspect of 'natural selection'. This is a useful addition to the Neodarwinist narrative. Natural selection may be originally designed for and by male scientists, on itself it is a phenomenon in nature in which both sexes are involved beyond active-passive dualism schemes.



Figure 15: The female figurines around the sign of Leo in the Zodiac of Dendera

‘Chosen mutations’, as a central principle of Astrological Darwinism, is a highly gendered concept too, on multiple levels. First of all, the combination of ‘chosen mutations’ and ‘natural selection’ of Astrological Darwinism can also be projected upon the female-male gender pattern. The ‘chosen mutation’ part of Astrological Darwinism is connected to the fertility tradition of the Cult of the *Goddess Figurines*. It can also be interpreted as a Pro-Choice Darwinism, where the women decide over their own body and that of their offspring, but now even on a genetic level; no man gets involved other than for sex and hunter gatherer clan safety. The ‘chosen mutations’ part can also be imagined in the line of the midwife-witch-magica tradition. The midwife-magica, as the female companion of the shaman, had, as a gatherer for two million years, piled up an impressive know how and practice of herbs and natural medicines. She helped women of the clan with births and abortions and other health issues. Due to these abortions, she was labeled a witch and prosecuted when men took control over female fertility in the last millennia.

As part of a duality, ‘chosen mutations’ is the female biased part of the two, with ‘natural selection’ as the male biased part. As the ‘natural selections’ part of Astrological Darwinism integrates or copies Neodarwinism, all feminist critique relevant for Neodarwinism’s ‘natural selection’ narratives will be directly applicable to Astrological Darwinism. Together with the female biased ‘chosen mutations’ part as all about fertility, Astrological Darwinism is rather traditional from the gender perspective, see for example Fig.15. Thus, Astrological Darwinism isn’t a ‘pro’-feminist narrative, but it is a highly gendered paradigm suitable for feminist critique and deconstruction. At least it doesn’t fit the classical dualism of passive versus active and from that perspective, Astrological Darwinism is different.



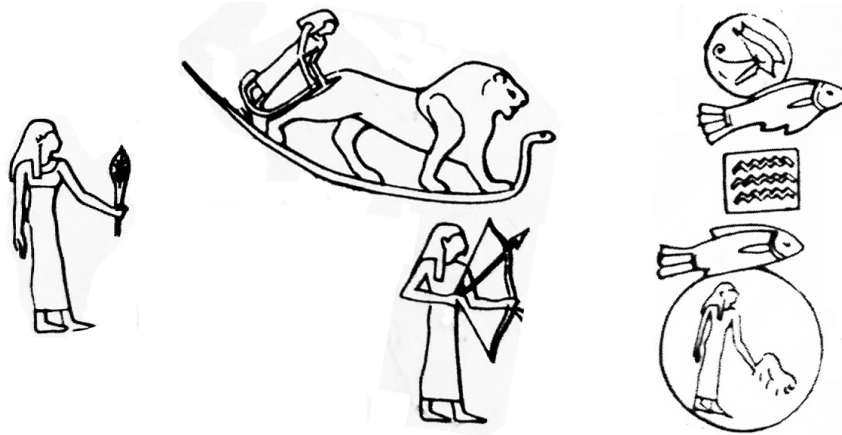


Figure 16: The female, from Virgin and Leo to Pisces in the Zodiac of Dendera

The practice of ‘chosen mutations’ fuses nature and consciousness. It is not based upon dualism and transcendence but on unity and immanence. The active agent is the female, or a matrilinear chain of women through several millennia. In the Age of Leo, the ‘life water’ or ‘élan vital’ infuses body and mind, rendering matter opaque and objective scientific analysis impossible. The female role according to the ‘chosen mutations’ paradigm is nothing less than choosing and designing humanity’s future on the genetic, heredity level around the Age of Leo. These periods of genetic boosts create windows, with women as the active agents, are the true initiators of whole new developments in human evolution. It made symbolism possible. It initiated use of boat technology. It resulted in magnificent cave art. It gave us the agricultural and permanent village dwelling mindset. It gave us philosophy and science. The Age of Leo is a women’s era in the same degree that our age is a male-get’s-it-all era.

But the male bias of our times seems an overreaction, an abnormality in human evolution. During the Age of Aquarius in the Upper Paleolithic, the cult of the Goddess figurines continued with a staggering conservatism. The hunter gatherer lifestyle and economy simply could not afford to suppress women in the way the pastoral and city economies have become accustomed to. Given humanity’s conservatism throughout its history spanning many Great Years, the suppression of women according to the pattern of the master-slave dualism is probably a side-effect of the Post-Neolithic revolution. It cannot be older than a few millennia and therefore must be a post genetic boost event, a phenotype based practice without roots in our genotype. It may even be a distortion as part of the manic and overpopulation phase humanity got itself into these last millennia.

Apart from our present era’s manic gender dualism, a certain cyclic variation of gender throughout the Great Year can be expected. This moderate cyclic gender

progression can be illustrated by projecting (gendered) meaning onto the images of the Dendera disk. Just before Leo, the sign of Virgin is depicted as a woman offering a fresh bouquet of flowers. See Fig. 16, left. Then, in Leo, the woman is pregnant as part of the genetic boost (pro-)creation creativity. Five signs further, in our age of Pisces, the double sign depicts the same woman, but now in a bubble below the lower fish, with the flowers, indicating her magical powers, in decay. The upper fish has an Egyptian eye in his bubble, the symbol of science and division calculus. So, the same woman that was the one and only center of her Age of Virgin, the same one that gave a pregnant direction to humanity in the Age of Leo, this young woman's magic is now in decay and subdued to science and the dividing power of the eye. Culturally, this is roughly what happened in the last 12.000 years. In the region of the Fertile Crescent, the Upper Paleolithic Cult of the home-based Goddess figurines developed into a Temple Cult of the Goddess, which temples were then taken over by the Cults of the God, which in turn has been overruled by science, kind of. To be clear, I do not in any way pretend that the ancient Egyptians put this narrative in the Zodiac. I am projecting a storyline upon the zodiac. Which is just surprisingly suited for my script.

Astrological Darwinism is gendered Darwinism on multiple levels. It portrays Neodarwinism as an all-male perspective. But Astrological Darwinism is not just about deconstruction of the Neodarwinist gender-biased approach, it analyzes Neodarwinism also as being part of the Cycle of Life, as one of the possible incorporation of the Eye in the sign of Pisces. The eye as contrasting the former virgin with the decaying flowers in Pisces, symbol of the gain of male objectivity and the loss of the genetic boost female capacity, the feminine magic. To put the development from Leo to Pisces in just few words, the Cult of the Goddess has been replaced by the Cult of Science, with the Religions of the God as the intermediate practice. A development from magica to priestess to priest to professor. The Cult of the Goddess Figurines had its roots in the immanence of the soul and its practice in the genetic boost creative window. The Cult of Science has its roots in the transcendence of the soul and its practice in its useful technical applications. The Religions of the God are a mere transformation from the Age of Leo to the Age of Aquarius, necessary to move us away from the 'magic' of the Goddess towards 'objectivity' of Science, from mythicall thinking towards rationality.

When the Cult of the Goddess was repressed by the organizers of the Religions of the God and their predecessors, female priestesses were put out of work in favor of an all male priesthood. Part of this repression and replacement was about control over female fertility. In Western Europe, this repression took place during the witch hunts at the end of the Medieval and the beginning of the Renaissance, when midwives, as presumed witches, were replaced by male doctors, men of medicine, educated at the newly established universities. In the beginning,

the knowledge of these men was in no way better, and usually worse, than the medical wisdom of the ancient tradition of the midwives. But this replacement wasn't about expertise regarding childbirth and the patients health, it was about control over female fertility. Men took over control, for the first time in the almost two hundred thousand years of the evolution of modern homo sapiens.

Science itself is not gendered, however. The eye in the sign of Pisces isn't a male eye, its a symbolized human eye. But in its history as competing with and partially replacing the Cults of the God, in which women were already put on the sideline, science started as a male dominated activity. It is only in the last fifty years that this is being repaired in the West, in such a way that within a generation the study of medicine in general and female fertility in special, will again be a female dominated activity. But the expansionist drive of homo sapiens in the Age of Aquarius part of the Great Years is a male dominated, survival of the fittest activity. The taking control of female fertility was part of the present Great Year expansionist competition, an unicum in the evolution of humanity. As such it is probably part of the manic phase humanity got into since the Neolithicum Revolution, caused by the unpredictable and unprecedented success that has occurred since the last genetic boost creative window.

Astrological Darwinism predicts a cyclic move from 'magic' centering around the female perspective in the Age of Leo towards 'science' as more of a male thing or development in the Age of Aquarius, and then forward again towards the new era of 'magic'. The 'mechanism' behind this periodical cultural shift is the soul as 'élan vital' going from immanent to transcendent and back. The 'mechanism' itself is gender neutral, prior to gender, but its manifestation in human life isn't. In biology, giving birth is a female prerogative and the therefore more dispensible, less valuable male has the primary role of defence/offence relative to predators/prey. Astrological Darwinism, being part of biology, remains highly gendered Darwinism.

## 6 A way out of the gene probability problem: Multiverse or Astrology?

*[...] only a tiny fraction of nucleotide sequences code for biological function; the overwhelming majority of nucleotide sequences would represent biological gobbledygook. Viewed this way, the origin of life is a type of search problem. Given a soup of classical molecular building blocks, how did this mixture discover the appropriate extremely improbable combination by chance in a reasonable period of time? Simple calculation shows that it would take much longer than the age of the universe, even if all the matter in the universe consisted of pre-biotic*

*soup, for even a single protein to form by chance. So the classical chance hypothesis seems unsatisfactory. (Davies 2004 [43])*

Two things are new in Astrological Darwinism, the concept of ‘chosen mutations’ and its 26.000 year periodicity. Both can be analyzed from a phenomenological perspective, what events do they produce, and from a fundamental perspective, how they can produce these events. The phenomenological side of the 26.000 Cycle of Life or Great Astrological Year has been discussed already, although briefly. In this section I am going to discuss the probability aspect of ‘chosen mutations’ versus ‘random mutations’. This involves a first encounter with quantum biology in combination with metaphysics. In the context of the continued belief in ‘random mutations’ as the ultimate cause of life, a Multiverse and Many Worlds metaphysics is needed to repair the faltering paradigm of Neodarwinism. The metaphysics of the Goddess Principle, as the basis of ‘chosen mutations’, eclectically uses philosophers as Bergson and Heidegger. In my view, the future of Darwinism will involve two conflicting directions, Multiverse Darwinism versus Astrological Darwinism. The conflict will revolve around the genetic mutations issue: either a belief in creative ‘random mutations’ in a Multiverse or a belief in creative ‘chosen mutations’ in a single Universe with the Goddess Principle active in it.

The essence of the Goddess Principle, as embodied in the individuated soul or ‘élan vital’, is the desire to become manifest. The soul as the metaphysical ‘beyond experimentation’ part of biology cannot be studied prior to its expression. I related this to the concept of ‘Seyn’ or ‘Beyng’ of Heidegger, with the remark that Heidegger intended ‘Beyng’ to be universally or materially and not just biologically relevant. The magic of ‘Beyng’ of the Goddess Principle, in my opinion, just applies to biology, leaving non-organic matter without magic and the exclusive domain of experimental physics. In this way I follow the intuition of Bohr and his concept of complementary principles, as applied to matter and the living. Life is the unconcealment of ‘Beyng’ and thus its aletheia, veritas or revelation. Life is the truth of the Goddess Principle as ‘Beyng’. The revelation of ‘Beyng’ is by definition a mixture of soul and matter, and as such it can be intuitively admired as a piece of art and it can be scientifically studied as being assembled out of stardust. The attempt however to reassemble life out of stardust and then giving it an electric kick in the butt in order for it to start living, is in my view a clear sign of meta-scientific hybris. It is however the dominating view of science that such an re-assemblage is possible without any additional principle and this materialist belief can only continue in the twenty-first century as Multiverse Darwinism.

The veritas of the Goddess Principle or ‘Beyng’ cannot be pre-calculated nor does it form itself according to a preexisting finality or intelligent design, because it reveals the entirely new. This is the main contribution of Bergson with his intuition of the ‘élan vital’. As such, life is beyond the God Principle of Intelligent

Design and beyond the causality mechanism of classical physics. Life has its source in the Goddess Principle as 'Beyng'. What comes to light has never been seen before, cannot be seen before. It's internal drive is to come to light, to be seen, to be revealed, also for itself. 'Beyng' wants to reveal itself for itself, and the accomplishment of this desire is life. The stage for its revelation is the Universe in its totality. Such is the metaphysics of Astrological Darwinism relative to life. The stage on which the Goddess Principle is playing her role is the Universe, our Universe as observable by astronomy and contemplated by cosmology.

In my view, studying this cosmic stage is the domain of experimental physics. Beyond the limits of experimental physics one can speculate about the role of the God Principle relative to the existence of the Universe, to its being there or not being there. When experimental physics determines that the galaxies in the Universe all move away from each other and thus all were part of a singularity to begin with, then speculation regarding the origin of this singularity belongs to the domain of the God Principle. In principle, the concept of the Big Bang is that space-time and matter are all created in this moment from a singularity. The narrative might go like this: In the beginning there was Nothing and then this Nothing exploded and from this explosion of Nothing, space-time and matter came into existence. A true Cosmic Egg Singularity is everything and nothing at the same time. In stead of Nothing or Cosmic Egg Singularity one can also use the concept 'God Principle' as a description of something we cannot possibly describe beyond those words. This is the true domain of metaphysics. In my view, once the 'God Principle' can be applied, Wittgenstein's seventh proposition is valid too.

To conclude that there should have been a Big Bang that was the beginning of space-time and matter as a Cosmic Egg Singularity is an extrapolation of experimental cosmology and as such a scientific conclusion. Going beyond this conclusion and contemplate further content or origin of this Cosmic Egg or even beyond this contemplating the existence of other Universes and a Multiverse isn't experimental science but either speculative pseudo-science or legitimate and valuable metaphysics, dependent on the claims of its adherents. Topics as the cause of the Big Bang itself and the possibility of a Multiverse are a part of the God Principle's domain. Wittgenstein's seventh proposition might be applied here: *Whereof one cannot speak, thereof one must be silent* [7]. Today's scientific publishers clearly do not agree.

The fragmented desire for manifestation of 'Beyng' or the 'élan vital' is in my view the driving force of the evolution of life in general and of humanity in particular. The Goddess Principle or 'Beyng' is a magical, because beyond science, addition to Neodarwinists mechanisms of 'random mutation' and 'natural selection'. It is my opinion that random mutations are not driving evolution at all. I consider random mutations to be a source of errors that needs repair-like

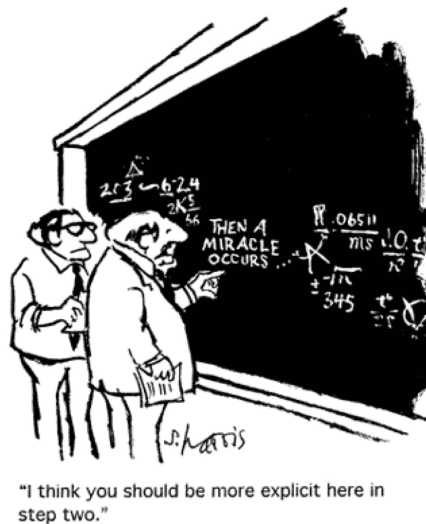


Figure 17: The status of creative ‘random mutations’ in Neodarwinism and of creative ‘chosen mutations’ in Astrological Darwinism, a status silenced in the first and proclaimed in the second.

countermeasures. Random mutations do not contribute positively to evolution, they cause cancer and mutilations. The fact that they happen and cannot be avoided is a major pain in the ass of evolution. In Magical Darwinism, the creative role of ‘random mutations’ is replaced by ‘chosen mutations’ caused by the soul as carrier of the Goddess Principle. But the whole process of natural selection is left intact in Magical Darwinism.

The funny thing is that almost the complete scientific work of evolutionary science can be taken over on a one to one basis in Astrological Darwinism because the creative influence of random mutations has never been proven. That part of Neodarwinism is just a narrative without experimental verification. It is the ‘and then a miracle happens’ moment of evolutionary science, an obligatory incantation in the evolutionary scientist narrative without any implications for the narrative itself, see Fig 17. The miraculous moment of Neodarwinism is the assumption that the mixture of ‘random mutations’ and ‘give it enough time’ is creative in the long run. It is this assumption that eventually leads ‘the sapient paradox’ of Renfrew. The ‘give it enough time’ part places it beyond experimental verification and effectively relocates the mysterious component to the passing of time.

Replacing the ‘random mutation’ narrative by the ‘chosen mutation’ narrative and accepting all the other parts of the science of evolution doesn’t change that science at all. Especially the whole timeline of the evolution of life on earth has been established in a ‘random mutations’ independent way. A time-tagged sequence of fossils does not care how mutations occur, the historical sequence just

expresses that mutations have taken place.

Surprisingly, ‘chosen mutations’ and ‘random mutations’ as creative input in the evolution of life are hypothesis that can be falsified. The issue of probability can be invoked to see which of the two creative principles fits the observations. The outcome of the probability calculus applied to the genome is that in one single universe, the ‘random mutations’ mechanism as producing the genome is incompatible with the size and age of the Universe. In the words of Yockey, who performed the calculations in 1977: *It is concluded that belief in currently accepted scenarios of spontaneous biogenesis is based on faith, contrary to conventional wisdom [24]*. In 2013 Kamenshchik et al. repeated the argumentation of Yockey, but now in a Multiverse and Many Worlds context. They concluded: *However, even a suitable planetary environment does not lead automatically to the emergence of the primitive life. In fact, the probability of emergence of the first DNA molecule to start the simplest replication cycle is about  $10^{-400}$  [63]*. Only in a Multiverse could there be one single Universe out of the approximately  $10^{400}$  Universes, contained in the Multiverse, in which the process of random mutations could have been the cause of life with an attached probability of 1. As Kamenshchik observed in a slightly different context: *This smallness of probability could be compensated by the huge number of universes constituting Multiverse [63]*. In stead of just invoking the Multiverse to justify the mechanism of ‘random mutations’ as the cause of evolution’s creative outcomes, Kamenshchik uses a mixture of the Multiverse and Everett’s Many Worlds Interpretation of Quantum Mechanics, which is as miraculous as the Multiverse and also produces such an amount of parallel Universes/Worlds:

[...] we suggest that all the mutations in the course of biological evolution are the quantum measurement like processes so that all their different outcomes are realized in different branches. The increasing of complexity now has a purely random character, so that only in few parallel worlds the biological evolution produces more and more complex species. [...] All the parallel worlds emerging due to mutations differ only by small variations in the mutating organism. This feature is common with a standard (neo)Darwinian paradigm. What is different from it is that all the versions of this variation are realized in different parallel Everett worlds. This naturally implies the increase of complexity in some of them just by random process. In our opinion, this solves the fundamental problem of the extremely low probability of life emergence and evolution to the most complex forms, including ourselves. [63]

In my opinion, invoking the Multiverse or Everett’s Many Worlds to make the notion of ‘random mutations’ creative instead of merely detriment to life is just a different way of saying ‘and then a miracle occurs’. Astrological Darwinism on the

other hand claims from the beginning that life is like a miracle, made possible by the occurrence of ‘chosen mutations’ caused by the Goddess Principle or the individuated ‘élan vital’ of the soul. Neodarwinism with ‘random mutations’ as the creative factor, when seriously tested using probability calculus, needs the magic of the Multiverse in Speculative Cosmology or of Everett’s Many Worlds in Speculative Quantum Mechanics, both beyond experimental verification and falsification. But they still claim scientific status for their fantastic narratives, which is the real problem with those speculations out of reach of experimental science. It would be authentic and honest if they claimed metaphysical status and admitted that their narratives are philosophies, not experimental science. Astrological Darwinism on the other hand doesn’t claim scientific status and has the advantage that it needs only one single World or Universe in which an additional metaphysical principle is at work in the line of the philosophies of Heidegger, Bergson and Bohr. This principle produces ‘chosen mutations’, which, because chosen by free will, do not produce random events and a random sequence of events through the ages. This is in accordance with the observation that the sequence of base pairs in the DNA molecule isn’t random but as unique as a piece of art.

The idea of ‘chosen mutation’ is that a quantum state at the genetic level, described by a wave function that contains stochastic information about possible outcomes of a collapse of that state, can collapse into a chosen outcome, whatever it’s quantum probability. Now, for one single chosen mutation, it is impossible to prove that it couldn’t have happened, because it was a quantum probability that could happen with a certain probability attached. It is like throwing two dice; throwing 12 once is no biggy but throwing 12 a hundred times in a row is. Nobody would believe those dice to be fair, someone manipulated them. In evolution, one single chosen mutation cannot be proven as implausible but a sequence of a billion chosen mutations should result in a gene in a state that is utterly improbable. A series of random mutations on the other hand always has to follow the pattern of a fair set of dice. So the answer is in the genes; is it a random sequence that follows the laws of probability or is it a unique sequence that is against the laws of probability? The answer of course is the second, the gene is a unique sequence that defies all probability calculus. Genes should not exist in this universe, if everything should happen according to the laws of physics alone. But genes do exist, leaving three options for the writer of evolutionary narratives beyond the realm of science: 1. Simply ignore the existential problem with the Neodarwinist paradigm and adopt the ‘business as usual’ attitude; 2. Expand our world or universe with as Many Parallel Worlds or with as big a Multiverse in order to fit the probability calculus towards ‘random mutations’, which bring the Neodarwinist paradigm in its ‘ad hoc repair’ state, described by Kuhn; 3. Move on to a new paradigm, for example the ‘chosen mutations’ paradigm with a Bergsonian vital



principle that is active in life and non-existent in non-living matter in line with Bohr complementarity.

The first option, the ostrich strategy, often uses the “its us or Creationism” argumentation. Well, it isn’t any more. The second ‘ad hoc’ paradigm repair option, involving as many Universes/Parallel Worlds as needed to fix the probability calculus, is already being seriously discussed in the scientific literature. Because ‘random mutations’ cannot be the creative cause of the too improbable gene, this is what calculations show when based upon the premises that the probability calculations have to be performed in one single universe, containing a limited amount of mass and existing a limited amount of time, they assume as many universes as needed in order to make the gene probable in a very small subset of universes. These universes may be part of the Multiverse (as a result of the application of the Anthropic Principle) or they may be part of Everett’s Many Worlds. A mixture of the two is emerging in the literature. Quoting Kamenshchick:

*The combination of the many-worlds interpretation of quantum theory with the anthropic principle allows to explain the biological evolution and its top result – the appearance of Human Mind [63].*

In this present state of affairs, ‘chosen mutations’, caused by the magic of the soul as carrier of the Goddess Principle, has to compete against ‘random mutations’, which needs the indispensable background of a sheer infinite Multiverse or Many Worlds to fix the probability calculus. It is the magic or metaphysics of the Goddess Principle in one single world against the ‘science’ or ‘landscape’ of the Multiverse or Many Worlds. In Astrological Darwinism, I am not opposing magic to science, just one metaphysical narrative against another metaphysical narrative. If we use Ockham’s razor, ‘chosen mutations’ fits the data in our single world best, whereas ‘random mutations’ as a hypothesis needs the supplementary input from the Many Worlds/Multiverse in order to fit the data. It is up to the reader to choose the preferred magic to make life happen: Multivers/Many Worlds; God’s Creationism/Intelligent Designer; Goddess Principle/élan vital. Sticking to classical Neodarwinism’s ‘random mutations’ belief without any probability calculus repair is an ostrich approach comparable to those who deny Einstein’s Relativity and stubbornly remain within the Newtonian/Galilean paradigm.

The advantage of the classical ‘random mutations’ hypothesis is that it doesn’t need something beyond the natural laws of physics, whereas ‘chosen mutations’ do need a vital principle in addition to the laws of physics. So as long as we couldn’t analyze the gene and compare it to the laws of quantum physics, it was the best hypothesis. But now that we can, the ‘random mutations’ hypothesis needs supplemental sub-hypothesis to remain within the applied calculus. So in this case, if we reject classical Neodarwinism and Creationism/Intelligent Design, the remaining choice is between the Goddess Principle or the Multiverse/Many Worlds.

I choose the Goddess Principle. Many others will go for the Multivers/Many Worlds. As additional to a strict Neodarwinist materialism, the Goddess principle reintroduces warmth in an otherwise random and soulless Multiverse.

The Neodarwinist incantation of ‘random mutations’ as the only fundamental creative driving force of hereditary DNA change on which natural selection then acts as a filter to produce sensible progress, gets its strength from a prior belief in a materialistic world in which Science has cast out all Magic. As such it is a continuation of Nineteenth century Positivism and its Mechanical Worldview. In the Twentieth century, Quantum Mechanics and Relativity have ended the Mechanical Dream of the Industrial Age in physics but this Dream lingers on in philosophies and worldviews, and in biology. Heisenberg’s uncertainty relations and Schrödinger’s probability waves haven’t reached the practices of the DNA manipulators and the brain-as-computer proponents, who still believe that science and technology will eventually fully explain and duplicate life and consciousness.

In my opinion, Quantum Mechanics has set axiomatic limits to the expansion of science, which allows magic to return and put a soft claim on the regions beyond those limits of experimental science. In any case, using an Astrological Darwinism internal rationale, after peak Science consciousness in the Age of Aquarius, magical consciousness will return on and by itself, replacing scientific consciousness while *progressing* towards the next genetic boost creative window with its peak in the upcoming Age of Leo.

## 7 Quantum Biology and the ‘chosen mutations’ axiom

Since the advent of Quantum Mechanics, scientific determinism as a centuries old research program or paradigm is under pressure. But to take Bohr as an example, an agnosticism stance concerning the principle of life as beyond science doesn’t make a competing paradigm. Just criticizing and talking about the limits of the old and well settled and thoroughly institutionalized deterministic research program cannot compete with it as such. For that, a positive alternative is needed, with its own constructive content in which one can believe. In terms of the known philosophy, the issue of ‘random mutations’ versus ‘chosen mutations’ is formulated as ‘determinism’ versus ‘free will’. A ‘random mutation’ follows the laws of physics in general and quantum mechanics in special. A ‘chosen mutation’ has all the properties of free will and is the source of free will in humans. ‘Chosen mutation’ as the primary ‘free will’ phenomenon is in principle beyond science and cognition and would thus implicate the end of determinism, by axiomatic definition.

The present debate concerning determinism is confusing because of the status

of probability in Quantum Mechanics. In nineteenth century thermodynamics, probability enters physics due to a lack of possible knowledge regarding the initial situation a large aggregate of atomic scale particles. For determinism, this was not problematic. In Quantum Mechanics, probability is an intrinsic property of single atomic scale particles, as long as they can be described by a matter wave equation, so before measurement. Some proponents of the deterministic research program consider intrinsic quantum probability already as a bridge to far and as surrendering the deterministic paradigm. In my view, they are correct in their opinion, because it is exactly the intrinsic nature of quantum probability which creates a window of opportunity for the magic of the Goddess Principle or 'Beyng' and the connected Astrological Darwinism. Without intrinsic quantum probability, 'chosen mutations' would depend on the God Principle of manipulating the laws of physics and as such a mere variant of Creationism/Intelligent Design.

But because all the 'make quantum probability classical again' research attempts have failed thus far, from Einstein to 't Hooft, alternatives have been developed to save both intrinsic quantum probability and determinism. One of these is a later version of the Broglie-Bohm pilot wave interpretation of Quantum Mechanics. Another one is Everett's Many Worlds interpretation of Quantum Mechanics, in which every quantum probability is realized in it's own parallel world, with a continuous splitting of Worlds into as many parallel Worlds as there are possible outcomes of measurements. In Everett's narrative, the intrinsic indeterminism of Quantum Mechanics is transformed into the extrinsic appearance of Many Parallel Worlds. The latest development is to fuse Many Worlds with the Multiverse, for example by assuming the existence of a Big Bang Planck Wave Equation which is then splitting in as Many Universes as the Cosmic Egg Wave Equation allows for. All these attempts are narratives beyond experimental science, mixed with a little bit or an enormous amount of mathematics. Due to the combination of complex mathematics and a lot of quantum speak, these theories look impressive and often need as much years of harsh study to master them as ordinary experimental science, but they are and remain meta-experimental-physics narratives, in short metaphysics. The amazing willingness to render credibility to these fantastic narratives of an infinite number of parallel worlds or Universes derives from the deterministic paradigm which they are trying to save, a paradigm that is deeply embedded in today's science, as well on the subconscious as on the institutionalized level.

All this is coming together in the 'origin of life' issue. The large majority of today's genetic engineers for example simply deny the relevance of quantum mechanics for genetics. They pretend to continue to live in the pre-quantum era, where atoms and molecules can be arranged as balls on a stick, untouched by intrinsic quantum probability. The randomness of mutations in their perception

is simple thermodynamic in nature and thus not a fundamental problem in search for a deterministic explanation of life. These genetic engineers, many of them commercially involved in the research labs of big corporations, continuously find specific genes producing definite properties as in a LEGO toy environment. Only a small minority of today's genetic engineers realize that things are a bit more complicated.

Then there is the 'What is life?' booklet of Schrödinger from 1944 in which he explains why Quantum Mechanics cannot possibly explain the hereditary a-periodic molecule, today's DNA [26]. In order to be able to do so, Quantum Mechanics should be revised in such a way that the intrinsic randomness could be removed by reducing it to more fundamental laws of physics. He firmly believed that this reduction of quantum randomness to sub-quantum order should be possible, due to the fact that he refused to let go of the materialistic and deterministic research program. He is one of the first quantum physicist to have realized that 'random mutations' cannot possibly produce the highly ordered DNA replicators.

A decade before Schrödinger, quantum physicist Jordan came to the same conclusion regarding the capacity of Quantum Mechanics to explain life, but he had a different solution because he didn't want to revise Quantum Mechanics. Instead he proposed to let go of the deterministic research program, as far as life was concerned. His elementary quote was '*L'homme machine*': *this idea is simply incorrect.* [27] He also wrote: *Ein Organismus wird nach dieser Theorie im Einzelfall akausal reagieren, und sich damit wesentlich von anorganischen Gebilden unterscheiden.* (Jordan, 1932, [27]) which translates as: *According to this theory, in individual cases an organism will react a-causal, and thus differentiate itself fundamentally from inorganic complexes.* This is in line with the vision of Bohr, who regarded the organic and the inorganic as complementary fields with each their own leading principle. But again, a-causal is simply not 'causal in the way science can explain things', without specifying the positive content from which the a-causal derives its decisions.

In the twenty first century, this has become a debate regarding the status of Quantum Biology among biologists, biochemists and biophysicists regarding the origin of life issue, defined as the appearance of the first self-replicating macromolecule or proto-biont. The biggest part of the biologists simply deny the relevance of Quantum Mechanics for biology, thus firmly remaining within the nineteenth century research program or belief system, but with full use of twenty first century technology, which has been developed by quantum physicists. The innovators in the field realize that Quantum Mechanics is unavoidable. They mainly try to explain the weirdness of life and its phenomena by comparing it to the weirdness of Quantum Mechanics. Most quantum biologists work within the deterministic research program and see the quantum weirdness as an opportunity in their at-

tempt to explain organic phenomena, especially its origin in the first replicator. The more exotic among them try to use quantum computing with qubits, something that hasn't been developed yet by physicists, to develop a narrative which explains the appearance of the proto-biont or first replicator.

This development is of course a bit weird itself, because quantum computing will remain firmly within the axioms of Quantum Mechanics, it will be a mere application of its principles. For physicists it is clear that qubits will not solve the origin of life issue of the 'random mutation' mechanism versus the highly ordered DNA self-replicator result. Qubits will not eliminate the intrinsic randomness of Quantum Mechanics, they will function according to the perfect intrinsic quantum randomness. We can quote physicist from Bohr into the twenty first century who continue to argue that Quantum Mechanics isn't capable of explaining living self-replicators, thus limiting to seriously damaging the deterministic paradigm. But non of them formulate a viable, competing alternative paradigm or research program, as I am trying to do by introducing Astrological Darwinism including the Goddess Principle as 'Beyng' or 'élan vital'.

It is my conviction that the deterministic paradigm will remain dominant in the life sciences for at least another hundred years, perhaps even two centuries, during which the research program will produce priceless innovations in nano-biology and eventually also pico-biology. But during these one or two centuries, the measurement problem of Quantum Mechanics and its intrinsic randomness in combination with the complementary principle of biology as foreseen by Bohr, will start to haunt bio-sciences to such a degree that eventually they will accept the limits of science vis a vis life and abandon the paradigm of striving to a total engineering life from scratch. Prohibitions aren't needed to achieve this slow abandoning of determinism because it will be inevitable. Hybris will always end itself by incompetence alone. What will remain is a bio-science in recognition of its limits and with full appreciation of its accomplishments.

In the next sub sections I will extensively use quotes as a method to illustrate the above and to give the reader a chance to form its own judgment.

## 7.1 Determinism as a centuries old research program

Vaidman, in 2014, discussed the problem of free will relative to scientific determinism. According to Vaidman [28], a clear and radical position was expressed by Spinoza:

*In nature there is nothing contingent, but all things have been determined from the necessity of the divine nature to exist and produce an effect in a certain way. (Spinoza, 1677, [29])*

A bit later, Leibniz expressed a similar opinion, but now in mathematical terms, as:

*Everything proceeds mathematically ... if someone could have a sufficient insight into the inner parts of things, and in addition had remembrance and intelligence enough to consider all the circumstances and take them into account, he would be a prophet and see the future in the present as in a mirror. (Leibniz, 1680, [30])*

This deterministic view evolved into the Newtonian worldview, as expressed by Laplace:

*We may regard the present state of the Universe as the effect of its past and the cause of its future. An intellect which at a certain moment would know all forces that set nature in motion, and all positions of all items of which nature is composed, if this intellect were also vast enough to submit these data to analysis, it would embrace in a single formula the movements of the greatest bodies of the Universe and those of the tiniest atom; for such an intellect nothing would be uncertain and the future just like the past would be present before its eyes. (Laplace, 1814, [31])*

This claim became known as the ‘Laplacian Demon’. In the end of the nineteenth century, first Maxwell’s electrodynamics and then thermodynamics were added to the Newtonian picture, together with an emerging atomism in physics and chemistry.

*The dominant view then was that physics, consisted of Newton’s mechanics and Maxwell’s electrodynamics, is a deterministic theory which is very close to provide a complete explanation of Nature. Most scientists accepted a gedanken possibility of existence of ‘Laplacean Demon’. (Vaidman, 2014, [28])*

Hundred years after Laplace, but still before the rise of Quantum Mechanics, Russell discussed the same issue, but also expressed doubts regarding the possible/principle reduction of free will to physical law:

The law of causation, according to which later events can theoretically be predicted by means of earlier events, has often been held to be *a priori*, a necessity of thought, a category without which science would not be possible. These claims seem to me excessive. In certain directions the law has been verified empirically, and in other directions there is no positive evidence against it. But science can use it where it has been

found to be true, without being forced into any assumption as to its truth in other fields. We cannot, therefore, feel any *a priori* certainty that causation must apply to human volitions. (Russell, 1914, [32])

Russell had philosophical and epistemological doubts, but with the rise of Quantum Mechanics, physicists too started to doubt determinism. This changed the scene regarding the issue of free will versus determinism. But with the doubting side being mainly agnostic and the deterministic side continuing the old paradigm, most fields of science continue within the research program set by the philosophers and scientists of the Enlightenment, simply ignoring or denying the relevance of Quantum Physics for their subject of study. Regarding the continuation of determinism as a research program for scientists, Earman gave a description of its practice that explains how a paradigm works:

*... while there is no a priori guarantee that the laws of the ideal theory of physics will be deterministic, the history of physics shows that determinism is taken to be what might be termed a ‘defeasible methodological imperative’: start by assuming that determinism is true; if the candidate laws discovered so far are not deterministic, then presume that there are other laws to be discovered, or that the ones so far discovered are only approximations to the correct laws; only after long and repeated failure may we entertain the hypothesis that the failure to find deterministic laws does not represent a lack of imagination or diligence on our part but reflects the fact that Nature is non-deterministic. (Earman, 1986, [33])*

In practice, scientists’ imagination regarding ways to continue the deterministic world view against all odds is astonishing. The credibility of these attempts is derived from the research program that has motivated science for centuries. Vaidman also continues to support the deterministic paradigm:

*I do not see a “failure to find deterministic laws of physics”. All physical laws I studied, except for the collapse of the wave function which has many other properties which suggest to rejected it, are deterministic. I think that the prevailing view of indeterminism in the last century is an accidental mistake of the evolution of Science, similar to ether hypothesis rejected hundred years ago. (Vaidman, 2014, [28])*

Vaidman is in company of famous others. He mentioned Schrödinger, Plank and Einstein, with his dictum: “God does not play dice”, as physicists who were standing against stochastic indeterminism. Bohm, de Broglie and lately ‘t Hooft can be added to the list. We quote ‘t Hooft, who we can allocate in the secular tradition of Leibniz and Laplace:

*If a theory is deterministic all the way, it implies that not only all observed phenomena, but also the observers themselves are controlled by deterministic laws. They certainly have no ‘free will’, their actions all have roots in the past, even the distant past. Allowing an observer to have free will, that is, to reset his observation apparatus at will without even infinitesimal disturbances of the surrounding universe, including modifications in the distant past, is fundamentally impossible. The notion that, also the actions by experimenters and observers are controlled by deterministic laws, is called superdeterminism. (‘t Hooft, 2014, [34], p.10)*

The present day issue regarding determinism and free will focuses on the origin of life and the question if science can explain and thus reproduce life in the laboratory. Quantum Mechanics is seen by physicist as the key specialism to tackle the challenge regarding the origin of life. Free will is a property of living beings, humans, and if those beings can be reproduced then free will is also replicated and explained.

## 7.2 Jordan about Quantum Biology in 1932

I start with a quote from Jordan (which I translated):

*Consequently the following belongs to the essence of the living: For the inorganic nature it is a defining tag that the statistical non-causality of the atomic reactions, through ‘averaging’ leads to the reign of almost perfect causality in the macroscopic domain. For the organic matter it is a defining tag that the non-causality of specific atomic reactions amplifies itself into macroscopic notable non-causality.*

*The German original reads: Das gehört also zum Wesen des Lebendigen: Für die anorganische Natur ist kennzeichnend, daß die statistische Akausalität der atomaren Reaktionen durch „Mittelbildung“ dazu führt, daß in makroskopischen Dimensionen praktisch vollkommene Kausalität besteht. Für die organische Natur ist kennzeichnend, daß die Akausalität bestimmter atomarer Reaktionen sich verstärkt zur makroskopisch wirksamen Akausalität. (Jordan, 1932, [27])*

The ‘statistical non-causality’ is Jordan’s description of ‘intrinsic quantum randomness’ that is beyond determinism due to its randomness and in that sense non-causal. In non living matter this leads, in large numbers, to macroscopic perfect causality, the same as in classical thermodynamics. In large numbers, the wave equation of Quantum Mechanics leads to very high precision in its predictions, which is a possible definition of scientific causality and determinism. This allows



physicists and engineers to construct things like reliable computers and internet communication using lasers. In the living, this non-causality of individual atomic reaction doesn't average away, but on the contrary is able to maintain itself well into macroscopic domain. It is significant that Jordan doesn't add the character 'statistical' to the individual atomic reaction in the living. Because it doesn't lead to an stochastic average on the macroscopic scale, it cannot be called random at the individual, microscopic scale. What Jordan describes as the 'non-causality of specific atomic reactions' with the specific omission of the word 'statistical' is what I call 'chosen collapse of the wave function' which produces 'random mutations'.

In the second quote, Jordan seems to introduce Quantum Biology, which he differentiates from Classical Biology.

*We can divide the reactions of an organism in two zones. First the zone of macroscopic causality, in which all reactions elapse in observable manner according to causal mechanical and chemical reactions. Secondly the zone of the "conducted" reactions, which play out at very small amounts of substances down to the atomic scale, which (according to Quantum Mechanics) consequently aren't causally determined, but which on the other hand (according to physiology) work determinative relative to the reactions of the first zone.*

*The German original reads: Wir können die Reaktionen eines Organismus in zwei Zonen einteilen. Erstens die Zone der makroskopischen Kausalität, in welcher alle Reaktionen in beobachtbarer Weise nach kausalen mechanischen und chemischen Gesetzen verlaufen. Zweitens die Zone der „dirigierenden“ Reaktionen, welche sich an sehr geringen Substanzmengen bis zu atomarer Größenordnung herunter abspielen, welche also (nach Ausweis der Atomphysik) nicht kausal determiniert sind, welche aber andererseits (nach Ausweis der Physiologie) gerade auslösend gegenüber den Reaktionen der ersten Zone wirken. (Jordan, 1932, [27])*

His two zones nicely follow the split arising at the beginning of the twenty first century between the zone of Classical Biology and the zone of Quantum Biology. Jordan goes beyond present day Quantum Biologists, who still work within the deterministic paradigm, when he describes the conducting reactions on the quantum scale as non-causal on the level of atoms, but still determining macroscopic physiological outcomes. Because the physiological outcomes aren't large scale averages, the second zone of Quantum Biology in its very core of individual atomic scale wave function collapse isn't functioning statistically or randomly.

Jordan continues to compare the structure and functioning of an organism with measuring devices used in physics to amplify events involving individual atoms to

macroscopic effect. This amplifier theory of organisms, the capacity to amplify individual quantum events into specific macroscopic physiological effects, is what separates the living from the non-organic matter, where only large aggregates can amplify quantum events into macroscopic averages. This amplifier idea is in accordance with the intuition of Bergson, who wrote it down before the advent of quantum mechanics in 1907.

Then Jordan continues with the limits of measurements in Quantum Biology as even more stringent than those in Quantum Mechanics.

*It might even be that the “inner” zone of the non-causal reactions, which should be regarded as the locus of the unity of an organism, is distinguished by an even higher degree of being non-observable [alt. transl.:of non-observability] as we know from Quantum Mechanics.*

*Es dürfte vielmehr die „innere” Zone der nichtkausalen Reaktionen, welche als der Sitz der die Einheit eines Organismus konstituierenden Reaktionsfähigkeiten anzusehen ist, durch einen noch höheren Grad der Nichtbeobachtbarkeit ihrer physikalischen Zustände ausgezeichnet sein, als wir aus der Atomphysik kennen. (Jordan, 1932, [27])*

In my view, the inner zone of non-causal reactions in Quantum Biology knows the highest degree of being non-observable, that of being completely non-observable ‘an sich’, so before its manifestation in Quantum Biology. The character of ‘Beyng’ or the Goddess Principle in its isolated form or ‘an sich’ is concealment. My paradigm is more radical, unconditional actually, than Jordan’s proposal. It’s unconcealment can be registered as Quantum Biology events with non-causal beginning in the ‘inner zone’ of its concealment, eventually leading to macroscopic physiological effects with the intermediary of organic amplifying structures.

Jordan then finishes his analysis of organic matter in comparison to the non-organic analytic capacity of Quantum Mechanics with a Quantum Biology Heisenberg uncertainty relation. He states that there might be an uncertainty relation between the livelihood of an organic structure and the scientific capacity to decompose and thus understand its quantum structure, similar to the situation of a mass with a highly defined momentum and a mass with a sharply determined localization. This resembles Bohr’s later observation, who uses his concept of complementary principles to state the same [3]. Both Jordan and Bohr imply that life, in its core, will probably be beyond scientific experimentation and thus beyond comprehension understood as performing calculable behavior according to definite laws. As such, they both announced the end of the deterministic research program for the zone of the living. What they didn’t do is announce the end of science. On the contrary, they made the first analysis in the field of Quantum Biology by formulating its intrinsic limits as experimental science.

## 7.3 Schrödinger's 1944 'What is life?' [26].

### 7.3.1 Reading Schrödinger, part one; two interpretations

In 1943 Schrödinger gave a series of lectures at Dublin's Trinity College with the title 'What is Life?'. A year later a book based on these lectures with the similar title was published. According to Penrose in a 1991 Foreword to a new edition of 'What is Life?': *It represents a powerful attempt to comprehend some of the genuine mysteries of life, made by a physicist whose own deep insights had done so much to change the way in which we understand what the world is made of.* Later in 2008, Penrose commented:

*Likewise, Schrodinger argues, it is certainly possible that new physical ingredients, going beyond those of 20th century physics, might be needed for a full understanding of the physical underpinnings of life.*

*There are probably not many biologists today who would argue for the necessity of such new physical ingredients in order to explain life.*

*Yet, in an Epilogue (On Determinism and Free Will) to his book, Schrodinger raises the further conundrum of how the conscious mind, with its apparent free will, can be accommodated within the statistico-deterministic framework of our current quantum/classical pictures.*

*[...] this unsatisfactory state of affairs in the foundations of quantum theory no doubt led him to be skeptical of the current dogma that the rules of quantum mechanics must hold true at all levels of physical description. (It may be pointed out that three others of the key figures in the development of quantum mechanics, namely Einstein, de Broglie, and Dirac, have also expressed the opinion that existing quantum mechanics must be a provisional theory.)*

*There is, indeed, a distinct possibility that the broadening of our picture of physical reality that may well be demanded by these considerations is something that will play a central role in any successful theory of the physics underlying the phenomenon of consciousness.*

*[...] the issues that Schrodinger raised concerning the relation of biology to quantum physics.*

*Do we really need to move forward to radical new theories of physical reality, as I myself believe, before the more subtle issues of biology – most importantly conscious mentality – can be understood in physical terms? (Penrose, 2008, [35], p. vii–x,)*

What is apparent in Penrose's comment, is the continued belief of Penrose in the deterministic paradigm. If quantum physics as it is today cannot bring us a theory

of life and consciousness, then it isn't the deterministic research program that is at stake, but Quantum Mechanics because it doesn't fulfill the promise of the paradigm, such it the reasoning. The goal is 'a full understanding of the physical underpinnings of life'. This goal is not questioned by Penrose. Is it even possible to understand the more subtle issues of biology in physical terms? In my view, this is impossible. Penrose believes it is. Penrose focuses on consciousness at today's level of evolution, I focus more on genetic mutations at the origin of life.

As for Quantum Biology, Penrose states that 'There are probably not many biologists today who would argue for the necessity of such new physical ingredients in order to explain life.' This is a confusing statement, because: 1. the majority of today's biologists consider Quantum Mechanics to be not necessary in order to gain a deterministic understanding of life; 2. a minority believes that Quantum Mechanics as it is will be needed and suffice in Quantum Biology in order to gain a deterministic understanding of life; 3. a minority of physicists believe that Quantum Mechanics needs to be and can be revised in order to gain a deterministic understanding of life in Quantum Biology; 4. a majority of of physicists believe that Quantum Mechanics cannot and doesn't need to be revised and a small minority of them expressed the belief that Quantum Biology is needed but that it will never suffice in order to gain a deterministic understanding of life. Category 1. is living the nineteenth centuries dream. Category 2. are biologists who lack a sufficient understanding of the fundamental problems of the quantum basis of life and of the measurement limitations of Quantum Mechanics. Category 3. has the problem that all attempts to find a sub-quantum deterministic theory has failed. Category 4. has the problem that they do not formulate or lack an alternative paradigm regarding life because they stop at the 'it can't be done' agnostic level. Then there is the 'hors category' of those who believe it is enough to reinterpret Quantum Mechanics without changing its hardware in order to save the deterministic belief, like Everett's Many Worlds re-interpretation who simply connects an extended narrative to the intrinsic quantum probability.

Penrose raises the issue of how the mind and free will, can be explained using the statistico-deterministic framework of today's quantum/classical pictures. But this also is confusing, because the classical statistics of thermodynamics, being circumstantial, remains firmly within the deterministic framework, while the quantum statistics, being intrinsic, is already halfway out of the deterministic framework. Using both in a single frase 'quantum/classical picture' doesn't help.

Abbot, Davies and Pati, the editors of the volume 'Quantum aspects of life' have a different interpretation of Schrödinger's intention with 'What is Life?':

*A landmark event in the history of science was the publication in 1944 of Erwin Schrodingers book What is Life? Six decades later, the question remains unanswered. Although biological processes are increasingly*

*well understood at the biochemical and molecular biological level, from the point of view of fundamental physics, life remains deeply mysterious. Schrodinger himself drew inspiration from his seminal work on quantum mechanics, which had so spectacularly explained the nature of matter, believing it was sufficiently powerful and remarkable to explain the nature of life too. (Abbot, Davies and Pati, 2008, [35], p. xiii)*

The last sentence, claiming that Schrödinger believed Quantum Mechanics to be powerful enough to explain life is contradicting the comment of Penrose, who stated that Schrödinger was skeptical regarding the foundations of Quantum Mechanics because it couldn't explain 'free will' and the essence of life. Such a contradiction in two subsequent forewords in one single book is exemplary for the confusing state of affairs regarding Quantum Biology as the application of Quantum Mechanics in Biology. In my view, Penrose is correct in his reading of Schrödinger.

The authors continue with:

*To be sure, quantum mechanics is indispensable for explaining the shapes, sizes and chemical affinities of biological molecules, but for almost all purposes scientists go on to treat these molecules using classical ball-and-stick models.*

*Life still seems an almost magical state of matter to physicists; furthermore, its origin from non-living chemicals is not understood at all.*

*In recent years, circumstantial evidence has accumulated that quantum mechanics may indeed, as Schrodinger hoped, cast important light on lifes origin and nature. (Abbot, Davies and Pati, 2008, [35], p. xiii)*

Again, this is not what Schrödinger hoped. Schrödinger hoped to re-invent Quantum Mechanics by formulating a more fundamental theory in which the observations by Jordan, that life's macroscopic order stems from the quantum reactions involving a collapse of the matter wave of a single or only a few atoms, could be made causal again in the classical, deterministic sense. Schrödinger didn't believe that Quantum Mechanics could cast important light on life's origin and nature. He was firmly convinced that in order to save his materialist and deterministic belief, Quantum Mechanics had to be fundamentally transformed. In fact, the analysis of Jordan and the one of Schrödinger are almost identical. They differ in the conclusion as black and white. Jordan reacts in the line of Bergson and Heidegger and is willing to give up the deterministic paradigm. Schrödinger follows Laplace and thus wants to give up Quantum Mechanics for a deterministic replacement. And Penrose follows Schrödinger.

### 7.3.2 Reading Schrödinger, part two; the original

*As we shall presently see, incredibly small groups of atoms, much too small to display exact statistical laws, do play a dominating role in the very orderly and lawful events within a living organism. They have control of the observable large-scale features which the organism acquires in the course of its development, they determine important characteristics of its functioning; (Schrödinger, 1944, [26], p.20)*

*How can we, from the point of view of statistical physics, reconcile the facts that the gene structure seems to involve only a comparatively small number of atoms (of the order of 1,000 and possibly much less), and that nevertheless it displays a most regular and lawful activity - with a durability or permanence that borders upon the miraculous? (Schrödinger, 1944, [26], p.46)*

*In the light of present knowledge, the mechanism of heredity is closely related to, nay, founded on, the very basis of quantum theory. (Schrödinger, 1944, [26], p.47)*

*The conjecture that a gene is a molecule is today, I dare say, a commonplace. [...] Quantum mechanics is the first theoretical aspect which accounts from first principles for all kinds of aggregates of atoms actually encountered in Nature. [...] Consequently, we may safely assert that there is no alternative to the molecular explanation of the hereditary substance. (Schrödinger, 1944, [26], p.57)*

*We believe a gene -or perhaps the whole chromosome fibre -to be an aperiodic solid. (Schrödinger, 1944, [26], p.61)*

*But, strangely enough, there is just one general conclusion to be obtained from it, and that, I confess, was my only motive for writing this book. (Schrödinger, 1944, [26], p.67)*

*From Delbruck's general picture of the hereditary substance it emerges that living matter, while not eluding the 'laws of physics' as established up to date, is likely to involve 'other laws of physics' hitherto unknown, which, however, once they have been revealed, will form just as integral a part of this science as the former. (Schrödinger, 1944, [26], p.68)*

*[...] the laws of physics, as we know them, are statistical laws [...] (Schrödinger, 1944, [26], p.68)*

*What is the characteristic feature of life? When is a piece of matter said to be alive? When it goes on 'doing something', moving, exchanging material with its environment, and so forth, and that for a much longer*

*period than we would expect of an inanimate piece of matter to 'keep going' under similar circumstances. (Schrödinger, 1944, [26], p.69)*

*It is by avoiding the rapid decay into the inert state of 'equilibrium' that an organism appears so enigmatic; so much so, that from the earliest times of human thought some special non-physical or supernatural force (vis viva, entelechy) was claimed to be operative in the organism, and in some quarters is still claimed. (Schrödinger, 1944, [26], p.70)*

*What I wish to make clear in this last chapter is, in short, that from all we have learnt about the structure of living matter, we must be prepared to find it working in a manner that cannot be reduced to the ordinary laws of physics. And that not on the ground that there is any 'new force' or what not, directing the behaviour of the single atoms within a living organism, but because the construction is different from anything we have yet tested in the physical laboratory. (Schrödinger, 1944, [26], p.76)*

*The unfolding of events in the life cycle of an organism exhibits an admirable regularity and orderliness, unrivalled by anything we meet with in inanimate matter. (Schrödinger, 1944, [26], p.77)*

*However that may be, the point to emphasize again and again is that to the physicist the state of affairs is not only not plausible but most exciting, because it is unprecedented. Contrary to the common belief the regular course of events, governed by the laws of physics, is never the consequence one well-ordered configuration of atoms -not unless that configuration of atoms repeats itself a great number of times, either as in the periodic crystal or as in a liquid or in a gas composed of a great number of identical molecules. (Schrödinger, 1944, [26], p.77-78)*

*In biology we are faced with an entirely different situation. A single group of atoms existing only in one copy produces orderly events, marvellously tuned in with each other and us number of with the environment according to most subtle laws. (Schrödinger, 1944, [26], p.79)*

*Well, this is a fantastic description, perhaps less becoming a scientist than a poet. However, it needs no poetical imagination but only clear and sober scientific reflection to recognize that we are here obviously faced with events whose regular and lawful unfolding is guided by a 'mechanism' entirely different from the 'probability mechanism' of physics. For it is simply a fact of observation that the guiding principle in every cell is embodied in a single atomic association existing only one copy (or sometimes two) -and a fact of observation that it may results in producing events which are a paragon of orderliness.*

*Whether we find it astonishing or whether we find it quite plausible that a small but highly organized group of atoms be capable of acting in this manner, the situation is unprecedented, it is unknown anywhere else except in living matter. The physicist and the chemist, investigating inanimate matter, have never witnessed phenomena which they had to interpret in this way. The case did not arise and so our theory does not cover it -our beautiful statistical theory of which we were so justly proud because it allowed us to look behind the curtain, to watch the magnificent order of exact physical law coming forth from atomic and molecular disorder; because it revealed that the most important, the most general, the all-embracing law of entropy could be understood without a special assumption ad hoc, for it is nothing but molecular disorder itself. (Schrödinger, 1944, [26], p.79-80)*

*The orderliness encountered in the unfolding of life springs from a different source. It appears that there are two different 'mechanisms' by which orderly events can be produced: the 'statistical mechanism' which produces order from disorder and the new one, producing order from order. (Schrödinger, 1944, [26], p.80)*

*We must be prepared to find a new type of physical law prevailing in it. Or are we to term it a non-physical, not to say a super-physical, law. No. I do not think that. For the new principle that is involved is a genuinely physical one: it is, in my opinion, nothing else than the principle of quantum theory over again. (Schrödinger, 1944, [26], p.80-81)*

*To the physicist I wish to emphasize that in my opinion, and contrary to the opinion upheld in some quarters, quantum indeterminacy plays no biologically relevant role in them (Schrödinger, 1944, [26], p.86)*

*So let us see whether we cannot draw the correct, non-contradictory conclusion from the following two premises: (i) My body functions as a pure mechanism according to the Laws of Nature. (ii) Yet I know, by incontrovertible direct experience, that I am directing its motions, of which I foresee the effects, that may be fateful and all-important, in which case I feel and take full responsibility for them. The only possible inference from these two facts is, I think, that I I in the widest meaning of the word, that is to say, every conscious mind that has ever said or felt 'I' -am the person, if any, who controls the 'motion of the atoms' according to the Laws of Nature. (Schrödinger, 1944, [26], p.86-87)*



### 7.3.3 Reading Schrödinger, part three; my interpretation

I personally fully agree with Schrödinger's observations, but disagree with his way out of the situation. As a Bergsonian vitalist and an eclectic Heideggerian two truths's believer, homoiosis and alethia, following Jordan, I radically opt for a new paradigm regarding life. Let's start with the premises as put down by Schrödinger:

- *incredibly small groups of atoms, much too small to display exact statistical laws, do play a dominating role in the very orderly and lawful events within a living organism*
- *the regular course of events, governed by the laws of physics, is never the consequence one well-ordered configuration of atoms -not unless that configuration of atoms repeats itself a great number of times*
- *In biology we are faced with an entirely different situation. A single group of atoms existing only in one copy produces orderly events, marvellously tuned in with each other and with the environment according to most subtle laws.*
- *we are here obviously faced with events whose regular and lawful unfolding is guided by a 'mechanism' entirely different from the 'probability mechanism' of physics.*
- *the situation is unprecedented, it is unknown anywhere else except in living matter. The physicist and the chemist, investigating inanimate matter, have never witnessed phenomena which they had to interpret in this way. The case did not arise and so our theory does not cover it*
- *The orderliness encountered in the unfolding of life springs from a different source. It appears that there are two different 'mechanisms' by which orderly events can be produced: the 'statistical mechanism' which produces order from disorder and the new one, producing order from order.*

These are the premises, from which Schrödinger derives the conclusion that Quantum Mechanics has to be done over again, with as the required result that the New Quantum Mechanics as a genuine theory of experimental physics is capable of dealing with the order encountered in living organisms. Schrödinger:

- *But, strangely enough, there is just one general conclusion to be obtained from it, and that, I confess, was my only motive for writing this book.*
- *we must be prepared to find it [the living] working in a manner that cannot be reduced to the ordinary laws of physics.*

- *We must be prepared to find a new type of physical law prevailing in it. Or are we to term it a non-physical, not to say a super-physical, law. No. I do not think that. For the new principle that is involved is a genuinely physical one: it is, in my opinion, nothing else than the principle of quantum theory over again.*

Starting with the same premises, my conclusion is that we have to make a quantum jump regarding the old deterministic paradigm and accept the radical alternative. The new principle involved is the Goddess Principle or ‘Beyng’. It produces or causes the ‘chosen collapse of the wave function’ of individual (sub)atomic particles. On the genetic level of the evolution of life it produces ‘chosen mutations’, which is nothing but a subcategory of the ‘chosen collapse of the wave function’. The working of the Goddess Principle cannot be reduced to the ordinary laws of physics, it is a genuine meta-physical law and as such we are justified to call it ‘magical’. Because the source of the ‘chosen collapse of the wave function’ is principally concealed, with the ‘chosen collapse of the wave function’ as it’s first moment of unconcealment, the order causing the ‘chosen collapse’ is beyond control by scientific methods but its unconcealment is in principle in reach of experimental science.

Random collapses of the wave function produce events that fall under the realm of Quantum Mechanics. Random collapses of wave functions are the core business of Quantum Mechanics, its natural environment where it excels. This means that ‘random mutations’, which eventually all are part of a subcategory of ‘random collapses of wave functions’, can only produce events that can be described by standard Copenhagen Quantum Mechanics. According to Jordan, Schrödinger and Bohr, these random collapses cannot possibly produce events that belong to the category of the living. Thus, as a corollary, ‘random mutations’ cannot produce life and Neodarwinism is incompatible with Copenhagen Quantum Mechanics. ‘Chosen mutations’ can produce life, but are beyond control of Quantum Mechanics and thus ‘magical mutations’ from the perspective of Quantum Mechanics. Jordan called these magical collapses of wave functions on the atomic scale non-statistical and non-causal (Akausalität) but nevertheless producing the perceived order of physiology. In my view, these magical collapses of wave functions are rooted in ‘Beyng’ or ‘élan vital’; the Goddess Principle. Astrological Darwinism is compatible with Copenhagen Quantum Mechanics, although its paradigm is a quantum jump away. Astrological Darwinism is a quantum jump beyond the deterministic research program or paradigm that gave a sense of direction to science for the last centuries.

The only genuine, authentic way to restore determinism and Neodarwinism is to follow the choices and conclusion of Einstein, Schrödinger, Penrose and ‘t Hooft and try to find a New Quantum Mechanics for which Schrödinger set the

requirements: it has to be able to explain and reproduce life by means of the laws of experimental physics. In this context, Everett's Many Worlds interpretation of Quantum Mechanics isn't experimental physics but metaphysics and as such cannot be the New Quantum Mechanics as Schrödinger meant it to be. It is my opinion that this New Quantum Mechanics research program is a dead end, impossible to produce or create. As far as life is concerned, 'Being' rules.

## 7.4 Bohr's essays on life and quantum mechanics

In 1958, Bohr published a series of essays he had given through the years on the implications of Quantum Mechanics for human knowledge (Bohr, 1958, [3]). Three of them have either the word 'life' or 'biology' in the title. From these three essays I selected a set of relevant quotes.

### 7.4.1 From 'Light and Life', 1932

The beginning quote sets the stage. Classical mechanics has been superseded by Quantum Mechanics in the atomic realm. This revolution, so Bohr, influences our understanding of life:

*This revision of the foundations of mechanics, extending to the very idea of physical explanation, not only is essential for the full appreciation of the situation in atomic theory but also creates a new background for the discussion of the problems of life in their relation to physics. (Bohr, 1958, [3], p. 7)*

Then Bohr states that Quantum Mechanics is essential for biology and that animate matter has features uncommon for inanimate matter:

*Indeed, the essential characteristics of living beings must be sought in a peculiar organisation in which features that may be analyzed by usual mechanics are interwoven with typically atomistic features to an extent unparalleled in inanimate matter. [...] The recognition of the essential importance of atomistic features in the mechanism of living organisms is in no way sufficient, however, for a comprehensive explanation of biological phenomena. (Bohr, 1958, [3], p. 8)*

But he also writes that the application of Quantum Mechanics in biology, which we nowadays call Quantum Biology, will not be enough for a thorough understanding of the living.

Although Quantum Mechanics will not be enough, Bohr doesn't expect any new property in the living that is alien to non-organic matter:

*If, therefore, we were able to push the analysis of the mechanism of living organisms as far as that of atomic phenomena, we should not expect to find any features foreign to inorganic matter. [...] the idea suggests itself that the minimal freedom we must allow the organism will be just large enough to permit it, so to say, to hide its ultimate secrets from us. On this view, the very existence of life must in biology be considered as an elementary fact, just as in atomic physics the existence of the quantum of action has to be taken as a basic fact that cannot be derived from ordinary mechanical physics. (Bohr, 1958, [3], p. 9)*

The reason that life will continue to hide its secrets from science is, according to Bohr, caused by a measurement problem fundamental to biology. Put in simple words: if we want to understand life's essence, we have to dig so deep that we will kill the living subject under investigation, thus chasing life away by performing the unavoidable invasion into the organism. This, according to Bohr, is the measurement problem in biology. It will prevent Quantum Biology to gain dominion over life.

#### **7.4.2 From 'Biology and Atomic Physics', 1937**

In the next essay, Bohr uses the concept of 'complementarity':

*In fact, we are led to conceive the proper biological regularities as representing laws of nature complementary to those appropriate to the account of the properties of inanimate bodies, [...]. In this sense, the existence of life itself should be considered, both as regards its definition and observation, as a basic postulate of biology, not susceptible of further analysis, in the same way as the existence of the quantum of action, together with the ultimate atomicity of matter, forms the elementary basis of atomic physics. (Bohr, 1958, [3], p. 21)*

The domain of biology and physics are complementary, but both are regulated by laws of nature. To be alive is an axiomatic addition, a first principle, applicable to the living and not to the inorganic. It is an axiom that sets the living apart from the non-living. Although it might seem self-evident and a tautology, but by using the concepts 'axiom' and 'complementary', Bohr expresses his conviction that physics cannot understand the living in its essence of being alive. He limits the analytic capacity of all Quantum Biology, of the application of Quantum Mechanics in biology. From the perspective of the deterministic research program or paradigm, this is huge.

Then he differentiates his position from both determinism (reducing everything to mechanics or quantum mechanics) and vitalism (as for example Bergson's 'élan vital'):

*It will be seen that such a viewpoint is equally removed from the extreme doctrines of mechanism and vitalism. (Bohr, 1958, [3], p. 22)*

Bohr specifies the limits of mechanism/determinism in a way that is still highly relevant for today's issues as for example the 'brain as a (quantum) computer' analogies:

*On the one hand, it condemns as irrelevant any comparison of living organisms with machines, be these the relatively simple constructions contemplated by the old iatro-physicists, or the most refined modern amplifier devices, the uncritical emphasis of which would expose us to deserve the nickname of "iatro-quantists." (Bohr, 1958, [3], p. 22)*

This is quite significant because Bohr simply says that a 'Frankenstein' is incompatible with Quantum Mechanics. Modern medicine has the man-machine idea as a leading principle, starting in the Renaissance with the comparison of the heart with a pump. In our times, the man-machine metaphor is more popular as ever. The metaphor updates itself in popular literature every time new technologies develop, but the principle and the supporting belief system or paradigm remains the same. The man-machine metaphor as a research program has given as mechanical kidneys, mechanical lungs, mechanical hearts used in hospitals for temporary taking over functions of organs. What Bohr states is that this research program is reaching its limits in the form of a measurement problem, comparable to the one in Quantum Mechanics. Simply stated: machines can take over many partial functions of a living organism, but there will never be a machine that can take over the function of being alive. Being alive is an axiom and as such its functioning is out of reach of science, its presence is the starting point for all medicine. Once life has departed, all medicine becomes useless. Bohr claims that Quantum Mechanics implicates that this limit is eternal, whatever "iatro-quantists" will try or pretend.

But Bohr is not only criticizing the pretension that life can be constructed from inanimate matter, from scratch, in the laboratory. He also resists attempts to use the demise of determinism relative to the origin of life issue as an occasion to reanimate any form of vitalism that is inconsistent with the known laws of science.

*On the other hand, it rejects as irrational all such attempts at introducing some kind of special biological laws inconsistent with well-established physical and chemical regularities [...]*

The content of biology *as a science* has to be reducible to physics and chemistry, otherwise it will not be scientific. This limit is instrumental: physics and chemistry provide the analytic equipment and the theoretical background for the use of those technologies in biology. Therefore, biologists have to register the result of their research in terms provided by physics and chemistry.

*In this connection it must be especially remembered that the possibility of avoiding any such inconsistency within the frame of complementarity is given by the very fact that no result of biological investigation can be unambiguously described otherwise than in terms of physics and chemistry, just as any account of experience even in atomic physics must ultimately rest on the use of the concepts indispensable for a conscious recording of sense impressions. (Bohr, 1958, [3], p. 22)*

In my view, Bohr sets severe limits to vitalism, without rendering it impossible. My paradigm of ‘chosen collapse of the wavefunction’ as being at the origin of life doesn’t go against any known law of physics and chemistry, because each single ‘chosen wave function collapse’ realizes one of the possible wave function collapses predicted by the matter wave equation. A ‘chosen collapse’ has to realize an Eigenstate in Hilbert Space. A single ‘chosen collapse’ in animate matter cannot be differentiated from a single ‘random collapse’ in inanimate matter because both can realize any Eigenstate in Hilbert Space. Only a long chain of such ‘chosen collapses’, each of which is possible according to the laws of Quantum Mechanics, is going to stand out against inanimate matter due to its increasing improbability. And this highly improbable character of living phenomena is exactly what is registered by biologists using the chemical and physical instrumentation in biology. Thus, the concept of ‘chosen wave function collapse’ isn’t in conflict with the limits to vitalism set by Bohr. It isn’t supported by Bohr either, he is against vitalism, but I do not pretend it to be. The paradigm of Astrological Darwinism is in its essence magical and as such beyond science. A ‘chosen collapse of the wave function, appearing in evolution as ‘chosen mutations’ is like a quantum jump away from traditional science and it cannot be logically deduced from it. It’s principle is part of metaphysics, not physics, but the phenomena it produces can be registered using the equipment of physicists.

#### **7.4.3 From ‘Physical Science and the Problem of Life’, 1957**

Then, decades later, and a few years after the discovery of the structure of DNA, Bohr mentions the insight gained into the phenomenon of natural DNA change, as an example of the use of atomic physics in biology:

*Progress in the field of atomic physics has, as is well known, found wide application in the biological sciences. In particular, I may mention the understanding we have gained of the peculiar stability of chemical structures in the cells responsible for the hereditary properties of the species, and of the statistical laws for the occurrence of mutations produced by exposing organisms to special agencies. (Bohr, 1958, [3], p. 100)*

Especially interesting is his mentioning of *the statistical laws for the occurrence of mutations produced by exposing organisms to special agencies*, his description of ‘random mutations’. These special agencies can be chemical substances, radioactive substances, cosmic radiation and other natural causes. These natural agencies produce mutations according to statistical laws and thus are ‘random mutations’.

Nevertheless, even with the advance of knowledge due to the application of atomic physics, Bohr remains critical of its reach relative to the specific character of the living:

*Here we must realize that the description and comprehension of the closed quantum phenomena exhibit no feature indicating that an organization of atoms is able to adapt itself to the surroundings in the way we witness in the maintenance and evolution of living organisms. (Bohr, 1958, [3], p. 100)*

So even the discovery of the structure of DNA and the phenomenon of ‘random mutations’ do not convince Bohr that the mystery of the origin of life is any closer to its unconcealment by science. In physics, organizations of atoms, behaving according to the laws of quantum physics, do not produce phenomenon comparable to the ones that can be witnessed in living organisms. This implies that Bohr didn’t believe that the combination of ‘random mutations’ according to the statistical laws of physics and ‘natural selection’ were enough to explain the origin of life and evolution.

Bohr also continues to express his opinion regarding the complementary characters of the living and the inanimate, again formulated as a measurement problem:

*Furthermore, it must be stressed that an account, exhaustive in the sense of quantum physics, of all the continually exchanged atoms in the organism not only is infeasible but would obviously require observational conditions incompatible with the display of life. (Bohr, 1958, [3], p. 100)*

What Bohr didn’t do was the formulation of a positive alternative as an addition to his skeptic attitude regarding what we today would call Quantum Biology to realize a reductionist explanation of life.

## **7.5 Quantum Biology and the origin of life**

### **7.5.1 The Neodarwinist narrative**

The standard deterministic view in molecular biology is given by Brenner:

*Molecular biology is nothing more than the search for explanations of the behavior of living things in terms of the molecules that compose them. (Brenner 1974, [36])*

It reduces behavior to the composition of molecules, which in turn are simply viewed as made of atoms on sticks. Quantum Mechanics isn't really implied here. The connected research program, or enterprise, is formulated as:

*Much has been written about the philosophical consequences of molecular biology. I think it is now quite clear what the enterprise is about. We are looking at a rather special part of the physical universe which contains special mechanisms none of which conflict at all with the laws of physics. That there would be new laws of Nature to be found in biological systems was a misjudged view and that hope or fear has just vanished. Our job is simply to find out how these interesting pieces of machinery work, how they get built and how they came to be the way they are. In one sense, the answers already exist and all we have to do is to find out how to look them up in Nature. That is why molecular biology seems to me to be the art of the inevitable. (Brenner 1974, [36])*

This is the confidence of Modernist determinism, not at all shattered by the doubts of the founders of Quantum Mechanics. It is proof that belief systems and their paradigms can continue to function long after the destruction of their foundation.

With regard to life and evolution, Neodarwinism is still firmly established in the narrative of 'random mutations' and 'natural selections' although serious calculations and considerations lead to the conclusion that the 'random' part of the 'random mutations' half of Neodarwinism is a narrative which doesn't hold scientifically.

*Evolution occurs through random mutations, which are local changes in the genetic sequence. In the long run, however, only a small fraction of the mutations survive – those proving advantageous to the organisms. This optimizing mechanism is labeled Darwinian selection, i.e. competition for limited resources leading to survival of the fittest. (Patel, 2008, [37], p.191)*

That the genetic sequence is a unique and small set of atoms, to a degree of uniqueness and individualization that the random processes of Quantum Mechanics cannot possibly explain its origin, nor its functioning, is simply ignored. That is how paradigms work: as long as it is possible, deny problems with its premises.

*The procedure of optimization needs a process of change, and a process of selection. The former is intrinsic, the latter is extrinsic, and the*



*two take place at different levels in biology. Indeed the difference between the two provides much ammunition for debates involving choice vs. environment, or nature vs. nurture. The changes are provided by mutations, which occur essentially randomly at the genetic level. That describes the genotype. The selection takes place by the environmental pressure at the level of whole organisms. It is not at all random, rather it is biased towards short-term survival (till reproduction). That describes the phenotype. (Patel, 2008, [37], p.192)*

As Patel states: *The changes are provided by mutations, which occur essentially randomly at the genetic level.* It doesn't matter that serious scientific considerations inevitably leads to the conclusion that the random part cannot be justified, the narrative continues. Forces outside of science itself are at work in maintaining the narrative, or rather the social discipline of continuation of the narrative.

### **7.5.2 Pattee's 1967, 1969 and 1971 papers**

Pattee in 1967 wrote the simple question:

*[...] if quantum mechanical laws were not necessary for understanding living matter, why can we not build classical hereditary machines which are alive? (Pattee, 1967, [38])*

In the perspective of Pattee, classical physics had been developed far enough to accomplish the task, if it were possible. This implies that it is time to explore the role of Quantum Mechanics in living organisms. There is a first obstacle, the founding physicists of Quantum Mechanics:

*Turning, then, to quantum mechanical description, it is at first surprising to find so many quantum physicists with strong doubts about the possibility of explaining living matter in terms of quantum mechanics. (Pattee, 1967, [38])*

These doubts are then contrasted with the optimism of biologists:

*Therefore, in spite of the optimism of geneticists and molecular biologists that the secret of heredity is relatively simple and nearly completely understood in terms of the laws of physics, there are substantial arguments by competent physicists that neither classical, statistical, thermodynamic nor quantum mechanical laws are alone sufficient for describing the known hereditary properties of life. (Pattee, 1967, [38])*

Pattee then positions himself relative to the issue:

*Although I do not agree with this conclusion, I believe that in the case of hereditary behavior we have an example of a fundamental biological problem where the real difficulty is often more clearly appreciated by the physicist than by the modern molecular biologist.*

*This is not to say that any experimental facts of molecular biology are wrong, but only that their physical and biological interpretations have been somewhat naïve.*

*My own conclusion is that it will be possible to interpret the origin of life and molecular hereditary propagation in terms of fundamental physical laws only by associating the description of a molecular hereditary process with the description of measurement in a quantum mechanical system. (Pattee, 1967, [38])*

Pattee is aware of the problematic situation and of the difference between skeptical physicists and naïve molecular biologists. His own conclusion, or better, the paradigm he prefers, is the quantum version of determinism, statistical-determinism.

The following quote is more interesting:

*But the association of the measurement process with the most elementary hereditary reactions in molecules and the origin of life raises the question, what is the measuring device in the living system? (Pattee, 1967, [38])*

This question is a crucial one. The measuring device causes the collapse of the wave function and forces the quantum system to randomly realize one of the possible Eigenstates in Hilbert Space. According to 't Hooft, in the Copenhagen Interpretation, the measurement realizes the collapse of the wave function: *As soon as the measurement is made, the wave function of the system collapses to a state in the subspace of Hilbert space that is an eigenstate of the observable* [[Hooft2014, p.29-30]] Thus, to ask what the measuring device in the living system might be is asking the question what in the living system is able to cause a collapse of the wave function in such a way that the system remains alive. In my paradigm, this is the exact description of the 'chosen collapse of the wave function'. Thus my answer to Pattee's question would be: the 'élan vital' (the Goddess Principle; Beyng) is the measuring device: by 'looking' at the quantum wave system, the 'élan vital' causes its collapse, an act described in Quantum Mechanics as performed by the measuring device. Which of the Eigenstates will be observed is, in inanimate matter, an intrinsically random process. In living systems, this can be random but it can also be chosen. When the 'élan vital' looks at the wave function, from the 'inside' without external measuring devices, it can choose the Eigenstate the system will collapse into. The result will be a non-random process.

Pattee ends with an observation which fits nicely into the paradigm of the chosen collapse of the wave function:

*The problem still remains, that our basic laws of physics treat nature as if nothing could have happened in any other way than the way it did, whereas all hereditary processes, including our abstract symbolic formalism and mental concepts treat nature as a set of alternatives among which choices can be made. These two logically inconsistent modes of description are at the foundation of the epistemological problem, and a more careful analysis of this apparent paradox will probably reveal that the generalized complementary principle itself has some deeper interpretation. (Pattee, 1967, [38])*

Practically, what he does here is to conclude that Bohr description fits the situation.

In his 1969 paper Pattee starts with a question:

*In biological terminology we describe the recording process as the accumulation of genetic information by natural selection. But this accumulation is now apparent only in highly evolved cells in complex ecosystems. The origin of life problem is to explain how this record accumulation began and why it can survive the universal tendency toward loss of records which occurs in non-living matter. What is the simplest physical system in which a persistent recording process constrains future events? (Pattee, 1969, [39])*

His answer is highly interesting, especially with regards to Schrödinger analysis:

*I believe we must follow the reasonable assumption that the first records were in single molecules, since that is the way they occur in modern cells. (Pattee, 1969, [39])*

This observation is critical, because in Quantum Mechanics, exact, non-random behavior stems from large aggregates of molecules, never from individual molecules. And the quantum exactness is always related to the averaging over large numbers of experiments or outcomes. This is a confirmation of the intuitions of Jordan and Schrödinger relative to the hereditary process. The next question is left without an answer:

*How does the motion of matter lead to records of these motions? [...] What can we mean by a primitive recording process in terms of physical description? In normal usage, the concept of a recording process implies three steps which we may call (1) writing, (2) storage, and (3)*

*reading. [...] it is the physics of writing and reading records which are the difficult concepts, while the physics of the storage, or of the symbol vehicle, is relatively trivial. (Pattee, 1969, [39])*

Only in the twenty first century is genetics starting to seriously work on the analysis of the writing and reading processes in genetics, after the storage sequence of the human genome has been thoroughly analyzed.

A few years later in 1971, Pattee formulated the problem of the origin of life with even more precision. His description allows me to piece in the concept of chosen mutations even more precise. Pattee starts with some general considerations:

*I would like to emphasize that my basic interest has not been the foundations of quantum mechanics, but the origin of life. I am looking for a clear physical reason why living matter is so manifestly different from lifeless matter in spite of the evidence that both living and lifeless matter obey the same set of physical laws. (Pattee, 1971, [40])*

This quote indicates that the difference between the living and the lifeless cannot be found in a different set of laws for each category. Pattee specifies this condition:

*Living matter behaves differently from non-living matter. I will put the problem of the origin of life as simply as possible for this discussion. Living matter is distinguished from non-living matter only by its collective behaviour in the course of time. [...] We know from the detailed experiments of molecular biology that there is almost certainly no microscopic or short-time reaction or interaction within living cells which does not follow the laws of ordinary physics and chemistry. (Pattee, 1971, [40])*

The difference is found in the collective behavior of the living, but the further down the scale of classical biochemistry, the more elusive the difference becomes. Every single materialist detail of processes in living organisms follows known laws of classical biochemistry. From the perspective of classical biochemistry, the difference is not in a different set of laws:

*Many molecular biologists conclude from these experiments that life differs from non-life only because life is very complicated dynamically compared to ordinary physical systems. (Pattee, 1971, [40])*

Of course, the narrative exposes the difference because the specialists can recognize two different categories, the living and the inanimate. Pattee continues:

*In other words, beginning with a common set of dynamical laws for the microscopic motions, we observe living matter evolving hierarchies*

*of collective order, and non-living matter evolving a collective disorder. Even the 'true believer' in total reductionism must agree that this aspect of living matter is different from non-living matter. Unless this crucial difference is explained in terms of physical laws, no one can claim to have reduced life to physics. (Pattee, 1971, [40])*

This sets the stage for the research program of determinism aiming at the reduction of the living to the inanimate. But this goal is too far away to tackle at once. Pattee is trying to focus in on the problem faced by the reductionist:

*Therefore the essential question of the origin of life is to find a physical basis for this clear, empirical dichotomy in the behaviour of matter. In particular we may ask: what is the simplest set of physical conditions that would allow matter to branch into two pathways – the living and lifeless – but under a single set of microscopic, dynamical laws? (Pattee, 1971, [40])*

In terms of the paradigm of Astrological Darwinism, the branching happens at the level where 'random mutations' can be superseded by 'chosen mutations'. This is a matter of statistics (random) or aberration of the expected statistics (chosen). Pattee:

*The problem is to first explain how statistical modes arise spontaneously, and second – the difficult part – to explain how the 'vital' statistical mode leads to increasing organization whereas the ordinary statistical description leads to increasing disorganization. (Pattee, 1971, [40])*

In physics, statistical modes arise from two main sources, thermodynamics and Quantum Mechanics. The thermodynamic randomness cannot be the source of the branching because it isn't fundamental but circumstantial, due to a lack of knowledge that might have been obtained if more effort could be invested. This is confirmed by analysis: all processes in living organisms follow the laws of thermodynamics. The second statistical mode arises in Quantum Mechanics and this randomness is intrinsic: it arises spontaneously at wave function collapse and it is perfectly stochastic and individual. It is here that a 'vital' statistical mode leads to the branching off of the living from the inanimate.

The problem for Pattee as a reductionist is that Quantum Mechanics doesn't have two sets of statistical modes, one 'vital' and one 'stochastic'. His analysis confirms the intuitions of Jordan, Schrödinger and Bohr. It is the context in which Pattee works, one that is already way more ahead in modern biochemistry, that makes the difference between his fact based analysis and the intuitions of Jordan, Schrödinger and Bohr.

It is here that we can insert our ‘chosen collapse of the wavefunction’, caused by the ‘élan vital’, into Pattee’s observation regarding the existence of a ‘*vital*’ *statistical mode* on the quantum level in living organisms. In the context of my paradigm, it is the ‘chosen collapse of the wave function’ caused by the ‘élan vital’ that leads to the ‘*vital*’ *statistical mode* of Pattee. But as an authentic reductionist, of the statistical-deterministic version, Pattee cannot propose such a solution to his problem regarding the origin of life. All he can do is to give a genuine description of the problems faced by the deterministic research program. Pattee ended his analysis with a general remark concerning the deterministic research program or paradigm:

*As the classical idea of laws of nature developed from the times of Galileo and Newton, the concept of determinism was almost always associated with the behaviour of machines. The universe, even including living matter, was compared to a gigantic machine, in spite of the fact that the machine is only found as an invention of the most highly evolved living organisms. [...] The growth of statistical mechanics did not alter the machine analogy since it was generally assumed that the loss of detail was the result of the practical inability of physicists to measure all the degrees of freedom. It was only with the recognition of the inescapable indeterminacy of conjugate variables [in Quantum Mechanics] that the machine analogy to physics broke down. But the machine concept remains an ingrained part of our thought. (Pattee, 1971, [40])*

If we look at the growing amount of books and papers on the brain as a (quantum) computer, and realize that an ordinary computer is already based on quantum mechanics in its internal functioning, Pattee’s observation that the machine concept is still all around despite the rise of quantum indeterminacy is highly accurate.

### **7.5.3 Yockney in 1977 and the ‘warm little pond’**

In 1977 Yockney wrote the paper ‘A Calculation of the Probability of Spontaneous Biogenesis by Information Theory’. From this paper I selected the some pieces of text. The first is about the ‘warm little pond’ origin of life scenario:

*Currently accepted scenarios concerning the origin of life are based on the Darwin-Oparin-Haldane “warm little pond” concept in which nucleotides, amino acids and all the basic compounds necessary to life are thought to have been formed by chemical and physical processes during a period of chemical evolution. The “warm little pond” may have been the whole ocean. According to this scenario these components assembled and disassembled into polymers and from this milieu the first*

*object which could be regarded as living appeared by chance. Once this object, or “protobiont”, was formed it found itself in an enormous nutrient culture which was consumed by its progeny in perhaps several hundred million years more or less and the primitive earth pullulated with organisms. [...] According to Simpson, “Virtually all biochemists agree that life on earth arose spontaneously from nonliving matter and that it would almost inevitably arise on sufficiently similar young planets elsewhere”. [...] It is the purpose of this paper to use information theory to calculate the probability that a protobiont genome could have arisen from randomly assembled polymers. [...] It is concluded that belief in currently accepted scenarios of spontaneous biogenesis is based on faith, contrary to conventional wisdom. (Yockey 1977, [24])*

In the second selection Yockey refers to Schrödinger’s ‘What is Life?’ book:

*The other important and remarkably prescient idea introduced to biology by Schrödinger, namely, the incorporation of an “hereditary code-script” in the chromosome viewed as an “aperiodic” crystal, survives in the form of the genetic code and the sequence hypothesis. He was the first to point out the enormous number of arrangements which could be achieved in this way and which is more than sufficient to record the vast range of biological specificity. His book was written long before the role of nucleic acids as the “aperiodic” crystal incorporating the “hereditary code-script” was known. (Yockey 1977, [24])*

In the third text, Yockey more or less concludes that the ‘warm little pond’ scenario functions as a narrative that cannot be backed up by science.

*The warm little pond scenario was invented ad hoc to serve as a materialistic reductionist explanation of the origin of life. It is unsupported by any other evidence and it will remain ad hoc until such evidence is found. Even if it existed, as described in the scenario, it nevertheless falls very far short indeed of achieving the purpose of its authors even with the aid of a dew ex machina. One must conclude that, contrary to the established and current wisdom a scenario describing the genesis of life on earth by chance and natural causes which can be accepted on the basis of fact and not faith has not yet been written. (Yockey 1977, [24])*

It is the ‘by chance and natural causes’ part of the ‘warm little pond’ scenario that is not supported and that makes it a ‘narrative’ instead of an established scientific fact. That life must have started off in some ‘warm little pond’ on earth a few billion years ago is almost beyond doubt. What caused the kick-off is the open

question. Yockey's conclusion of his calculation of the probability of spontaneous random biogenesis is that the random process is too improbable to be scientifically supportable. He doesn't come up with an alternative causation.

#### 7.5.4 Arnold in 1998 and genetic engineering

In 1990's, genetic modification as a research activity, both industrial and fundamental, starts to become important. The genetic engineers know what they are doing, relative to the evolution of life:

*My research has been devoted to recreating in the laboratory the key processes of evolution and doing it in such a way that we can design scientifically interesting and technologically useful molecules. The challenge is to collapse the time scale for evolution from millions of years to months or even weeks. (Arnold 1998, [41])*

The narrative which surrounds their activities is clearly Neodarwinistic. Arnold contrasts the random, blind process of nature with his own activity as a genetic engineer:

*Evolution does not work toward any particular direction, nor is there a goal; the underlying processes occur spontaneously during reproduction and survival. The laboratory evolution experiment, in contrast, often has a defined goal, and the key processes mutation, recombination, and screening or selections are carefully controlled by the experimenter. (Arnold 1998, [41])*

Arnold then indicates the difficulty of his work as a genetic engineer:

*Obtaining an enzyme with a particular new feature is not a trivial task. It requires a good evolutionary strategy, carefully thought out to maximize the chances of success. Consider the following facts: (i) Protein sequence space is huge: with 20 letters in the protein alphabet, there are  $20^{300}$  – essentially an infinite number of ways to string together 300 amino acids. (ii) Protein space is mostly empty of function, especially the particular function you want. (iii) Beneficial mutations are rare. Combinations of beneficial mutations are very rare. (Arnold 1998, [41])*

The interesting about Arnold's paper is that in it he confirms Yockey's analysis, but now from the perspective of a genetic engineer who firmly believes in the Neodarwinist narrative.



*Given that we now have the tools to implement evolution in the laboratory, the justifications for continuing to try to tame proteins rationally sound rather hollow. In fact, directed evolution is being picked up very quickly by protein engineering groups eager to obtain new functional proteins. The strategies we have developed are robust and can be applied to a wide variety of design problems with a significant probability of success. The limitations, however, of the approach I have outlined are significant. Perhaps the most important is that it will be difficult, if not impossible, to evolve surprising new functions (i.e., those that cannot be created by single or double amino acid substitutions). (Arnold 1998, [41])*

It is clear that genetic engineers are capable of reshuffling DNA sequences and recombining DNA from different sources, but that they haven't got the tools to predict the outcome of their actions. It is basically a trial and error process in DNA reshuffling and studying the effect, hoping something interesting comes out. He clearly states that it is difficult to impossible to design completely new functions, that is, to design new species. If these genetic engineers were responsible for the future of human evolution, that evolution would never ever experience the genetic boosts like for example the cave art creative explosion or the boat fairing genetic quantum jump or the agrarian boost.

If the genetic engineer concludes that he isn't capable of creating something new that involves more than two amino acid substitutions, due to the enormous amount of possible combinations and the lack of insight into the internal processes essential to life, what then to expect of the 'random mutations' process in regard of the supposed capacity to create new species? Input: 1. *Protein sequence space is huge: with 20 letters in the protein alphabet, there are  $20^{300}$  – essentially an infinite number of ways to string together 300 amino acids.*; 2. *The challenge is to collapse the time scale for evolution from millions of years to months or even weeks.*; 3. In the laboratory, they can speed up the rate of random mutations at will. Output: Nevertheless they remain incapable to create complex new functions or species. Conclusion: This is not the way evolution works in nature.

The 'random mutations' as the creative causation of evolution narrative has become unscientific. It lingers on for two reasons, the presence of Creationism and the lack of a positive alternative. It can linger on because the rest of Neodarwinism, the importance of genetics and natural selection and the factual history of the evolution of species, makes real sense. The only reason that the '*random mutations*' as the creative factor part of the evolutionary narrative is still the dominant paradigm in non-Creationist circles is because it completes the evolutionary narrative, upholding the deterministic research program regarding the mystery of life. It is time to give it some competition in the form of an alternative paradigm:

‘chosen mutations’ in Astrological Darwinism.

As to the science or practice of genetic engineering that interprets its own artificial activity in the context of or against the mirror of ‘random mutations’ as nature’s way, it is my opinion that it should be stimulated as much as possible. The best way to get rid of a failing axiom like ‘random mutations’ is to stimulate its proponents to prove it wrong by pushing the experimental research to the limits of the technical possible. We need more scientists like Arnold, who give genuine report of the successes, the difficulties and the impossibilities of genetic engineering against the background of the evolution of life on earth.

In that context, the challenge for Neodarwinist genetic engineering is to create a really new species with astounding properties in the laboratory. To make true their pretense to speed up evolution in the laboratory. Up until now, the big successes of genetics are based upon the technique to breed across the natural limit of species. However impressive that is, it still is nature itself that delivers the creative factor. It is not speeding up the creative process but a mere messing around with nature’s results. I challenge genetic engineers to create something really new in a known species without using the genes of others, in the category of an extra sense for low energy x-rays in bats or in drosophila.

One of the bigger differences between Neodarwinism and Astrological Darwinism is that the first pretends to gain full future control including the option to speed up human evolution by genetic engineering, its in the paradigm of determinism, and that the second cannot speed up evolution because its creative cause is ‘Beyng’/Goddess Principle as the concealed by its very essence. And when evolution in Astrological Darwinism gets its genetic boost creative window in the Age of Leo, it is of a Pro Choice character under immanent magic control of generations of matrilinear connected women in an era when interest in science, as a dualism inspired mentality, will be at its ultimate low.

### **7.5.5 Cobb in 2013, short genetic engineering update**

In 2013, Cobb confirms and updates Arnold’s 1998 observations.

*An implicit awareness of the evolvability of the natural world, though it would perhaps not be formalized until Darwin’s *On the Origin of Species* in 1859, inspired the development of the millennia-old practices of selective breeding and domestication. Of course, early practitioners of these techniques could exhibit control only on the screening of target organisms for desired traits; the mechanisms by which variation could be introduced to a population and the means by which these variations could be controlled (or even influenced) were completely unknown. Nevertheless, great results were achieved that revolutionized all of human*

*civilization. In the mid-twentieth century, evolution was brought into the laboratory, primarily as a means of recreating and exploring natural evolutionary processes. With the discovery of chemical mutagens came the first methods of purposely introducing mutations to a host organism at an increased frequency, albeit with no control over the targeting of such mutations. (Cobb 2013, [42])*

Mutations in the lab are produced in a trial and error approach. By messing around a bit with existing genes, through chemically induced mutations, the changed organism is carefully observed and tested for possible effects.

As the a priori prediction of the effect of mutations on a given protein is often difficult, the earliest techniques focused simply on random mutagenesis. (Cobb 2013, [42])

Progress has been made since Arnold's 1998 paper but some things have remained the same: nature outperforms the genetic engineers.

While impressive progress has been made in the de novo design of protein catalysts, the fact remains that designed enzymes are typically significantly inferior to those found in nature. (Cobb 2013, [42])

### **7.5.6 Davies in 2004 and the 'warm little quantum pond'**

Davies is what Bohr called an 'iatro-quantists', those who compare living organisms with refined quantum machines, as for example comparing the brain with a quantum computer. In Bohr's perspective it had a negative connotation, but in today's context, the biologists who advocate the development and relevance of Quantum Biology are early innovators. Bohr's 'iatro-physicists', those who compare living organisms with machines working according to classical physics, are the conservative, old fashioned ones ([3], p. 22).

In his 2004 paper Davies referred to both Schrödinger and Bohr as two physicists who had the expectation that quantum mechanics might play a key role in biology. Davies described the *ball-and-rod view of life* as the semi-classical deterministic approach to organisms:

*Quantum mechanics also accounts for the strengths of molecular bonds that hold the machinery of life together and permit metabolism. But these examples are not quite what Schrödinger and Bohr were hinting at. They merely serve to determine the structure, stereochemistry and chemical properties of molecules, which may thereafter be treated as essentially classical. This leads to the ball-and-rod view of life, which is the one routinely adopted by biochemists and molecular biologists,*

*according to which all essential biological functions may be understood in terms of the arrangements and rearrangements of classical molecular units of various shapes, sizes and stickiness. (Davies, 2004, [43])*

Davies mentions typical quantum aspects as superpositions, entanglement and tunneling that do not exist in classical physics and are known for their quantum weirdness. He then asks himself if the weirdness of life and the weirdness of Quantum Mechanics might be positively connected. In the perspective of Jordan, Schrödinger, Bohr, de Broglie and Einstein, such a question would be a dead end from the start because the quantum weirdness follows from its axioms and its the axioms that are incompatible with life. Nevertheless, Davies question is useful because of the difference between conclusions from theory and those from experiment. The conclusions of the founders of Quantum Mechanics that its axioms prevented an understanding of life based on them was general. What is needed afterwards is the experimental verification of those broad insights. Davies:

*Might it be that the qualitatively distinctive properties of life owe their origin to some aspect of quantum weirdness? In this paper, I shall consider the possibility that one or more of the above properties may play a key role in the operation of biological or pre-biological processes. (Davies, 2004, [43])*

He continues to specify the possible role of Quantum Mechanics in life's fundamental processes:

*Although there is no agreed definition of life, all living organisms are information processors: they store a genetic database and replicate it, with occasional errors, thus providing the raw material for natural selection. The direction of information flow is bottom up: the form of the organism and its selective qualities can be traced back to molecular processes. The question then arises of whether, since this information flows from the quantum realm, any vestige of its quantum nature, other than its inherent randomness, is manifested. (Davies, 2004, [43])*

Davies then gives some examples of experimental and theoretical works offering indications that quantum weirdness might be at work in biological systems. One of the examples he gives is highly relevant for Astrological Darwinism:

*Quantum mutations. Ever since Crick and Watson elucidated the structure of DNA the possibility has been seriously entertained that mutations might occur as a result of quantum fluctuations, which would serve as a source of random biological information. Proton tunneling can indeed spontaneously alter the structure of nucleotide bases, leading to incorrect pair bonding. (Davies, 2004, [43])*

We see that the Quantum Biology early innovators are setting the stage for ‘chosen mutations’ as a subcategory of ‘chosen collapse of the wavefunction’ caused by the ‘élan vital’ of the soul.

Proton tunneling is a known quantum phenomenon capable of causing mutations in DNA. In such instances, potential pre-collapse proton tunneling inside DNA is happening all the time, but only a wave function collapse producing a low probability appearance of such a proton on the wrong, low amplitude side of the quantum tunnel actually produces a mutation. Thus, chosen wave function collapse of such a proton wave function can be a cause of mutations. The beauty of this vital causation is that one single chosen proton tunneling mutation cannot be distinguished from a random proton tunneling mutation, because the vital action actualizes one of the possible Eigenstates of the proton wave function. In single cases, the axiom of ‘chosen mutations’ cannot be falsified. Only in the long run, after many of those ‘chosen mutations’ will an aberration from random processes become apparent and measurable. This long run effect of a whole chain of ‘chosen mutations’ has been verified many times in the last decades. This is exactly the reason that the axiom of creative ‘random mutations’ causation is in trouble.

After he has given examples of quantum phenomena relative for the genome, Davies considers the ‘warm little pond’ origin of life or ‘first replicating genome’ scenario, at first from the classical biochemical perspective. According to Davies, it is already clear that:

*only a tiny fraction of nucleotide sequences code for biological function; the overwhelming majority of nucleotide sequences would represent biological gobbledygook. Viewed this way, the origin of life is a type of search problem. Given a soup of classical molecular building blocks, how did this mixture discover the appropriate extremely improbable combination by chance in a reasonable period of time? Simple calculation shows that it would take much longer than the age of the universe, even if all the matter in the universe consisted of pre-biotic soup, for even a single protein to form by chance. So the classical chance hypothesis seems unsatisfactory. (Davies 2004 [43])*

It is here that Quantum Mechanics, or rather Quantum Computing, can come to the rescue of the ‘warm little pond’ plus ‘random mutations’ origin of life narrative:

*Quantum mechanics may offer a radical alternative, however. Since quantum systems can exist in superpositions of states, searches of sequence space or configuration space may proceed much faster. In effect, a quantum system may feel out a vast array of alternatives simultaneously. In some cases, this speed-up factor is exponential. So the question is: Can quantum mechanics fast-track matter to life by discovering*

*biologically potent molecular configurations much faster than one might expect using classical estimates? This is the motivation that underlies the quest for a quantum computer; in effect, quantum computation enables information processing to take place in a large number of states in parallel, thus shortcutting the computational resources necessary to process a given amount of information. Is it conceivable that living systems exploit quantum information processing in some way, either to kick-start life, or to assist in its more efficient running? (Needless to say, if there is quantum information processing taking place within living cells today, there is a huge potential for the quantum computation industry to learn a few new tricks.) (Davies, 2004, [43])*

This ‘warm little quantum pond’ plus ‘random wave function collapses’ narrative has its own problems, indicating that this narrative or paradigm is entering its ad hoc repair state:

*Two fundamental problems stand in the way of this conjecture, however. The first is decoherence, which I shall discuss in the next section. The second concerns the implicit teleological aspect of all searches. A search implies a pre-specified target or destination. Though it is easy to believe that quantum superpositions might accelerate the discovery of a specific, special, physical state (e.g., the living state), there is an element of teleology creeping into this mode of thought. (Davies, 2004, [43])*

The competing ‘warm little quantum pond’ plus ‘chosen wave function collapses’ narrative doesn’t have the ‘too improbable’ problem of the random or quantum random scenario’s of the origin of life narratives. But the quantum version of the ‘warm little pond’ narrative is an improvement over the older biochemist classical version. It prepares the stage for our ‘chosen wave function collapses’ in the primeval ‘warm little pond’ origin of life narrative.

### **7.5.7 Davies in 2008 and the chosen wave function collapse**

In his 2008 paper, Davies started with a familiar observation:

*Molecular biology proved so successful that rich pickings could be harvested merely from crude ball-and-stick models of molecules. However, with the maturity of the subject, hints began to surface that non-trivial quantum effects might be of crucial significance in the functioning of certain biosystems. (Davies, 2008, [44], p.4)*

Then he poses a sharp question, which seems directed towards the crude ball-and-stick molecular biologists:

*Because the molecular realm is unquestionably quantum mechanical in nature, the issue I am raising is whether classicality emerged before life or whether life emerged before classicality. (Davies, 2008, [44], p.4)*

Which has a conservative response first:

*The orthodox view is that an extended period of increasingly complex ball-and-stick chemistry preceded the transition to the first genuinely autonomous living system (which may not have been an individual cell, more likely it was a cellular cooperative). (Davies, 2008, [44], p.4)*

But Davies is researching the other option as the more interesting and in the end rewarding one. This starts with:

*Although there is no agreed definition of life, all living organisms are information processors: they store a genetic database and replicate it, with occasional errors, thus providing the basis for natural selection. (Davies, 2008, [44], p.5)*

This information has a unique direction:

*The direction of information flow is bottom up: the form of the organism and its selective qualities can be traced back to molecular processes. The question then arises of whether, since this information flows from the quantum realm, any vestige of its quantum nature, other than its inherent randomness, is manifested. (Davies, 2008, [44], p.5)*

This is an already interesting view, the Davies intuition that information concerning living processes flow from the quantum realm into the physiological domain, exactly as Jordan wrote already in 1932. If its inherent quantum randomness can be manifested this way in organic processes then the chosen wave function collapses can do the same thing, because one by one the difference between a chosen Eigenstate and a random Eigenstate as the outcome of a wave function collapse cannot be determined. If one single random wave function collapse can get its information flow through from the quantum realm to the realm of classical microbiology, then a chosen wave function collapse can do the same thing.

Let's continue with Davies:

*The hypothesis I am proposing is that the transition from non-life to life was a quantum-mediated process, and that the earliest form of life involved nontrivial quantum mechanical aspects. (Davies, 2008, [44], p.11)*

This is nice, I fully agree with Davies. There is one crucial addition and then it perfectly fits my paradigm: one of the nontrivial quantum biology aspects is the chosen wave function collapse of Astrological Darwinism. And due to the fact that a single chosen collapse of the wave function cannot be differentiated from a random collapse with the implication it's existence cannot be falsified experimentally, Davies hypothesis and mine have similar experimental probability of being correct.

Then Davies gets really interesting from the 'chosen wave function collapse' point of view [(Davies, 2008, [44], p.11):

*Because life is a highly unusual state of matter, its formation from an arbitrary initial state is presumably extremely improbable.*

This is the general consensus among scientific 'origin of life' investigators.

*Quantum mechanics provides a way to drastically shorten the odds and fast-track matter to life by exploiting the parallel processing properties of superpositions. There is, however, a deep philosophical issue that must be confronted.*

This implies the use of quantum algorithms, which are at the basis of future quantum computers.

*I am defining life as a certain special state of low probability.*

This is not a definition but a general observation, already made by Jordan and Schrodinger and since then repeated by many others.

*Quantum mechanics enables the space of possibilities to be much more efficiently explored than a stochastic classical system.*

This is the reason research into quantum computing is booming.

*Now, if there are branches of the wave function containing life (e.g. a quantum replicator), they will, by assumption, have very small amplitudes.*

Now Davies gets interesting and innovative, by connecting the origin of life issue to quantum wave functions with certain Eigenstates, the collapse onto whom eventually caused the branching off of life from inanimate matter.

*We must therefore explain why the wave function of the system collapses onto one of these states of such low intrinsic probability.*



This is the crucial problem of the Quantum Biology approach of the ‘origin of life’ mystery. This is the moment where Astrological Darwinism steps in with the axiom of ‘chosen collapse of the wave function’ onto one of these states of low intrinsic probability. Beyond that limit, Astrological Darwinism reaches the concealment of ‘Beyng’, meaning that deeper research into the why of the causation will be in vain. In positive term this guarantees free will to be and remain really free and not just as an illusion to exercise free will in a deterministic world. But Davies as a Quantum Biologist working within the statistico-determinist research program must go on. Given the deterministic paradigm, only total control will be satisfying.

*Expressed differently, how does a quantum superposition recognize that it has discovered life and initiate the said collapse?*

Here Davies stumbles on the issue that quantum computers too have to be programmed in search algorithms by a programmer with a goal in mind. Using that analogy inevitably leads to a goal oriented ‘origin of life’ solution.

*There seems to be an unavoidable teleological component involved: the system somehow selects life from the vastly greater number of states that are nonliving. (Davies, 2008, [44], p.11)*

The other problem besides the teleological pitfall Davies is confronted with is quantum coherence and decoherence issue related to the maintenance of quantum superpositions, but that is an subject for later considerations.

The crucial sentence in the above quotes from Davies 2008 paper is *We must therefore explain why the wave function of the system collapses onto one of these states of such low intrinsic probability.* This is where the ‘chosen collapse of the wave function’ is inserted in Davies’ analysis. That is all there is to the scientific part of the magic of ‘Beyng’ as ‘élan vital’ and the Goddess Principle. The soul containing the ‘élan vital’ and in the state of concealment of ‘Beyng’ only has to ‘look’ at the right moment to magically cause the said collapse of the wave function into its Eigenstate of extremely low intrinsic probability. By ‘looking’ the soul performs an intrinsic measurement and life can have its go, starting in the ‘warm little quantum pond’ in Earths early years. This is how animate matter branched of from inanimate

This is the crux: the soul as ‘élan vital’ has the ‘metaphysic’ capacity to chose a preferred collapse. The magic of the Goddess Principle stems from two ingredients: 1. as ‘Beyng’ on itself, ‘Seyn an sich’, it is the fundamentally ‘hidden variable’ and thus beyond experimentation and calculation; 2. as ‘Beyng towards its unconcealment’, aletheia/veritas/revelation, it has the capacity to initiate a collapse of the wave-function by choice or free will. As a result, it cannot produce magic that is impossible from a physicist point of view but it can bring forth as much quantum

states with a low intrinsic probability as needed for its unconcealment. Such a series of wave function collapses, each with a low intrinsic probability, creates final state that is improbable to such a degree that it looks like and actually is magical. As such, my definition doesn't add anything new to the experimentally observed. The magic of 'Beyng' or the Goddess Principle has already been observed for decades: life is improbable beyond scientific repair. The present day issue is the refusal of scientists to surrender, to admit the defeat and give up the Laplacian dream to precalculate life and its actions, thus eliminating free will and realizing the deterministic dream. Belief in the Goddess Principle is first and foremost the acceptance of life as being too improbable a quantum state for science to explain and predict.

Schrodinger already realized this and as a true and authentic believer in materialism and determinism, his escape route was to find a unifying theory of fields as a way to formulate a more fundamental theory of the quantum realm, in such a way that life's phenomena would become predictable/calculable. Bohr realized the same situation vis a vis life in relation to quantum mechanics and he accepted the complementary principles of both overlapping domains. He added that to be able or not able to explain life or not was not his concern as physicist, he only needed to explain non living matter and for that, quantum mechanics was sufficient in its area of application.

Davies, after having paved the way for the axiom of intrinsic 'chosen wave function collapse' in his attempt to formulate a Quantum Biology solution to the 'warm little pond' issue, is pulling back from his own innovative approach:

Actually, the way I have expressed it is an abuse of language. In the standard formulation of quantum mechanics, a quantum system itself never initiates collapse. The wave-function collapses as a result of interaction with the environment. (Davies, 2008, [44], p.11)

Davies is correct of course, from the scientific perspective an intrinsically random wave function collapse can only be caused from the outside, as an interaction with the environment and never be the result of a wave intrinsic search algorithm, whether classical or quantum. This is where the Goddess Principle makes a difference. The soul initiates an intrinsic collapse of the wave function, so from inside out, as a hidden variable, that is the hypotheses leading to Astrological Darwinism. In the non-living, that is impossible. The magic of the 'chosen mutations' is this initiated collapse of the wave function, located in the genome, a collapse initiated from the inside by the soul. The result is an utterly improbable genome, from the 'random mutations' point of view.

What is clear from the attempt of Davies to solve the 'warm little pond' plus 'random mutations' improbability issue is that Quantum Biology creates an environment where the axiom of the 'chosen wave function collapse' and its sub-domain

of ‘chosen mutations’ can flourish. In my opinion, the further Quantum Biology will be developed, both experimentally and theoretically, the more its intrinsic limits will manifest itself in the direction Bohr envisioned. Those limits or impossibilities are starting points of the metaphysics or the magic of the ‘chosen mutations’. As such, Astrological Darwinism favors funding for Quantum Biology, whatever its research program or paradigm. As long as it is firmly rooted in experimental science. Because Many Worlds Quantum Biology for example is as metaphysical as Astrological Darwinism regarding wave function collapse interpretation.

Common sense Copenhagen Consensuses based Quantum Biology or some version of ‘shut up and calculate’ based Quantum Biology is what I would favor, firmly focused on challenging the experimental frontiers. This in order to keep physics and metaphysics apart and avoid pseudo-physics as Many Worlds Interpretation or Multiverse narratives to profit from the political credit experimental physics has obtained in the past. Astrological Darwinism doesn’t pretend to be scientific but it does claim to go on as authentic metaphysics where physics ends. In order to do that as genuine as possible, physics and its applications as Quantum Biology, have to explore, experience and report their limits intrinsically in an environment of academic freedom.

### 7.5.8 Al-Khalili and McFadden in 2008: quantum computing pond

Al-Khalili and McFadden wrote in 2008:

*There was obviously much that was vague and hand-waving about the Oparin-Haldane primordial soup theory, particularly the precise nature of the early self-replicators and how they formed, but the theory at least provided a credible alternative to divine creation as the origin of life. (Al-Khalili, McFadden, 2008, [35], p.34)*

The theory of the primordial soup or ‘warm little pond’ formation of early self-replicators is a narrative lacking both experimental and computational verification. But as the beginning of the evolution of life on earth it is a logical start of Darwin’s narrative. As such the ‘warm little pond’ relates to Darwin’s evolution as the Big Bang relates to Hubble’s Law. Both present singularities in their respective fields, the start of life out of inanimate space-time and matter for the first and the start of space-time and matter out of nothing for the second. In my perspective, the first singularity relates to the Goddess Principle and the second singularity to the God Principle, as long as both Principles are ‘an sich’ interpreted as entities to which Wittgenstein’s seventh proposition applies.

*The Miller-Urey experiments were so remarkable that many thought that the problem of the origin of life had been more-or-less solved. When*

*the work was published there was widespread anticipation that it would not be long before simple life forms were crawling out of origin of life experiments. But it did not happen. (Al-Khalili, McFadden, 2008, [35], p.35)*

According to the Astrological Darwinism paradigm, the missing element is ‘Beyng’ as the Goddess Principle. In layman’s terms, a soul exercising free will is missing from the laboratory primeval soup bowl of the Miller-Urey experiments. Of course, in the statistical-deterministic paradigm, it is a problem of randomness and statistics or a matter of explaining the appearance of the improbable out of the probable in desperate attempts to explain away the singularity at the beginning of Darwin’s evolution. Again and again, those scientists seriously going through the ‘random mutations’ process as being at the causal origin of life stumble upon the improbability of even the simplest living structures to have formed randomly. Sometimes the illustrations are formulated as an experimental conundrum:

*So we are left with a dilemma. The simplest self-replicating organisms alive today are far from simple and unlikely to have formed spontaneously in the primordial oceans. The astronomer Fred Hoyle considered the probability of assembling a structure like a bacterium from the random thermodynamic processes available on the early Earth and likened its chances to that of a tornado in a junkyard spontaneously assembling a Boeing 747. (Al-Khalili, McFadden, 2008, [35], p.37)*

On other occasions, the possible permutations are calculated and compared to the permutation producing context:

*Even if it were possible to generate structures as large as 165 bases, the chances of generating Bartels ribozyme by random processes (in their experiments their starting point was a known RNA ligase) are exceedingly small. There are  $41^{65}$  (or  $2 \times 10^{99}$ ) possible 165 base long RNA structures. If there was just one molecule of each of the possible 165 base long RNA molecules in the primordial soup then the combined mass of all those RNA molecules would be  $1.9 \times 10^{77}$  kilograms. To put this number in perspective, the entire mass of the observable universe is estimated as approximately  $3 \times 10^{52}$  kilograms. It clearly would have to have been an astronomically big pond to have had any chance of generating a ribozyme self-replicator by random processes alone. We thereby come to the crux of the origin of life problem. (Al-Khalili, McFadden, 2008, [35], p.38-39)*

Then Al-Khalili and McFadden come to a surprising conclusion:

*The answer is probably that self-replication, even in the protected environment of digital computers, is too complex to emerge by chance. (Al-Khalili, McFadden, 2008, [35], p.39)*

Of course, the social strength of the deterministic research program will prove to be too strong to allow such a simple surrendering to the inevitable:

*Thus quantum mechanics underpins at the most fundamental level the machinery of life itself. However, what is emerging today is the notion that quantum mechanics may play more than this basic role of determining molecular structure, bonding and chemical affinity. After all, biology is based on chemistry, which in turn is subject to quantum principles such as Paulis Exclusion Principle. Thus, a number of the more counterintuitive features of the theory, such as quantum superposition, entanglement, tunnelling and decoherence, may also turn out to play a vital role in describing life itself. This is not so speculative as it sounds; it is already well established that quantum tunnelling of protons may alter the structure of nucleotide bases and can be responsible for certain types of mutations. Likewise, it plays a vital role in many enzyme-driven reactions and enzyme catalysis. We propose here that some of these more profound aspects of quantum mechanics may have provided a helping hand in kick starting life within the primordial soup. (Al-Khalili, McFadden, 2008, [35], p.39-40)*

This kind of repeats the reasoning of Davies and thus supports his approach: quantum weirdness to the rescue.

*With a limited pool of proto self-replicators available in our primordial soup the library of possible structures made by the system will be very tiny in comparison to the total space of structures that needs to be searched. [...] However, given the sheer improbability that the correct configuration is hit upon by chance and the time taken for classical chemical mutation of breaking and reforming covalent bonds, speeding up of the search mechanism would be greatly desired. [...] However, the system still suffers from the search space problem: there are not enough molecules within the dynamic combinatorial soup to find the self-replicator within a feasible timescale. [...] Firstly, it has been argued that while it is easy to believe that quantum superpositions might accelerate the discovery of the correct and unique replicator state from amongst the myriad of other equally complex but wrong structures, an element of teleology is required; namely that the molecule must somehow know before hand what it is aiming for. (Al-Khalili, McFadden, 2008, [35], p.41-42)*

Again, a repetition of Davies' reasoning, including the issue of teleology. Another interesting aspect of this narrative under construction appears:

*There are of course many difficulties with this scenario, but, as described above, there are many difficulties with all explanations of the origin of life. If the emergence of life depended on an unlikely sequence of maintenance of quantum coherence within some small primordial pool then it may yet be the most plausible origin of life scenario. And the proposal has one further merit: it could be explored experimentally. As stated earlier, our proposal is of course tied closely to the feasibility of building a quantum computer and we do not realistically see how the merits of the former can be explored and tested before we fully understand the possibilities of the latter. (Al-Khalili, McFadden, 2008, [35], p.47)*

The attempts to explain the appearance of the improbable out of the probable in the 'quantum little warm pond' scenario do need functional quantum computer, that is, quantum computers performing as is promised in quantum computing fund raising promotion leaflets. There is of course nothing wrong with these developments regarding Quantum Biology and Quantum Computing. They will create the perfect environment for Astrological Darwinism to start off because these activities are most probably going to experimentally confirm Bohr's intuitions regarding the complementary aspects of life and the inanimate.

## 8 Quantum Gravity Biology and Astrology

### 8.1 The two axioms of Astrological Darwinism

Astrological Darwinism has two metaphysical axioms that have direct overlap with science due the phenomenology these axioms produce, the 'chosen wave function collapse' and the Great Year of human evolution or the Cycle of Life that follows the precession of the equinox. The previous section dealt with the scientific aspect of the phenomena produced by the 'chosen wave function collapse' and the subset of 'chosen mutations'. The 'chosen wave function collapse' is a metaphysical axiom and a quantum jump away from science but nevertheless very close to the observations of and reasoning in Quantum Biology. The way the axiom is formulated implies that it is even impossible to distinguish an individual 'chosen wave function collapse' from the inanimate 'random wave function collapse'. As such, the magic of the 'chosen mutation' can only become apparent as the result of a long series of such events. And even then it is only the magic of realizing the utterly improbable, never magically realizing the impossible by violating the laws of physics. And

this is exactly the judgment of scientists regarding the Darwin Singularity, that its occurrence is utterly improbable if analyzed from the perspective of ‘random mutations’ as its supposed creative cause.

The second axiom of Astrological Darwinism is the truly astrological part, the ‘élan vital’ following the precession of the equinox as the external clock for its cycle of immanence and transcendence. Its phenomenology is the rhythm of human evolution as observed for the last 100.000 years. The scientific overlap of the second axiom is above all with Paleo-anthropology, with the addition that the axiom is metaphysical in nature and only the phenomena it produces can be researched by science.

But the astrological based cycle implies a connection between subtle changes in the field of gravity, or the space-time curvature, as observable on earth, and the soul’s capability of producing ‘chosen mutations’. There might also be a certain amount of holism involved because according to the axiom, this cycle applies for all life on earth. But such an apparent holism can also be caused by the combination of individuated ‘chosen mutations’ and ‘natural selection’, if for example an single cellular organism in the first billion years of the evolution of life on Earth managed to change its genetic creativity from steady and slowly into cyclic with shorter but stronger genetic boosts followed by a period with a strong focus on expansion. If such a cyclic behavior gave that cellular organism a definite fitness advantage over the competition, then eventually all life would incorporate such a cyclic evolutionary character. This is one of the arguments explaining why the Cycle of Life must have been integrated in the evolution of life on Earth in a very early stage, not far removed in time from the Darwinian Singularity, defined as the first happening of life in previously inanimate matter. (The Darwinian Singularity is life’s analogy of the Big Bang as Hubble’s Singularity.)

The holistic aspect can only be guessed at, not intrinsically investigated, due to the concealment of ‘Beyng’. It is an interesting subject and touches upon the Quantum Biology concept of coherence. The holistic action of the soul in one single organism has its roots in ‘Beyng’ and as such is out of control of science, both experimentally as theoretically. But it can replace the need for coherence in Quantum Biology. Because the holistic actions of the soul relative to ‘wave function collapse’ are founded in ‘Beyng’, it is independent of the coherence versus decoherence issue in Quantum Biology. The soul doesn’t need quantum coherence to produce holistic effects. This has far reaching implications for the brain as a would be quantum computer, because the quantum computer is dependent on the maintenance of coherence in a sea of potential decoherence influences. But if the soul is capable of holistic quantum actions due to its root in ‘Beyng’ and its being full of ‘élan vital’, then the brain might well be a holistic ‘chosen wave function collapse’ quantum meta-computer. Technology cannot possibly reproduce such a

meta-computer because it is limited in its practice to the exploitation of intrinsic random wave function collapses and the avoidance of such collapses in as many coherent qubits as technically possible. The coherence of the brain however might well be rooted in its ‘Beyng’ and then quantum decoherence isn’t an issue for the brain. If this intuition proves to be right, then the brain’s ultimate functioning is forever out of reach of science and technology.

But to come back to the second axiom, if the Cycle of Life is the product of Astrological Darwinism, then it might have been an individual invention by some organism in the course of early evolution of life on earth. During the first two and a half billion years after the Darwin Singularity around four billion years ago, bacteria and archaea were the dominant forms of life on Earth. It took two billion years for Eukaryote cells, which have a nucleus, to develop. See Fig. 18. Then it still took a billion years for the first multicellular organisms to appear. It is

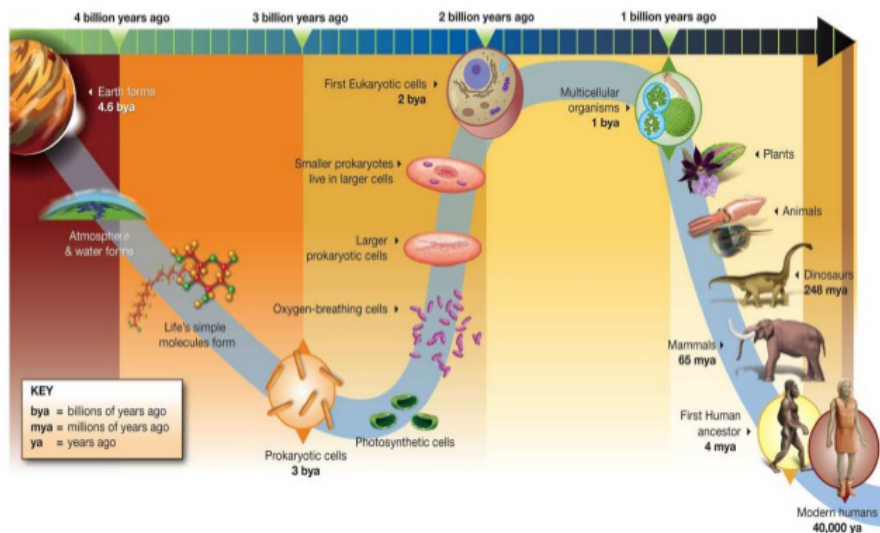


Figure 18: The timeline of life on Earth.

possible that all Eukaryotes follow the Cycle of Life, which then must have been incorporated at least two billion years ago. If only multicellular organisms follow the Cycle of Life, then it must have been incorporated at least one billion years ago. It is highly unlikely that it got incorporated after the appearance of multicellular lifeforms. The effect must have been a significant increase in the speed of evolution in the direction of higher complexity. It seems unavoidable that all autochthonous cells in a multicellular organism must follow the Cycle of Life coherently. It is my first guess that either a proto-Eukaryote or a proto-multicellular incorporated the Cycle of Life in its organism and thus was able to speed up its evolutionary progress.



From the perspective of the 'élan vital' as flowing from the soul into the organism and causing 'chosen wave function collapses' and as a subset 'chosen mutations', this flow might have been a steady one at the beginning of evolution. From that pre-cycle perspective, the innovation must have involved a cutting off of the inflow and thus creating a transcendent bubble of 'élan vital' around one extreme of the cycle and letting go of this created bubble around the other extreme of the cycle, creating an intense immanent phase, the genetic boost creative window. During the transcendent bubble part, the organism could focus entirely on expansion. The cycle itself might have had a secondary effect: that of sexual specialization, with one sex specialized in the genetic boost immanent part of the cycle and the other sex specialized in the expansion transcendent part. This leads to the appearance of the proto-sexualized Eukaryotes as the moment of incorporation of the Cycle of Life in evolution. That would then imply that bacteria, archaea and pre-sexual eukaryotes do not have the Cycle of Life incorporated in their biorhythm and that these life forms have a slow but steady pace of 'chosen mutations' development and adaptation.

A quote from a specialist in the field gives the following insight:

*What happened during the Proterozoic evolution of eukaryotic phytoplankton? [...] First, the evidence suggests that the eukaryotic cell type appeared early in the Proterozoic, perhaps more or less coincident with the development of a stable aerobic environment some 2000 to 1800 Ma ago.*

*Second, eukaryotic micro-algae existed, but evolved only quite slowly, prior to about 1200 Ma ago. Like slowly evolving Proterozoic cyanobacteria, these early evolving eukaryotes evidently lacked the capacity for sexual reproduction.*

*Third, about 1100 Ma ago, eukaryotic plankton began to diversify very rapidly. Interestingly, it is at about this time that fossil phytoplankton first show plausible evidence of eukaryotic sexuality [...]. (Schopf, 1992, [46])*

It is my hypothesis that the Cycle of Life got incorporated by a proto-sexual eukaryote and that the cycle of life led to a speed up of evolution and to the appearance of sexuality, which in turn caused its own increase in the tempo of evolution.

*The capacity for sexual reproduction was one of the most important of all innovations to have ever evolved, a development providing means for the production of offspring that combined traits from two parental sources, rather than being exact copies of a single, asexual parent cell.*

*Thus the advent of eukaryotic sexuality would have resulted in tremendous increases of genetic diversity and of rates of evolution in the newly evolved sexual lineage. (Schopf, 1992, [46])*

If my hypothesis is correct then all post-sexual Eukaryote life on earth is subject to the Great Year. This includes all multi-cellular organisms on Earth. My hypothesis also implies that all pre-sexual life must have been able to sense the precession of the equinox and must therefore have gravitoperception, operating either at the quantum level or at the quantum gravity Planck scale. One Eukaryote cell then used this gravitoperception to change the steady flow of 'élan vital' into a cyclic process flexibly locked on to the precession of the equinox. The subsequent genetic boost - expansionist boost cycle of the Great Year proved to be a decisive selective advantage and led to a connected sexual differentiation, which turned out to produce selective advantages of its own. If all of this happened prior to the appearance of multi-cellular organisms, then the Great Year's causation is quantum-bio-locked into all cells of an organism. It also implies that active gravityperception isn't to be found in specialized cells but in all cells that reproduce sexually. Of course, it is always possible that some cells in organisms have developed additional specialized use of gravitoperception. These considerations, together with the previous Quantum Biology results, lead to certain corollaries on the boundary of metaphysics and science in relation to the problem of astrological causation.

## 8.2 'Élan vital' at the Planck scale

I start with the results from Quantum Biology and then extrapolate these to the future science of Quantum Gravity Biology. This of course is highly speculative because firstly Quantum Biology has yet to be developed starting with the present day first strong indicators of its necessity. And second, Quantum Gravity as the fusion of Quantum Mechanics and Einstein's General Relativity has not been found yet. So thirdly, talking about the implications for life and astrology of the fusion of Quantum Biology with Quantum Gravity into the future Quantum Gravity Biology is still a bit premature. That nevertheless is the content of this section.

It allows us to extrapolate the hypothesis of Davies with regards to Quantum Biology into its Quantum Gravity Biology expression. Davies had:

*The hypothesis I am proposing is that the transition from non-life to life was a quantum-mediated process, and that the earliest form of life involved nontrivial quantum mechanical aspects. (Davies, 2008, [44], p.11)*

In the context of Astrological Darwinism this reads:

*The hypothesis I am proposing is that the transition from non-life to life was a quantum-gravity mediated process, and that the earliest form of life involved nontrivial quantum gravity aspects at the Planck scale.*

The second element of Davies, concerning information flow in the organism from the quantum realm upwards, can also be extrapolated into the Quantum Gravity Biology domain. We had:

*The direction of information flow is bottom up: the form of the organism and its selective qualities can be traced back to molecular processes. The question then arises of whether, since this information flows from the quantum realm, any vestige of its quantum nature, other than its inherent randomness, is manifested. (Davies, 2008, [44], p.5)*

Because the ‘élan vital’ as ‘Beyng’ of the soul is meta-physical, if its flow is bottom up, then that bottom is the deepest realm in physics possible, which is the physics at the Planck scale. It is nothing but a simple and self-evident extrapolation. We get the following:

*The direction of information flow is bottom up: some of the functions of the organism and its selective qualities will eventually be traced back to the Planck scale. The question then arises of whether, since this information flows from the quantum gravity realm upwards, any vestige of its quantum gravity nature is manifested in its physiology or psychology.*

This of course is all that is needed to justify gravitoperception and astrology. It is a distinct possibility and it cannot be falsified nor verified for another hundred or two hundred years by future Quantum Gravity Biologists.

The strategy applied here is similar to that of Quantum Brain proponents: *use a not yet existing machine, a high capacity quantum computer using many, many coherent qubits, to claim that eventually the brain will be nothing but an example of that machine. And thus, we are all just a machine. As will eventually be proven in some distant future.* Thus, the proof of the Quantum Brain hypothesis is a promise that might be fulfilled in the distant future, but all the speculations and popular science magazine extrapolation can be produced and sold today.

### **8.3 Magnetoperception in Quantum Biology**

Pollack in 2012 described the slow discovery of magnetoperception in birds.

*Many mechanisms are at work in bird navigational ability, but the most elusive one to humans may be how they sense magnetic fields. Although conjecture in the late nineteenth century held that birds could*

*use the earth's magnetic field, it was only in the 1960s that scientists first demonstrated this experimentally. But the bigger question remained: How do birds sense the magnetic field? (Pollack, 2012, [47])*

This short introduction doesn't really cover the cumbersome process of acceptance and subsequent further development of scientific knowledge of the extra sense of those birds. Pollack wrote about the first laboratory based demonstration of this sense in the European robin by Wiltschko:

*Although suggestions were made in the late nineteenth century that birds could use magnetic information for navigation, they were met with disbelief. [...] In other words, when Wiltschko started his studies at Frankfurt, very few scientists believed birds used the magnetic field, and even fewer were studying this phenomenon. He talks about the climate he faced: "You see, when we started at this time in the early sixties, everybody believed that birds can only orient by celestial cues, like sun and stars." (Pollack, 2012, [47])*

This is the interesting story for Astrological Darwinism. Birds have a sense that allows them to perceive the magnetic field of the Earth and to use that sense to navigate along their long migratory paths. But although some scientists in the second part of the nineteenth century, when the magnetic field of the Earth was being measured with the use of a global network of calibrated stations, had the intuition that birds used the magnetic field of the Earth, the established scientific community didn't believe such a sense existed.

The process of scientific acceptance of this sense in birds went through several phases. In the first phase, scientists measured the global Earth magnetic field with newly developed accurate electromagnetic compasses. They discovered the local differences in this geomagnetic field, especially its inclination. This is when some scientists suggested that birds might be using these field differences during long distance avian navigation. But due to the lack of a known measuring device small enough to fit into the birds, these first hints couldn't be developed any further.

Before the measurement of the Earth magnetic field, nobody even suggested that birds could use magnetism to navigate. Everyone simply assumed these birds to behave like early sailors and 'simply' navigated using sun, moon and stars. Thus, as long as scientists didn't sense the Earth magnetic field, using newly developed measuring devices installed in a global network of stations, it didn't come to mind that birds could. The first experimental breakthrough happened in the early 1960's, when it was discovered that birds could navigate without seeing the sky.

*In fact, however, another graduate student of Merckel's, Hans Fromme, had just discovered that certain birds could orient in closed rooms with-*

*out stars. Wiltschko said this finding was highly debated, and his advisor Merkel wanted Wiltschko to replicate the controversial finding. Merkel specifically wanted Wiltschko to prove these birds could orient without the stars, and then to find out what they were using instead. Wiltschko, luckily or unluckily, had some clues to work with, which he describes: “[Hans Fromme] finished his thesis by saying that there are two possibilities. One is magnetism, and the other is that the birds hear radio signals, receive radio signals, from the stars.” (Pollack, 2012, [47])*

This example also elucidates that one set of experiments by one scientist doesn't produce a change in the scientific mind set. Different scientists have to be able to confirm the results in separate experiments. The experimental findings have to be robust. Such a process, from first positive experiments to a robust and indisputable result, can take a decade or more. Pollack reports of the experience of Wiltschko regarding his experiments with the magnetoperception of the European robin:

*He summarizes the 1966 article, originally published in German: “Robins are not oriented if you keep them in a very weak magnetic field. But if you keep them for longer than three days in such a field, then they can re-orient. And if you then change the horizontal component of this weak magnetic field, so you change magnetic north, then the birds follow this change.” But the scientific community did not believe in the findings; “It was met with highest skepticism,” says Wiltschko. (Pollack, 2012, [47])*

Repeated experiments eventually resulted in a publication in Science:

*The Wiltschkos published their first paper together in 1972 in Science, which suggested that a birds magnetic compass is an inclination compass, distinguishing between poleward and equatorward, unlike our technical compass that distinguishes north and south. (Pollack, 2012, [47])*

This part of the story is only about the experimental discovery that some birds have a sense called magnetoperception allowing them to navigate on the Earth's magnetic field. The 'mechanism' and the location of this extra sense in the small bird was still unknown. The setup of Wiltschko's experiments was not very complicated. Bohr would call it a perfect example of classical experimental technique:

*To demonstrate magnetic compass orientation in animals, one needs a behavior where the animal reliably prefers a direction. Here, the migratory behavior of birds proved most helpful: during the migration season, migratory birds undertake extended flights in their migratory*

*direction. The urge to head in this direction is so strong that even captive migrants move in this direction in suitable circular cages: they hop and flutter into the direction in which their free-flying conspecifics migrate. The distribution of their activity can be recorded and from this, their heading calculated. Usually, a group of 10 to 15 birds is tested singly several times, and from the mean headings of these birds, a grand mean is calculated. – All behavioral data from migratory birds reported here were obtained this way. (Wiltschko, 2014, [48])*

It seems as if Quantum Mechanics is not involved. Yet, without Quantum Mechanics, this behavior cannot be explained. These small birds use a system that amplifies minute magnetic quantum effects, involving energy level differences of  $\mu\text{eV}$  and thus ten-thousand times smaller than the smallest classical chemical ball-and-stick reaction energy levels, into a macroscopic urge to fly in a certain direction. I quote Zhang on the subject:

*[...] until 1970, most scientists believed that ordinary magnetic fields had no significant effect on chemical or biochemical reactions, since the magnetic energy of typical molecules, under ordinary magnetic fields, is much smaller than the thermal energy at room temperature and is much smaller than the activation energies for those reactions. This situation changed significantly in the 1970's after a series of experimental results were reported on magnetic field effects on chemical reactions (Zhang, 2015, [49])*

Then in the early seventies, Schulten, a theorist, arrived at the conclusion that a magnetic field could influence a chemical reaction in a process now known as the radical pair mechanism involving fast electron spin triplet states. To give an impression of the atmosphere around sublime quantum chemical reaction mechanisms, Pollack cited Atkins:

*in 1976 the colorful chemist Peter W. Atkins wrote, "The study of the magnetic field effects on chemical reactions has long been a romping ground for charlatans." (Pollack, 2012, [47])*

This is of course the present description of Astrologists claiming that the influence of the planets on living organisms is real: charlatans. The story of magnetoperception is important for Astrological Darwinism as an analogy. Eventually, the radical pair mechanism by which minute changes in a magnetic field can influence the outcome of certain chemical reactions got confirmed by a large community of experimenters. Studying and inventing engineering applications for the radical pair chemistry has become a well established specialization. One of the earlier

applications was the proposal of the radical pair mechanism as the key to understanding the avian navigation capacities of birds. The process in the birds is described as follows:

*The proposed radical pair mechanism for avian compass postulates that absorption of blue or green light creates a radical pair of electrons. The radical pair undergoes coherent quantum oscillations between entangled singlet and triplet states, at a rate depending on the external magnetic fields. Finally, the pairs in the singlet and the triplet states will lead to different chemical products, providing orientation information for birds. (Zhang, 2015, [49])*

It is interesting to read the technical reports of quantum biologists, partly because at the end of highly technical analysis they are capable to honestly admit the limits of their knowledge:

*The standard radical-pair model can be summarized as follows, although the exact details and steps involved can be quite complex: a radical pair is (typically) a pair of bound molecules that each has an unpaired electron. These pairs are created, by a photochemical process, in spin-correlated states; that is, singlets or triplets. The state of these spins then evolves under the combined effect of the Earth's weak magnetic field and internal nuclear hyperfine interactions with the host nuclei. Finally, the rate of charge recombination depends on the spin of the separated charges, directly influencing the reaction products of these radical pairs. These differing reaction products are in principle biologically detectable. Thus, if the relative weights of the singlet and triplet states are sensitive to the angle of the external (geo-magnetic) field, the reaction products will be also, leading to a magnetic compass. The precise nature of the radical pair that might be involved in this mechanism is as yet unknown. (Lamber, 2013, [50])*

What is described here is a biological quantum amplifier, using low energy sensitive coherent spin states to translate magnetic field orientation differences into differences in chemical reactions. The products of those chemical reactions in turn can be detected neurologically and thus translated into information and action of the birds.

It illustrates that quantum biology is rapidly evolving beyond being mere 'hypothetical' (Gauger, 2011, [51]). Quantum bio-coherence is a key issue in the discussions which focus on the limits of scientific knowledge on the subject:

*Discovery of room temperature quantum coherence in the avian compass of birds, in the olfactory receptors and in light harvesting complexes in*

*the last few years indicate that quantum effects might be ubiquitous in biological systems. While the quantum chemical understanding of the details of light harvesting systems is almost complete, no organizing principle has been found which could explain why quantum coherence is maintained in these systems for much longer than the characteristic decoherence time imposed by their room temperature environment. (Vattay, 2014, [52])*

In the paper of Kominis, ‘The radical-pair mechanism as a paradigm for the emerging science of quantum biology’, the old skeptical attitude is contrasted with the newly gained insights:

*The intuitive disposition prevailing until recently, namely that quantum coherence phenomena have no relevance to biology, can be simply understood. Indeed, quantum coherence has been clearly manifested in carefully prepared and well-isolated quantum systems, the experimental implementation of which was technically demanding. It was thus plausible to assume that all timescales of interest in complex biological matter are orders of magnitude larger than the coherence time of any underlying quantum phenomenon. (Kominis, 2016, [53])*

In less technical terms, the scientists in their labs use conditions of high vacuum and low temperature to create and maintain quantum coherence. In animals, the space is crawling with molecules and at above room temperature. Under those conditions, scientists aren’t capable to create and use quantum coherent states. It is then assumed that, until proven otherwise, animals cannot do what the scientists can’t themselves. The quantum coherent states in animals should be extremely short lived and not be sustainable long enough for any practical organic use. This assumption is beginning to be proven otherwise:

*In recent years, however, a different physical picture is gradually emerging. [...] It appears that nature has optimized biological function using both worlds, i.e. taking advantage of quantum coherence amidst an equally essential yet not detrimental decoherence. (Kominis, 2016, [53])*

This means that in Quantum Biology, the acceptance of existence of extraordinary bio-quantum-systems is growing.

*It is clear that concepts of quantum measurements, quantum (de)coherence and entanglement take on a distinct scientific flavor when applied to migrating birds. It is true that the last several years have witnessed several exciting discoveries making the case of quantum biology. We feel*



*that the synthesis of the two seemingly disjoint fields that dominated 20<sup>th</sup> century science, "quantum" and "bio", will lead to breakthroughs beyond our current ability to forecast. (Kominis, 2016, [53])*

The scientist Zhang is very open about the motives regarding the study of Quantum Biology:

*We believe that the quantum avian compass can play an important role in avian navigation and can also provide the foundation for a new generation of sensitive and selective magnetic-sensing nano-devices. (Zhang, 2015, [49])*

The precise functioning of the birds avian compass is still partly guessed at, as expressed by Zhang:

*The precise mechanism of avian navigation has been a mystery for centuries. Every year migrant birds navigate hundreds or even thousands of miles between their seasonal habitats. Scientists have been trying to explain this astonishing phenomenon for decades. To date, the primary biophysical process underlying the avian compass still remains unknown. (Zhang, 2015, [49])*

The stakes in understanding the quantum mechanical functioning of these compasses are clear:

*the ultimate goal of studying the mechanisms of bird navigation is to learn from nature and to design highly effective devices that can mimic biological systems in order to detect weak magnetic fields, and to use the geomagnetic field to navigate. (Zhang, 2015, [49])*

The hopes of Zhang are realistic. In 2011, Gauger reported:

*An artificial chemical compass operating according to this principle has been demonstrated experimentally, and a very recent theoretical study examines the presence of entanglement within such a system. (Gauger et al., 2011, [51])*

Although the complete 'biomechanism' of the avian compass of birds isn't unraveled or unconcealed yet, an interesting meta-picture emerges regarding bio-senses in relation to science and scientists. It is this meta-picture that is interesting for Astrological Darwinism. A certain sense regarding a physical field or energy in organisms cannot be acknowledged by science if the scientists themselves cannot sense these fields or energies with the use of their instruments. As soon

as they develop the instruments and use it to chart the field and its energy differences, the first hints arise that maybe living organisms might already use this field biologically. But as long as the instruments of the scientists are too rude to be imaginable as part of organs inside organisms, a skeptic, rejective attitude prevails and the sense is ignored, treated as non-existent. But as soon as a certain field of science outside biology is developed that can be used to investigate the ignored sense, a new field of bio-science, studying it and looking for use outside the organisms, rapidly arises. Quantum magnetoperception is now an accepted field of experimental interest, attracting an increasing funding due to the commercially and military interesting possible applications regarding avian navigation.

Another interesting observation at the meta-level can be made. Almost all new fields of science have somehow already been discovered by living organisms a long, long time ago and have been incorporated when useful for their lives. Scientists discover electricity and then find out that organisms used electricity all along. Some organisms even have a sense for detecting electric field differences. Science discovers the details of magnetism and afterwards find out that certain organisms have a magnetic field difference sense more sensitive than they could imagine. Science discovers Quantum Mechanics and after a while they find out that organisms already used it for their vital functioning.

So what about the field of gravity? What about space-time curvature? Do certain organisms have a sense to detect differences in the field of gravity way beyond our present comprehension? Remember that strength differences in a field of gravity can be detected by precise quantum clocks, which are essentially quantum-oscillating atoms. This principle is the key ingredient in every Global Positioning System or GPS. What if life has found out ways to explore and use those field differences through the intermediary of quantum-oscillating atoms in the first billion years of single cell evolution and afterwards continue to incorporate the sense in more complex bio-systems? Would such an extrapolation of previous experiences be too extravagant?

## 8.4 Gravitoperception in Quantum Gravity Biology

The problem of astrology is that it assumes a connection between the psyche and subtle differences in the field of gravity detected on earth. This implies the capability of gravitoperception, a gravito-compass more sensible than available to science, at least on such a small scale of a sense inside a single Eukaryote cell. The standard scientific approach is clear. As long as scientists do not have a developed technology of small scale hypersensitive gravitoperceptors, organisms can't have them either. The field of bio-gravitoperception has to involve precise quantum-clocks which produces signals that can be amplified from the quantum level into chemical reactions which in turn are connected to the production of neurological

signals. This is the futuristic concept of bio-GPS sensitivity.

Bio-GPS is the idea that organisms already figured out millions or billions of years ago what we humans managed to construct in the last decades; a global/solar navigation system using a combination of the theory of relativity, general and special, and quantum mechanics [54]. The lesson of the past is that if we can build it, life has already made subtle use of it for eons. But only after we build a such system ourselves as an external instrumentation, can we consciously look for similar approaches, or ‘bio-techniques’, in animals and plants.

A quantum level bio-GPS sense is less futuristic as it seems, because it involves well developed fields of science that have evolved in standard engineering of Global Positioning Systems. Instead of electric field differences or magnetic field differences, it involves gravitational field differences. We humans are already capable of technically registering those field differences and the involved fields of science are well developed. The difference between Quantum Biology of magnetoperception and Quantum Biology of gravitoperception is in the quantum-atomic level. QB magnetoperception needs a molecule capable of producing the light-activated radical pair mechanism. QB gravitoperception needs an atomic or molecular quantum oscillator connected with an appropriate amplifier system. QB gravitoperception doesn’t need unknown theories or unknown technical instruments, all it needs is to figure out how organisms do the things our engineers can do too. Of course, the standard common sense reaction of scientists should be that such a proposal is nonsense; a bio-GPS sense is impossible, is non-existent. But the analogy tells me that in hundred years from now, such a bio-sense will be discovered. This isn’t that far fetched an extrapolation of recent developments and a quit reasonable futurological prediction.

I can go a step further in my speculations and move from Quantum Biology gravitoperception to Quantum Gravity Biology gravitoperception. This is clearly far more speculative because scientists do not have a theory of nor experiments in quantum gravity. A small scale hypersensitive bio-gravity compass might involve quantum gravity at the Planck scale, which doesn’t exists scientifically. And the general rule is that if we don’t understand it scientifically and don’t have it technically, we can’t admit/prove/accept/demonstrate that plants and animals have it biologically. Thus, organisms are denied to have been able to explore and use the unknown field of quantum gravity in the course of their evolution. This is how skeptic driven experimental science proceeds, luckily to be honest. But metaphysics isn’t an experimental science and it can therefor boldly go where no scientist has gone before. Metaphysics can extrapolate into the far future of science and humanity and build expectations or foresee possible developments.

If a theory of quantum gravity at the Planck scale hasn’t been found yet by scientists, that doesn’t mean it hasn’t been explored and use in the course of the

evolution of life. Physicists do agree that physics at the Planck scale exists, so a biophysicist might agree that biophysics at the Planck scale can exist. There are arguments that indicate that if it has been explored it must have been so at the very beginning of evolution, very close to the Darwin Singularity. The very first steps of the 'élan vital' into the unexplored world of space-time and matter must have begun at the Planck scale of Quantum Gravity, the smallest of scales known in our Universe of space-time and matter. During those very first steps of the 'élan vital' into this unexplored world it might very well have developed a sense for Quantum Gravity phenomena at the Planck scale and created a practice of Quantum Gravity Biology at those smallest of dimensions.

Talking about quantum-gravitoperception using the principles of Quantum Gravity and its related bio-sensitivity is completely speculative and at the same time makes sense from a reasonable extrapolation of past developments into the future. Using magnetoperception as an analog, science will not be capable of accepting gravitoperception in organisms as long as scientists haven't build a comparable technological analog in the laboratory. On the level of GPS, the technology already exists and Quantum Biology will probably discover its bio-analog in the form of gravitoperception in the next hundred years. On the level of Quantum Gravity at the Planck scale, the scientific theory and related engineering applications still have to be invented. Only at the end of that scientific and engineering phase will it be possible to discover similar functions in organisms. It happened again and again that scientists discovered a new field of physics, after which it developed into a specialized field of engineering, only to discover later that organisms used it already for many millions of years. It is my opinion that organisms use quantum-gravitoperception already for billions of years and that it was developed not long after the Darwin Singularity.

During the first a-sexual single cellular phase of evolution, from four billion years ago to about one and a half billion years ago, we have no indications that this sense was critical. It is my hypothesis that the incorporation of the precession of the equinox as a time-lock for a cyclic flow of the 'élan vital' was at the basis of the eukaryote sexual and multicellular evolutionary speed up. It gave the organism that developed it a critical selective advantage and thus became part of all multi-cellular life on earth. As such, it is deeply embedded in all complex organisms, creating as one of its products the Cycle of Life or Great Year of evolution. The involved sense of quantum-gravitoperception might well be beyond human technology, if organisms use coherence or holism founded in the 'élan vital' of the sole instead of the usual quantum coherence applied in many quantum based technologies.

Due to lack of relevant fields of science, it is impossible to go much deeper into the technical details of quantum-gravitoperception in organisms. What can

be foreseen is that it will take one or two hundred years for science to develop the specialisms needed to verify or falsify the hypothesis of or the belief in quantum-gravitoperception in organisms. This gives Astrological Darwinism ample space-time to exist/continue as a reasonable metaphysics and a possible extrapolation based on known events. The ultimate test for Astrological Darwinism will of course not be available for another ten thousand years, when the next genetic boost creative window will start and interest in science will have faded to a sheer minimum.

There is another interesting line of thought, concerning the cycle of immanence and transcendence of the 'élan vital' relative to the body. It concerns the theory of scientific development throughout the centuries and millennia. According to Astrological Darwinism, our era for the last 6.000 years is one of increasing dualism or transcendence. From the side of consciousness, first the world and then our body has become less opaque and more transparent all along that development, due to the withdrawal or depletion of the 'élan vital' from our body. In philosophy this development has been interpreted as progress and is perceived as part of the linear history of humanity: from magic to myth to logic to science. In Astrological Darwinism, this same development is viewed as part of the cyclic history of humanity, as a temporary phase and not as definite progress. It is predicted that somewhere halfway the Age of Aquarius, peak dualism will be reached. The total transparency of the body relative to the soul as containing the 'élan vital' will allow scientific consciousness to get an intuition for one of the deepest senses available in ourselves as an organism, the sense for space-time curvature as our quantum-gravitoperception on the Planck scale of Quantum Gravity Biology. From the negative side, it can be argued that as long as on that deepest layer, dualism isn't reached yet and immanence still dominant, we will not be able to grasp the functioning of space-time and matter on that level. We will simply lack the intuitive insight due to its opaqueness. In this way, Astrological Darwinism also implies a cyclic theory of scientific consciousness.

In conclusion, Astrological Darwinism will have freedom of thought due to the absence of scientific capacity to falsify or verify its axioms for another one or two hundred years at least. On the one hand this means that it will remain a field full of 'charlatans', me included. On the other hand, it must be given the same status as those deterministic futurologists, our 'techno-charlatans', predicting the reign of the 'machine' over man in the not so distant future [55], or those babbling about Multiverse 'world ensembles'. Astrological Darwinism has a different metaphysical view on the future of science, technology and the development of humanity. In the logic of Astrological Darwinism, two other data are important regarding its verification/falsification; the one of peak dualism which will be accompanied by peak scientific intuition, peak Einstein so to say, and the one of peak immanence

when the next genetic boost creative window will be at its maximum.

## 9 Multiple Darwin and Hubble Singularities?

### 9.1 Speculating about Multiple Darwin Singularities

In the world view of Astrological Darwinism, two singularities determine our existence. The Hubble Singularity as the Big Bang created space-time and matter, in short ‘Being’, and represents the kick-off of our Universe. The Darwin Singularity created life on Earth in the ‘warm little quantum gravity pond’ where the ‘élan vital’ made its first little steps into the realm of matter and represents the kick-off of life on our blue planet. The Hubble Singularity can be related to ‘Being’ and a God Principle and the Darwin Singularity can likewise be connected to ‘Beyng’ and a Goddess Principle, as long as Wittgenstein’s seventh proposition is applied. To relate both to one single God Principle and one ‘Being’ dismisses the fundamental phenomenological differences of those two Singularities.

Of course, sexuality appeared only after almost two billion years of the evolution of life on earth and so both the Hubble and the Darwin Singularities are pre-sexual or a-sexual. But as soon as sexuality appeared, one sex got more involved in the material Hubble side of life and the other sex more in the ‘élan vital’ Darwin side of it. Thus, when conscious culture appeared among anatomically modern humans, one sex was more into God narratives and the other sex more into Goddess narratives. We modern humans have inherited that Paleolithic tradition.

The Darwin Singularity might have occurred on every planet suitable for life in some form. The Kepler telescope has discovered many, many planets in our region of the Milky Way, some of which are possibly Earth like [56]. In Astrological Darwinism, there is no reason to assume that ‘Beyng’ would be uniquely associated with our Earth. The branching seen in the earths evolutionary tree, with the observed property that life developing on an isolated island or continent creates its own unique solutions and opportunities, is probably happening on as many planets as are suitable. When branching is a property of ‘Beyng’ manifest in matter, it is reasonable to assume that such branching is part of ‘Beyng’ itself and that it can branch off even before material manifestation and thus explore different planets in the Universe. The underlying principle is the desire for unconcealment or truth of ‘Beyng’. Thus, there might be many planets on which the Goddess Principle can flourish.

Relative to the Hubble Singularity it is more difficult to add a similar reasoning within the limits set by Wittgenstein’s seventh. We lack a Kepler telescope analog relative to the environment in which the Hubble Singularity has occurred. Such a

Multiverse telescope is infinitely difficult to build, given the fact that space-time and matter cannot be used in its construction. How do we, creatures in space-time and matter, explore and study environments in which space-time and matter can be created, before they are created? How do we add anything to the God Principle other than the observation that it is related to the creation of Being out of Nothing?

## 9.2 Speculations regarding Multiple Hubble Singularities

Never mind Wittgenstein, speculations regarding multiple Hubble Singularities to have occurred in Nothingness have lead to the concept of the ‘real existierender’ or ‘really existing’ Multiverse.

*Recent developments in cosmology and particle physics have led to the much more radical proposal that there could also be other Big Bangs that might be completely disconnected from ours. The ensemble of universes is then sometimes referred to as the “multiverse”. (Carr, 2008, [64])*

The concept Multiverse is strongly related to the Anthropic Principle, which claims that our Universe is uniquely and deterministically fitted by the requirement to accommodate Darwin Singularities and its subsequent evolution of life, leading to present day humanity.

There is another way to look at the Uniqueness issue of our Universe and the Hubble Singularity. Physics can be split in theoretical physics and experimental physics, with both branches dependent upon each others work. The Multiverse issue might be seen as arising from the attempt of certain theoretical physicists to emancipate or free them from experimental physics. The building of physics as a science is constructed upon two pillars, mathematics and observations. This construction has lead to theories which are highly mathematical but require the input of a certain amount of constants of nature which can only be determined by experimental physicists. The theorists would like to calculate the value of those constants of nature using their laws and mathematics but they fail to do so.

In reaction they have developed the idea that those constants of nature might not be constant at all. Of course, in our Universe these constants are what they are, constants of nature. Then, if your want to vary them because you don’t know how to fixate them, you have to leave our Universe and enter an imaginary Universe in which those constants have other values. For example, Newton’s gravitational constant has a certain value that is unique for our Universe. Vary it and our weight on Earth would alter, become more or less. Carter formulated it a bit more extreme:

*a stronger gravitational constant would be incompatible with the formation of planets and hence, presumably, of observers (Carter, 1974, [57])*

The concept of the Multiverse as really existing (in German: ‘real existierend’) claims that for every imaginable value of Newton’s gravitation constant, there is a Universe in which that value is realized. The same trick can be performed regarding the value of the electric charge of electrons, the quantum of charge, et cetera. In such a way, theoretically you can create as many Universes as you wish. And the limits imposed by experimental physics with their annoying ‘constants of nature’ are eliminated. These ‘constants of nature’ have then become the ‘variables of the Multiverse’

Once this mathematical procedure is discovered relative to the constants of nature, it can also be applied to the initial conditions of the Hubble Singularity and to the Laws of Physics themselves. What if, at the beginning of the Big Bang, anti-matter would have dominated over matter with a small percentage? With a different set of initial conditions, a different Universe than ours would have appeared. In a Universe where gravity would have anti-gravity like positive electricity has negative electric charge, its development would have been entirely different. All these ‘what if’s’ would have lead to different Universe than the one we live in. And most of those ‘what if’ Universes wouldn’t be very friendly to life as we know it. If you convince yourself that all those ‘what if’ Universes are real, you get the Multiverse proposal. That is what can happen if theory tries to emancipate itself from experiment. If fantasy gets rid of the common sense of actual builders, you end up with more or less poetic narratives in stead of engineered science.

## **9.3 The Anthropic Principle and the Multiverse**

### **9.3.1 Carter in 1974**

The concept of the Multiverse started more or less with Carter in 1974. In that year Carter formulated the Strong Anthropic Principle:

*the Universe (and hence the fundamental parameters on which it depends) must be such as to admit the creation of observers within it at some stage. (Carter, 1974, [57])*

Carter then used this notion to formulate an early version of the Multiverse:

*It is of course always philosophically possible - as a last resort, when no stronger physical argument is available - to promote a prediction based on the strong anthropic principle to the status of an explanation*



*by thinking in terms of a ‘world ensemble’. By this I mean an ensemble of universes characterized by all conceivable combinations of initial conditions and fundamental constants. (Carter, 1974, [57])*

A special subset of the Multiverse or ‘world ensemble’ contains cognizable observers:

*The existence of any organism describable as an observer will only be possible for certain restricted combinations of the parameters, which distinguish within the world-ensemble an exceptional cognizable subset. (Carter, 1974, [57])*

The motivation for such a reasoning is given by Carter as follows:

*One of the features of the Universe that one might attempt to explain in this way [...] is the weakness of the gravitational coupling constant. (Carter, 1974, [57])*

Another argument in favor of a ‘world ensemble’ is also directly related to the occurrence of life:

*Similar but even stronger arguments can be made placing a priori restrictions on the fundamental parameters of nuclear physics. For example it is well known that the ‘strong’ coupling constant is only marginally strong enough to bind nucleons into nuclei: if it were rather weaker hydrogen would be the only element, and this too would presumably be incompatible with the existence of life. (Carter, 1974, [57])*

Then Carter positions his approach regarding the Anthropic Principle and the Multiverse concept in the context of Everett Quantum Cosmology

*The acceptability of predictions of this kind as explanations depends on one’s attitude to the world ensemble concept. Although the idea that there may exist many universes, of which only one can be known to us, may at first sight seem philosophically undesirable, it does not really go very much further than the Everett doctrine to which one is virtually forced by the internal logic of quantum theory. According to the Everett doctrine the Universe, or more precisely the state vector of the Universe, has many branches of which only one can be known to any well defined observer (although all are equally ‘real’). This doctrine would fit very naturally with the world ensemble philosophy that I have tried to describe. (Carter, 1974, [57])*

Thus, Carter positions the Multiverse concept from the very beginning as a twin version of the Everett Many Worlds Interpretation of Quantum Mechanics, with the one doctrine's credibility enforcing the credibility of the other.

Then we get the final reason for the Anthropic Principle:

*Even though I would personally be happier with explanations of the values of the fundamental coupling constants etc. based on a deeper mathematical structure (in which they would no longer be fundamental but would be derived), I think it is worthwhile in the meanwhile to make a systematic exploration of the a priori limits that can be placed on these parameters (so long as they remain fundamental) by the strong anthropic principle. If it were to turn out that strict limits could always be obtained in this way, while attempts to derive them from more fundamental mathematical structures failed, this would be able to be construed as evidence that the world ensemble philosophy should be taken seriously - even if one did not like it. (Carter, 1974, [57])*

What is happening here is the attempt to reduce all of physics to half of its foundation, the theoretical or mathematical half. In my opinion, physics is half experimental and half theoretical by essence of its object/subject, the study of nature by one of its inhabitants. If one would let go of the wish to get rid of all experimental input, then physicists could be happy with a situation in which part of the construction of physics was made out of mathematical laws and part out of experimentally determined 'fundamental constants' or the 'given by nature'.

Without the impetus to derive the 'fundamental experimental input parameters' from theory, there would be no Anthropic Principle 'landscape' and no Multiverse fantasy. From that perspective, the Multiverse and the Anthropic Principle are the result of the Platonic influence in physics. An Aristotelian minded physicist would be happy with a science that is part irreducible theory, part irreducible praxis. The Platonic influence in postmodern physics is however very strong and still growing.

### 9.3.2 Carr in 1982

The weak version of the Anthropic Principle is in a certain way self evident. It looks at the Universe as physicists that have evolved as part of the evolution of life on Earth. This took some three and a half billion years. In turn, our solar system has its own history, starting as the reminiscent of a supernova explosion. This exploding star was part of our Galaxy, which arose a certain while after the Big Bang. Due to this prehistory of physicists observing the Universe, once physicists start to observe the Universe, it must have reached a typical age of about ten to twenty billion years. And a Universe of that age, having expanded all that time

with the speed of light, must be of a typical volume. The fact that astrologers observe the Universe leads to the conclusion that this Universe must have reached a certain expansion, see Fig. 19. According to Carr:

*By this argument, at least one feature of the universe, its size, is very dependent on the awareness of man. The conjecture that certain features of the world are determined by man's existence in this way has become known as the "Anthropic Principle". (Carr, 1982, [58])*

This weak version of the Anthropic Principle implies for example the obvious fact that we, as human observers, cannot possibly have witnessed the Big Bang because we evolved long after the Hubble Singularity. The reasoning is of the same category as the observation that I cannot possibly have been a witness of the murder of Julius Ceasar by Brutus. And Moses cannot have published the ten commandments directly on the internet, due to the fact that the age in which he was born lacked both computers and internet. The obvious fact that *certain features of the world are determined by man's existence* is due to the necessity of those features in the the chain of causation leading to the appearance of men.

The strong Anthropic Principle however, goes beyond the obvious. It is an attempt to explain or derive the values of the 'constants of nature', values that up to the present can only be determined by experimental methods. Carr explains this issue:

*Physics claims that the structure of the world is determined by various fundamental constants: for example, the speed of light ( $c$ ), Planck's constant ( $h/2\pi$ ), the gravitational constant ( $G$ ), the charge of the electron ( $e$ ), and the masses of various elementary particles like the proton ( $m_p$ ) and the electron ( $m_e$ ). Certain combinations of these constants have a special physical significance. Thus  $h/2\pi m_p c$ , which is about  $10^{13}$  cm, specifies the size of the proton; and  $h^2/4\pi^2 m_e e^2$ , which is about  $10^8$  cm, specifies the size of the atom. By making other combinations we can form "pure numbers", that is, combinations in which all the units of mass, length and time have cancelled out. For example, the so called "fine structure" constant, ( $\alpha = 2\pi e^2/hc$ , is about  $10^2$ ) This determines the strength of the electromagnetic interaction and it plays a crucial role in any situation where electromagnetism is important. Another important dimensionless number is the gravitational fine structure constant, ( $\alpha_G = 2\pi G m_p^2/hc$ , is about  $10^{-38}$ ). This determines the strength of the gravitational interaction and it plays an important role in determining the structure of very large objects (like stars). (Carr, 1982, [58])*

The weak version of the Anthropic Principle accepts the laws of physics and the value of the 'constants of nature' and is all about the consequences of those given

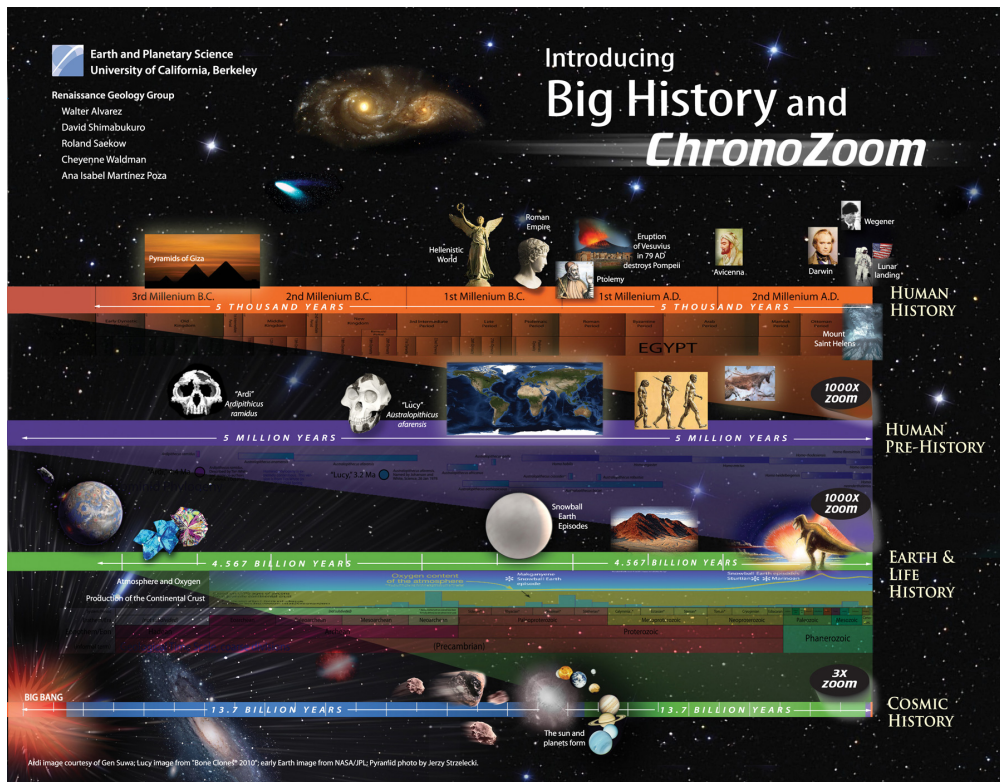


Figure 19: Weak Anthropic Principle: a Universe with astrologers present in it must obviously be around 10–20 billion years old.

laws and values. The strong version however tries to pin down, explain or derive the value of those constants theoretically (Carr, 1982, [58]). Being unable to do this lead the Anthropic branch of physicists to the ‘solution’ that every possible value might have a Universe connected to it. Being unable to explain why our own Universe was special, they turned the ‘problem’ upside down and claimed that our Universe wasn’t special at all but a mere part of a bigger Multiverse or ‘ensemble of worlds’ in which every value of the fundamental constants was realized. Carr, following Carter, connected this the strong version of the Anthropic Principle to the Everett Quantum Cosmology scenario:

*There is another framework for the Anthropic Principle which might seem more plausible. This is the “Many Worlds” interpretation of quantum mechanics, proposed nearly 20 years ago by Everett. [...] It is only a slight extrapolation of this scheme to imagine an ensemble of “parallel” universes, each of which differs in the values of its fundamental constants. In some universes  $\alpha$  is big, in others  $\alpha$  is small, but only in a tiny fraction of these many worlds will the values be such that*

*life can evolve. (Carr, 1982, [58])*

In this way, Carr relates the Everett scheme to the Hubble Singularity itself. The outcome of our own Hubble Singularity is a precise value of  $\alpha$ , which implies that the branching into Universes with different values of  $\alpha$  must occur inside or at a very early moment of the ‘explosion’ of the Hubble Singularity. In the original Everett scheme, only our own world with known ‘constants of nature’ branched off at every observation. It has to be clear that the above isn’t a physical theory, but just a narrative. Nobody can mathematically write down the actual Cosmological Wave Equation which is supposed to branch of into a Multiverse, it’s only a concept. The Everett scheme, quantum or cosmological, is nothing but a meta-physics narrative with no implications whatsoever for experimental science itself. It’s use lies in the attempt to uphold determinism as a paradigm and research program.

### 9.3.3 Barrow and Tipler in 1986

Barrow and Tipler in 1986 clarified the intention of the physicists working within the strong version of the Anthropic Principle research program:

*These, and other gross features of the Universe are the consequences of necessity; they are manifestations of the possible equilibrium states between competing forces of attraction and repulsion. The intrinsic strengths of these controlling forces of Nature are determined by a mysterious collection of pure numbers that we call the constants of Nature. The Holy Grail of modern physics is to explain why these numerical constants— quantities like the ratio of the proton and electron masses for example – have the particular numerical values they do. (Barrow and Tipler, 1986, [62], p. 5)*

It is the Holy Grail of modern physics that pushes physicists on the road of the Anthropic Principle. The key explanatory ingredient is the existence of observers in our own Universe ([62], p. 13). According to Barrow and Tipler, many ‘world ensembles’ can be imagined according to our willingness to speculate about either: 1. different sets of cosmological initial data; 2. different numerical values of fundamental constants; 3. different space-time dimensions; 4. different laws of physics ([62], p. 20). Then they formulated their version of the strong Anthropic Principle: *The Universe must have those properties which allow life to develop within it at some stage in its history.* ([62], p. 20).

In the strong Anthropic Principle, the origin of life or the Darwin Singularity is central in the subsequent reasoning. Then things get mixed up, because they use the standard theory of Neodarwinism as a reference for the boundary conditions of

the Universe and its ‘constants of nature’. But Neodarwinism has a problem with the Darwin Singularities extreme improbability of being caused by mere chance.

*there has developed a general consensus among evolutionists that the evolution of intelligent life, comparable in information-processing ability to that of Homo sapiens, is so improbable that it is unlikely to have occurred on any other planet in the entire visible universe. (Barrow and Tipler, 1986, [62], p. 113)*

This statement is not exactly correct. The evolution of intelligent life, and of life in general, as caused by random mutations as the creative factor, is so improbable that it is unlikely to have occurred like that on any planet in the entire Universe. This observation is one of the two starting points of the ‘chosen mutations’ axiom of Astrological Darwinism. But Barrow and Tipler remain within the problematic axioms of Neodarwinism to construct their version of the Anthropic narrative. Determinism and the capacity of future science to outperform natural evolution is part of the story:

*It will be possible, we believe, to construct a computer that can process information at the human level; that is to say, be as intelligent as a human being. In fact, our arguments will assume such a computer to be possible. But we will never be able to completely understand such a machine at the causal level; it will sometimes act unpredictably, and we will find teleological explanations of its actions more useful than causal ones, at least in understanding its most complex behaviour. This is not to advocate vitalism in computers; we assume of course that computer elements obey the laws of physics, and that there are no ‘vital’ forces acting anywhere in Nature. (Barrow and Tipler, 1986, [62], p. 137)*

These computer-Frankenstein’s continue the man-machine metaphor as a goal to be realized in the future, as key in the deterministic research program.

*Ontological reductionism claims that the ‘stuff’ comprising the world can be reduced ultimately to the particles and forces studied by physics; the vast majority of biologists (and we ourselves) are ontological reductionists. (Barrow and Tipler, 1986, [62], p. 138)*

It is interesting to see how the quantum-reductionists evolve into Multiverse and Many World ‘magicians’ in their attempt to uphold determinism, despite the discovery of intrinsic quantum randomness as an irreducible aspect of nature. As a development, it is inevitable for reductionists to become quantum-reductionists and then the Multiverse/Many-Worlds scenario cannot be avoided. Eventually the quantum-reductionists will infect Neodarwinism with the Multiverse/Many-Worlds narrative too. The first signs are already there.

### 9.3.4 Tegmark, apostle of the Multiverse

Tegmark, a cosmologist at MIT, is a true apostle of the Multiverse. According to Tegmark, the Multiverse/Many-Worlds scenario isn't a just narrative but an established fact of experimental science.

*By this very definition of “universe,” one might expect the notion of a multiverse to be forever in the domain of metaphysics. Yet the borderline between physics and metaphysics is defined by whether a theory is experimentally testable, not by whether it is weird or involves unobservable entities. The frontiers of physics have gradually expanded to incorporate ever more abstract (and once metaphysical) concepts such as a round Earth, invisible electromagnetic fields, time slowdown at high speeds, quantum superpositions, curved space, and black holes. Over the past several years the concept of a multiverse has joined this list. It is grounded in well-tested theories such as relativity and quantum mechanics, and it fulfills both of the basic criteria of an empirical science: it makes predictions, and it can be falsified. Scientists have discussed as many as four distinct types of parallel universes. The key question is not whether the multiverse exists but rather how many levels it has. (Tegmark, 2003, [59])*

This statement, that the narrative of the Multiverse has already joined the ranks of Maxwell-Hertz's electromagnetic waves, Einstein's theory of relativity and Bohr's Quantum Mechanics, was published in 2003 in Scientific American has to be interpreted as a power-play using popular scientific magazines as a part of the battleground. It is the tactics of 'intimidation by popular press' and an attempt to get rid of the professional opposition by an appeal to the public. Let's contrast it by quoting another physicist:

*The multiverse idea is provable neither by observation, nor as an implication of well established physics. [...] The multiverse theory cannot make any testable predictions because it can explain anything at all. (Ellis, 2008, [64])*

Tegmark however is firmly shifting the frontiers of experimental science back to the Platonic half of it. In his multi-leveled Multiverse scenario, at the highest level it is an 'everything goes' Platonic-mathematical heaven:

*The initial conditions and physical constants in the Level I, Level II and Level III multiverses can vary, but the fundamental laws that govern nature remain the same. Why stop there? Why not allow the laws themselves to vary? How about a universe that obeys the laws of classical physics, with no quantum effects? How about time that comes*

*in discrete steps, as for computers, instead of being continuous? How about a universe that is simply an empty dodecahedron? In the Level IV multiverse, all these alternative realities actually exist. (Tegmark, 2003, [59])*

In the quoted article he explains the philosophical origin of his everything mathematically goes philosophy:

*As children, long before we had even heard of mathematics, we were all indoctrinated with the Aristotelian paradigm. The Platonic view is an acquired taste. Modern theoretical physicists tend to be Platonists, suspecting that mathematics describes the universe so well because the universe is inherently mathematical. Then all of physics is ultimately a mathematics problem: a mathematician with unlimited intelligence and resources could in principle compute the frog perspective – that is, compute what self-aware observers the universe contains, what they perceive, and what languages they invent to describe their perceptions to one another. A mathematical structure is an abstract, immutable entity existing outside of space and time. (Tegmark, 2003, [59])*

This is the ultimate Pythagorean-Platonic dream: *A mathematical structure is an abstract, immutable entity existing outside of space and time.* From here, step by step, Tegmark goes on to construct a Multiverse.

*The Platonic paradigm raises the question of why the universe is the way it is. To an Aristotelian, this is a meaningless question: the universe just is. But a Platonist cannot help but wonder why it could not have been different. If the universe is inherently mathematical, then why was only one of the many mathematical structures singled out to describe a universe? (Tegmark, 2003, [59])*

The answer of course is that our own mathematical Universe isn't singled out, isn't special at all:

*As a way out of this conundrum, I have suggested that complete mathematical symmetry holds: that all mathematical structures exist physically as well. Every mathematical structure corresponds to a parallel universe. The elements of this multiverse do not reside in the same space but exist outside of space and time. Most of them are probably devoid of observers. This hypothesis can be viewed as a form of radical Platonism. (Tegmark, 2003, [59])*

Tegmark at least is honest about his metaphysical position: radical Platonism. But he should have been as honest about the scientific status of his Platonism,



being beyond experimental verification and thus mere metaphysics. It's a narrative adjacent to the magical world of a Tolkien. He is nevertheless trying to sell this metaphysical narrative as experimental science in an attempt to obtain the same esteem. His four level Multiverse scenario are summarized in a hierarchy:

*The scientific theories of parallel universes, therefore, form a four-level hierarchy, in which universes become progressively more different from ours. They might have different initial conditions (Level I); different physical constants and particles (Level II); or different physical laws (Level IV). It is ironic that Level III [Everett many worlds] is the one that has drawn the most fire in the past decades, because it is the only one that adds no qualitatively new types of universes. (Tegmark, 2003, [59])*

Where Barrow and Tipler had four types of Multiverse origins, initial conditions, values of constants, space-time dimensions and the laws themselves, with the Everett scenario as the source of Many Worlds with these four types all similar, Tegmark probably places space-time dimensions under the laws of physics.

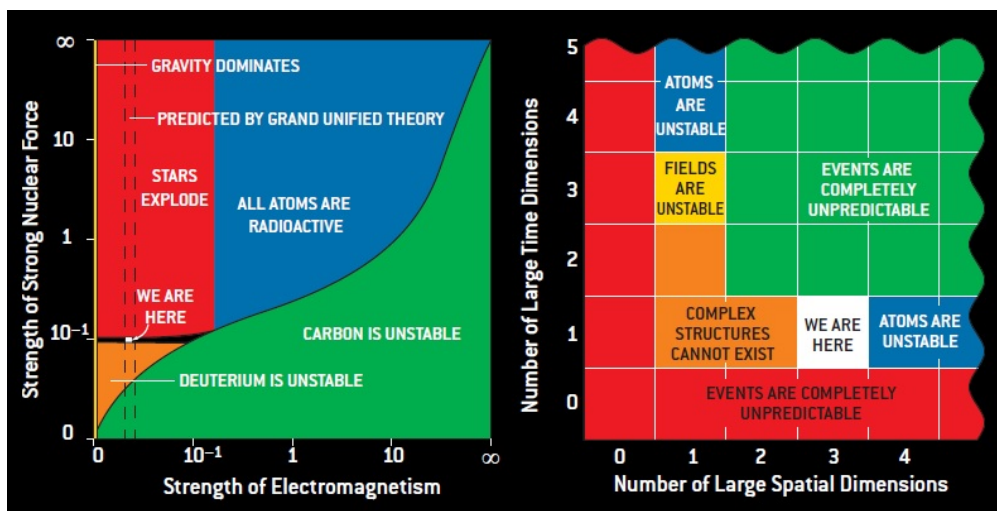


Figure 20: Cosmologist can vary fundamental properties, like the strength of the forces of nature (left) and the number of observable space and time dimensions (right), and then infer what the Universe would be like. The smallness of the 'We are here' part in the graphs has led to the fine tuning idea and the Anthropic Principle. (Tegmark, 2003, [59]).

In an attempt to gain the esteem of experimental science, Tegmark already claims the future realization of quantum computing as proof of the Everett narrative.

*If current efforts to build quantum computers succeed, they will provide further evidence for Level III, as they would, in essence, be exploiting the parallelism of the Level III multiverse for parallel computation. (Tegmark, 2003, [59])*

But for quantum computing to succeed or not doesn't depend on the interpretation of Quantum Mechanics. It is very possible that the breakthrough in quantum computing will be achieved by physicists firmly believing in the Copenhagen Interpretation and rejecting the Everett narrative. The successful team might also be composed of physicists divided over four or five different interpretations of Quantum Mechanics, because that doesn't matter for the experimental success. There might even be a considerable percentage of Creationists among the team successfully engineering the first quantum computer. That will however not be regarded as proof of Creationism.

Then Tegmark asks a question that clarifies things:

*So should you believe in parallel universes? The principal arguments against them are that they are wasteful and that they are weird. The first argument is that multiverse theories are vulnerable to Occam's razor because they postulate the existence of other worlds that we can never observe. Why should nature be so wasteful and indulge in such opulence as an infinity of different worlds? (Tegmark, 2003, [59])*

So should you believe in parallel universes? My reaction: a true theory of physics doesn't need to be believed in, it proves itself useful or dangerous to mankind and that is all it needs to be. The truth of physics is its usefulness and that comes down to its experimental verification. Can we eventually engineer things using those theories? If you need to believe in it to let it be true, then it isn't really physics. Then it is metaphysics or theo-physics. You don't need to believe in smartphones in order to use them or make them real but a certain amount of people need to believe in Christ in order to make Christianity real. If parallel universes need our belief and confirmation in order to be real, then it isn't experimental physics but metaphysics. In the end of the article, Tegmark defends the Multiverse proposal using simplicity and elegance as an argument:

*A common feature of all four multiverse levels is that the simplest and arguably most elegant theory involves parallel universes by default. To deny the existence of those universes, one needs to complicate the theory by adding experimentally unsupported processes and ad hoc postulates: finite space, wave function collapse and ontological asymmetry. Our judgment therefore comes down to which we find more wasteful and inelegant: many worlds or many words. Perhaps we will gradually get*

*used to the weird ways of our cosmos and find its strangeness to be part of its charm. (Tegmark, 2003, [59])*

This of course is a matter of taste. My opinion is that Bohr's Copenhagen Interpretation is the most compact interpretation needed for physicists and that it leaves room for additional metaphysics, clearly separated from physics. The freedom that this allows is in my view of the highest philosophical elegance and simplicity. Luckily, Tegmark himself isn't consistent in his claim that the Multiverse/Many-Worlds scenario is an established part of experimental science. In a 2007 paper in Nature, he asks the question:

*After 50 years we can celebrate the fact that Everett's interpretation is still consistent with quantum observations, but we face another pressing question: is it science or mere philosophy? (Tegmark, 2007, [60])*

In my opinion, asking this question implies that it is a philosophy. You do not ask a French nuclear physicist working at a nuclear power plant such a question with regards to his field of science. His industry is providing more than eighty percent of the electric power used by his country. For Astrological Darwinism however, it is important to understand the prestige that is strategically being amassed by the Multiverse/Many Worlds narrative, because it is its nearest and most desired opponent around. It will be so due to my expectation that the future of Neodarwinism as a credible deterministic theory will depend on the Everett Quantum Cosmological scenario.

## **9.4 Many Worlds Quantum Cosmology and the Origin of Life**

In 2013 Kamenshchik and Teryaev presented the obvious development in the Many World/Multiverse narrative: a justification for the improbability of life as caused by creative 'random mutations'. First they present the Copenhagen Interpretation of Quantum Mechanics. The novelty of the new branch of physics is the fact that its experiments usually have more than one possible outcome, even if one has a complete as possible knowledge of the system. All a physicist can do is to calculate the probabilities of the different possible outcomes on a repetition of an experiment. [63]

Kamenshchik and Teryaev praised the Copenhagen Interpretation for its beneficial influence on the further development of experimental quantum physics. But they also concluded that dissatisfaction with its philosophical implications lead to alternatives interpretations. Attempts to reinstall the classical determinism, in which every specific experiment has one single outcome, by physicists as Planck, Einstein, Schrödinger and de Broglie eventually led to the de Broglie-Bohm pilot

wave or ‘hidden variables’ interpretation. But in the decades thereafter, the ‘hidden variables’ way out of the intrinsic randomness got blocked by the verification of Bell’s ideas at the end of the twentieth century. [63]

Dissatisfaction with the Copenhagen Interpretation also led to the Everett Many Worlds Interpretation, which doesn’t use real ‘hidden variables’ but as real ‘hidden worlds’. Then in the seventies, Many Worlds and the Anthropic ‘world ensemble’ of Carter met and a Many Worlds/Multiverse landscape or coalition formed.

*The general idea of AP [the Anthropic Principle] consists in the statement that existence of the (human) observer imposes important restrictions on the basic laws and fundamental physical constants. As soon as these restrictions happen to be of tantamount importance, the required values of physical constants appear to be extremely improbable. This smallness of probability could be compensated by the huge number of universes constituting Multiverse. (Kamenshchik and Teryaev, 2013, [63])*

The reasoning presented here already contains a fair amount of hidden assumptions. First of all, the physical constants or ‘constants of nature’ can only be determined by experimental means, there are no ways to obtain them by a theoretical procedure. As such, they have the value they have. To give them the attribute of being ‘improbably small’ is a judgment based on the taste of the physicist, not on some objective criteria. Only in a Universe where the constants of nature can be determined by some objective algorithm can the value be compared to values obtained by a slightly changed algorithm. But then they wouldn’t be constants of nature but derived values in a theory.

In the next step, Kamenshchik and Teryaev move from the improbably small cosmological constant to the improbably small chance of DNA to appear in the ‘warm little pond’ by the sole cause of ‘random mutations’.

*However, even a suitable planetary environment does not lead automatically to the emergence of the primitive life. In fact, the probability of emergence of the first DNA molecule to start the simplest replication cycle is about  $10^{-400}$ . [...] This huge number may be compensated by a huge number of attempts in the framework of MWI [Many Worlds Interpretation]. (Kamenshchik and Teryaev, 2013, [63])*

This may seem like a small step, but it crosses an important line. The improbability of the smallness of the cosmological constant is a subjective improbability, as explained a few lines back. The improbability of the DNA as caused by creative ‘random mutations’ on the other hand is an objective improbability.

In our own universe, the cosmological constant is a ‘constant of nature’, solely determinable by experimental physicists. Whether the measured value is experienced as ‘small’ or ‘big’ is a subjective notion. Only inside the Anthropic narrative can such a ‘constant of nature’ acquire a certain degree of improbability, as compared to all the other values it could theoretically have and in other hypothetical universes fictionally has. In other words, the improbable aspect of the cosmological constant can only be such against an already accepted background of a Multiverse. But the improbability of the DNA to have been the product of pure chance in the ‘warm little pond’ is an improbability in our own, unique, single existing Universe. It is a real improbability, calculable by experimental scientists based upon the observed qualities of DNA and its workings. Genetic engineers can do and have done the calculations, based upon their routines as real world bio-architects.

The analogy between the improbability of the cosmological constant and of other ‘constants of nature’ and the improbability of the origin of life as a process of pure chance only exists in the Multiverse narrative. And as such it does exist and it is highly probable that its influence will spread, because it is the only narrative that can save the ‘creative random mutation’ from its demise. Neodarwinism’s future as a deterministic/materialist paradigm depends on the Anthropic, Multiverse–Many-Worlds landscape for the future credibility of its creative ‘random mutations’ axiom.

Kamenshchik and Teryaev point to McFadden as the original source of the idea of connecting the evolution of life to the Many Worlds interpretation.

*In fact, a similar opportunity (without these estimates) was explored by J. McFadden [McFadden, 2001] in the case of the earliest stage of the biological evolution, where he expressed a revolutionary idea that the first life appears only in one of the innumerable Everett worlds. (Kamenshchik and Teryaev, 2013, [63])*

The next interesting thing to happen in the reasoning of Kamenshchik and Teryaev, is the realization that ‘random mutations’ have to be quantum processes in order for the Many Worlds scenario to be applicable. First they expressed the idea quite general.

*To explore the possible role of MWI in the evolution, we suggest to extend this mechanism to all the stages of biological evolution. (Kamenshchik and Teryaev, 2013, [63])*

Then they go into a more detailed description, concerning ‘random mutations’. If ‘random mutations’ were classical ball-and-stick chemical processes, then apparent ‘wave function collapse’ wouldn’t be present and the branching into Many Worlds as the Everett alternative to wave function collapse wouldn’t apply. Thus, according to Kamenshchik and Teryaev:

*[...] we suggest that all the mutations in the course of biological evolution are the quantum measurement-like processes so that all their different outcomes are realized in different branches. The increasing of complexity now has a purely random character, so that only in few parallel worlds the biological evolution produces more and more complex species. [...] All the parallel worlds emerging due to mutations differ only by small variations in the mutating organism. This feature is common with a standard (neo)Darwinian paradigm. What is different from it is that all the versions of this variation are realized in different parallel Everett worlds. This naturally implies the increase of complexity in some of them just by random process. In our opinion, this solves the fundamental problem of the extremely low probability of life emergence and evolution to the most complex forms, including ourselves. (Kamenshchik and Teryaev, 2013, [63])*

In Quantum Biology, the Many World Interpretation of the origin of life, as presented by Kamenshchik and Teryaev, is at present the only deterministic alternative to Bohr's intuition regarding the principles of matter and life as being complementary. Because the 'hidden variable' approach as a research program failed to deliver and at present only has a very few scientists still working on it.

According to Kamenshchik and Teryaev:

*The combination of the many-worlds interpretation of quantum theory with the anthropic principle allows to explain the biological evolution and its top result – the appearance of Human Mind. (Kamenshchik and Teryaev, 2013, [63])*

This explanation is based on the expansion of our Universe/World into as many Universes/Worlds as needed to fix the probability calculations regarding the appearance of DNA by chance.

*The other important problem is the arising of complexity during biological evolution, including such extreme cases as Life itself and Mind. We suggest that crucial role is played the Many-Worlds interpretation, so that extremely small probability is fully compensated by enormous number of trials. (Kamenshchik and Teryaev, 2013, [63])*

And because we cannot check the actual number of Parallel Worlds by observation or experimentation, this justification of the random appearance of life is just a Narrative, with the appearance of being a science. In the next twenty to forty years it will eventually become the prevailing Neodarwinist narrative in the realm of statistical-deterministic Quantum Biology.

## 9.5 Critical assessment of the Multiverse/Many-Worlds proposal

In 2008 in an article entitled ‘Universe or Multiverse?’, Carr and Ellis discussed the scientific status of the Multiverse proposal. Carr defended the Multiverse hypothesis, Ellis strongly criticized it. One of the questions was whether the Multiverse and Many Worlds proposals were part of science or metaphysics:

*[...] are speculations about other universes that can never be seen, based on theories that may never be testable, philosophy or science? (Carr, 2008, [64])*

For common sense philosophers and scientists, the issue is simple, this is metaphysics, not physics. But things are, of course, never straightforward.

*It should be stressed at the outset that physicists are polarized about the notion of a multiverse. (Carr, 2008, [64])*

For Quantum Biology and the mystery of the origin of life, Everett quantum cosmology is the most relevant aspect of the Multiverse landscape.

*Quantum cosmology is most naturally interpreted in the context of the “many worlds” interpretation of quantum mechanics, in which the universe branches every time an observation is made (rather than the alternative view in which the wavefunction collapses). (Carr, 2008, [64])*

Astrological Darwinism has as its most important axiom the belief in the magic of the ‘chosen wave function collapse’ in general and the ‘chosen mutations’ as its subset. This axiom has no value whatsoever in the ‘Everett Quantum Cosmology’, because in the Everett world nothing gets chosen because everything will happen in one of the possible branches of a World into Many Worlds. Choice and Free Will are illusions in the Everett Many World Interpretation of Quantum Cosmology. The illusion of making choices is related to the Everett hypothesis that every branch has its own conscious observer and we always happen to necessarily be in just one of those branching Many Worlds.

In the following remark, Carr clarifies that the Multiverse proposal is pure Platonism:

*The assumption here is that any mathematically possible universe must exist somewhere. (Carr, 2008, [64])*

This also implies the end of experimental science in the Multiverse domain. The difficulty with physics, especially theoretical physics, is that many mathematical constructions can be made in order to invent new physics, but that only a very small

portion of those Platonic constructions survive the ordeal of experimental scrutiny, which consists of making an experimental prediction which has to be proven correct in the real world laboratories. Take for example the problem of a relativistic theory of gravity from the beginning of the twentieth century. Several physicists were trying to unify Newton's theory of gravity with the special theory of relativity. Many theoretical proposals saw the day of light, but only one managed to get across the experimental barrier. What if those scientists would have believed that any possible mathematical proposal for a unification of Newton's theory of gravity with the special theory of relativity would corresponded to a Universe existing somewhere in a parallel dimension? Suppose they would have been content with the belief that any mathematical possible unification would be real somewhere and therefore didn't bother to prove it real, through a decisive experimental test, in our own world? Would the one theory that made it through the experimental barrier have been developed with such energy and perseverance? Would we have functioning global positioning systems or ever detect gravitational waves? In my view, Platonism is nice as a belief or a philosophy, but it isn't experimental science, it potential science if falsifiable/verifiable by experiment or else it is metaphysics.

The seriousness of the Multiverse Platonists regarding the reality of their chimera is revealed in the next quote:

*One should note that the proposal being made is that there is a really existing multiverse. [...] astronomers may never be able to observe the other universes with their telescopes and particle physicists may never be able to detect the extra dimensions with their accelerators. So although physicists such as Leonard Susskind favor the multiverse because it does away with the need for a creator, other physicists regard the idea as just as metaphysical. (Carr, 2008, [64])*

In this quote, Carr reveals a primary motive of the Multiverse narrative: to get rid of Creationism. Of course, physics as a experimental science shouldn't be involved in world view narratives. Computer hardware doesn't care about the content of the texts typed on such a computer and then distributed on the internet. The effect of the explosion of an atomic bomb doesn't change according to the belief system of the one pushing the button. If Susskind needs the Multiverse narrative in order to compete with the Creationists narrative, then he is competing in the field of metaphysical narratives or belief systems, not on the field of experimental science. The strategical reason Multiverse proponents want their theory to be valued as a real science is to gather the full prestige of experimental science behind their Platonic project.

In the 'Universe or Multiverse?' paper, Ellis gave strong arguments against the Multiverse proposal as being part of the experimental sciences. In the first quote, the stakes are set:



*The very nature of the scientific enterprise is at stake in the multiverse debate. Its advocates propose weakening the nature of scientific proof in order to claim that the multiverse hypothesis provides a scientific explanation. This is a dangerous tactic. (Ellis, 2008, [64])*

Then Ellis clarifies what he means by the basic criteria of science:

*Two central scientific virtues are testability and explanatory power. In the cosmological context, these are often in conflict with each other and there has been an increasing tendency in theoretical physics and cosmology to say it does not matter whether a proposal is testable: if it fits into our other theories in a convincing way, with great explanatory power, then testing is superfluous. The extreme case is the multiverse proposal, where no direct observational test of the hypothesis is possible. (Ellis, 2008, [64])*

Testability and explanatory power are two crucial ingredients of a scientific theory. The Multiverse proposal does away with the testability part. Thus, it cannot claim to be an established scientific theory. Nevertheless, Multiverse proponents aren't that modest:

*Despite this, many articles and books dogmatically proclaim that the multiverse is an established scientific fact. (Ellis, 2008, [64])*

This reveals that a game of real world power is being played, a highly political game. Ellis warns for the negative effects on the long run:

*In this context one must re-evaluate what the core of science is: can one maintain one has a genuine scientific theory when direct and indeed indirect tests of the theory are impossible? If one claims this, one is altering the meaning of science. One should be very careful before so doing. There are many other theories waiting in the wings, hoping for a weakening of what is meant by "science". Those proposing this weakening in the case of cosmology should be aware of the flood of alternative scientific theories whose advocates will then state that they too can claim the mantle of scientific respectability. (Ellis, 2008, [64])*

In my view, Ellis is right. Experimental science is too important an activity for humanity to let it strand in philosophical disputes.

*[...] the foundations must be respected if one is to preserve the core features of science that have led to its phenomenal success: that is the feedback from reality to theory provided by experiment and observational testing. (Ellis, 2008, [64])*

This is a clear warning against pure Platonism in science. The Multiverse proposal doesn't meet the criteria of experimental science, according to Ellis:

*The multiverse idea is provable neither by observation, nor as an implication of well established physics. [...] The multiverse theory cannot make any testable predictions because it can explain anything at all. (Ellis, 2008, [64])*

Then he gives his opinion regarding the status of the Multiverse proposal:

*Let me state it more strongly: it is dangerous to weaken the grounds of scientific proof in order to include multiverses under the mantle of "tested science". It is a retrograde step towards the claim that we can establish the nature of the universe by pure thought without having to confirm our theories by observational or experimental tests. This abandons the key principle that has led to the extraordinary success of science. The claim that multiverses exist is a belief rather than an established scientific fact. (Ellis, 2008, [64])*

Multiverse proponents are trying to reestablishing Platonism as a science instead of speculative metaphysics. In my view, the fusion of the Everett Quantum Cosmology leading to Many Worlds and the Anthropic Principle leading to a Multiverse is a Narrative and as such should be treated as serious metaphysics. It is the continuation of the deterministic world view that has driven much of science for the last centuries. It is an attempt to adapt this world view to the new scientific reality created by Quantum Mechanics. The survival of this paradigm or research program is at stake. But a general paradigm driving scientific research is never science itself but a belief system. And this is exactly what Multiverse apostles are targeting: the belief system of scientists in general and physicists in special. In order to measure their success, they perform questionnaires at conferences asking the participants to which interpretation of Quantum Mechanics they adhere/believe. The last decades saw a shift from a Copenhagen majority towards a clear Everett Many Worlds dominance. In the decades to come, this will evolve towards a Many-Worlds/Multiverse majority. Whether Multiverse/Many-Worlds is science or not doesn't matter because it is all about belief systems.

I want to end this section with a 2016 quote from Horgan:

*Physicists' fantasies about parallel and virtual realms are not just stale. Increasingly, they strike me as escapist and even irresponsible, because they are so lacking in evidence. Scientists shouldn't have to serve the public good any more than poets or musicians. But if theories are being passed off as science, shouldn't they have at least a remote chance of being empirically corroborated? Otherwise, how do they differ from pseudo-scientific ideas like intelligent design? (Horgan, 2016, [65])*

In my perspective, physicists in the game of popularization of physics like Susskind are fighting Creationism and Intelligent Design with a logical argumentation as Platonic and non-scientific as the arguments of their proponents. They should be transparent about this and stop claiming to have the full credit or backup of experimental science. The problem is in the claim, not in the metaphysical content of their proposals.

## 9.6 Astrological Darwinism and Everett Quantum Cosmology

The Darwin Singularity is the first moment of appearance of life in inanimate matter on Earth. This concept can be generalized into ‘a Darwin Singularity’ as the first moment of appearance of life in inanimate matter on some planet in the Universe. As a singularity it can be related to the Goddess Principle and in Astrological Darwinism also to ‘Beyng’ and to the individuated ‘élan vital’ of souls. In Astrological Darwinism it seems a logical assumption that many other planets in our Universe might experience their Darwin Singularity moment somewhere in the past, present or future. We have detected other planets around stars with the Kepler telescope and some of them are esteemed ‘Earth like’.

The Hubble Singularity is the first moment of appearance of space-time and matter and as such the creative beginning of our Universe. As a singularity it can be related to the God Principle and philosophically to Heidegger’s concept of ‘Being’ as opposed to ‘Beyng’. The split of ‘Being’ and ‘Beyng’ according to the Hubble Singularity and the God Principle on the one hand and the Darwin Singularity and the Goddess Principle on the other hand has nothing to do with Heidegger. It is my own eclectic appropriation/integration of some of Heidegger’s thoughts and concepts. In my view, the possibility of multiple Hubble Singularities is beyond our capacity of both judgment and observation. Wittgenstein’s seventh should apply.

The Everett Quantum Cosmology assumes that the Hubble Singularity also created a Cosmological Wave Equation and that at every moment a quantum decision is being made somewhere in the Universe, the Cosmos branches in as many Worlds as the Cosmological Wave Equation has solutions or Eigenstates. This implies that the Universes evolve as deterministic as the Cosmological Wave Equation and that not a single option is ever not realized in one of its innumerable branches. The assumption of such a Cosmic Wave Equation is of course wholly Platonic and nothing more than a Narrative. In my view it is an attempt to escape the quantum thread to the age old deterministic belief system.

The Everett Quantum Cosmology can explain away the problem of extreme improbability of the Darwin Singularity to have happened on a basis of mere

chance, the ‘creative random mutations’ axiom of the Neodarwinist paradigm.

*The other important problem is the arising of complexity during biological evolution, including such extreme cases as Life itself and Mind. We suggest that crucial role is played the Many-Worlds interpretation, so that extremely small probability is fully compensated by enormous number of trials. (Kamenshchik and Teryaev, 2013, [63])*

This allows the Neodarwinists to continue their belief system despite the Quantum Mechanics problem it poses. Because in the Many Worlds proposal, nobody ever makes a choice when all possible choices are realized all the time, the crucial concept of ‘chosen mutation’ of Astrological Darwinism as giving creative direction to the evolution of life loses all meaning in Everett Quantum Cosmology. The two paradigms are mutually exclusive. In Astrological Darwinism, choices are really made all the time, blocking some futures and realizing others. Choices matter and the ultimate source of making choices is the soul, with the organism carrying the moral responsibility for those ‘chosen wave function collapses’.

At the same time as being the opposition, Everett Quantum Cosmology as a Quantum Biology environment is preferable for Astrological Darwinism over the older ball-and-stick classical biochemists environment. Astrological Darwinism needs Quantum Biology, in fact it needs the far more futuristic Quantum Gravity Biology as its preferred environment. The previous quote from Kamenshchik and Teryaev is important in this matter:

*[...] we suggest that all the mutations in the course of biological evolution are the quantum measurement-like processes so that all their different outcomes are realized in different branches. (Kamenshchik and Teryaev, 2013, [63])*

In fact, Astrological Darwinism claims that *all the mutations in the course of biological evolution are the quantum measurement-like processes so that all their different outcomes are available as possible choices for the ‘élan vital’ of the soul.* Thus, with regards to the problem of the origin of life and the evolution of it, the Everett Quantum Cosmology and Astrological Darwinism both need a fully developed Quantum Biology as the preferred environment. Both paradigms or Narratives add their respective metaphysics to Quantum Biology as an experimental science. As such, the Everett Quantum Cosmology version of Neodarwinism is the preferred opposition for Astrological Darwinism. In a sense, Astrological Darwinism can strategically choose to be the alter ego of the Everett Quantum Cosmology.

As for the issue of the interpretation of Quantum Mechanics, Astrological Darwinism strongly favors the Copenhagen Interpretation including Bohr’s intuition

of complementary principles dominating matter on the one hand and life on the other hand. Experimental science should be clearly separated from metaphysics and it is not the task of physics to settle disputes that originate in metaphysics. The issues of determinism and the mysteries of the origin of life and the origin of the Universe are metaphysical issues, not problems of experimental science. This differentiation should be clearly visible in the funding of those activities.

## 10 The world view of Astrological Darwinism

The world view of Astrological Darwinism can be summarized in not that many words. I consider it to be metaphysically prudent to hold on to one single Hubble Singularity. I do believe in many Darwin Singularities all across the Universe. Special about the earth is mainly its astronomical and climatological relative stability for the last four billion years. Although there might be a lot of Earth-like planets out there, not many of them will have the benefit of such a stable history. As for the history of our Universe and the Earth, Astrological Darwinism abides by the timeline as constructed by experimental scientists in the course of the twentieth century, see Fig. 19. Actually, Astrological Darwinism strongly supports experimental science with Bohr as its champion. In my view, Neodarwinism is part experimental science and, due to its axiom of ‘creative random mutations’, part metaphysical narrative. If you take Neodarwinism as a whole and replace the axiom of *creative* ‘random mutations’ by the axiom of *creative* ‘chosen mutations’, you get Astrological Darwinism. Random mutations still happen, but they do not create life, they are just detrimental to it.

The concept of ‘chosen wave function collapse’ delivers the complementary principle of life, in a Bohr-Jordan sense, setting the animate apart from the inanimate. Both chosen and random wave function collapse can only have an Eigenstate of the wave function as an outcome and thus it is impossible to distinguish one single chosen collapse from one single random collapse. This implies that a ‘chosen wave function collapse’ cannot violate any law of physics. Only after many subsequent ‘chosen wave function collapses’, when stored in some kind of a material memory like a DNA molecule, or any other historical record, will the difference with the inanimate appear, as its utter improbability. The magic of the physically possible but utterly improbable, that is ‘all’ that life can achieve in our Universe.

The choices in the ‘chosen mutations’ are made by the soul as a metaphysical entity filled with ‘élan vital’ and as individuated ‘Beyng’, the last visualized as the Goddess Principle and eclectically connected to Heisenberg’s ideas of concealment. For science, Beyng is the forever concealed, but intrinsically it has the drive to achieve its own unconcealment, which it achieves through life or as life. Following Bergson, this ‘élan vital’ started its entry into the inanimate world at the smallest

of material dimensions, which in our age is known as the Planck scale of things, where the as yet unknown laws of quantum gravity rule. Once these first steps of 'élan vital' resulted in some form of material memory storage, elementary of molecular, the Darwin Singularity became a fact. This first form of animated material memory storage is also called the 'protobiont'.

In the first two billion years of evolution on earth, life evolved extremely slow and steady, from the perspective of later evolving complexity that is. Evolution has a tendency to accelerate, partly due to the fact that organisms continuously tend to out compete each other in a natural selection environment. The 'élan vital' used its power of 'chosen mutations' continuously, while it was also forced to pay attention to its survival and procreation. This absence of focus made evolution a very slow process, a property of early life called hypobradytely. Then, in between the appearance of the eukaryotic cells and the invention of sexual bi-morphism, a proto-sexualized eukaryote cell time-locked its flowing 'élan vital' to the precession of the equinox. For this it used its gravitoperception, a Planck-scale quantum-gravity bio-sense, acquired somewhere in the previous two billion years. This cell almost completely blocked the flow of 'élan vital' during one extreme of the zodiacal cycle while letting it flow maximally during the other extreme of the cycle. As a result, it could focus on the external competition around the Age of Aquarius and concentrate its internal genetic innovations around the Age of Leo.

This bio-innovation proved extremely successful. It also led to the bi-morphic specialization, with some cells within a species performing better during the materialist Age of Aquarius and other cells outperforming others during the magical Age of Leo. This eventually led to sexual bi-morphism and sexual reproduction. The sexually reproductive single-cell eukaryotes became so successful that they eventually started to clutter together to form the first multi-cellular organisms. In this way, all cells of complex organisms have the Cycle of Life locked in on a single cellular level. This Astrological Great Year is flexibly regulated by a Planck scale quantum gravity gravitoperception existing in every single cell of multi-cellular organisms. The only organisms on Earth that are not locked in to the precession of the equinox are the pre-sexual single cellular organisms, the bacteria, archaea and the non-sexual eukaryota. These cellular organisms can genetically innovate all the time, but at a very slow pace, as hypobradytely, compared to the highly effective genetic boost creative windows active in the sexual eukaryota. The Cycle of Life is thus restricted as the Cycle of (Sexually Reproductive) Life. But for all purposes, calling it the Cycle of Life or the Great Year of Evolution still makes sense.

According to Astrological Darwinism, the Cycle of Life as an early innovation in the evolution of life produced sexuality as a byproduct. This byproduct did speed up evolution even more than the Cycle of Life itself. But that is character-

istic of evolution, that every newer genetic invention tends to speed up evolution exponentially because it has to outperform the latest invention. For humanity, the Great Year is recognizable by its characteristic genetic boosts and subsequent expansion, until a new frontier is reached that can only be conquered by a new genetic boost. The Upper Paleolithic is the most recognizable Great Year, with its artistic genetic boost. But the Neolithic agrarian revolution is also a fine example of a genetic boost creative period, followed by expansion still continuing today. There is also the boat faring innovative genetic boost, with the subsequent Out of Africa, Into Eurasia expansion Great Year.

The Cycle of Life of 26.000 years thus gives us a pattern that is recognizable in our past and that will continue in our future. It explains the 'sapien paradox' of Renfrew and at the same time doesn't completely acknowledge Renfrew's premises that modern man is genetically unchanged, or finished, for at least 60.000 years. Humanity went through two genetic boosts creative windows since the Out of Africa, Into Eurasia event some 60.000 years ago. The effects of these two genetic boosts were subtle and epoch making at the same time. The Upper Paleolithic genetic boost allowed for example the expansion into the harsh winter climate zones of the Northern hemisphere, thus also opening the doorway to the America's.

In Europe the Upper Paleolithic genetic boost created cave artists and in North Africa it might have created monumental stone sculpting artists creating the pre-Sphinx Lion about 25.000 years ago, around the peak of the last Age of Aquarius. In the region of the Fertile Crescent, wild wheat gathering was already an important food source 23.000 years ago and this allowed the establishment of more permanent settlements and created a lot of spare time for its inhabitants. In Europe, it was the winter climate for which food storage was needed that created spare time in the cold winters, during which the people withdrew into the caves. In other regions, where there was no need or occasion for building food supplies, the people lacked the connected concentrated availability of idle time. Which is a necessary condition for creating great works of art. This happened in Europe and produced magnificent cave art. It happened in the Levant as the result of wild wheat gathering, which resulted in monumental large stone monuments as Gobekli Tepe (Schmidt, 2010, [66]).

It is a characteristic of the early agriculturists to erect large stone monuments everywhere they settled in Europe, agriculturalists that immigrated from the Fertile Crescent. The habit of spending spare time on the construction of monumental stone constructions seems to predate agriculture and might have originated in the first clans of wild wheat gatherers dating as long as 23.000 years ago [17]. In the 11.000 years in between the first evidence of wild wheat gathering and the construction of Gobekli Tepe by such wild wheat gathering tribes, before turning to agriculture, a lot of interesting construction work is possible. For that we don't

need ancient aliens. All we need to do it to forget our twentieth century mind set and change back into the rhythm innovations and trends of the Great Year followed by humanity for millions of years. In ten to twenty thousand years of stable circumstances, relatively small tribes of people can achieve great things. All they need is idle, spare time and nobody to tell them what to do with it. That is the environment in which art and monuments are created, without further mystery. They were successful in gathering and storing foods, thus they got bored, and the rest is history. Boredom often is a better explanation for the construction of great monuments than a secret and hidden, Illuminati inspired, narrative. It is the 'lets do it, because we can, and we are bored' spirit. That is, in my opinion, why we have a Sphinx.

In the paleolithic timeline of recent human history, recent means the last 100.000 years. Around 55.000 years ago humans build boats of high enough quality to get from Asia into Australia/New Guinea. Historians are a bit weird because when the discussion turns to the period in time when humans entered the American continent, somewhere between 25.000 and 15.000 years ago, they focus on the existence or not of a land bridge as a necessary condition for the crossing of 50 miles of open sea of the Bering Strait. As if humans lost their sea faring abilities during that 30.000-40.000 years. Some 10.000 to 20.000 years after the first humans entered the America's, others colonized the islands of the pacific, indicating that the sea faring abilities only increased in time, never diminished. In the same reasoning, if we have evidence of megalithic constructions by hunter and gatherer tribes some 13.000 years ago, before the invention of agriculture but connected to the gathering and processing of wild wheat and we have evidence that this gathering and processing of wild wheat was already practiced in that region 23.000 years ago, then that gives us an unproblematic window of 11.000 years in which tribes in those area might have constructed their first megalithic thingy. By the time these people entered Europe as agriculturalists, building megalithic thingies was already part of their identity, if we look at what they left behind all over Europe.

The largest part of our historians and cultural experts still live in the time frame set by the Bible. That gives them some 6.000 years for man to have risen from wildness to cultivation and civilization. Their time frame doesn't even cover the highly essential Neolithic revolution, when humanity invented agriculture. According to that time frame, the birth of 'reason' dates back 2500 years, to the Greeks of Athens and other Mediterranean cities. The discovery of Ancient Egypt was already a shock, absorbed at the end of the nineteenth and the beginning of the twentieth century. And its a history of continuous progress, where humanity left the dark ages of magic, to enter first the age of myth, then the age of religion and finally the age of science. All in that time frame of at its most 6.000 years.

In the time frame of Astrological Darwinism, which is basically the timeline of



paleontology to which the rhythm of the Cycle of Life is added, those last 6.000 years of our cultural historians are but one fourth of our present Great Year. Instead of linear progress, Astrological Darwinism views cultural history as cyclic. The progress of the last 6.000 years covers the Age of Taurus, the Age of Aries and the Age of Pisces. Indeed, due to its proximity to the Age of Leo, the Age of Taurus might still be considered as predominantly magical. And the Age of Aries is already closer to the Age of Aquarius than to the Age of Leo, so it might represent a time when magic lost weight to logic, with myths and organized cults as its mixture. The Age of Pisces then shows the victory of reason over magic, due to the increasing transcendence of the soul and the growing dualism of body and soul.

The Age of Aquarius then is the coming of peak dualism and transcendence. After which 'progress' will halt and the pendulum will turn back towards immanence of the soul and the connected magical consciousness. This of course is unthinkable in the mindset of our dominant cultural historians and futurologists. As peak dualism and transcendence, the Age of Aquarius might be associated with peak spiritualism. Personally I believe that peak science will be a more accurate description and that the compensating spiritualism will be mostly that, a compensation of the Age's main development. But as such it has the important task to maintain a balance, philosophically. In the Age of Aquarius, people need to be reminded of the transcendent soul, waiting in captivity and concealment for its time to enter this world. Waiting in captivity, due to a billion year old equinoxial precession linked time-lock embedded deeply into every single cell of our body. Waiting to produce its own aletheia, truth or unconcealment in the next genetic boost creative window in the upcoming Age of Leo.

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