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The Third Story of the Universe: an evolutionary worldview for the noosphere

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Abstract: We introduce and elaborate the new, evolutionary worldview, as a "Third Story", intended to replace and complement the earlier religious (First) and mechanistic (Second) worldviews. The confusions created by a world that is ever more volatile, uncertain, complex and ambiguous have eroded people's sense of coherence, that is, the degree to which they experience the world as comprehensible, manageable and meaningful. The First Story provides meaning and values, but its descriptions no longer provide an accurate understanding of the universe. The Second Story, which sees the universe as a clockwork mechanism governed by the laws of nature, provides more accurate predictions that allow us to build powerful technologies. However, it does not provide meaning or values. The Third Story sees the universe as self-organizing towards increasing complexity and consciousness, subsequently producing matter, life, mind and society. It understands the fundamental mechanism of evolution as mutual adaptation between interacting systems, thus generating synergetic wholes that in turn interact, so as integrate into even more complex wholes. Its implicit value is the search for fitness and synergy, thus inviting individuals to work towards a further integration of the noosphere, i.e. the planetary superorganism formed by humanity, its technological extensions, and the ecosystem.

Keywords: xxxxxx.

Introduction

Throughout the centuries, people have been fascinated by stories that can explain the universe in which they live, as well as their own role in that universe. All cultures have origin myths, which describe how the world was created. Such myths not only explain some of the important features of the world, such as the succession of night and day, but they also provide a meaning to human life. That is because the story typically explains why humans were created and what they are supposed to do. Thus, origin stories help people to make sense of their life and the wider universe in which they live, providing them with insights and values that can guide their actions.

The presently most widely spread of these stories is the one narrated in the book Genesis of the Christian Bible and its counterparts of the Jewish Torah and the Islamic Qur'an. Genesis explains how the world was created by God in seven days, and how God, after creating the Earth, the plants and the animals, finally created the first humans, Adam and Eve. These humans were put there with a mission or purpose, which included working hard, worshiping God and obeying His commands as formulated in the Scriptures.

We will denote origin stories such as these, which are rooted in tradition, myth and religion, collectively as the "First Story". For centuries, each First Story has been taken as a literal truth by its adherents. However, as scientific knowledge developed, most of the facts related in these stories became increasingly hard to believe. For example, we now know that the Earth is just one among billions of planets in the universe, that it took billions of years for the first plants and animals to appear on Earth, and hundreds of millions of years more for humans to evolve out of these animals. Modern theologians warry to cohere with the development of modern science have shifted from literal to allegorical interpretations. Still, the core mythical-religious worldview of the First Story was gradually eroded by the standard scientific worldview, which we may call the "Second Story".

The power of the Second Story was demonstrated by its ability to make very accurate predictions in domains such as astronomy, mechanics and chemistry and to provide detailed explanations of previously mysterious phenomena such as the weather, the causes of infections, or the movements of the planets. The scientific narrative received further confirmation from the ever more powerful technologies that were based on its theories, from life-saving drugs to space-faring engines and increasingly intelligent computers. As a result, the scientific worldview has become the dominant one in our present society, with just some small segments of fundamentalists holding on to a literal acceptance of their First Story.

However, there is an important feature of the First Story that is lacking in the Second one: the question of value, meaning or purpose. Science intends to merely describe how the world functions, not to prescribe how people in that world should behave. Moreover, as philosophers have pointed out under the moniker of the "naturalistic fallacy": prescriptions (values) cannot be derived from descriptions (facts, observations). A description of some part of the world, such as a map, however accurate, does not in itself give you directions, such as which destination on that map you should travel to (Turchin, 1990).

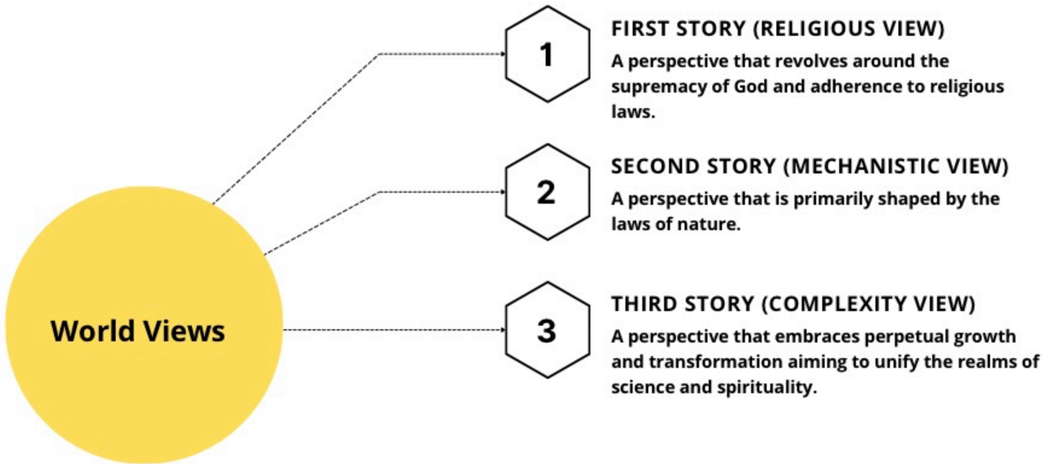
This lack of directions has become an acute problem in our contemporary society, which is commonly characterized as a VUCA (Volatile, Uncertain, Complex and Ambiguous) world (Beigi, 2015; Bennett & Lemoine, 2014; Mack & Khare, 2016). Many people seem to have lost their *sense of coherence*, i.e. their experience of the world as comprehensible, manageable and meaningful (Antonovsky, 1998). The resulting feeling of confusion, anxiety and despair, which we have analyzed in a previous paper (Heylighen & Beigi, 2023), has been called the *Techno-Social Dilemma*. In the present paper, we will argue that this predicament requires the development of a new integrated worldview (Aerts et al., 2002), which we call the "Third Story". Such a narrative combines the most up-to-date scientific understanding of the universe as interconnected and evolving with a sense of meaning, value and purpose that sees humans as actively involved in this evolution towards greater complexity, intelligence and consciousness. But before we describe the Third Story, we will investigate some of the background questions and assumptions that lead to the First and Second stories.

The confusions of a VUCA world

In an age marked by unprecedented technological strides and incessant connectivity, the commodity of attention is becoming increasingly scarce (Heylighen & Vidal, 2008). The relentless demands on our cognitive resources, from smartphone notifications to the stream of information on social media, subject us to an overload of stimuli to make sense of (Compernolle, 2014). The confrontation with chaotic, inconsistent and ever-changing information results in stress, confusion and the fragmentation of mental models. Yet, we do need to cope with the challenges of the present VUCA world (Bennett & Lemoine, 2014). *Volatility* necessitates long-term thinking. *Uncertainty* demands resourcefulness, adaptivity and foresight. *Complexity* requires systemic thinking and an awareness of global interconnectedness. *Ambiguity* calls for sense-making, curiosity and experimentation (Beigi, 2015).

Humans are cognitive beings predisposed to seeking explanations that resonate as true and meaningful. This makes them vulnerable to cognitive biases. Humans are also evolutionarily inclined to regress into tribalism and primitive cognitive habits in time of crisis (Pinker, 2018). That is conducive to either reverting to familiar narratives or yearning for bygone eras. Cognitive biases such as the availability heuristic, the bad news bias and the optimism gap tilt public views towards distorted perceptions of the world's situation (Jackson et al., 2016). Overly simplified, emotional and false information propagates more easily (Jagiello & Hills, 2018; Vosoughi et al., 2018; Zimmer et al., 2019), skewing people's view of the world. This onslaught of dramatic and disconnected information, amplified by the war on attention, has a detrimental effect on the current generation, producing a climate of anxiety, pessimism and despair (Haidt, 2024; Heylighen & Beigi, 2023; Udupa et al., 2023).

Our present predicament calls for a new system of values that can bring back a sense of coherence and balance. These values should not be limited to religious or scientific beliefs but should be inclusive and speak to all people without creating division or tribalism. In a previous work, we discussed the need for such a new sense of coherence (Heylighen & Beigi, 2023). Nevertheless, the devil is always in the details of stories because the plasticity of the human belief system and the susceptibility of the human mind to deception and illusions make it increasingly vulnerable to stories and narratives of the world that are fragmentary and polarizing . Moreover, because stories have a group bonding effect, bringing people together in a shared cognitive and emotional sphere, they can easily reduce our cognitive and reasoning capacities once



we believe them and automatically retell them without critical examination (Cowen, 2011; Rose-Stockwell, 2023; Törnberg, 2018). However, this should not translate into dismissing the power of storytelling in inspiring progress in difficult times. Instead, it is a call for recognizing the impact of stories we tell ourselves collectively or are propagated by media outlets that are against the current advances in understanding the world or are false yet told in a powerful language.

The Birth of the Second Story

Next to religious systems of meaning (the First Story), there exists a parallel narrative (the Second Story) where scientists, philosophers, and thinkers have presented an alternative framework for understanding the world. The advent of the scientific revolution and the Age of Enlightenment marked a shift toward empirical inquiry, reason, and the pursuit of knowledge independent of religious dogma (O'Hara, 2012; Pinker, 2018). This intellectual movement ushered in a new era where individuals sought explanations for natural phenomena through observation, experimentation, and critical thinking.

Philosophers have explored existential questions and ethical considerations without relying on religious doctrines. The diversity of thought within philosophy highlights humanity's underlying knowledge-seeking nature, the power of its intellectual capacity and our continuous quest for meaning, not solely confined to and guided by religious paradigms. Nevertheless, as societies grapple with the complexities of the modern world, individuals find themselves at the intersection of these two narratives, navigating between the spiritual guidance offered by religious traditions and the intellectual inquiry championed by scientific and philosophical discourse. These two sides are often portrayed as a tension, but can also create a dynamic dialogue where individuals can draw upon a spectrum of perspectives to derive meaning, find purpose, and address the profound questions that have captivated human curiosity throughout the ages (Liogier, 2009) (Fig. 1).

Fig 1 -

First Story and Sense of Coherence

Many scholars have argued for a positive impact of attitudes and behaviors associated with religiosity, prayers and rituals (Anyfantakis et al., 2015). A religious worldview helps people to make sense of what happens to them—in other words, to develop a sense that their life and the world in which they live are coherent. However, a study that simultaneously investigated the effects of religiosity and of having a sense of coherence did not find such positive effects of religiosity on its own (Tagay et al., 2006). The study revealed no meaningful correlation between religiosity and anxiety, depression, or post-traumatic stress disorder. On the other hand, it found that sense of coherence did offer a clear protection against these painful conditions.

Coined by Aaron Antonovsky, the *Sense Of Coherence* (SOC) denotes a general attitude about life and the world in which one lives, which is composed of three aspects (Antonovsky, 1998; Eriksson & Lindström, 2006):

(1) *comprehensibility*: people have a general understanding of how the world functions and which things may or may not happen to them.
(2) *manageability*: people feel they have the necessary (individual or social) resources and skills that would allow them to cope with challenges.
(3) *meaningfulness*: people have goals and values that they consider worth striving for.

Many studies have consistently shown that individuals with a higher sense of coherence can deal better with life challenges, traumas and stressors.

SOC provides a constructive and enduring way of making sense of the world. The stronger a person's SOC, the more likely the person will be able to cope successfully with stressful situations (Eriksson & Lindström, 2006). The SOC model assumes active participation from individuals in shaping their worldviews and formulating an empowering life narrative. In other words, individuals with a strong SOC can identify relevant coping resources, effectively utilize these resources, and derive emotionally significant lessons when faced with unfortunate life events (McGregor, 2017). Such proactive engagement connects individuals' agency directly to how they make sense of the world in which they live.

To understand the implications better, it is worth analyzing more deeply what precisely "making sense of the world" consists of. A useful framework is provided by the concept of an *integrated worldview*. This is a broad conceptual scheme that helps people orient themselves in the world and find *meaning* in what happens to them (Park, 2010; Steger, 2009). In the tradition initiated by the philosopher Leo Apostel, an integrated worldview can be seen as consisting of six components that form a coherent whole (Aerts et al., 1994; Vidal, 2008, 2012). These components can be understood as fundamental aspects or dimensions of meaning. Whenever we are confronted with a situation or phenomenon that we need to make sense of, we will tend to ask the following questions:

(1) *Present* (Identification): what is it? What precisely is going on?
(2) *Past* (Explanation): where does it come from? Why is it there? What caused it to be?
(3) *Future* (Prediction): where is it going to? What are the likely consequences?
(4) *Knowledge*: do I have the necessary facts? How can I find out more?
(5) *Action*: what can I do? What courses of action do I have?
(6) *Value*: what are the good and the bad aspects? Which goals should I try to achieve?

The first three aspects are “objective”: they focus on understanding the external situation. The last three are subjective: they try to clarify the relation between the subject (“I”) and the situation, so that the subject knows how to react. This worldview scheme can be understood as an extension of Antonovsky’s three-component SOC scheme (see Fig. 2). SOC’s comprehensibility component is here subdivided in the meaning components (1)-(4). Fully comprehending a complex situation, such as the present state of the world, requires understanding: its main components or features (1), its origin or causes (2), its likely consequences (3), but also your own level of knowledge or ignorance (4), so that you do not jump too quickly to conclusions based on incomplete information. SOC’s manageability maps to component (5), i.e. knowing which actions you can produce that are appropriate to the situation. SOC’s meaningfulness finally corresponds to component (6): being able to formulate worthwhile goals for your actions in the present situation.

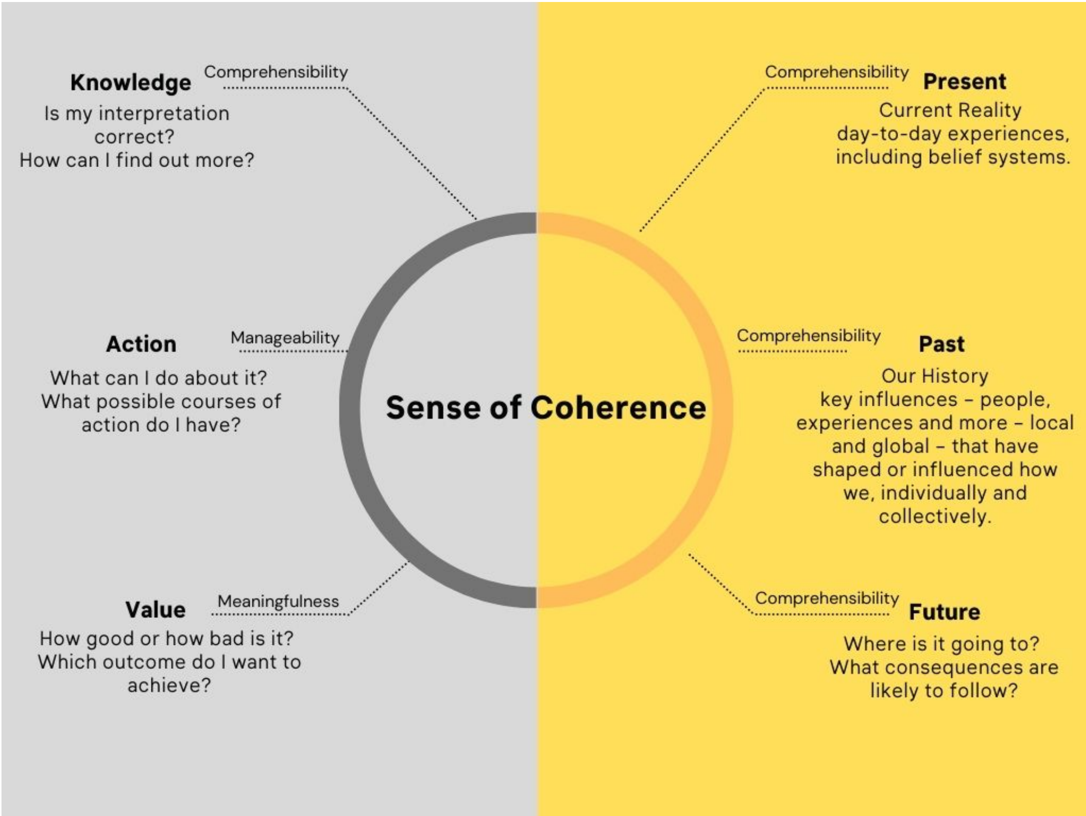


Figure 2: the sense of coherence analyzed into its components. Left (grey background) are the subjective components, right (yellow) are the objective ones (from (Heylighen & Beigi, 2023).

'Higher religiosity' is characterized by a profound level of faith and adherence to specific religious doctrines, and has been shown to have positive correlations with enhanced coping skills (Anyfantakis et al., 2015). However, we propose that the framework presented by the religious/spiritual or the First Story does not directly and adequately address the need for critical thinking, the formation of a new sense of self, and the generation of meaning and renewed hope. This applies in particular to individuals leaning towards a more secular worldview, amidst the confusions of the VUCA world and in the face of extreme events where people's sense of comprehensibility of the world is radically challenged (e.g. loss of loved one due to God's will vs. due to coincidence, misfortune, or the natural consequence of diseases).

In times of change and uncertainty, our ability to adapt and bounce back depends on our sense of control and willingness to embrace new realities. Coping with life's challenges also requires a flexible mindset and an openness to new possibilities, allowing us to shape our future actively (Beigi, 2015). While religion can provide a source of hope, Snyder's research highlights the need for a more nuanced understanding of what hope means (Snyder, 2002), emphasizing the complex interplay between goals, plans, and agency (Table 1). For Snyder, hope is a motivational state that arises from a sense of control over our actions (goal-directed energy) and a clear sense of the steps we need to take to achieve our goals (pathways). Individuals with high hope traits, reminiscent of those in the high SOC group, demonstrate characteristic behaviors associated with a growth mindset (Dweck, 2016), such as flexible thinking, goal-setting proficiency, and sustained motivation.

Component	**Characteristics**
Goals	A goal is a cognitive component and has two general types. Type A is about positive approaches or goal outcomes that can be: 1) Envisioned for the first time; 2) sustaining the present goal outcome; and 3) increasing that already initiated. Type B is about forestalling negative goal outcomes that can be 1) Deterring so that it never appears or 2) Deterring so that its appearance is delayed.
Pathways Thinking	A positive cognitive attitude toward a certain challenge, such as positive self-talk, fuses a high-hope person pursuing a specified goal. Also, high-hope people are flexible thinkers, good at creating plausible alternate routes and quick at effectively tailoring routes, especially when impeded. The pathways thinking is far more tenuous for a low-hope person, and the resulting route is not well-articulated; the low-hope person should be unlikely to produce alternate routes.
Agency Thinking	The perceived capacity to use one's pathways to reach a desired goal. When people encounter impediments, the agency helps people to channel the requisite motivation to the best alternative pathway.

Table 1: Different Components of Hope Theory- Adapted from (Beigi, 2015; Snyder, 2002)

Towards a Third Story

Throughout history, the First Story tailored by religion has played a pivotal role as the primary source of meaning and certainty on a global scale. In times of difficulty, turning to scripture and the divine offers a profound sense of comfort and assurance, especially within religious societies. Additionally, religions have been fostering communal bonds. However, a resilient sense of coherence in the VUCA world that is increasing connectivity between various parts of the brain and not just reducing fear and insecurity requires a story that is supported by both scientific research and tried and tested contemplative theories and practices such as mindfulness meditation, compassion training, loving-kindness meditation and other techniques that are widely studied and supported by the scientific community and spiritual communities worldwide.

Previously, we described the structure of sense of coherence as three elements of manageability, comprehensibility and sense of meaning. Bundling all these elements into one sacred top-down pathway of causation builds a sense of coherence, but we argue that this sense of coherence is shallow rather than deep. In crafting a Third Story, we have integrated these elements into our thoughts and proposed a third way that takes the best of each story into one coherent picture.

The cognitive component of religious stories is limited in assigning the root causes of all things to one point, God, limiting individuals' agency in taking control of their lives and, therefore, actively modifying and upgrading their sense of coherence. In this paper, while acknowledging the strong inclination to interpret the present situation through the lens of old stories, we extend an invitation to the reader to consider a narrative that embraces both the complexity of the human predicament and its astonishing capacity not only to endure but to thrive in the face of a perpetually changing world. We believe the narrative of the Third Story we formulate in this paper and its signature behavioral features are highly pertinent to the challenges of the information-saturated VUCA world while simultaneously acting as a reminder of the key values that were once championed by the past luminaries across various culture (Liogier, 2012, 2023).

But before we can elaborate the Third Story, we need to analyze its predecessor, the Second Story, which is rooted in the traditional scientific worldview.

The Second Story

The classical scientific worldview (Heylighen et al., 2007) can be summarized as the *clockwork universe* (Dolnick, 2011). It was inspired largely by Newtonian physics, which provided a very accurate description of the trajectories of the planets and other heavenly bodies under the influence of the force of gravity. The movement of the planets is perfectly predictable. Thus, the solar system can be modeled as a giant clockwork mechanism with its different interlocking gears and wheels moving together so as to simulate how each planet rotates around the sun in its elliptic orbit, while its moons rotate around the planet itself (see Figure 3). According to Newtonian mechanics, every movement of every material object can similarly be described by a mathematically specified trajectory through space and time. This brings us to the fundamental assumptions of the Second Story (Heylighen et al., 2007).

Figure 3: a clockwork mechanism simulating the movements of the planets and their moons. Photo source: Wiki Commons

The first assumption is *materialism*: all phenomena are the effect of material objects, which are ultimately constituted of particles. These particles can be conceived as similar to billiard balls: rigid components composed of some inert substance that we call matter. The second assumption is *reductionism*: all the properties of objects can be explained by the way their components, i.e. ultimately their particles, are arranged in space. There are no emergent properties: the whole is merely an aggregate or sum of its parts. The third assumption is *determinism*: the movements of these objects and particles are fully determined by the forces that act on them. The forces are exerted by other material objects as specified by the Laws of Nature. These laws leave no choice or freedom in how objects move: their future trajectory is unambiguously fixed. The final assumption is *reversibility* (Prigogine & Stengers, 1984): the trajectory is determined not just towards the future, but towards the past. The laws of nature do not distinguish between the future and the past; there is no "arrow of time", neither progress nor deterioration. Thus, the universe is similar to a mechanical clock, whose mechanism could be turned forward or backward, but does not allow any choice in the way it moves.

These different assumptions can be summarized by the notion of *distinction conservation* (Heylighen, 1989; Heylighen et al., 2007): the world consists of well-defined, distinct objects, having well-defined, distinct properties. These distinctions are objective and unambiguous. As these objects move through space, distinctions are conserved: objects and their properties remain distinct. They do not merge, split in two, appear, or disappear. In such a clockwork universe, there is no room for creativity, emergence, or evolution. Information is conserved. As made famous by Laplace's thought experiment, if some hypothetical demon would know the complete state of the universe at the present moment, then it would be able to calculate the universe's further states at any moment in either the past or the future (Heylighen, 2012). In such a worldview, there cannot be any surprise, novelty, or emergence. There is also no freedom to change the course of events, since everything is determined beforehand.

In practice, however, we do not know the precise state of the universe. Therefore, we can make precise predictions only for certain cases, such as the movements of the planets. Nevertheless, the Newtonian worldview assumes that we can in principle acquire ever more complete information by accurate, scientific observation. Thus, our powers of prediction can continue to grow without limit. Eventually, we should be able to eliminate all uncertainty, ignorance and confusion. Moreover, the better we can predict how a particular system or mechanism will behave, the better we can control that mechanism, so as to make it do precisely what we want. For example, we can build a rocket and program its trajectory in such a way that it will land in a particular spot on the planet Mars at a particular day and hour years from now.

This is the great strength of the Second Story: it suggests that we can explain, predict and control the behavior of virtually any material system. It provides us with methods to design and build mechanisms that will achieve practically any material objective. This is the basis of industrial society and its ever more powerful and efficient technologies. These technologies allow us to produce about any good we desire. The resulting machines, vehicles, and factories have in essence resolved the age-old problem of scarcity: nowadays, we have the means to supply every person on Earth with not just the basic food and accommodation needed to live comfortably, but with a dizzying array of consumer goods. This is a great advance compared to previous centuries. It allowed us to largely eliminate ancient scourges such as famines, plagues, poverty, child mortality, illiteracy and ignorance (Pinker, 2018).

However, such progress reveals a fundamental contradiction within the Second Story. Improving the human condition by applying scientific knowledge assumes that: 1) you have the freedom to choose between different approaches; 2) you have a system of values that tells you which approach is better, and which is worse. The Newtonian worldview leaves no place for either freedom or value: since everything is determined since the beginning of time, it is in principle impossible to choose one course of action over another one (Heylighen, 2012).

The contradiction is to some degree resolved by two further assumptions: *mind-body dualism* and *rationality*. To explain our apparently free will, the scientist/philosopher Descartes assumed that the human mind is intrinsically separate from the matter that constitutes its body and that is subjected to the laws of mechanics (Descartes, 1999; Heylighen & Beigi, 2018). Therefore, human individuals are not just inert objects: they have agency and can thus freely decide how their body should behave. That allows them to manipulate matter as they please.

However, this assumption introduces an element of arbitrariness in the mechanistic worldview, threatening to undo its powers of prediction and its elimination of uncertainty. Therefore, economists have conceptualized humans as *rational agents* (Heap, 2013; Zafirovski, 2003): their behavior is not arbitrary, but aimed at maximizing their "utility". Utility is a measure of the value that some option has for an individual who is choosing between different options—such as which good to buy in a shop. Utility can be seen as the degree of benefit, satisfaction or happiness that the individual expects to get by choosing that option. Rationality refers to the assumption that people always choose the option with the highest utility. If we moreover assume that utility is a function that can be calculated for any option by acquiring the necessary information, then human behavior becomes predictable again. This assumption allows economists to build mathematical models of human decision-making that are just as deterministic as the models used by physicists to predict the movement of the planets.

In practice, utility tends to be equated with monetary value or with the quantity of matter contained in some good. Thus, while the Second Story does not propose any explicit goals or values, its implicit values are quantitative and materialistic: acquiring more and bigger material objects is better. These are the values that have been driving industrialism, communism, capitalism and neo-liberalism (Liogier, 2023). This attitude of economic rationality is reinforced by the philosophy of mind-body dualism (Lent, 2022). If individual humans are the only entities endowed with mind and agency, while all other entities, such as animals, plants and natural resources, are merely passive pieces of matter, then humans can use, consume, or exploit these objects in any way they desire (Abram, 2010).

This attitude of unlimited exploitation is reinforced by reductionism: if the world is merely an amalgam of independent, inert objects, then it does not matter if you remove some of these objects in order to consume or otherwise manipulate them as you please. This attitude stands in contrast with the more holistic or systemic worldview that we find e.g. in the animism of many indigenous cultures, in Taoism, and in contemporary ecology (Lent, 2022). Here, the world is conceived as a network of interdependent systems or agents (Heylighen, 2023a). Removing some of these agents can affect many others, including the humans themselves. We will elaborate this systemic perspective when introducing the Third Story.

It is worth noting that the Second Story's assumption of determinism has been put into question from within the mechanistic worldview itself. Quantum mechanics is a theory of matter that assumes a fundamental uncertainty about the behavior of particles. It implies that the outcome of certain physical processes is intrinsically random. Similarly, the Neo-Darwinist theory of biological evolution assumes random mutations. However, randomness does not negate the other assumptions of the Second Story. In practice, random processes are statistically predictable. Random processes, just as much as deterministic processes, lack any form of freedom, agency, intrinsic value, progress, or interdependence. Thus, the addition of randomness does not fundamentally address the shortcomings of the Second Story.

In conclusion, the Second Story does provide some sense of coherence, by making the world appear more comprehensible, predictable and manageable. Analyzing phenomena in their material components and discovering the natural laws that govern the behavior of these components helps us to understand the present state of the world, and to some degree its past and future. It also helps us to acquire knowledge and to act more effectively, in particular by developing technological systems that apply these laws to process material resources into economic goods.

However, the Second Story does not provide any sense of meaning, value or purpose. Its only implicit values are materialistic and quantitative, suggesting that we can freely exploit natural resources in any which way. Moreover, it does not offer any inspiring vision of the future, since it assumes that the future is only quantitatively different from the past. It also fails to explain the origin of important phenomena, such as matter, life, mind and society, since it assumes that nothing truly new can emerge. The problem with the Second Story can be summarized by a famous quote of the Nobel-prize winning physicist Steven Weinberg: “The more the universe seems comprehensible, the more it seems pointless” (Weinberg, 1988). That also explains why the mechanistic worldview has been criticized for *disenchanting* the world (Prigogine & Stengers, 1984), stripping away its beauty, wonder and mystery by reducing everything to cold mechanisms. Nevertheless, the more recent scientific insights into complexity and evolution are ready to re-enchant the world, opening our mind to the endless possibilities for discovery, creation, and improvement (Heylighen, 2025; Kauffman, 2019).

The Third Story: the self-organization of complexity

The new scientific worldview that forms the basis of the Third Story can be summarized as the *self-organizing universe* (Jantsch, 1980; Swimme & Tucker, 2011; Turchin, 1977). It sees the universe as evolving step by step from simple elements to complex, intelligent organization. The steps include the subsequent emergence of space and time (the Big Bang), particles, atoms, molecules, cells, organisms, minds, and societies. That means that cosmological evolution is directional: there is a sense of “progress” in that the present is qualitatively different from the past.

The direction of the progress can be summarized by the *law of complexity-consciousness*, formulated by the evolutionary philosopher-scientist Teilhard de Chardin (Savary, 2014; Steinhart, 2008; Teilhard de Chardin, 1959b, 1966). This is not an actual “law”, because the new worldview is not deterministic, but rather an observation of a long-term trend: as systems evolve, they tend to become both more complex and more conscious of their surroundings. This trend can be explained by the fact that some outcomes are much more likely than others. This follows from our understanding of evolution as a combination of *variation*, which is typically random or at least non-directional, and *natural selection*, which eliminates the unfit variations but keeps the fitter ones. Thus, selection produces an implicit direction, or “arrow”, pointing towards greater fitness (Heylighen, 1992b, 1999; J. Stewart, 2000).

This follows from the well-known principle of the survival of the fittest. However, the "fittest" here should not be interpreted—as it often is—as the "strongest", the most "dominant", or the most "selfish". A system is fit when it is *adapted to its environment*. That environment consists of other systems with which the first system interacts, typically by exchanging resources. Fitting in therefore means having *good relationships* with these others. Good relationships are characterized by minimal conflict or friction, and maximal *synergy*. Synergy means that the different systems survive better together than alone (Corning, 1998, 2003). Their interaction is of the "win-win" type, which is also known as "positive sum": the total fitness achieved when acting together is larger than the one they would achieve when acting each on their own.

A conflictual relationship, on the other hand, can be characterized as "lose-lose" or "negative sum": the conflict saps resources from both sides, making them less likely to survive in interaction (Heylighen & Campbell, 1995). Therefore, natural selection will tend to eliminate conflictual relationships, either by eliminating one or both systems, or by replacing their interaction by a more synergetic one. For example, the simplest way to remove conflict is to avoid interacting with the other party, e.g. by moving to a different environment or niche. A more neutral interaction is of the "win-lose" or "zero-sum" type, where the gains made by one system (e.g. by consuming common resources) imply equivalent losses by the other systems. Such relationships will not be immediately eliminated, but if ever variation would discover a win-win variant, the latter is likely to take over from the win-lose variant. An application of this principle is the observation that parasites, which extract resources from their host without providing anything in return (win-lose), in the longer term tend to evolve to mutualists, which do help their host (win-win) (Maynard Smith & Szathmáry, 1997; J. L. Sachs et al., 2011).

Some examples from different domains may illustrate the emergence of such synergetic relationships. An example in physics is an atom, which has a nucleus that contains both protons and neutrons. Neutrons on their own are unstable: they eventually disintegrate into a proton, electron and neutrino. However, the bonding with a proton via the strong nuclear force in the nucleus stabilizes the neutron, allowing it to survive indefinitely. Thus, neutrons can only survive thanks to their synergetic relationship with protons in the atoms that make up most of matter. For an example in chemistry, a sodium atom (Na) on its own will react violently with common substances, such as water, and is as such unstable. However, when bonded with a similarly reactive chlorine atom (Cl) it forms the stable molecule of table salt (NaCl), which is a common ingredient of sea water and of food.

In biology, corals are formed through the mutualist symbiosis between coral polyps and unicellular algae that live within the polyp. Both partners benefit from this synergetic relationship: the polyp provides a safe haven for the algae to grow, while the algae through photosynthesis produce nutrients and oxygen for the polyp. Ecosystems are giant networks of mutually supportive relationships between various plants, animals, bacteria, soils, ponds and rivers. They have self-organized over decades or centuries through the mutual adaptation of these diverse organic and geological agencies (Heylighen, 2023a). Human societies are composed of directly or indirectly cooperating individuals, who support each other by taking on different specializations and responsibilities, while making their products and services available to others.

Self-organization is the process through which the different components of a collective—such as an assembly of particles, atoms or molecules, the different species in an ecosystem, or an assembly of individuals—mutually adapt, so as to form a synergetic whole where each of the components fits in with the others (Ashby, 1962; Heylighen, 2023c). Such mutual adaptation happens through *co-evolution*: each of the components explores a range of variations, until it settles in one that fits in with the environment formed by all the other components. Such mutually "fit" interactions between components are stabilized. The network of relationships formed in this way *integrates* the different components into a coherent whole or "system". This system is characterized by *emergent properties*: the whole is more than the sum of its parts (Corning, 2002; Heylighen, 2023b). Thanks to the synergetic relationships, the components together can do things that they cannot do on their own. That means that co-evolution has produced a qualitatively novel organization.

This emergent whole will now also undergo variation and selection. That means that natural selection now functions simultaneously at the level of the whole and at the level of the parts. This is known as *multilevel selection* (Wilson, 1997). The need to maintain cooperation within the whole generally leads to the evolution of intrinsic control mechanisms that prevent "cheaters", parasites, or "free riders" to exploit the effort of others without contributing themselves to the maintenance of the whole (J. E. Stewart, 2020).

Mutually adapting components not only integrate; they typically also differentiate. That means that they diversify by specializing in performing different functions that complement the functions of the others. For example, in society there is a division of labor; in a multicellular organism cells differentiate in different tissues and organs; and in ecosystems species specialize in exploiting different niches. The combination of *differentiation* and *integration* means that the system becomes more complex (Heylighen, 1999): it incorporates a wider variety of components that are linked through more and stronger connections. Integration also produces a *hierarchy* of complexity: wholes at one level become components of an encompassing system at the next higher level, which itself may become a component of an even more encompassing whole. For example, particles get integrated into atoms, atoms into molecules, molecules into macromolecules, which may themselves become integrated into crystals organelles, or cells, and so on...

The growth of consciousness

This progressive complexification explains one half of Teilhard's law of complexity-consciousness. The other half, the growth of consciousness can also be explained by evolutionary reasoning based on adaptation. Once complexity has reached the level of simple living organisms, such as bacterial cells, adaptation becomes an active process. An organism will not just passively undergo variation until it hits on a variant that is fit enough to survive: it will actively seek conditions in which it is more likely to survive. For example, bacteria can distinguish between beneficial molecules, such as food, and deleterious ones, such as poisons. They will move in such a way that food concentration increases while poison concentration decreases. Thus, they are goal-directed: moving towards food and away from poison, a directed movement known as *chemotaxis*.

A similar goal-directedness can be found in all living systems (Heylighen, 2023b; Heylighen et al., 2022). For example, plants will grow towards the light with their branches and leaves, while their roots will seek out the patches of earth with the highest concentration of water and nutrients. Such goal-directedness or agency requires a minimal awareness of the state of the system and its environment. Organisms need to be able to sense what they need (e.g. food, water, light …) as well as what is available in their surroundings that may satisfy that need. The better they are able to do that, the better they are able to adapt to a variety of different conditions, and therefore the fitter they will be. That is why the growth of fitness during evolution is accompanied by a growth in the range and quality of awareness, and why Teilhard spoke about the growth of consciousness.

One way to visualize the range of awareness is what Michael Levin has called the "cognitive boundary" of an organism (Levin, 2019). These are the limits in space and time of what the organism can sense or understand. These define a kind of "cognitive light cone" around the organism as it is situated here and now (see Figure 4). That means that the organism does not have any information about what may exist outside of its cone. For example, a small creature such as a tick may be aware only of what exists within a radius of one centimeter around its present position, and one second in the past or future of its present moment. A dog may be aware of the places within a one-kilometer radius, while remembering something that happened a week ago. A human will have a much wider cognitive cone, potentially knowing about the existence of galaxies billions of light years away and of the Big Bang, which happened 14 billion years ago.

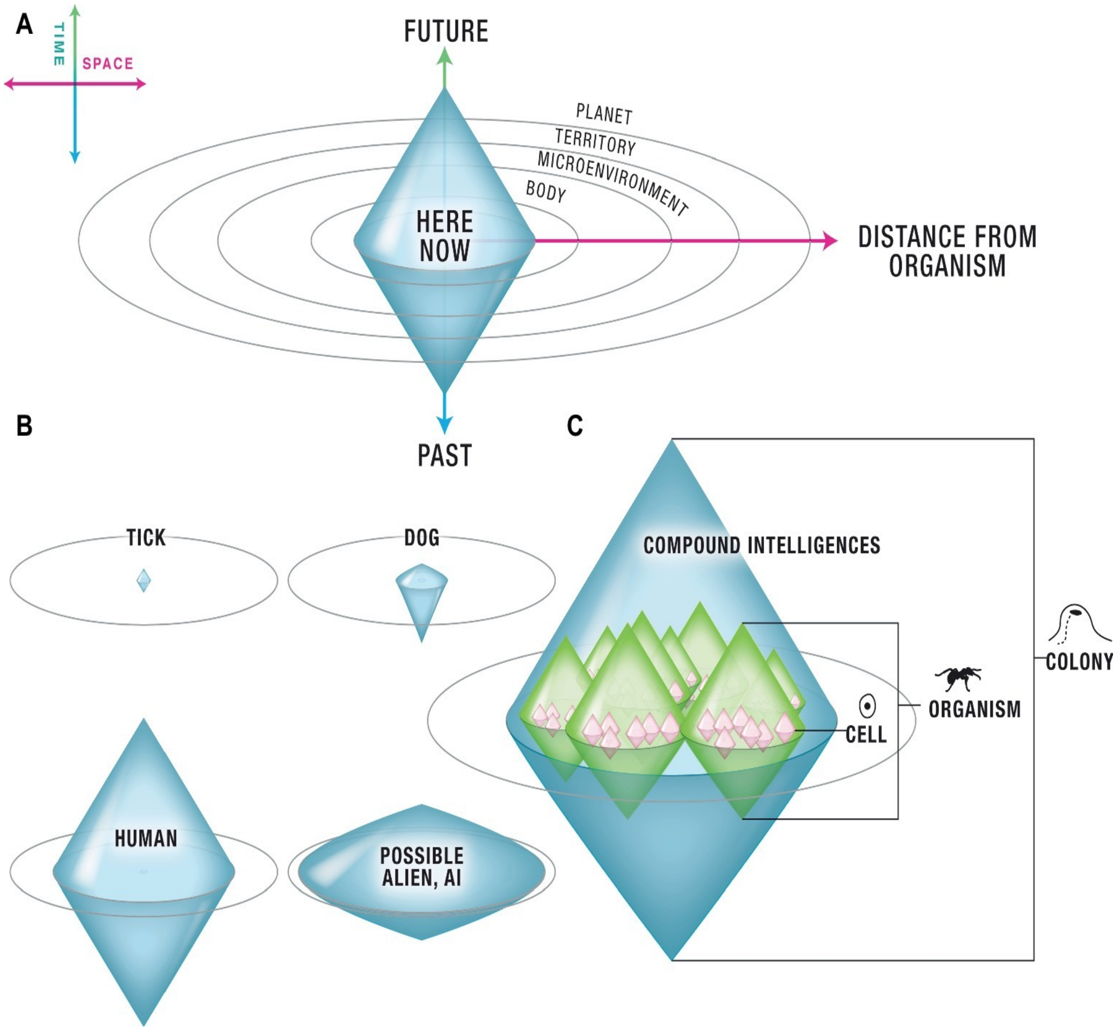


Figure 1: the cognitive light cones, extending in space and time, of different types of agents, source: (Levin, 2019).

When simple organisms become integrated with other organisms—like when cells form a multicellular organism or ants form a colony—their range of awareness expands. That is because the synergetic relationships that couple them together allow the propagation of information. For examples, cells in an organism communicate via electrical signals and the release of specialized molecules, such as hormones and neurotransmitters. Ants in a colony communicate with pheromones. Thus, individual organisms can be informed about relevant conditions sensed by other individuals situated elsewhere in the collective. That allows them to respond more adaptively to challenges and opportunities.

Consciousness grows not only in range, but in depth or quality. Evolutionarily more advanced organisms have a deeper understanding of their situation, which allows them to tackle more complex challenges. Thus, the growing ability to adapt is accompanied by growing intelligence and insight (Heylighen, 1999; Heylighen et al., 2022). The integration and differentiation that characterize the growth of complexity facilitate this growth of intelligence. The different cells in a multicellular organism will not just blindly transmit information to their neighbors, they will selectively filter, reinforce or aggregate pieces of information so as to create a more meaningful picture of the conditions. In animals, certain cells, the neurons, specialize in this information processing function. Interconnected neurons form a nervous system, eventually evolving into a brain, that can make sense of complex combinations of signals coming from the different sensory organs. Similarly, in societies the information gathered by individuals is distributed via a complex network of communication media, stored in books and computer memories, aggregated, and interpreted by experts, scientists and specialized data processing software, so as to extract its deeper meaning.

A brief history of the universe

Now that we have reviewed the mechanisms of self-organization and evolution, we can use them to understand how subsequent forms of organization, such as matter, life, mind and society, have originated. Many books have attempted to narrate the emergence and evolution of such increasingly complex systems (e.g. Chaisson, 2005; Maynard Smith & Szathmáry, 1997; Swimme & Tucker, 2011; Turchin, 1977). Their subject matter is known as *Big History* (Christian, 2011; Spier, 2015)—that is, the history of not just human civilization, but of the whole universe. Given the extensive literature and the fact that our scientific understanding of this development is still far from complete, we will here just outline the major steps, i.e. the known transitions to a higher level of complexity and consciousness (Heylighen, 1995, 2000; Okasha, 2005).

The universe originated in a "Big Bang". This was the origin of not just matter and energy, but of space and time. Therefore, it does not really make sense to ask what came before the Big Bang (Heylighen, 2010). One way to understand this emergence of something out of nothing is as a *quantum fluctuation of the vacuum*. From the perspective of quantum field theory, the vacuum (emptiness or nothingness) is not a homogeneous void but a turbulent chaos of virtual particle-antiparticle pairs appearing and almost immediately disappearing again. Some of these fluctuations may have been large enough to stabilize (Tryon, 1973), thus generating a differentiation between different regions of space, containing different amounts of matter and energy. This emergence of stable matter from the void does not contradict the law of conservation of energy, because the positive energy of matter can be counterbalanced by the negative energy of gravitation pulling this matter together (Hawking, 2009; Hertog, 2023).

Such explanations of the ultimate origin are still quite speculative, though, because our present physical theories cannot be extrapolated to a time before there was anything like a universe (Heylighen, 2010). However, once elementary particles and space-time were formed, we can combine standard physics with astronomical observations of an expanding universe to infer the subsequent series of events (Chaisson, 2005; Swimme & Tucker, 2011). As space expanded during the Big Bang, the chaotic cloud of highly energetic particles diffused and cooled down, allowing the quarks to coalesce into more stable protons and neutrons, held together by the strong nuclear force. In the next stage, these nucleons integrated with electrons to form simple atoms—hydrogen and helium—held together by the weaker electromagnetic force.

Clouds of hydrogen and helium more slowly coalesced by means of the even weaker force of gravity into galaxies and stars. The enormous pressure and heat building up in the center of stars made these simple atoms react and coalesce into more complex atoms, such as oxygen, carbon, iron and silicon, constituting heavier elements. Because of the enormous energy generated by these nuclear reactions in their core, the most massive of these stars exploded in what is known as a supernova. These explosions spewed these heavier elements out into space, where gravity could now again make them coalesce into rocks, asteroids and planets. Some of these elements would undergo chemical reactions in order to form molecules, such as water or silica.

This evolution up to now produced increasingly complex systems, from particles, via atoms to stars, molecules, and planets. However, except for stars, these systems are essentially rigid or static. At least on our planet Earth, however, this evolution also produced systems that are intrinsically dynamic, characterized by self-maintaining flows of matter and energy. Such self-organized flows are known as *dissipative structures* (Prigogine & Stengers, 1984). Examples of dissipative structures are flames, rivers, vortices, and hurricanes.

Self-maintaining flows of chemical reactions are known as *autocatalytic sets* or as *chemical organizations* (Hordijk et al., 2018). These can be seen as a precursor of life: they have the equivalent of a primitive metabolism that consumes "food" molecules in order to extract energy and produce the building blocks necessary to keep the system running, while excreting "waste" molecules that are no longer useful. Some of these building block molecules, such as bilipids, may stick together to form flexible membranes that surround the autocatalytic cycle, thus protecting it from perturbations (Bitbol & Luisi, 2004). This created the equivalent of the first living *cells*.

Another innovation was the formation of the more complex RNA molecules (Pressman et al., 2015). These not only helped catalyze the reactions that make up the primitive metabolism, but were able to pass on this ability to offspring, that is, to cells splitting off when the main cell body grows too large. Since different RNAs catalyze different reactions, some of these were more effective in maintaining and growing primitive cells than others. Thus, we see the beginning of biological evolution by natural selection, where cells containing more effective RNAs would eventually replace cells with less effective RNA. Through continuing variation and selection, these RNA molecules eventually evolved into the more complex and stable DNA molecules that constitute our genes.

This origin of single-celled life is also the origin of goal-directedness, sensation and action (Heylighen et al., 2022, 2022), and thus of a rudimentary mind or consciousness. Indeed, even simple bacteria are able to sense and discriminate between positive and negative conditions, while acting so as to exploit the positive ones and evade the negative ones. As we saw, bacteria will navigate to approach food and avoid poisons.

Some of these simple "prokaryotic" (bacteria-like) cells eventually merged with other cells that performed complementary functions. This merger (known as symbiogenesis) is the origin of the more complex "eukaryotic" cells that make up our body (Agafonov et al., 2021; Maynard Smith & Szathmáry, 1997). The original engulfed cells are still recognizable within the larger cell as organelles, i.e. subsystems performing specialized functions, such as mitochondria producing energy.

Another "major transition" in the evolution of complexity is the origin of *multicellular organisms* (Maynard Smith & Szathmáry, 1997; J. E. Stewart, 2020). Here, cells of the same type not only integrate by forming an aggregate, colony, or collective; they also differentiate into different types, tissues and organs. That allows them to specialize in performing different functions for the overall organism. In the case of animals, certain cell types, neurons, specialize in transmitting electrical signals between different parts of the organism. That allows these parts to act in a coordinated manner. Eventually, this network of interconnected neurons develops a complex hub, the central nervous system or brain.

This brain not only allows the organism to process complex information coming from different sensory organs, it also *learns* to adapt to novel situations by changing the strength of the connections between neurons (Heylighen, 1995; Turchin, 1977). This happens by reinforcing connections that contributed to a successful reaction, while weakening connections whose effect was unsuccessful. Thus, the organism can acquire knowledge that was not yet present in the genes it inherited. This greatly expands the range of situations an organism can deal with, expanding its awareness and intelligence.

A next transition in cognitive capabilities is the emergence of *symbolic* thinking (Deacon, 1998; Gontier et al., 2024; Heylighen, 2024). This is characteristic of humans. By combining words or other symbols according to the rules of grammar, humans are able to generate an infinite sequence of potential sentences, describing an infinite number of conceivable situations. This ability allows them to reason and reflect about actual or hypothetical situations and thus to design and invent new concepts, plans and theories. It also allows them to communicate these ideas to others and to register that knowledge in enduring documents, so that others can build on it. Thus, the emergence of symbolic thought has led to an explosion in knowledge. Its application to the development of increasingly powerful technological systems made humans into the dominant species on this planet.

However, to understand the implications of this sharing and co-creation of symbolic knowledge, we need to move to a yet higher level of complexity and consciousness: the *noosphere*.

The noosphere

The presently most advanced level of evolution is our planetary human civilization. Humanity, supported by its technological extensions and the ecosystems that it controls, can be conceived as a *global superorganism* (Heylighen, 2007; Stock, 1993; Vidal, 2024). A superorganism is a collective organism consisting of individual organisms. Ant colonies or beehives are commonly viewed as superorganisms. However, humanity is as yet less well-integrated than such older superorganisms: there is still a lot of conflict and friction between the different parts of global society. Such conflicts and other forms of harmful interaction, such as unsustainable practices, tend to attract most attention in the news. However, this focus on as yet unsolved societal problems obscures the fact that most components of society are coupled in a remarkably synergetic manner.

Every day, massive amounts of food, resources, goods, energy, services and information circulate around the globe, efficiently reaching consumers from producers, while supporting the people that most need it—e.g. in relief aid after natural disasters or vaccination campaigns to protect against infectious diseases. These activities are not directed by any central controller, world government, or Earth ruler. Like in all organisms and superorganisms, these activities happen in a largely decentralized, self-organizing manner, where local demand elicits a flow of supply that satisfies the demand. These flows use efficient channels, such as shipping routes, highways, pipelines, and electricity networks, to reach the place where they are needed. This network of channels along which matter and energy are distributed can be visualized as the circulatory system of the global superorganism (Jacob, 2023; Stock, 1993). It plays a role similar to the network of blood and lymph vessels in our body that bring nutrients and energy to every cell and organ. Similarly, information is nowadays distributed nearly instantaneously via the global Internet, which plays a role similar to our nervous system.

The paleontologist/philosopher Pierre Teilhard de Chardin and the geochemist Vladimir Vernadsky have conceptualized this network of interconnections between humans and their technological extension as the *noosphere* (Teilhard de Chardin, 1959a; Vernadsky, 1945; Vidal, 2024; Yanshina, 1993). The noosphere (sphere of thought or mind) extends the biosphere (all living organisms) and the geosphere (rocks, seas, and air) that surround the planet. In Teilhard's writings, depending on the context, the noosphere can refer either to the nervous system of the planetary superorganism (the "Global Brain"), or to the superorganism as a whole.

Nowadays, many people fear that, because of climate change, pollution and resource exhaustion, human civilization is on the verge of collapse (Ehrlich & Ehrlich, 2013; Heylighen & Beigi, 2023). However, when considering the noosphere as a complex adaptive system, it becomes clear that this superorganism is remarkably *resilient* (Beigi, 2019), and able to adapt to the most complex challenges. An illustration of this resilience is the impact of the Covid pandemic, which not only killed millions of people, but for months interrupted normal work regimes in most parts of the world, while disrupting global supply chains. Moreover, it incited a flurry of conspiracy theories which made people worldwide doubt the reality of the disease and the need for the proposed remedies. Yet, the pandemic passed without major disasters: it did not cause any famine, economic collapse, or even persistent recession. This illustrates how the global system is flexible enough to absorb big shocks without great damage to its social, economic and technological infrastructure.

The pandemic also illustrated the remarkable intelligence of the noosphere. The virus that caused it had never been observed before and its appearance and spread could not be predicted. Yet, thanks to global scientific collaboration supported by the Internet, within months of its appearance the virus was isolated, its genome was sequenced, and protective vaccines were developed in a record time. This shows how humanity's collective intelligence supported by its information and communication technologies is able to increasingly rapidly solve the problems that threaten it (Beigi & Heylighen, 2021).

The problem of climate change caused by the release of greenhouse gases is a more enduring, complex and deep-rooted challenge that cannot be tackled as quickly, unfortunately. However, we have by now acquired the necessary technologies, such as solar panels, windmills, and batteries, to produce energy without releasing such gases, while research and development are on-going to make these technologies less expensive, more efficient, and more ubiquitous. We have recently reached the inflection point where energy produced sustainably is cheaper than energy produced from fossil fuels (Ritchie, 2024). Economic logic therefore dictates that sooner or later all fossil fuel installations will be replaced by sustainable alternatives. Despite a slow start, the transition is likely to accelerate ever more quickly, given that, thanks to ongoing research and development, the price of crucial components, such as batteries and solar panels, is decreasing exponentially.

This development further illustrates the growth of noospheric consciousness. First, the noosphere has become conscious of certain negative effects of its activities on the planet, such as climate change, pollution, and loss of biodiversity. It has then developed an understanding of causes and potential remedies. It has now started to implement a strategy to deal with these problems. This implementation will still have to deal with myriad difficulties, misunderstandings and disagreements in order to reach its objectives. Yet, by now the amount of knowledge accumulated, the number of smart and motivated people working on such problems, and the efficiency of the communication channels that allow these people and knowledge bases to collaborate is so great that we can expect these problems to be resolved increasingly quickly and efficiently.

Values and meaning in the Third Story

Unlike the Second Story portrayal of a clockwork universe, where humans essentially have no role to play, the Third Story of an evolving geosphere, biosphere and noosphere suggests a number of clear directions, guidelines and values. The directionality of evolution is towards increasing complexity and consciousness through the development of more synergetic relations. However, evolution is not deterministic: it does not follow a prearranged trajectory and does not converge towards a fixed end point. It rather explores a space of possibilities, driven by the trial-and-error process of variation and natural selection. The number of potential variations is infinite. The number of those variations that would be fit enough to survive is much smaller, but still unlimited. Therefore, we cannot predict what the outcome of evolution will be.

However, we can predict that unfit variations will not last. That provides us with a general guideline for our actions: try to avoid unfit situations. These are the kind of situations that are unsustainable in the long run, such as conflicts, frictions, unstable or fragile configurations, processes that exhaust resources or that accumulate toxic waste products. More positively, the Third Story suggests that we should actively seek synergy, using our technologies, knowledge and imagination to explore as yet untried but promising potentials for positive-sum interactions. Thus, we would be in a way helping or accelerating the process of evolution by means of our intelligence—an approach that has been called "conscious evolution" (Marx Hubbard, 2003, 2015; J. Stewart, 2007). This would be merely an extension of the natural process of evolving "vicarious selectors" (Campbell, 1956, 1987), the cognitive mechanisms that evolution has developed for reducing the number of errors in its trial-and-error search, thus shortcutting its typically long and slow meanderings through the space of potential configurations. Thus, we should continue to systematically deepen our knowledge, intelligence and consciousness, because that will allow us to avoid errors, to make wiser decisions and to develop better solutions.

These general values of fitness, consciousness and synergy apply at all the relevant levels: individual people, social systems, and the global ecosystem. Individuals should seek to maximally develop their own potentials, a process that the humanist psychologist Abraham Maslow has called *self-actualization* (Heylighen, 1992a; Kaufman, 2020; Maslow, 1970). They should also be ready to go beyond conventional limitations or mental boundaries, a process that Liogier has called *raw transcendence* (Liogier, 2023). They should respect the freedom of others to develop in the way they want, while helping them when they are in need. They should try to avoid conflicts when possible, and actively seek positive-sum interactions. Society in general should provide its members with the resources, security and freedom to develop their unique identities, while supporting the emergence of coordinated, synergetic networks of collaboration. It should in particular support the emancipation of as yet underprivileged communities, while as much as possible preserving or restoring natural ecosystems and biodiversity. A more concrete list of objectives for global society can be found in the United Nations' *sustainable development goals* (J. D. Sachs et al., 2019).

Thanks to our very advanced science, technology and economy, we have the material and intellectual means to achieve these evolutionary values. What is still lacking is the broad understanding, confidence and enthusiasm needed to tackle these challenges. That is because of the erosion of our sense of coherence, as discussed earlier, which produces confusion, anxiety, pessimism and despair (Heylighen & Beigi, 2023). We hope that a concrete formulation of the Third Story will restore people's sense of coherence, and thus provide them with the clarity of purpose, positive outlook, and passionate engagement needed to live a meaningful and constructive life.

Conclusion

We have argued that the confusions produced by a Volatile, Uncertain, Complex and Ambiguous (VUCA) world have eroded our sense of coherence. As a result, most people no longer see the world in which they live as comprehensible, manageable and meaningful. Historically, a sense of coherence has been provided by overarching narratives or worldviews, which situate human life within the larger universe and its evolution.

We have distinguished three common classes of worldviews, which we called respectively the First, Second, and Third Story, and discussed their strengths and weaknesses. The First Story is the traditional religious worldview, which sees the world as created and governed by one or more deities. It provides values and meaning but has limited use in helping us to understand and manage the complexities of the present world.

The Second Story is the traditional scientific worldview, which can be summarized as the clockwork universe. It sees the universe as a collection of material objects, moving through space and time as determined by the laws of nature. It provides a more detailed and reliable understanding of the workings of the world, which allows us to accurately predict many phenomena and to design technologies that help us to solve our problems. However, it does not provide any meaning or values, because it assumes that all decisions are either predetermined or random.

The Third Story is the newly emerging scientific worldview, which sees the universe as self-organizing and evolving towards greater complexity and consciousness. It retains the understanding, prediction and technological applications provided by the Second Story, but adds that we are free in making decisions, while observing that decisions that lead to unfit configurations are not sustainable. Therefore, it admonishes us to explore many different variations in order to find the ones that are most viable in the long term. This means that we should try to avoid conflict and friction, minimize consumption of scarce resources and production of waste, and maximize synergy. By doing that, we will increase the well-being, coherence and consciousness of individuals, society, and the global superorganism. Thus, the Third Story is intrinsically optimistic, future-oriented and emancipatory, highlighting the unlimited creative potential of both humans and the world in which they live.

It further provides us with a sense of wholeness and coherence by seeing individuals as part of the global superorganism or noosphere, the self-organizing system that encompasses humans, their technological extensions and the planetary ecosystem. This connects us to a larger whole, whose mental and physical capabilities greatly transcend our limited, individual intelligences. That to some degree provides an alternative for the spiritual connection to the divine offered by the First Story. Thus, the Third Story combines the benefits of First and Second Stories without their limitations, while offering a comprehensive, science-based worldview that includes a concrete sense of purpose, ethics and values. We hope that further elaborations and narrations of such a Third Story in different media and addressed to different audiences will help us to effectively combat the Techno-Social Dilemma, and thus reduce the prevailing atmosphere of meaninglessness, anxiety and despair.

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References

Abram, D. (2010). *Becoming Animal: An Earthly Cosmology*. Knopf Doubleday Publishing Group.

Aerts, D., Apostel, L., De Moor, B., Hellemans, S., Maex, E., Van Belle, H., & Van der Veken, J. (1994). *World Views. From fragmentation to integration*. VUB Press. http://www.vub.ac.be/CLEA/pub/books/worldviews.pdf

Aerts, D., Apostel, L., De Moor, B., Hellemans, S., Maex, E., Van Belle, H., & Van der Veken, J. (2002). *Worldviews: From fragmentation to integration*. VUB Press. http://www.vub.ac.be/CLEA/pub/books/worldviews.html

Agafonov, V. A., Negrobov, V. V., & Igamberdiev, A. U. (2021). Symbiogenesis as a driving force of evolution: The legacy of Boris Kozo-Polyansky. *Biosystems*, *199*, 104302. https://doi.org/10.1016/j.biosystems.2020.104302

Antonovsky, A. (1998). The sense of coherence: An historical and future perspective. In *Stress, coping, and health in families: Sense of coherence and resiliency* (pp. 3–20). Sage Publications, Inc.

Anyfantakis, D., Symvoulakis, E. K., Linardakis, M., Shea, S., Panagiotakos, D., & Lionis, C. (2015). Effect of religiosity/spirituality and sense of coherence on depression within a rural population in Greece: The Spili III project. *BMC Psychiatry*, *15*(1), 173. https://doi.org/10.1186/s12888-015-0561-3

Ashby, W. R. (1962). Principles of the self-organizing system. In H. von Foerster & G. W. Zopf (Eds.), *Principles of Self-Organization* (pp. 255–278). Pergamon Press. http://csis.pace.edu/~marchese/CS396x/Computing/Ashby.pdf

Beigi, S. (2015). *Mindfulness Engineering: A Unifying Theory of Resilience for Volatile, Uncertain, Complex and Ambiguous (VUCA) World* [Ph.D., University of Bristol]. http://ethos.bl.uk/OrderDetails.do?uin=uk.bl.ethos.687062

Beigi, S. (2019). A Road Map for Cross Operationalization of Resilience. In S. I. S. Rattan & M. Kyriazis (Eds.), *The Science of Hormesis in Health and Longevity* (pp. 235–242). Academic Press. https://doi.org/10.1016/B978-0-12-814253-0.00021-8

Beigi, S., & Heylighen, F. (2021). Collective Consciousness Supported by the Web: Healthy or Toxic? In N. T. Nguyen, L. Iliadis, I. Maglogiannis, & B. Trawiński (Eds.), *Computational Collective Intelligence* (pp. 81–93). Springer International Publishing. https://doi.org/10.1007/978-3-030-88081-1_7

Bennett, N., & Lemoine, G. J. (2014). What a difference a word makes: Understanding threats to performance in a VUCA world. *Business Horizons*, *57*(3), 311–317. https://doi.org/10.1016/j.bushor.2014.01.001

Bitbol, M., & Luisi, P. L. (2004). Autopoiesis with or without cognition: Defining life at its edge. *Journal of the Royal Society Interface*, *1*(1), 99–107.

Campbell, D. T. (1956). Perception as substitute trial and error. *Psychological Review*, *63*(5), 330–342.

Campbell, D. T. (1987). Evolutionary epistemology. *Evolutionary Epistemology, Rationality, and the Sociology of Knowledge*, 47–89.

Chaisson, E. (2005). Epic of Evolution: Seven Ages of the Cosmos. In *Epic of Evolution*. Columbia University Press. https://doi.org/10.7312/chai13560

Christian, D. (2011). *Maps of time: An introduction to big history* (Vol. 2). Univ of California Press.

Compernolle, T. (2014). *Brain Chains: Discover Your Brain, to Unleash Its Full Potential In a Hyperconnected, Multitasking World* (1 edition). compublications.

Corning, P. A. (1998). "The synergism hypothesis": On the concept of synergy and its role in the evolution of complex systems. *Journal of Social and Evolutionary Systems*, *21*(2), 133–172.

Corning, P. A. (2002). The re-emergence of "emergence": A venerable concept in search of a theory. *Complexity*, *7*(6), 18–30. https://doi.org/10.1002/cplx.10043

Corning, P. A. (2003). *Nature's magic: Synergy in evolution and the fate of humankind*. Cambridge University Press Cambridge, UK.

Cowen, T. (2011). *The Great Stagnation: How America Ate All The Low-Hanging Fruit of Modern History, Got Sick, and Will (Eventually) Feel Better: A Penguin eSpecial from Dutton*. Penguin.

Deacon, T. W. (1998). *The Symbolic Species: The Co-evolution of Language and the Brain*. W. W. Norton & Company.

Descartes, R. (1999). *Discourse on Method and Meditations on First Philosophy, 4th Ed.* (D. A. Cress, Trans.; 4th edition). Hackett Publishing Company.

Dolnick, E. (2011). *The Clockwork Universe: Isaac Newton, the Royal Society, and the Birth of the Modern World*. HarperCollins.

Dweck, C. (2016). What having a "growth mindset" actually means. *Harvard Business Review*, *13*(2), 2–5.

Ehrlich, P. R., & Ehrlich, A. H. (2013). Can a collapse of global civilization be avoided? *Proceedings of the Royal Society B: Biological Sciences*, *280*(1754), 20122845. https://doi.org/10.1098/rspb.2012.2845

Eriksson, M., & Lindström, B. (2006). Antonovsky's sense of coherence scale and the relation with health: A systematic review. *Journal of Epidemiology & Community Health*, *60*(5), 376–381. https://doi.org/10.1136/jech.2005.041616

Gontier, N., Lock, A., & Sinha, C. (2024). *The Oxford Handbook of Human Symbolic Evolution*. Oxford University Press.

Haidt, J. (2024). *The Anxious Generation: How the Great Rewiring of Childhood Is Causing an Epidemic of Mental Illness*. Penguin Press.

Hawking, S. (2009). *A Brief History Of Time: From Big Bang To Black Holes*. Random House.

Heap, S. P. H. (2013). Rationality. In *Handbook on the Economics of Reciprocity and Social Enterprise* (pp. 277–284). Edward Elgar Publishing. https://www.elgaronline.com/display/edcoll/9781849804639/9781849804639.00036.xml

Hertog, T. (2023). *On the Origin of Time: Stephen Hawking's Final Theory*. Bantam.

Heylighen, F. (1989). Causality as Distinction Conservation: A theory of predictability, reversibility and time order. *Cybernetics and Systems*, *20*(5), 361–384. https://doi.org/10.1080/01969728908902213

Heylighen, F. (1992a). A cognitive-systemic reconstruction of Maslow's theory of self-actualization. *Behavioral Science*, *37*(1), 39–58. https://doi.org/10.1002/bs.3830370105

Heylighen, F. (1992b). Principles of Systems and Cybernetics: An evolutionary perspective. In *Cybernetics and Systems' 92* (pp. 3–10). http://cyberneticscockpit.com/global/documents/principlescybsys.pdf

Heylighen, F. (1995). (Meta)systems as constraints on variation—A classification and natural history of metasystem transitions. *World Futures*, *45*(1), 59–85. https://doi.org/10.1080/02604027.1995.9972554

Heylighen, F. (1999). The growth of structural and functional complexity during evolution. In F. Heylighen, J. Bollen, & A. Riegler (Eds.), *The evolution of complexity* (pp. 17–44). Springer. http://pcp.vub.ac.be/Papers/ComplexityGrowth.pdf

Heylighen, F. (2000). Evolutionary Transitions: How do levels of complexity emerge? *Complexity*, *6*(1), 53–57. https://doi.org/10.1002/1099-0526(200009/10)6:1<53::AID-CPLX1008>3.0.CO;2-O

Heylighen, F. (2007). The Global Superorganism: An evolutionary-cybernetic model of the emerging network society. *Social Evolution & History*, *6*(1), 58–119.

Heylighen, F. (2010). The Self-Organization of Time and Causality: Steps Towards Understanding the Ultimate Origin. *Foundations of Science*, *15*(4), 345–356. https://doi.org/10.1007/s10699-010-9171-1

Heylighen, F. (2012). *A Tale of Challenge, Adventure and Mystery: Towards an agent-based unification of narrative and scientific models of behavior* (ECCO Working Papers 2012–06; ECCO). Vrije Universiteit Brussel. http://pcp.vub.ac.be/papers/TaleofAdventure.pdf

Heylighen, F. (2023a). Relational agency: A new ontology for co-evolving systems. In P. Corning, S. A. Kauffman, D. Noble, J. A. Shapi, R. I. Vane-Wright, & A. Pross (Eds.), *Evolution 'On Purpose': Teleonomy in Living Systems* (pp. 79–104). MIT Press. https://researchportal.vub.be/files/79556854/Heylighen_RelationalAgency.pdf

Heylighen, F. (2023b). The meaning and origin of goal-directedness: A dynamical systems perspective. *Biological Journal of the Linnean Society*, *139*(4), 370–387. https://doi.org/10.1093/biolinnean/blac060

Heylighen, F. (2023c). Why Emergence and Self-Organization are Conceptually Simple, Common and Natural. In *Proceedings of the Science Week on Complexity, UM6P, Ben Guerir, 2023*.

Heylighen, F. (2024). Transcending the Rational Symbol System: How Information and Communication Technology Integrates Science, Art, Philosophy, and Spirituality into a Global Brain. In N. Gontier, A. Lock, & C. Sinha (Eds.), *Oxford Handbook of Human Symbolic Evolution* (pp. 991–1026). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780198813781.013.37

Heylighen, F. (2025). Curiosity, Awe and Wonder: The Emotions that Open Our Mind. *Foundations of Science*. https://doi.org/10.1007/s10699-025-09972-5

Heylighen, F., & Beigi, S. (2018). Mind Outside Brain: A Radically Non-Dualist Foundation for Distributed Cognition. In J. A. Carter, A. Clark, J. Kallestrup, S. O. Palermos, & D. Pritchard (Eds.), *Socially Extended Epistemology* (pp. 59–86). Oxford University Press. https://doi.org/10.1093/oso/9780198801764.003.0005

Heylighen, F., & Beigi, S. (2023). Anxiety, Depression and Despair in the Information Age: The Techno-Social Dilemma. *Anxiety, Depression and Despair in the Information Age*, *2023*. https://researchportal.vub.be/files/109723848/Techno_social_dilemma.pdf

Heylighen, F., Beigi, S., & Busseniers, E. (2022). The role of self-maintaining resilient reaction networks in the origin and evolution of life. *Biosystems*, *219*, 104720. https://doi.org/10.1016/j.biosystems.2022.104720

Heylighen, F., & Campbell, D. T. (1995). Selection of organization at the social level: Obstacles and facilitators of metasystem transitions. *World Futures*, *45*(1–4), 181–212. https://doi.org/10.1080/02604027.1995.9972560

Heylighen, F., Cilliers, P., & Gershenson, C. (2007). Complexity and Philosophy. In J. Bogg & R. Geyer (Eds.), *Complexity, science and society* (pp. 117–134). Radcliffe Publishing,. http://arxiv.org/abs/cs/0604072

Heylighen, F., & Vidal, C. (2008). Getting Things Done: The Science behind Stress-Free Productivity. *Long Range Planning*, *41*(6), 585–605. https://doi.org/10.1016/j.lrp.2008.09.004

Hordijk, W., Steel, M., & Dittrich, P. (2018). Autocatalytic sets and chemical organizations: Modeling self-sustaining reaction networks at the origin of life. *New Journal of Physics*, *20*(1), 015011.

Jackson, D., Thorsen, E., & Wring, D. (2016). *EU Referendum Analysis 2016: Media, Voters and the Campaign.* The Centre for the Study of Journalism, Culture and Community. http://eprints.bournemouth.ac.uk/24337/

Jacob, M. S. (2023). Toward a Bio-Organon: A model of interdependence between energy, information and knowledge in living systems. *Biosystems*, *230*, 104939. https://doi.org/10.1016/j.biosystems.2023.104939

Jagiello, R. D., & Hills, T. T. (2018). Bad News Has Wings: Dread Risk Mediates Social Amplification in Risk Communication. *Risk Analysis*, *38*(10), 2193–2207. https://doi.org/10.1111/risa.13117

Jantsch, E. (1980). *The self-organizing universe: Scientific and human implications of the emerging paradigm of evolution*. Pergamon Pr.

Kauffman, S. A. (2019). The Re-Enchantment of Humanity. In V. N. Redekop & G. N. Redekop (Eds.), *Awakening: Exploring Spirituality, Emergent Creativity, and Reconciliation* (p. 19). Rowman & Littlefield.

Kaufman, S. B. (2020). *Transcend: The New Science of Self-Actualization*. TarcherPerigee.

Lent, J. (2022). *The Web of Meaning: Integrating Science and Traditional Wisdom to Find Our Place in the Universe* (Main edition). Profile Books.

Levin, M. (2019). The Computational Boundary of a "Self": Developmental Bioelectricity Drives Multicellularity and Scale-Free Cognition. *Frontiers in Psychology*, *10*, 2688. https://doi.org/10.3389/fpsyg.2019.02688

Liogier, R. (2009). L'individuo-globalisme: Nouvelle culture croyante des sociétés industrielles avancées. *Revue Internationale de Politique Comparée*, *16*(1), 135–154.

Liogier, R. (2023). *Khaos: La promesse trahie de la modernité*. Les Liens qui Libèrent.

Mack, O., & Khare, A. (2016). Perspectives on a VUCA World. In O. Mack, A. Khare, A. Krämer, & T. Burgartz (Eds.), *Managing in a VUCA World* (pp. 3–19). Springer International Publishing. https://doi.org/10.1007/978-3-319-16889-0_1

Marx Hubbard, B. (2003). Conscious evolution: The next stage of human development. *Systems Research and Behavioral Science*, *20*(4), 359–370. https://doi.org/10.1002/sres.510

Marx Hubbard, B. (2015). *Conscious Evolution: Awakening the Power of Our Social Potential*. New World Library.

Maslow, A. H. (1970). *Motivation and personality* (2nd ed.). Harper & Row.

Maynard Smith, J., & Szathmáry, E. (1997). *The major transitions in evolution*. Oxford University Press, USA.
McGregor, S. L. (2017). *Salutogenic Consumer Education*. https://www.consultmcgregor.com/documents/publications/salutogenic_consumer_education_monograph.pdf
O'Hara, K. (2012). *The Enlightenment: A Beginner's Guide*. Simon and Schuster.
Okasha, S. (2005). Multilevel Selection and the Major Transitions in Evolution. *Philosophy of Science*, *72*(5), 1013–1025. https://doi.org/10.1086/508102
Park, C. L. (2010). Making sense of the meaning literature: An integrative review of meaning making and its effects on adjustment to stressful life events. *Psychological Bulletin*, *136*(2), 257.
Pinker, S. (2018). *Enlightenment Now: The Case for Reason, Science, Humanism, and Progress*. Viking.
Pressman, A., Blanco, C., & Chen, I. A. (2015). The RNA World as a Model System to Study the Origin of Life. *Current Biology*, *25*(19), R953–R963. https://doi.org/10.1016/j.cub.2015.06.016
Prigogine, I., & Stengers, I. (1984). *Order Out of Chaos: Man's New Dialogue with Nature*. Bantam Books.
Ritchie, H. (2024). *Not the End of the World: How We Can Be the First Generation to Build a Sustainable Planet*. Little, Brown Spark.
Rose-Stockwell, T. (2023). *Outrage Machine: How Tech Amplifies Discontent, Disrupts Democracy—And What We Can Do About It*. Legacy Lit.
Sachs, J. D., Schmidt-Traub, G., Mazzucato, M., Messner, D., Nakicenovic, N., & Rockström, J. (2019). Six Transformations to achieve the Sustainable Development Goals. *Nature Sustainability*, *2*(9), 805–814. https://doi.org/10.1038/s41893-019-0352-9
Sachs, J. L., Skophammer, R. G., & Regus, J. U. (2011). Evolutionary transitions in bacterial symbiosis. *Proceedings of the National Academy of Sciences*, *108*(supplement_2), 10800–10807. https://doi.org/10.1073/pnas.1100304108
Savary, L. M. (2014). *Expanding Teilhard's" complexity-consciousness" Law*. American Teilhard Association. https://dtnetwork.org/wp-content/uploads/2014/04/Teilhard-Studies68LouSavary.pdf
Snyder, C. R. (2002). Hope Theory: Rainbows in the Mind. *Psychological Inquiry*, *13*(4), 249–275. https://doi.org/10.1207/S15327965PLI1304_01
Spier, F. (2015). *Big history and the future of humanity*. John Wiley & Sons.
Steger, M. F. (2009). Meaning in Life. In S. J. Lopez & C. R. Snyder (Eds.), *The Oxford Handbook of Positive Psychology* (p. 0). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780195187243.013.0064
Steinhart, E. (2008). Teilhard de Chardin and Transhumanism. *Journal of Evolution and Technology*, *20*(1), 1–22.
Stewart, J. (2000). *Evolution's Arrow: The Direction of Evolution and the Future of Humanity*. Chapman Pr. http://users.tpg.com.au/users/jes999/EvAr.pdf
Stewart, J. (2007). The Future Evolution of Consciousness. *Journal of Consciousness Studies*, *14*(8), 58–92.
Stewart, J. E. (2020). Towards a general theory of the major cooperative evolutionary transitions. *Biosystems*, 104237. https://doi.org/10.1016/j.biosystems.2020.104237
Stock, G. (1993). *Metaman: The merging of humans and machines into a global superorganism*. Simon & Schuster.

Swimme, B. T., & Tucker, M. E. (2011). *Journey of the Universe*. Yale University Press.

Tagay, S., Erim, Y., Brähler, E., & Senf, W. (2006). Religiosity and sense of coherence – Protective factors of mental health and well-being? *Zeitschrift Für Medizinische Psychologie*, *15*(4), 165–171.

Teilhard de Chardin, P. (1959a). The Formation of the Noosphere: A Plausible Biological Interpretation of Human History. In *The Future of Man* (pp. 149–178). Image Books Doubleday. https://www.organism.earth/library/document/formation-of-the-noosphere

Teilhard de Chardin, P. (1959b). *The phenomenon of man*. Collins London.

Teilhard de Chardin, P. (1966). *Man's place in nature: The human zoological Group* (R. HAGUE, Trans.).

Törnberg, P. (2018). Echo chambers and viral misinformation: Modeling fake news as complex contagion. *PLOS ONE*, *13*(9), e0203958. https://doi.org/10.1371/journal.pone.0203958

Tryon, E. P. (1973). Is the Universe a Vacuum Fluctuation? *Nature*, *246*(5433), 396–397. https://doi.org/10.1038/246396a0

Turchin, V. (1977). *The Phenomenon of Science: A Cybernetic Approach to Human Evolution* (1st edition). Columbia Univ Pr.

Turchin, V. (1990). Cybernetics and Philosophy. *The Cybernetics of Complex Systems, F. Geyer (Ed.),(Intersystems, Salinas, California)*, 61–74.

Udupa, N. S., Joine, T. E., Twenge, J. M., & McAlliste, C. (2023). Increases in poor mental health, mental distress, and depression symptoms among U.S. adults, 1993-2020. *Journal of Mood and Anxiety Disorders*, 100013. https://doi.org/10.1016/j.xjmad.2023.100013

Vernadsky, W. I. (1945). The Biosphere and the Noösphere. *American Scientist*, *33*(1), xxii–12.

Vidal, C. (2008). Wat is een wereldbeeld? (What is a worldview?). In H. Van Belle & J. Van Der Veken (Eds.), *Nieuwheid denken. De wetenschappen en het creatieve aspect van de werkelijkheid* (pp. 71–86). Acco.

Vidal, C. (2012). Metaphilosophical Criteria for Worldview Comparison. *Metaphilosophy*, *43*(3), 306–347. https://doi.org/10.1111/j.1467-9973.2012.01749.x

Vidal, C. (2024). What is the noosphere? Planetary superorganism, major evolutionary transition and emergence. *Systems Research and Behavioral Science*, *n/a*(n/a). https://doi.org/10.1002/sres.2997

Vosoughi, S., Roy, D., & Aral, S. (2018). The spread of true and false news online. *Science*, *359*(6380), 1146–1151. https://doi.org/10.1126/science.aap9559

Weinberg, S. (1988). *The First Three Minutes: A Modern View Of The Origin Of The Universe* (Revised). Basic Books.

Wilson, D. S. (1997). Altruism and Organism: Disentangling the Themes of Multilevel Selection Theory. *The American Naturalist*, *150*(S1), S122–S134. https://doi.org/10.1086/286053

Yanshina, F. T. (1993). VI Vernadsky's noosphere: An Utopia or a real perspective. *Social Sciences and the Present*, *1*, 163–173.

Zafirovski, M. (2003). Human rational behavior and economic rationality. *Electronic Journal of Sociology*, *7*(2), 1–34.

Zimmer, F., Scheibe, K., Stock, M., & Stock, W. G. (2019). Fake News in Social Media: Bad Algorithms or Biased Users? *Journal of Information Science Theory and Practice: JISTaP*, *7*(2), 40–53.