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Ecology in Liminal Times

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Editorial | Special Issue III

This year's iteration of ESPhil's MA Research Practice is devoted to the theme of ecology—a horizon of meaning that seems to determine more intensely, with each passing day, our quotidian practices, capacities for production, socio-political norms and every aspect of life considered by and large hitherto untethered from the fate of the non-human. Not only this, but as the essays of the special issue argue, questions of ecology are not and cannot be separated from the state of global and local technologies. The burst of artificial intelligence into mainstream discourse over the past year has compounded the awareness that technicity is at once the salvaging and ruinous power of every organism and its corresponding niche of flourishing. It is not inconceivable that in the not-too-distant future we will witness not only AI protests, in direct parallel to environmental demonstrations, but perhaps highly sophisticated public movements that target the dead-ends of the eco-technical intersections.

This year's journey proved arduous, with only two of our graduate students—Anna Zoë Moritz and Levi van den Bogaard—at the helm; yet the results left nothing to be desired. The symposium *Ecology in Liminal Times* took place at EUR on the 25th of May 2023. Aside of the core contributions of the graduate students, the programme was enriched with the participation of Dr Rick Dolphijn and Dr Carolina Sánchez from Utrecht University's Media and Cultural Studies, of Dr Yogi Hendlin of ESPhil, and finally, of the exchange doctoral researcher Johan May.

The present issue opens with the joint contribution of Dr Yogi Hale Hendlin and Daniel Kamp 'Can a Crisis be Singular?', which sets the stage of the complexity of the poly- and meta-crisis that we are confronted with at present. The essay shows the interweaving of tactics of delay and denial with their obverse, paralyzing despair in the face of imminent doom. The essay makes a strong plea for the need to rethink the principles that underpin the most entrenched and unexamined principles on which the lives of Global North are by and large premised and to take radical, yet necessary, measures without delay.

The issue proceeds with Johan May' essay 'General Ecological (Ill)Health in the Exorganological Biosphere', which further explores the interweaving of crises, premised on the Guattarian interlocking of environmental, mental and social ecologies. The Anthropocene, as the era in which various crises coalesce into a hyper-crisis, implicates also the voiding of thought, by short-circuiting our noetic capacities for attention, knowledge and care-ful thinking, thus making critique impossible. Working closely with and through Stiegler, the essay offers a diagnosis of the above along with a gesture towards overcoming current ill health and opening the vista of the 'Neganthropocene', an era in which a renewed care for diverse and genuine individuations becomes possible.

Anna Zoë Moritz's contribution, 'The Self in the Smart Home: An Ecological Analysis of The Digital Epoch', advances the eco-technical problematic by taking the 'oikos' of ecology in its literal-etymological sense, in order to explore the ecology of the domestic in the age of the latter's digital transformation. The Internet of Things paradigm forces us to confront theoretically the home as a physical environment consisting of smart, networked devices, which create a milieu of everyday algorithmic governance in which not only attention and other cognitive capacities, but selfhood at

large, dissolves. Using Hildebrandt's notion of the 'onlife world', the essay theorizes the Internet of Things and offers potential nodes of resistance to its corrosion of selfhood.

The issue closes with Levi van den Bogaard's essay 'Perennially Liminal: Re-Enchanting the Anthropocene Through an Ecology of Sapiential and Spiritual Practices' which explores yet another bifurcation of crisis, into ecosystem collapse and meaning loss. Biosemiotics provides here a framework for recognizing ecology as a series of dialogues between human and non-human meaning-making systems, in which the semiosis of culture appears as a sophisticated expression of embodied and embedded processes of perpetual emergence of meaning. In conjunction with biosemiotics, the essay marshals a wealth of theoretical perspectives (Abram, Marder, Morton and Vervaeke, among others), in order to explore the liniments of a world beyond eco-anxiety and disenchantment.

We hope that you will appreciate the intuitions that animate this special issue and thus relish some rays of resistant hope in the face of the unprecedented ecological peril in which we find ourselves.

Dr Georgios Tsagdis
Research Practice Coordinator
and Guest Editor

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About

The Erasmus Student Journal of Philosophy (ESJP) is a double-blind peer-reviewed student journal that publishes the best philosophical papers written by students from the Erasmus School of Philosophy, Erasmus University Rotterdam and from the Humanities Programme of the Erasmus University College. Its aims are to further enrich the philosophical environment in which Rotterdam's philosophy students develop their thinking and bring their best work to the attention of a wider intellectual audience. Aside from serving as an important academic platform for students to present their work, the journal has two other goals. First, to provide members of the editorial board with the opportunity to develop their own editing and writing skills. Second, to enable students to realize their first official academic publication during their time as a student at ESPhil or the Humanities Department of the EUC. A new issue of the ESJP appears on our website every January and June.

To ensure the highest possible quality, the ESJP only accepts papers that (a) have been written for a course that is part of the Erasmus University College or Erasmus School of Philosophy curriculum and (b) nominated for publication in the ESJP by the teacher of that course. Each paper that is published in the ESJP is subjected to a double-blind peer review process in which at least one other teacher and two student editors act as referees.

The ESJP encourages students to keep in mind the possibility of publishing their course papers in our journal, and to write papers that appeal to a wider intellectual audience.

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Can a Crisis be Singular?

Yogi Hale Hendlin & Daniel Kamp

The "Age of Separation" is the moniker Charles Eisenstein (2007) assigns to our current era. This isn't just the separation between humans and nature, consciousness from body, subject from object, or any other simple, if severe, break that structures our life. The polycrisis we find ourselves in is instead fractal, where separation has no beginning or end, as instrumentalization is reciprocal. The polycrisis, or metacrisis, is concerned with the feedback loops of hate and dehumanization, as much as it does with carelessness, and the conceit that we can touch without being touched.

By whichever terms we wish to call this great reckoning, our zeitgeist is the moment in which many believe the house of cards which has become our constructed world will come crashing down. This simultaneously creates hope and fear, depending on the delusions of grandeur one fosters – that the sinners will be exposed, that all disease will be made manifest, that we will finally get to the bottom of all lies. Relief. In this sense of exposure and reckoning, our crises are welcomed by accelerationists, whether atheist or religiously devout, as they wish to bring this Apocalypse on all our heads, because they believe it is (1) inevitable, and (2) that they will somehow be whisked away as part of the elect, either to an earthly heaven on an island while the world burns, or into the firmament after death, welcomed into the graces of a loving god. These devaluations of life on earth permanently displace the real into a realm of the imaginary, temporal or immaterial. As such, this displacement constitutes a reckless willingness to sacrifice all materiality, all life, on the bet that another existence, better, awaits (and based on the shaky premise that one is a member of the elect few).

The position of privilege, whether real or imagined, which justifies the sacrifice of the earth and its creatures as collateral, represents the height of selfishness, of disconnection, and the belief in individual salvation apart from one's symbionts. The fact that our civilization has yet to take drastic action in diagnosing and treating this nihilistic disease, suggests that we have learned nothing from history.

A Genealogy of Metacrisis

The Holocaust, the Pogroms, Mao's great leap forward – all sought to gain momentarily at another's expense. Whether human or more-than-human, the other was despised, seen as enemy, and an unpassable gulf of moral distance was erected. With the slogan *Ren Ding Shen Tian* (Man Must Conquer Nature), Mao Zedong declared in 1958 to "make the high mountain bow its head; make the river yield the way." Today, we might call this logic 'ecotoxic masculinity.' But for Mao, this was a sincere effort to flush out weakness, whether perceived in man or nature. And because the more-than-human world was glossed as fragile, malleable, or responsive, that is, cognitively but also physically open and vulnerable, it was despised; regarded as something to supersede, overcome. As a historian describes it:

> *"One of the most extreme measures was an effort to stop birds eating grain. As part of the Four Pests campaign – a hygiene campaign against flies, mosquitoes, rats and sparrows – people were called upon to shoot sparrows, destroy their nests and bang pots and pans until the birds died of exhaustion. Millions of sparrows, perhaps even hundreds of millions, were killed. The measure though left crops vulnerable. Pests such as locusts became the real winners, as they had lost a major predator. Mao called off the sparrow campaign, but it was too late. A perfect storm had gathered. A toxic combination of widespread deforestation, misuse of poisons and pesticides and misinformed*

> *agricultural policy combined with poor weather to create a devastating famine. Up to 45 million people died. By the early 1960s, the Great Leap Forward was repealed." (Steinfield 2018).*

The metacrisis we face is not just a crisis of our ecological world, but as Val Plumwood (2002) diagnosed, it is also a crisis of reason. Where we get fixated on the crutches and scaffolding of our maps of the world, the heuristics of the finger pointing to the territory, rather than the territory itself.

Under the fallacy of misplaced concreteness or 'fixation of belief' (in the words of Whitehead (1929) and Peirce (1878)) we remain oblivious to the trophic cascades in the more-than-human-world. Trophic cascade interactions, such as the interaction between the 'Four Pests', only retrospectively show themselves to us if all we are set out to do is conquer nature. While cleverness devises an optimal way of killing the most sparrows, wisdom discerns between the models that the reasoning aspects of ourselves construct. Similarly, to imagine that the polycrisis could be contained through piecemeal changes to our preexisting model naively buys into the logic of reformism: that things are not that bad, and that by picking low-hanging fruit, we will placate the angry gods, or mob, whichever happens to be momentarily more pressing. Electric cars are not a solution for keeping the planet alive, although they will surely keep the vehicle industry alive while claiming to perform the former work.

But whether it is denial or doomerism, we find ourselves surrounded by mimetic desire derailed, a civilization in decline. If it were optional, if we could revive civilization by becoming an ecocivilization, wouldn't this be preferable to simple collapse, giving up on the totality of things, ideas, places, people, traditions, creatures we care about? Without passing on the baton to the next generation, the very things valued as having supreme worth in the current generation and civilization will be lost. By being willing to give up everything *except* for domination and control – that is, the anxiety of separation – we lose everything to a single constriction, a single fear of a single group of very afraid people. Art, music, learning, culture, national treasures, all become worthless when the fundament of life is at stake. People will burn Mona Lisas and Rembrandts to stay warm if they must.

Facing Uncertainty not Risk

The existential anxiety of facing the indeterminacy of the world, an indeterminacy running all the way down to the quantum level (as Heisenberg and Bohr taught us), must be faced and become part of our construction of models; seeing models *as* models. Attempts to shortcut this uncertainty and quantify it into risk equate to delusions of hermetic sandboxing, permitting some of us to get away with widening the gap between the real and the rational, while foisting the inevitable remainders on others, out of (our) sight, out of mind. As Michel Serres has written,

> *"If our rational could wed the real, the real our rational, our reasoned undertakings would leave no residue; so if garbage proliferates in the gap between them, it's because that gap produces pollution, which fills in the distance between the rational and the real. Since the filth is growing, the breach between the two worlds must be getting worse."* (1990, p. 24-25)

Rationality-as-model proliferates this gap as it incessantly constructs maps of the world, often forgetting that "disorder is simply the order we are not looking for" (Bergson 1934, p. 104). Rationality is never enacted alone. It is always navigating in *ratio* to, in relation to a *topos*, where a foregrounding of certain aspects of reality is always at the expense of backgrounding others.

A crisis of reason is a fixation on self-deceptive aspects at the expense of backgrounded aspects that accumulate, and as remainder, dispossess. Where instead of leaders ushering in a peaceful transition of power, the maieutic of birthing a new generation in continuation with the old, from the same bloodline, so

to speak, we have become inundated with technological distractions – electric cars, new fuels, geoengineering, AI, and so on – as the stop gaps which aim to embalm the old, dying body. We're performing heart transplants as fast as we can, but still smoking. These *deus ex machina* nonsolutions approach life imitating art, according to the central trope of the hit movie *Don't Look Up* betting the farm on last-minute intervention. The worst type of procrastination, it drags along our anxieties until our anxieties prove true – keeping us in paralysis the entire time until our untimely death. Thus coalesce the dark arts of planetary gaslighting.

Against deceptive modeling, Consilience Project director Daniel Schmachtenberger discusses our polycrisis as a series of meta-crises: all the prevalent crises – social, ecological, technological, psychological, political, economic, and so on – are mutually reinforcing and bound up with each other. If true, this has grave implications for how we organize knowledge in education and action in politics. Already, we see the separation of disciplines has created an impotent academic system where the humanities, social sciences, and natural sciences largely talk past each other, like blind men feeling different parts of an elephant (one, it's ears; another, it's tusk; a third, it's leg; another it's tail) all believing that the part they have grasped constitutes quintessential elephantness. In the realm of action, we have governments that devote large quantities of money to supposed sustainability, while another ministry's entire logic is to engage in activities that deliberately cut away any consideration of sustainability in their accounting, ensuring climate chaos and biodiversity collapse. Lack of coordination is key. When we measure success or failure in piecemeal terms, we end up with improper emotions – certainty that we have achieved something or grasped something, only to at a later point have the vanity of our ambitions crumble back that assertion that we are the good guys (Hendlin 2019; Princen 2005).

These mereological problems of confusing parts for wholes, models for reality, subjective reason for Reason, could be called metonymic fallacies. While instrumentalizing fast enough to reach escape velocity, our precarious relationship with uncertainty remains unaddressed, where the constraints of our models enable a proliferation of discoordination that continue to cause untold suffering. For example, in the early 90s, as pharmaceutical companies ramped up distribution of selective serotonin reuptake inhibitors (SSRIs) for treating depression. American journalist Ethan Watters (2010) observed these companies first employing marketing strategies to convince citizens in Japan that their anxieties towards life were 'depression,' to medicalize malaise into a pathology that could be prescribed their pharmaceuticals. After the globalization of the Western model of medicine, medicalizing and pharmaceuticalizing life into treatment-ordained pathologies, updated research now realizes that SSRIs are ineffective against depression (Katakam et al 2019, Olfson et al. 2006; Sharma et al. 2016; Gøtzsche 2017), and that the entire theory and evidence linking depression and brain chemistry (especially serotonin) is faulty (Moncrieff et al. 2022). Garbage proliferates in the agnotological gap between the real and the rational.

Despite shrill attestations to the contrary by the greatest marketeers, health is not solely a matter of overcoming risks of illness; rather it may be characterized "by the capacity to maintain balance in spite of being knocked around by changes to one's internal condition, the environment and the balance between them," which requires a bona fide stance towards uncertainty (Dolphijn et al. 2020, 24). In times of 'Human Resource Management' and 'risk management' we are bludgeoned into accepting that uncertainty needs to be 'managed' by experts, rather than becoming experts of the self. Quantified into an appropriate dose of SSRIs, the profit model of long-term illness maintenance industries exemplifies the tendency of quantifying uncertainty into risk, and then via this weakly constructed scaffolding claim to master the feared unknown. With the same logic as Mao's catastrophic model, we tie maximization functions of industries, such as those of pharma, oil, and cars, geared towards optimizing for extractive power. Companies with no regard of our health in their metrics of success provide our food, while the hospitals that care for our health fail to account

for our nutrition. How on earth does it become plausible, to anyone, that this form of willful discoordination is a good idea?

Finding ourselves in a continuous crisis prevents reflection – preventing the human need to "think what we are doing," as Hannah Arendt (1959, 5) urged us. To 'think what we are doing' requires time, space, quiet, no distractions. Constant crisis precisely truncates our sense of space, the luxury of thinking, reflecting, being able to modulate between modes of being, unstuck ourselves from a degenerative steady state; stable but dysfunctional. How do we instead reconcile those dehumanized and marginalized in our society? How do we rebuild our naturecultures, when we have to do this this time by design, rather than through the unrushed evolutionary process of generational attunement? It seems that knowing what to do is not the problem. For hundreds of years, we have seen a direct correlation between inequality and environmental pollution, between monopolies and poverty, between the privatization of the public sphere and the commons and the decline of citizenries. So how do we exist between going with the toxic flow of sewage we're all swimming in, and the exhaustion of constant struggle? How do we learn to better understand ourselves and our world, without the shame, heat, and retaliation that hate – self and other – conjures?

Facing Complexity beyond *Technē*

Here, Daniel Schmachtenberger (2023) has quipped: "the answer to all the problems is all the solutions." To hunker down on a single approach, or to say that a single approach is better than others, is to miss the forests for the trees. We don't need one thing or another. We need everything, everywhere, all at once (preferably, with coordination).

It's easy, though, for such pronouncements to sound empty. To say that we need all the solutions might appear tantamount to the empty gesture – thoughts and prayers. But in fact, the acknowledgement of complexity brings us to our knees, humbling us to admit that "Nature is not only more complex than we think, but more complex than we *can* think" (Egler 1977, 2, italics added). We face a world that we are getting wrong, with the remainders of pollution, where "the messenger [must] always brings strange news; if not, he's nothing but a parrot" (Serres & Latour, 2008, 66). To realize our destiny not just as disembodied minds, but aspects of ecosystems, as co-created members of a world inhabited and teeming with beings integral to our existence. Not just physically, but ideationally, where this radical thought would entail ethics and aesthetics to be isomorphic – understanding that beauty is the currency in which existence exchanges. Thich Nhat Hahn's book *How to Fight* (2017) links personal liberation with social and ecological liberation. There's no escape or get-out-of-jail free card that allows personal salvation at the expense the health of one's environment.

Of course, this is operationalized through the quotidian, the almost boring issues of harm reduction: ending our addiction to fossil fuels, transitioning out of an accelerationist society through re-regionalization, and prioritizing the basic necessities of life for all. In short: sufficiency (Princen 2005). Certainly, in an egalitarian framework, rationing will be crucial. If we have limited resources, due to the destruction of our ecosystems and living beyond our carrying capacity, to get through the lean years – which, we'll first have to accept, there will be lean years – then in order to avert violence and competition for the necessities of life, we will have to ration. Rationing is highly democratic, as it acknowledges that suffering (or at least its perception) is nonoptional, and that we choose to equitably distribute that suffering, rather than to pretend that some people deserve to bear the brunt of it while others can opt-out.

Ration has its root in the Latin *ratio*, meaning both reason and an 'approportionate accounting for'. The difference between two kinds of resource rationing (that, is nonprice and price) are that while the "rationing function of price refers to the adjustment of demand through changes in price of a scarce product to bring it line with supply", 'nonprice' rationing is "when the price is *not* allowed to move to a point at which demand

and supply align" (Cox 2013, 21-22). Rationing, like rationality, is always navigating in *ratio* to, in relation to a *topos*, where a foregrounding of certain aspects of reality is always at the expense of backgrounding others. While Price rationing is only in terms of the *map* of the territory, the economy (with the goal to align the measured demand and supply), nonprice rationing is in terms of the *territory* and its actual resources. This 'real' rationing would be a natural and "necessary response to externally imposed limits on production" so that "everyone has enough in times of scarcity" (14). When rationing is in terms of the real and not the rational, the breach (that proliferated garbage) between the real and the rational closes. Both rationality and rationing are only functions of allocation, not as the ultimate judge on *how* to allocate, which requires more than the *technē* of engineers. Life, meaning, significance, trade-offs are not engineering problems that can be solved by number-pushers offering rational calculus of costs and benefits. Utility cannot solve the emotions which ultimately are guiding our every actions. Only acknowledging and then learning to orchestrate our own emotional arrangements, hormonal states, biochemistries of desire (Hendlin 2021), can we actually come to a place where *technē* can do us any good to properly ration. While few will want to hear about rationing, as we've been hypnotized to equate it with scarcity and lack rather than sufficiency, it is only a symptom of a precarious relationship to uncertainty, where any threat to our attachments is identified as an existential threat. Our cars, our fossil fuels, technological-emotional crutches, our daily routines and addictions, have through a process of cathexis become the concentration of our identity – that we cannot imagine that our self persists without them.

Re-membering (of) the Self

Rationality on its own cannot coordinate a response to the polycrisis we face. *Logos* cannot act alone as it merely means to gather, to give an account of, but without any form of *mythos* to know what to be accountable for, our vain attempts of 'management' and trust in 'market competition' will fail. Recovering and building back a shared *mythos* affords us to share a model of the world, a worldview in which collective stories allow one another to face that uncertainty we would otherwise deny with useless band-aids that EVs and SSRIs provide via instrumental rationality. 'Degrowth' and rationing are about ensuring this story of us stays alive, as whatever happens, the only uncertainty will be if we will still be here to see experience the earth. Degrowth will be about re-*membering* ourselves to each other and the world for the sake of common sense. As we, *Homo sapiens*, with the Latin root of *sapere*, to taste, can ask from the reasoning aspects of ourselves to lend a hand to allow us to come back to our senses and remember we are in a continuous co-creation. Our ecologies, which orient us, lend us memories through smell, inspiration through the sweet air, ground and orient us through our sensual memory, ward off promises of luxurious housing developments and lucrative mining operations. Belonging in both our human and ecological community, is the surest way to build strong allegiances that can perpetuate these naturecultural systems in the face of this polycrisis. A community that loves us unconditionally, that has a place for us no matter, that gives us bearing and compass, is itself an immune system against charlatans and chicanery which otherwise find the threads of our insecurity and pull until there's nothing left.

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General Ecological (Ill-)Health in the Ex-Organological Technosphere

Johan May

It is well established today that we are confronted with a profound ecological crisis during the latest stage of the Anthropocene, where the latter may be considered in tandem with the evolution of the technosphere[1]. This entails that our contemporary ecological condition is thoroughly intertwined with the "proliferation of technology across the globe" (Haff 2013, 301). As such, it requires further characterization beyond a restricted sense of the ecological as a general or techno-ecological condition (e.g., see Hörl 2017). Bernard Stiegler's thought seems especially insightful in this regard, which enables us to construe the technosphere of the Anthropocene in techno-ecological terms as an ex-organological and pharmacological assemblage (Stiegler 2018a). We will see that a significant insight to be drawn from this perspective is that our contemporary condition may be understood in terms of a general ecological sense of (ill-)health, as it relates to Georges Canguilhem's conception of health (Canguilhem 1991) informing Stiegler's view of noesis (Stiegler 2019).

In what follows, the concepts of the Anthropocene and the technosphere are discussed as the locality and general background of the concerns in this paper, along with how the traditional concept of ecology as restricted to living organisms and ecosystems is transformed in light of the planetary significance of technology. The planetary significance of technology (theorized at the level of the Earth System as the technosphere) has also been interpreted in the work of Stiegler (2018a) as having a cosmological or cosmo-technological significance, where, as we will see, he understands the technospheric Anthropocene in terms of an "Entropocene". Afterwards, we see how Stiegler's thought enables us to characterize the Anthropocene era as a question of general ecological (ill-)health. This notion will then be exemplified in terms of his treatment of the pharmacological "infidelity" of the technical milieu, which noetic life necessarily encounters in ex-organological existence (Stiegler 2017); as well as by his neganthropological understanding of the function of noesis (2018a).

Anthropocenic Techno-Ecology

The Anthropocene is a proposed name (among several others) for a purportedly new geological epoch in which anthropogenic processes and systems have a profoundly disorganizing impact on the Earth's ecosystems as well as the overall trajectory of the Earth System[2]. These processes, although they have been interpreted in various ways and referred to by correspondingly different names (e.g., see Montévil 2021), are widely conceived as stemming from the activity of the anthropos—regardless of whether this relates specifically to the human, to modern industrial technics, or to related forms of economic and social organization[3]. Their disruptive impact on the Earth's ecosystems and natural processes has reached a level

1 For more on the profound sense of the ecological crisis, which largely concerns a convergence of numerous alarming trends in climate, ecology and public health—along with a disruption of institutions and social systems as a result of the incessantly accelerating speed of technical evolution and innovation after the digital turn, see Charles F. Kennel (2020), Bernard Stiegler and the Internation Collective (Stiegler et al. 2021) and Daniel Ross and Stiegler (2022).

2 This corresponds to what geographers and ecologists call "anthropization", which involves the transformation of landscapes and ecosystems through human activity; as well as to the notion of "anthropogenic forcing" as entailing the disruption of dynamic natural (e.g., climate, ecological) systems through such activity (Alombert and Krzykawski 2021, 307).

3 While the exact dating of this allegedly new epoch of the Earth System remains subject to debate, as with the standards via which this debate is to be settled, it is generally considered as corresponding to the advent of industrialization—or, otherwise, the great acceleration of the 1950s (Ross 2021, 28). For some scholars, however, the Anthropocene has its origin in phenomena that precede both the human and modernity.

such that it has brought into question the continued possibility of human existence—and along with it—all life on Earth (Alombert and Krzykawski 2021, 305-306). As will be discussed in greater detail shortly, this has also been characterized in terms of the general tendency of the Anthropocene to degrade what Erwin Schrödinger theorizes as "negentropy" (Schrödinger 1944); a careless, disorganizing and toxifying—generally "entropic" tendency which Stiegler refers to by his concept of "anthropy", on account of which the Anthropocene era corresponds above all to a general and rapid increase of entropic processes of all kinds (Stiegler 2018a). This "anthropic" tendency (which Stiegler coins with a nod to terms such as "anthropogenic forcing" recently used in reports by the IPCC) has to do with the functioning of the Earth System Science (ESS) notion of the technosphere—the globalized technical system which underpins all Anthropocenic activity and systems.

Peter Haff (2014) theorizes the technosphere as the Anthropocene's "defining system", thus serving as the broad locality of all anthropogenic activity and processes across the globe. The technosphere consists in much more than the growing accumulation of technical artefacts and artificial systems on Earth. It also has active and inactive components. It is theorized as a complex system with its own dynamics and emergent properties which may be compared to the biosphere as it was theorized by Vladimir Vernadsky; that is, the biosphere as not only entailing the overall mass of living things—but the combination of life-sustaining elements (e.g., air, water, soil, etc.), including the Sun as its main energy source (see Zalasiewicz 2018). Similar to the biosphere, the technosphere acts and functions as an energy metabolism which is dynamically composed with the other geospheres (e.g., lithosphere, hydrosphere, atmosphere). It is from them that it derives a great deal of its energy resources (Lemmens 2022, 212). In short, as Erich Hörl writes, the technosphere is "an entire network and a global cooperation of natural and non-natural, human and nonhuman actors and forces—from all kinds of flows of energy and communication, via processes of production, to bureaucracies, states, and human beings—in which technology becomes an autonomous entity and matrix" (Hörl 2017, 10).[4] Since the notion of technology discussed here seems to encompass much more than our everyday understanding of the term, it may be worth briefly discussing the conception of technology this paper employs to understand the technosphere.

The technosphere seems to be based on an understanding of technics or technology as a dynamic process of becoming or artificial exteriorization—which brings to mind what Stiegler refers to as the "exosomatization" (Stiegler 2018a) of the living—a process of technical evolution which begins approximately since the dawn of hominization (1998), and which has more recently culminated in what is discussed here as the technosphere. This is related to what the biological mathematician Alfred J. Lotka (1945) theorizes as "exosomatic" evolution, which entails that anthropogenic activity and processes in general are rooted in an exosomatic (which means a prosthetic-technical) form of organogenesis, rather than a strictly biological (or "endosomatic") organogenesis. According to Lotka, the former consists in a certain bifurcation form the latter, an "entirely new path" in the history of life's evolution which corresponds to the phenomenon of hominization; where ever since the initial productions of artefacts and tools (which Lotka calls "exosomatic organs"), "increased adaptation [of the hominid being] has been achieved by the incomparably more rapid development of 'artificial' aids to our native receptor-effector apparatus" (Lotka 1945, 188). This view of an exosomatic form of life informs Stiegler's conception of the human lifeform as a technical or prosthetic form of life. Stiegler conceives of anthropogenesis as a technogenesis, which means that the process of becoming (the evolution) of the human species is irreducibly conditioned and supported

[4] Pieter Lemmens points out that from the Earth System Science perspective of Haff (Haff 2013), technology is approached from an outside view as "deliberately non-anthropocentric […] technocentric or system-centric […] [and] geo-systematically as a more or less self-regulated global phenomenon which follows its own dynamic trajectory, possessing intrinsic purposiveness and thus largely escaping human control" (Lemmens 2022, 212). The technosphere appears to have "bootstrapped" itself into its current state, as is the case with emergent complex systems in general, and has incorporated humans as essential components and ultimately subsumes human activity.

by, insofar as it is in an originary sense composed with, the evolution of technics (Stiegler 1998). It is this conception of technics (as a process of exosomatization) that seems to underpin the anthropogenic processes of the Anthropocene. It concerns a process of the artificialization of the biosphere (and of the living) which inaugurates the Anthropocene when it accelerates to such an extent that it develops into the global technosphere. According to Daniel Ross, this profound acceleration of the Anthropocene occurs during industrialization, when human beings "begin to employ new means in this process of anthropization [as exosomatization]: new forms of energy production and consumption with the development of heat engines and new forms of automation with the development of machinery and factories" (Ross 2021, 27-28).

The significance of the notion of the technosphere is ultimately that it profoundly affects the ecological systems of the biosphere. As Michał Krzykawski and Susanna Lindberg write, "characterized by the intervention of technological systems and technosciences into nature", it may be seen as responsible for "anthropogenic changes in the biosphere and the reorganization of social and biological structures" (Krzykawski and Lindberg 2021, 197-198). These changes have engendered the Earth-system mutation known as climate change (or global warming) as well as the global ecological crisis which is widely understood in terms of the destruction of ecosystems, loss of biodiversity, extinction of species and oceanic acidification (Lemmens 2022). As such, the notion of the technosphere accounts for the disorganizing and disruptive impacts of anthropogenic processes. According to Lemmens, this may be considered in terms of the way the technosphere differs from the biosphere. The technosphere, understood as a metabolic system, is distinct to the biosphere in terms of its relationship to the energy resources on which it depends in order to function. As Lemmens writes, the technosphere functions in accordance with the general "principle of maximum entropy production", which means "it evolves to a state in which usable energy is consumed as fast as possible" (Lemmens 2022, 212). It has thus far also been largely unsuccessful at recycling its own waste and has thereby greatly accelerated the global ecological crisis.

The sense of an entropic functioning and entropy production mentioned by Lemmens (also see Haff 2013) may be seen broadly in terms of a systemic tendency of the technosphere in the Anthropocene to "exhaust its dynamic potentials, as well as its capacity for conservation or renewal" (Alombert and Krzykawski 2021, 311-312). As such, it closely related to Stiegler's view of the Entropocene (Stiegler 2018a). This understanding is based on a generalized conception of entropy, involving also biological and informational theories beyond the original thermodynamic sense as it is postulated by the second law of thermodynamics as the irreversible degradation and dissipation of energy in closed systems (Montévil 2021, 2). It also presupposes the sense in which entropy is understood in physicalist theory as a universal tendency, where the universe itself is conceived as a closed system which in principle leads to its own eventual "heat death" (see Alombert and Krzykawski 2021, 312). For Stiegler (2017), the significance of the Anthropocene (insofar as it is underpinned by the technosphere, which he understands in terms of the notion of technics as exosomatization) is that it corresponds to the generalized and rapid increase of entropies or rates of entropy in the cosmic locality of the Earth's biosphere. This entails not just the physical (or thermodynamic) sense of entropy as the degradation of energy and the dispersion of mineral resources, but further encompasses a biological sense of entropy as the reduction of biodiversity and the destruction of ecosystems, an informational conception of entropy as the reduction of knowledge to automated digital calculation and information—and correspondingly, a psycho-social sense of entropy as the destruction of cultural and social diversity and the systemic degradation of the conditions of noesis (where noesis refers broadly to the capacities of thought and singular reasoning processes) (Stiegler et al. 2021). These conceptions of entropy,

which are seen as theoretically analogous yet distinct, each combine to the overall production of anthropogenic entropies in the "biosphere-cum-technosphere" (Stiegler 2018b).[5]

As another way of understanding the Anthropocene as a technospheric phenomenon, and therefore, with a cosmological significance (insofar as it involves a localized acceleration of entropy in the biosphere), its anthropogenic processes are ultimately then less a question of the "anthropos" than they are a question of "anthropy" (Stiegler 2018a). Anthropy, as Stiegler employs the term (as an almost homologous variation on the notion of entropy), refers to a distinctly exosomatic form of entropy production—an artificially accentuated form of entropy production in the Earth's biosphere that results from techno-economic processes of production and consumption (see Alombert and Krzykawski 2021, 307). Although its impact reaches beyond the "natural" ecological level of biological organizations and ecosystems (since it also entails the production of informational and thermodynamic or physical entropy), Stiegler argues that anthropy largely involves the elimination of what Erwin Schrödinger (1944) theorized as "negative entropy", and what has later been called negentropy. In short, negentropy concerns the locally cosmic biospheric character (or function) of the living understood as endowed with a metabolic capacity to temporarily defer and postpone the universal entropic tendency on Earth by exchanging matter and energy with its environment (Alombert and Krzykawski 2021, 312). It does so through activities concerning the organization of itself and its environment alike, as well as through the evolutionary diversification of organs, functions and species (Schrödinger 1944). While all negentropic activity, in its exchange of matter and energy with the environment, itself inescapably produces its own forms of entropy in the biosphere, it does so to the extent that it strives to postpone its own inevitable entropic fate, which would be death or organic dissolution (Alombert and Krzykawski 2021, 312).

The functioning of the technosphere can in this way be understood in light of the above as accelerating the global ecological crisis in the sense of systematically eliminating the negentropy of the biosphere (Stiegler 2018a). As we will see shortly, however, in addition to the elimination of negentropy (e.g., loss of biodiversity, species extinction and the destruction of ecosystems), the technosphere also functions, especially in its contemporary computational capitalist form or configuration (where it operates on the basis of the data economy), to degrade the capacities of thought and the psycho-social conditions of noesis (Montévil et al. 2021, 51). Stiegler (2018a) refers to this as a process of de-noetization specific to the industrial period and the technosphere (also see Stiegler et al. 2021). This further exacerbates the crisis of the Anthropocene insofar as individual and collective (or psycho-social noetic) practices of critique, deliberation, knowledge, theorization, reason, etc.—at the level of psycho-social ecologies and thought—become increasingly incapable of attending to, taking care of, or ultimately transforming the current state of affairs (Ross and Stiegler 2021). As will be discussed in the section below, noetic practices are characterized by Stiegler in his later work (Stiegler 2018a) in terms of *neganthropy*, which similar to his concept of *anthropy*, entails a distinct exosomatic form of the production of negentropy on Earth via exosomatic technics and systems of the technosphere. According to Stiegler, as with negentropy, "neganthropy" is systematically being degraded and weakened by the computational capitalist functioning of the contemporary technosphere under the data consumerist economy (Stiegler 2018a; also see Ross and Stiegler 2022).

In a very general way, then, the relationship of the technosphere with the biosphere does not seem to be a healthy one. Moreover, in light of this relationship, it seems that environmental ecology, mental ecology and social ecology, as Felix Guattari (1989) argues in *The Three Ecologies*, must be understood together as indissociable in terms of a general and less restrictive conception of the ecological question. Indeed, the technosphere and its pervasive impact has transformed the question of ecology into what may be referred

5 According to Anne Alombert and Krzykawski, entropy can be understood, in the generalized sense of the Anthropocenic technosphere as an Entropocene, as involving a "tendency towards disorganization, destructuration and disorder" (see Alombert and Krzykawski 2021, 311).

to as a general ecological or techno-ecological question (e.g., Hörl 2017). This is to the extent that there is no area of the ecological field that can be said to remain independent from the planetary scale conditioning processes and influence of the technosphere. At the level of the environmental, the mental and the socius, as Hörl writes, "the technosphere becomes the milieu of milieux" (2017, 11). In the contemporary technosphere, Guattari's three ecologies are thus radically interconnected. Insofar as the contemporary organization of the technosphere determines its predominant mode of functioning as generally anthropic (or toxifying) in its relationship to the biosphere, as we will see in greater detail below, the Anthropocene may perhaps be seen as involving a question of general or techno-ecological health and illness. Related to this line of thinking, it will now be considered below how the general or techno-ecological condition of the latest stage of the Anthropocene, which will be considered along the lines of Stiegler's "general organology" and "pharmacology" (2020), may be understood as a question of general ecological (ill-)health.

Techno-Ecological (ill-)Health

Stiegler's general organological perspective to the Anthropocenic technosphere presupposes a sense of (ill-)health, where this has to do with his view of noesis as it is informed by Georges Canguilhem's view of health and normativity. Stiegler writes the following about this sense of (ill-)health: "Health, for Canguilhem, is *that which is capable of learning something about the disease*, it being understood that what *characterizes* the human exorganism is its *capacity to make itself ill* […]. This capacity to fall ill and to *learn something about the illness* is what is called noesis—thinking, which I also write as taking care (*la pansée*): it is what produces care-ful treatments (*pansements*)" (Stiegler 2019, 113). To understand this, along with how this idea can be understood in general or techno-ecological terms as relating to the Anthropocenic technosphere, it is necessary to first clarify Stiegler's understanding of noesis (as a technesis), general organology and pharmacology.

Noesis is understood by Stiegler in terms of a process of becoming, and is seen as evolving from the outset, since the beginning of hominization, as a techno-ecological phenomenon; where the "interior" of the noetic being is constituted in terms of a reciprocally co-evolving, prosthetic relationship to the "exterior" of the exosomatic or technical milieu (Stiegler 1998). Artefacts and tools are considered by Stiegler as the retentional supports for the evolution of noesis across the generations. They serve as a transgenerational (and as such fundamentally social) structure for the transmission of cultural memory and knowledge, through which lessons of individual experience can be retained beyond the natural limits of biological retention (or memory) (also see Stiegler 2020). The always relational becoming of noesis, as a technesis and a techno-ecological process, is however always overdetermined due to the bivalent character of technics. Stiegler understands technics as *pharmaka*, which means that they are both curative and toxifying—they can be both beneficial and detrimental to the becoming of noesis (see Ars Industrialis 2012). Therefore, Stiegler considers the capacities of thought, although they are fundamentally supported by technics, to be inherently fragile and in need of being taken care of. This taking care is achieved through knowledge and various kinds of social practices, which are conceived as practices of care that are made possible by and reside within social organizations or systems (Stiegler 2018a).

Due to the bivalent tendencies of artefacts and technics, Stiegler argues that thought must understand itself as careful thought (Stiegler 2018a), where thinking also entails taking care of its own exosomatic or technological conditions of possibility (its techno-ecology). Technics require attention and care so that their benign, curative and enabling tendencies do not become toxic—whether this is in relation to the self, others or the entire technologically conditioned environment. Stiegler's understanding presupposes it is only on the condition of a relatively well-organized techno-ecology (a techno-ecology that is taken-care of)—which he argues necessitates a systematic valorization of our attentional capacities and the conditions of noesis (Stiegler 2016)—that we can wish to be capable of taking care of what is then not just an ecological but general ecological assemblage (Stiegler 2017). Careful thought is thus an important instance of how Stiegler's

thought may be seen as presupposing a certain sense of general ecological (ill-)health, since health as a capacity of noesis for taking care of itself, others and the techno-ecological condition in general is always co-extensive with the capacity for the self, others and the technical milieu to become ill by virtue of the bivalent pharmacological tendencies that pervade it. Health, as in the work of Canguilhem, is not a positively defined state, but rather the interactive and relational capacity to learn from disease or the environment's infidelity in order to take care of it and treat it.

This is a highly relevant perspective with regard to the technosphere; which, as we have seen, has arguably become the milieu of milieux (Hörl 2017). In terms of the conception of technics as exosomatization already discussed, the contemporary technosphere may be seen as the latest stage of a history of exosomatization; and, as such, as an exosomatic milieu that extends throughout the entire biosphere (Stiegler 2018a). If the general ecological condition of the Anthropocene era may be understood as a question of ill-health, this means it first and foremost a question of the technospheric conditions of noesis. When the techno-ecological conditions of noesis cease to be socially organized and prescribed in a careful way, general ecological ill-health is inevitable. The technospheric conditions of noesis are exosomatic and organological (ex-organological), as will be discussed in what follows, and as such they are pharmacological—in need of careful thought.

The General Organological Conditions of (Ill-)Health

Stiegler relates the techno-ecological conditions of noesis to psychic and social individuation as developed in the work of Gilbert Simondon (2020). As Anne Alombert explains, psychic and social individuation refers to "processes through which individuals relate to each other and form groups, sharing emotions, ideas, practices or values (the processes through which [an] *I* becomes a *we*)" (2019, 320). For Simondon, psychic individuation is always conditioned by collective or social individuation processes (e.g., culture or the evolution of a shared language) in which the psychic individual participates; while collective individuation also always presupposes psychic individuals that relate to one another. The Simondonian "pre-individual" (2020), which is a field of nature charged with the potentials and tension out of which the various regimes of individuation emerge, at once individuates both psychically and socially, while pre-individual elements persist through these always incomplete and reciprocally co-constitutive individuations of the I and the We. In contrast to Simondon's view, Stiegler holds that technical individuation, or the exosomatic evolution of technics and the technical milieu, fundamentally conditions the pre-individual field (and our access to it), and the process of psychosocial individuation, as the retentional conditions in which it is possible as a reciprocal co-evolutionary becoming. Stiegler argues that it is only on the condition of technics (the most relevant of which here are language, rituals, writing, radio, cinema, digital platforms, networks, infrastructures, systems, etc.) that is possible to individuate singularly and socially—for example, through expressing singularities, sharing ideas, emotions, knowledge, and relating to others (see Alombert 2019, 320). As such, these individuation processes are what enable development of our noetic capacities and functions as their techno-ecological conditions of possibility.

These processes constitute the object of investigation of Stiegler's "general organology" (2020, 73), a theoretical platform for analysing and studying, as well as prescribing arrangements among, indissociably and transductively related processes of "psycho-socio-techno-logical" (or organological) individuation. The term transductive which Stiegler adopts from Simondon here means that changes at one level (e.g., the technical) has consequences for the others—which is why it is called "general" organology and can be understood as a generalized sense of ecology insofar as its primary concern is the relationships among processes of individuation. For example, when new technological systems are developed, there is typically a period of shock and disadjustment of social systems and individuation processes. This is when noetic life

encounters the "infidelity of the milieu" (Canguilhem 1997), in relation to which Stiegler argues that psychic and collective individuals (or societies) need to develop new conditions of "fidelity" or reliability in the sense of curative practices and knowledge for taking care of the pharmacological infidelity of the technical milieu (Stiegler 2017). After the period of shock, in which the technical milieu ceases to be adopted or transindividuated among psychic and social individuals, there is usually a period of social readjustment to and a collective adoption of the technical milieu by society. During this "second stage" technics again supports processes of psychic and social individuation based on curative knowledge practices and socialized rules for our relationships to and our use of these new technics (Stiegler 2017). The production of new norms and conditions of fidelity, however, are only possible by virtue of a relatively functional or perhaps healthy organological assemblage (Hörl 2017, 26). In other words, it is crucial that the techno-ecological conditions of noesis and careful thought foster rather than undermine noetic capacities. This itself is the work of careful thought and noesis. Here, the infidelity of the milieu resembles what Stiegler understands as the capacity of the noetic being—viewed in techno-ecological terms—to make itself ill; and the production of new forms of fidelity (as knowledge and social practices of care and therapeutics) stem from the capacity of noesis to learn from its illness and the infidelity of the milieu.

In his later work, Stiegler (2019) refers to organological beings as ex-organological beings, where he integrates his general organological understanding with the significance of Lotka's exosomatic perspective. The processes of ex-organological individuation entail a transductively related evolution of endosomatic (bodily or psychosomatic) organs, collective organs or social organizations (e.g., institutions), and exosomatic organs and systems (Stiegler 2020). As in his general organology, these processes are pervaded by technics and their pharmacological tendencies, and care must be taken at each of these levels of analysis.

The technical not only supports psychosocial individuation processes and the capacities of noesis, but also contains the potential to be detrimental or toxifying to these processes—that is, in this case, it may contribute to a loss of individuation or knowledge and a degradation of the capacities of noesis. Insofar as individuation processes entail the capacity to become singular and express singularities through all kinds of knowledge practices, it may equally be undermined through dis-individuation, where this depends on the organization of technics at the level of collective or societal level, and insofar as it has a crucial bearing on the capacities of noesis to produce new social norms, knowledge and therapeutic practices or treatments in relation to the pharmacological infidelity of the ex-organological milieu (Stiegler 2017).

According to Stiegler, the pharmacological character of technological becoming under the rule of global consumerist economic development seems to reveal itself more than ever during the current stage of the Anthropocene, which is characterized not only by climate change, the destruction of ecosystems and the loss of biodiversity—but also by the data driven attention economy's degradation of our attentional capacities and disruption of the techno-ecological conditions of careful thought and noesis. Stiegler argues that this hyper-systemic (Ross and Stiegler 2022) pharmacological crisis arises due to a "a situation where marketing's social prescription of the use of technology occurs outside of, or by circumventing, any public regulation" (see Stiegler 2020, 75). There is a widespread loss of individuation and knowledge due to the "disruption" of social organization which has been taking place since the digital turn of the early 1990s (Stiegler 2018). This disruption refers to the disorganization of social systems, or the upheaval of social systems due to their inability to keep up with the accelerating speed of technical evolution and innovations. As Alombert and Krzykawski write in this regard, "technical transformations occur so quickly that they leave the political and social realms behind, as well as public power in general, so that no new viable model of long-term social and economic development can emerge […] regulation, legislation and knowledge always arrive too late: the resulting expansion of legal vacuums and theoretical vacuums seem to be without

historical precedent" (2021, 311). This renders social organizations and systems incapable of fulfilling what is considered by Stiegler as their care-taking function in an ex-organological assemblage.

Apart from this sense of disruption, the contemporary technosphere, in what has now become a thoroughly computational capitalism operating in terms of the data economy, functions to degrade and nullify our noetic capacities. Most digital applications, devices, and platforms belonging to the data economy, are geared towards addictive use that exploits the drives (aimed at short-term satisfaction), disrupts attention, reduces time for critical reflection and imagination, and ultimately occupies a destructive relationship to our noetic capacities (Alombert 2022, 36). Stiegler understands this tendency of the contemporary technosphere in terms of a process of de-noetization, which is a systemic degradation of the techno-ecological conditions of noesis (Stiegler et al. 2021).[6] Again, such negative side effects of technics is due to the pharmacological character of all technics (in this case of calculation based digital technics), which necessarily tend to become toxic when they are not practiced according to knowledge and socialized rules (Stiegler 2016). When technologies cease to be taken care of at each of the organological levels, the techno-ecological condition ceases to be healthy, since noesis as the capacity for health fails to fulfil its general ecological function.

The exorganological milieu today ceases to be taken care of. Its consumerist economic logic—which values permanent innovation (Stiegler 1998) above fostering our noetic capacities whilst disregarding the role of technics (and the valorization of careful thought in relation to technics) in the unfolding of individuation processes—renders its functioning detrimental and toxic to our general ecological condition. This relates as much to noetic techno-ecologies as it does to the natural ecosystems of the biosphere (Stiegler et al. 2021; also see Alombert 2022), since the generally entropic functioning of the technosphere consequently accelerates the global ecological crisis by producing more and more anthropy (Stiegler 2016; 2018a). In what follows, this paper concludes with a brief discussion of Stiegler's neganthropological thought in relation to the sense of general ecological (ill-)health that this paper argues to be presupposed in his work.

(Neg)Anthropy

Stiegler's neganthropological perspective (Stiegler 2018a) on the Anthropocene as Entropocene reinterprets Guattari's schema of the three ecologies (Guattari 1989) as being pervaded by the locally (biospheric and technospheric) cosmo-technological tendencies of anthropy and neganthropy. Similar to the sense in which Guattari argues that environmental, mental, and social ecologies must be understood together in systemic terms as a generalized ecology, Stiegler insists on the need to distinguish and connect (since they compose with each other in complex and unpredictable ways) three types of entropies (Alombert 2022). On this view, the general ecological crisis of the Entropocene under the now fully computational capitalist configuration of the technosphere can be seen as "a triple problem of environmental […], mental […] and social ecology, in which the entropisation of biological organisations, [and noetic or psycho-social] organisations all combine" (Alombert 2022, 39).

These anthropies include the de-noetization processes of computational capitalism and the data economy in terms of how they exacerbate them. These processes involve psycho-social forms of entropy, which largely have to do with the disruption and disorganization of collective or social organizations. Moreover, they concern the increasingly automated functioning of the digital technosphere, where calculation prevails over any other form of decision-making (Stiegler 2016, 8-9), and thus relates to what Stiegler conceives in terms of informational entropy (Stiegler et al. 2021). According to Stiegler, latter concerns a crisis of critique (see Ross and Stiegler 2022) and of scientific practices of theorization, since our

[6] A key example of this de-noetization tendency is that we are living in an age of post-truth, or perhaps the ideological fantasy famously put forward in *Wired* by Chris Anderson in 2013 that Big Data computational processes are capable of substituting traditional scientific theorizing, making the latter appear as redundant (Stiegler 2016).

over reliance on automated decision-making systems and the actionable insights derived from big data systems seem to increasingly bypass or substitute critical practices, theorization and singular reasoning (Stiegler 2016). It also has to do with psychic forms of entropy, which relate to the disruption of our attentional capacities on social media platforms which may be considered in terms of what Katherine Hayles has discussed in terms of "hyper-attention" (Hayles 2007) or what Jonathan Crary (2013) has characterized as the destruction of our mental capacities for concentration, patience, desire, imagination and protentional thinking through the functioning of the data economy (see Alombert 2022, 43).

While it is beyond the scope of this paper to discuss each of the different forms of entropy in the detail they deserve, and in the sense Stiegler associates them with the Entropocene (Stiegler et al. 2021), they are significance as examples of the infidelity of the ex-organological milieu; of how noesis can be degraded and undermined by the functioning of the contemporary technosphere, where the question of (ill-)health becomes relevant as the capacity of noesis to learn from its techno-ecological infidelity in order to learn how to take care of or transform it. Anthropy can ultimately be seen as relating to a general ecological illness of the Anthropocene era, since it involves the generalized degradation of our noetic capacities as capacities for taking care of our general ecological condition. As with the degradation of negentropy by the technosphere, the digital technosphere under the organization of the data economy predominantly functions to eliminate careful thought—and moreover, "thought about the direction and fate of technics in particular" (Ross and Stiegler 2022, 20).[7] If the Anthropocene has in this sense fallen ill, insofar as the potential of noesis is to produce curative knowledge practices or therapeutic prescriptions is fundamentally weakened, we may conceive the notion of neganthropy as a function of the capacity of noesis for striving towards general ecological health (see Stiegler 2018c). This is what is arguably at stake in his later neganthropological thought. Ultimately, the significance of the notion of general ecological (ill-)health as a techno-ecological concept is that fostering the conditions of noesis—such as by differently organizing the technosphere in a more careful way that valorizes the attentional and care-taking capacities of individuals and collectives—is necessary to transition towards a more healthy and sustainable ex-organological organization of the technosphere beyond the Anthropocene (e.g., see Stiegler et al. 2021). This would in turn enable a more healthy and sustainable ecological world.

[7] This is not to say that digital technology doesn't enable or facilitate the exchange of thought and critical reflection. Stiegler is especially interested in cultivating the positive pharmacological tendencies of new technologies, as he has focuses on contributing to in his various research collectives and organizations. Instead, the predominant character of the deployment of digital technologies based on addictive, consumer-driven and data techniques significantly undermines and weakens the positive potential of these technologies.

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The Self in the Smart Home: *An Ecological Analysis of The Digital Epoch*

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The term ecology comes from *οἶκος (oikos)* and *λόγος (logos)* and translates from Greek to: 'the study and discourse on the home'. From the moment *homo sapiens* was born, humans lived on the earth and treated it like an *οἶκος*. It was a home, a place to inhabit. And it still is: yet a lot has changed over the years. Our *οἶκος* has become reduced and exploited, but also enhanced and refined with the development of technology. The invention of the computer during the twentieth century, in particular, brought forth a rapid transformation of the world we live in.

In 1822, Charles Babbage conceptualized his idea of a computer, which he developed until the end of his lifetime. It took some time to execute his ideas, but more than two and a half centuries later, his design was finally built by the London Science Museum in 1991. Two years later, on April 30th of 1993, the World Wide Web entered the public domain and could be used royalty-free all over the world. This moment was a vital turning point in what we now call the Digital Age. Since then, the volume of internet traffic has increased immensely. In the present day, the internet allows billions of people to consult a global information system and interact with each other instantaneously and without restraint. Not only the industry became fully digital, but human communication as well.

This rise of digital technologies and the development of data networks have brought unprecedented changes to our daily lives. From the way we communicate to the way we work; technology has transformed every aspect of human existence. While certain technologies have undoubtedly brought many benefits to society, concerns have also been raised as to their influence. In *The Age of Disruption* (2016), Bernard Stiegler warns us against the unorderly character of our current epoch, and the loss of reason that it creates. The speed at which technology is shaping our experiences, leaves no space for traditional ways of thinking. Another danger brought forth in the digital era is the growing impact of attention as a capitalist resource, as Yves Citton argues in *The Ecology of Attention* (2017). Not only is it problematic to think of attention as a resource, but if it is one, it is becoming scarcer by the minute. Moreover, some argue that our reality is increasingly mediated by technology. This has direct implications for our individual agency, which decreases when human behavioral patterns are analyzed, recognized and predicted (Hildebrandt 2015, 111).
This raises the question: are we losing ourselves in technology? In this essay, I will examine this question by applying an ecological perspective to the modern digital era. From this ecological point for view, the digital world of the internet will be examined as an environment, and human beings as the organisms co-inhabiting it. On this basis, I will explore the ways in which technology is changing our relationship with ourselves and others. I will analyze the arguments for and against the idea that technology is leading to a loss of self, and conclude by offering my own perspective on this issue. In so doing, this essay aims to provide a nuanced understanding of the role of the digital environment in shaping human identities, and the future implications this might have.

I. The Digital Age – its Characteristics and Implications

Loss of Reason

In *The Age of Disruption* (2019), Bernard Stiegler warned us against 'automatic nihilism': a process in which digital means disrupt our social relations. The speed at which digital information circulates through mobile devices, chips and terminals is quicker than lightning. The reticulated society that is essentially based on digital technologies, will become the "global cause of a colossal social disintegration" (Stiegler 2019, 7). In this disintegration, techno-capitalism plays a central role by reducing both communal and individual aspects of human life to being solely computational objects. In the state of the reticulated society, our identities are primarily understood and shaped in computational terms, devoid of other essential dimensions of human existence. Our social relations are penetrated by digital reticulation as it dis-integrates and exploits our interactions. While these were once personal and intimate, they have now become part of a data-driven economy, valued for their profit. Moreover, because we are caught in automatism and addiction to digital technologies, we no longer engage in a process of reflection that would allow for new modes of thought. Hence there is no 'redoubling' that is typical for the emergence of a new epoch (Rivas 2022, 522). The process of disintegration and the absence of reflection is what Stiegler calls 'disruption'. A phenomenon that constitutes the problem of the absence of an epoch: there is a loss of reason, a collective loss of the feeling of existence, that always arrives too late – hence it has failed to achieve epochal status. The digital age is an age of disruption, that will end in a global social explosion.

Stiegler builds on Heidegger's philosophy of technology and updates his methodology in order to apply it to the digital era. In *Being and Time* (1927), Heidegger distinguished the present-at-hand from the ready-at-hand. The ready-at-hand is the reality from everyday life, the practical mode of encountering objects. When something is ready-at-hand, we perceive it as a tool or instrument that serves a specific purpose or function. In turn, the present-at-hand refers to a mode in which we detach the object from its immediate context and examine it rather than focus on its task. Heidegger argues that technology – as being ready-at-hand – forms the worlding of the modern age (Irwin 2019, 363). Stiegler takes this argument further and claims that technology shapes *all* ages, as it always has a central place in human culture. The connection between humans and technology has always existed according to Stiegler, however, in our current age the role of technology in human life becomes different.

According to Stiegler, a techno-logical *epokhē* occurs in two stages: all previous ways of thinking are suspended, and a new present is established, giving rise to new ways of thinking. However, in the digital age there is no place for this second development, hence no new form of thinking is inaugurated. Automatisms and addictions take over what used to be our standard way of living (Stiegler 2019, 15). Digital technologies are reshaping our experiences: our understanding of time, memory, and desire. The result is an absolute emptiness of thought that is typical for the age of disruption. It is also what Heidegger called the 'end of philosophy', as it has lost touch with the concrete living experience, with 'Being' itself (Irwin 2019, 364).
Imagine that you made a trip by car for the weekend to a holiday location and are now heading back home. You might feel like the ride home takes less time. Since you already have memories of the places you passed, there is no need for your brain to slow down and process these when you pass them for a second time. This perception is similar to our experience when digital technologies mediate our understanding: there is no slowing down anymore, only high paced digestion of stimuli. There is no reason for us to process these since the processing is already done by the digital mediator. What is left for us is the mere result. There is not only a loss of reason, but also a loss of control.

The problem is not that digital technologies are invading human natural life. On the contrary, Stiegler argues in *Technics and Time* (2009) that the human and the technological are co-constitutive domains that evolved simultaneously. Humans need material technicity to experience memories and reflect on their

history. However, the rapid acceleration of technological change brings forth an equally rapid transformation of our experience and human-machine interaction. For example, global social media platforms are now the main form of interaction between humans, hence these are functioning as mediators. Such platforms and other digital technologies heavily re-shape not only our communication, but also our knowledge production and our aesthetic experience of the world. They have become so integrated into the human experience, that the fundamental unity between human and machine is out of balance. Whereas the two domains are co-institutive, the technological domain is now overtaking the human one.

Rethinking traditional categories

When human identities are constantly being mediated by technologies, the question arises if this mediation constitutes a corresponding erosion of identity. Arguably, the *hyperindustrial* mode of production and consumption in the digital era replaces human culture and its traditions. Human identity is characterized by its many intellectual and cultural traditions. Categories such as "culture" and "identity" must be rethought, as the digital age requires us to move along in its accelerated metamorphosis.

In *The Age of Disruption* (2019), Stiegler addresses the alienating effects of technologies as well, in order to understand how consumerism and capitalism relate to the human capacity of (collective) decision-making. An essential mechanism related to the manipulative character of technologies and the individual is the mechanism of attention (Citton 2017, 7). In a time of 'information overload' attention has become a vital capital on the digital market. Think of advertisements, consumer data, cookies, and search choices: all of these things require and shape our attention, which in turn can be sold and traded. The phrase 'paying attention' has thus become literal.

> *"The wealth of information means a dearth of something else – a scarcity of whatever that information consumes. What information consumes is rather obvious: it consumes the attention of its recipients."* (Simon 1969, 40).

The attention economy is characterized by a new scarcity: not of material goods, but of the attention that is needed in order to consume information. People are constantly directing their attention, while big companies such as Google, Facebook or Cambridge Analytics seek to capture and monetize it. But the resource that is attention is becoming scarcer, which leads Yves Citton to predict that we will be sending payment requests for our attention to a cultural good in the future (Citton 2017, 8). Attention has always been a resource, but it has never been the most desired one on the market. In today's attention economy, however, companies rely on capturing users' attention to generate revenue. Since the capacity of individuals that can allocate their attention is limited, attention has become a valuable resource and currency.

One of the key challenges posed by the digital era, according to Citton, is that it has disorganized the traditional mechanisms for regulating attention and allocating cognitive resources equitably. For example, the constant barrage of stimuli and notifications can be difficult to manage or resist and can lead to a sense of information overload and distraction. This is what happens when people scroll through their smartphone continuously but feel like they are not paying attention to important things in the world outside it. Perhaps they do not even feel it or feel anything at all. The phone not only poses as a distraction and negation of other places to direct your attention, it also overflows you with so much information that it becomes impossible to process all of it (Citton 2017, 20). Additionally, the algorithms that govern the most popular digital platforms are designed to maximize engagement and consumption, often at the expense of more reflective or deliberative forms of attention.

Both Stiegler and Citton connect our current age to a disruption of social relations. They warn that something is being lost in the digital era. For Stiegler, this is the loss of reason caused by the rapid transformation of our experience and human-machine interactions. For Citton, it is the loss of traditional categories such as identity, as attention has become a vital capital on the market, which influences attentional literacy and collective action. Consequently, the values and norms that guide our use of technology need to be considered critically. This can be done by applying an ecological perspective on the digital age and viewing it as an online ecosystem. Therefore, the next part of this essay will explore what constitutes the environment in an age of disruption and attentional capitalism.

II. The *Οἶκος* – Defining the Digital Environment

Applying an ecological perspective to our current digital age requires us to think about the ways in which humans interact with the environment. From this perspective, humans can be seen as individual organisms that exist within a broader ecosystem of technological artifacts, each with its own set of affordances and constraints that either limit or enable possibilities for action. This ecology physically includes the technology that surrounds us, including the collective network of smart automated devices known as the Internet of Things (IoT). One can for example think of the case of the smart home, in which multiple devices work together to create the most effective living situation. The current ecosystem also consists of digital components, which are not primarily material, but with which we nonetheless, interact.

Internet of Things as an Ecosystem

Like an ecosystem, the IoT is characterized by its complex interactions, the co-operation of organisms and their environment and feedback loops. The IoT can be understood as a system of interconnected devices, sensors, and networks, which work together to collect, analyze, and share data. These interconnected devices can be smart appliances as well as sensors and other data collectors. They interact with organisms living inside the system, as each living being contributes something to the environment. When the behavior of one component influences the behavior of another, a feedback loop may arise. For example, a smart thermostat can adjust the temperature in a home based on data collected from sensors about the outside temperature and the presence of people in the home. This adjustment can then affect the behavior of other devices in the home, such as smart lighting or security systems. It can also affect the behavior of the people inside the house, who can detect a change in temperature. Temperature may also influence people's mental capabilities, such as their concentration or their mood.

However, our current digital environment does not only consist of the Internet of Things. It spreads beyond that: there is an enormous cloud of information that cannot be seen with the human eye, but still is around us all the time. It takes up literal space in the form of remote data storages, while its virtual space is almost limitless. Almost, because online storage may not be an option when the amount of data is excessive. Hence it takes up the virtual space as well. Remote servers can be accessed from any device with an internet connection. Hence, the network of the internet and all its components, works as an ecosystem and is incomprehensibly vast and complex. Every system works on a set of rules and a distribution of power. What or who then forms the driving power in the ecosystem of the Internet of Things?

In his work *The Stack: On Software and Sovereignty* (2015), Benjamin Bratton argues that the world is increasingly being shaped by a new kind of technological infrastructure called 'The Stack'. The Stack is a term he uses to describe a vertically integrated, global system of information and communication technologies that is increasingly centralizing power and control in the hands of a small number of technology companies, governments, and other actors (Bratton 2015, 4). The Stack consists of six different layers: Earth, Cloud, City, Address, Interface, and User. It functions similarly to an in vitro ecosystem: each layer

builds upon the one below it and is intertwined with the others, creating a complex and interconnected system.

The Stack is thus comparable to an ecosystem: multiple layers of interfaces interact with the data and its users, which creates a network of interdependent relationships. In turn, these interactions give rise to new behaviors, resulting in feedback loops. However, it is important to note that the Stack is a man-made construct, while ecosystems are natural systems. The origin and construction of the ecosystem is not of importance in this distinction, but the difference in traits between a cybernetic information system and a natural organism is noteworthy.

Technology as an Extended Phenotype

From a bio-philosophical point of view, digital technology can be seen as a kind of *extended phenotype* of humans, a term coined by biologist Richard Dawkins to refer to the physical manifestations of an organism's genes in the environment. A good extended phenotype cooperates with the organism, acting on some shared expectation that follows from the principles of reproduction (Dawkins 2004, 383). One could think of spiderwebs: they aid in survival and feeding by capturing prey for the spider, thus contributing to the spider's reproduction. The IoT represents an extension of human genes into the world of technology, at least of their capabilities and agency. The IoT enables us to monitor, control, and optimize a wide range of systems and processes that were previously beyond our reach. Hence, smart technologies form an important factor in the human life, while these act on principles of reproduction as well. Human survival need not be the direct goal, but through comfort, entertainment and assistance in labor, smart technologies contribute to prolongation of the human lifespan.

Humans have been operating in niche construction for centuries. Activities such as agriculture and urbanization are means of modifying the environment to better suit their needs. Digital innovation is next in line: smart technologies, which are able to sense and act upon data in real time, can be seen as a new frontier of niche construction (Baedke and Gilbert 2021). However, viewing the relationship between humans and technology solely through the lens of niche construction may oversimplify the complexity of this interaction. The transformative power of technology does not only exist in modifying the environment, but in shaping a worldview as well. It reveals certain aspects of reality while concealing or marginalizing others. Technology is not neutral but imbued with values, norms, and biases that influence our understanding of the world and our place within it.

Heidegger was a frontrunner in the recognition of technology's impact on the human experience. In 'The Question Concerning Technology' (1954), he equates technology with a mode of revealing, in which the world is brought into view and made available for human use and manipulation. At the same time, technology is a mode of concealing, which reduces parts of the world to mere resources and standing reserves. This is what Heidegger called *enframing (Gestell)* (Heidegger 1977, 325). Heidegger was convinced of this essence of technology and its role in the concealment of the world. Technology counts out other modes of revealing, and it defines our modern way of understanding the world as primarily instrumental (Heidegger 1977, 321).

There are several reasons as to why Heidegger's notion of technology as a mode of revealing is more adequate than the view of technology as a tool for improving human life. First, technology as a mode of revealing emphasizes how technology shapes our understanding of the world and how it can obscure it (Heidegger 1977, 323). Smart technologies, through their autonomous logic, shape human experiences and interactions in various ways. They influence the information we receive, the products and services recommended to us, and the content we consume. They mediate our social interactions, curate our online

experiences, and shape our digital environments. This brings forth a certain way of perceiving and moreover, it creates a certain distance between humans and reality; hence it can also cause alienation.

The impact of technology is too substantial to see it as mere tool. After all, technology is not neutral or objective: it is shaped by culture and time, and in turn it shapes us, just like other aspects of the environment do.

The Landscape of the Onlife World

In *Smart Technologies and the End(s) of Law* (2015), Mireille Hildebrandt introduces the concept of the 'Onlife World', which refers to the "ecology of digital data", an interconnected relationship between humans and technology as nodes in a network. According to Hildebrandt, humans living in the Onlife World are no longer mere individual organisms interacting with their environment and each other, but rather nodes in a network of algorithms and data flows. The Onlife World includes numerous "organisms" or nodes other than humans, such as devices, databases and technologies that act upon data generated by (human) activity. Hildebrandt highlights that the concept of the Onlife World is not simply a way of explaining digital infrastructures and human-technology relationships, but a term that represents a transformative lifeworld (Hildebrandt 2015, 30). The distinction between online and offline, the human and the non-human, and the public and private is fading, and will eventually become imaginary. The Onlife World thrives on artificial life forms, ambient intelligences that are not alive in the biological sense but can be considered living beings in a metaphorical sense. Artificial life forms can exhibit emergent properties that simulate aspects of life-like behavior. For example, they can demonstrate autonomy in decision-making and responsiveness to stimuli. From a functionalist point of view, these artificial intelligences are just as much alive as humans are. Therefore, traditional distinctions such as the one between human and non-human are fading, and this is yet one of the transformative aspects of the Onlife World.

The landscape of the Onlife World is characterized by the dominance of written language over oral language, a transition that started with the invention of the printer and is now at the stage of mass media (Hildebrandt 2015, 94). Like Stiegler, Hildebrandt recognizes that as a result of the hyperconnectivity of the internet and all its written information, all our surroundings are being mediated. This happens especially when we engage with applications that provide an "augmented reality" experience, such as Google Street View or the entertainment app Pokémon Go. To some extent, humans will become dependent on this "new" perception, as it will rebuild our immediate environment, our *Umwelt*. Moreover, it will reconstruct our *Welt*, the residing environment woven between the texts, which we experience as our reality (Hildebrandt 2015, 98).

Our *Welt* is subject to substantial change, due to the rise of new semantic references that came along with Big Data. Predictive analytics or data mining refer to new uses of data and modeling techniques that can be used to anticipate future behaviors or developments. Subsequently, there is a need to invent new ways to recognize reliable patterns (Hildebrandt 2015, 100). In every ecosystem, living organisms can anticipate changes in their environment through pattern recognition. For the largest part, pattern recognition happens by way of profiling. Human profiling constitutes a double contingency: the human language forces us to anticipate ourselves as an 'I' in the *Umwelt*, but also to see ourselves in the role of another, the 'me' in the *Welt*. The result of human profiling is self-consciousness. We are aware that we profile others, while they are profiling us.

Interestingly, this double anticipation becomes trifold in the digital era. A third profiler, namely the new digital environment, is constantly recognizing patterns as to act upon them. Human profiling therefore intertwines with machine profiling. It is no longer a matter of humans profiling each other, but humans living in a landscape that anticipates us (Hildebrandt 2015, 111). Think of predictions based on our online

behavior, advertisements that concur with our hobbies, or employers aware of every little thing someone ever put on the internet. Hildebrandt does not claim that we used to be the masters and that we have lost now control of our inventions. Nevertheless, in the landscape of the Onlife World, a reconfiguration of the *Welt* and the *Umwelt* takes place, and agency extends itself all over this landscape. The environment has turned *agential*, in which the predicted constitutes the present as the frozen past.

Filtered Reality

The dominance of written language has several consequences other than hyperconnectivity. In *Seeing Ourselves Through Technology* (2014), Jill Walker argued that the filter we use in everyday speech – choice of words, choice of what to tell and what not – has become pervasive in the algorithmic culture. Content of reality is constantly filtered: technology alters texts, images and data, resulting in a filtered environment (Walker 2014, 20). Filters need not be literal filters that we use on Instagram to aestheticize pictures. Filters can be technological, but also cognitive or cultural. Nonetheless, all these filters are embedded in our digital culture through algorithms. Oftentimes we are not aware of them, even if they are harmful. An example is the bias towards white skin in twentieth-century photography (Walker 2014, 28). The earliest forms of camera film were calibrated in a way to create detailed pictures for light skinned faces, but due to light sensitivity, darker faces were not depicted with the same amount of detail. This small failure in the art of photography started as a mere technological filter but played into the hands of racism as a cultural one. A century later, racist algorithms for image detection form the modern version of this filter. It shows how the digital environment shapes what we see, and how filters can create a distance between us and reality.

In *Seeing Ourselves Through Technology* (2014), Walker seems to adopt the view of technology as a literal mediator, that which stands between us and reality. However, I would argue that technology is a part of our reality, of the landscape we seek to sail through. It is not only the means towards comprehension, but also a form of comprehension. Similar to Heidegger's argument, technology forms our new horizon. Nevertheless, it can still be an obstacle towards understanding reality as well.

It appears that the new *οἶκος* consists of a complex infrastructure of data currents, internet connections, self-learning machines and other smart technologies. In a like manner as a natural ecosystem, it builds on feedback loops and responds to changes of organisms' behavior in adapting the system. The importance of pattern recognition in the human-machine interaction cannot be overstated. Moreover, the dominance of written language has transformed our *Welt* as well as the *Umwelt* due to the need to adapt to a completely agential environment. As a result, reality is constantly being mediated and filtered by technologies, creating a wider distance between the environment and its inhabitants.

III. The *Λόγος* - the Self in the Online Environment

Now that we have explored the *οἶκος* of the digital era, it is time to turn to the *λόγος*. Who exactly studies the house from within? The study can only be done by the organisms living in the *οἶκος*, which consist of us, the humans. The capability of *λόγος* is a good start for the study, because apparently, humans are capable of applying their reason to their experience in a first-person perspective. However, the inquiry of this essay is to find out if we are still able to do so, in the rapidly transforming digital epoch. Therefore, the consequences for the human self, our individuality, and our values, will be examined in this chapter, in order to answer the question: is a part of the human self "lost" when interacting with an artificial online environment?

Loss of Individuality: Technology 'Taking Over'

The possibility of humans – losing themselves – in technology is a concern that has been raised by many scholars and critics in relation to the rise of automated environments such as the Internet of Things (IoT).

The idea is that when humans rely too heavily on smart technologies to think, decide, and act for them, they may begin to lose touch with their own individuality, creativity, and agency, as well as their ability to make informed judgments and ethical choices. For the sake of this essay, I will from here on assume that all human beings possess a certain individuality, a conscious sense of self. Starting from this assumption, this part of the essay is focused on the possibility of losing the self in our digital environment.

Smart technologies are designed to automate and optimize many aspects of human life, from home appliances to transportation systems to health monitoring. While these technologies can certainly improve efficiency, convenience, and safety, they also run the risk of reducing human beings to mere inputs and outputs in a larger system of control and optimization. There is a point at which some part of the human essence is lost. It could be reason, as Stiegler argued, as well as creativity – when humans are no longer stimulated to think for themselves, or overstimulated, therefore *unable* to think.

Position of the Observer

Language made it possible for humans to distance themselves and take up the position of the observer from a third person perspective. The third person perspective hides the first person who actually takes that perspective. This allows us to reflect upon ourselves as an object in the world, which leads to a double paradoxical perspective (Hildebrandt 2015, 102). The "me" that is objectified and observed, is never identical the active "I" that observes. Hence, there is a split in our sense of self, which since Descartes has been theorized by scholars such as Mead and Plessner. The latter introduced the notion of *eccentricity*, which means the looking from a distance, literally being out of the center (Hildebrandt 2015, 102). According to Plessner, we can only ever understand ourselves when we de-center, which is one of the essential parts of the *conditio humana.*

Subsequently, our immediacy is mediated. What we see and understand of the world is a construction, in between ourselves and the world. This allows human beings to make references and take a stance from somewhere else, or someone else, the "other mind" (Hildebrandt 2015, 104). What is interesting about the Onlife World, is that the digital landscape is full of nonhuman agents, that will have to develop a theory of mind to figure humans out. Contrarily, we also want to understand their "other mind". The *eccentricity* that is at the core of the human condition, suddenly becomes a core for the nonhuman condition as well. Systems can also take up the position of the observer, as they surely have already done. Hence not only the environment is subject to change because of this development, but also all of the ambient organisms, as the split in the sense of self becomes ubiquitous for every conscious actor in the digital ecosystem.

Power Plays and Governance

Before, I compared the Stack to a natural ecosystem. What is different to the Stack in this comparison, is that various actors try to gain control over all the layers of the system, resulting in new plays of power and control (Bratton 2015, 20). In Bratton's Stack, the main power holders are corporations which have a great sway over the network, such as Facebook, Google and Amazon. There is a relatively small amount of such entities, controlling a massive amount of information resources. This form of control is different from the last century in the sense of scale: sovereignty used to be carried out on a level of nations, now the level has become global (Bratton 2015, 21). Bratton calls this concept *platform sovereignty*: power has shifted to platform companies, and these platforms are widespread, heavily influencing our daily lives. The most dominant platform companies are GAFA (Google, Amazon, Facebook and Apple). These companies provide the underlying technological architecture and frameworks that enable the functioning of digital ecosystems. Oftentimes such companies offer a wide range of services, from search engines to cloud computing. Their control over the digital infrastructure grants them influence over various aspects of social, economic, and

political life. Even though platform companies are still bound by supra-national legislation, they operate within a field that has not been strictly legally demarcated. This offers them space and freedom to use their power globally.

Stiegler, on the other hand, argues that the digital age is characterized by a new form of "algorithmic governmentality" that relies on the collection and analysis of vast amounts of data (Stiegler 2019, 198). This new form of governmentality is driven by the increasing use of artificial intelligence and machine learning algorithms, which are used to analyze and control human behavior. This new form of control is particularly insidious because it operates outside of our vision. It is also linked to surveillance and its conflict with the right to privacy. When all details of individual lives are on the table, there is no room left for hiding personal possessions, our actions, feelings, and thoughts.

This change in governance and sovereignty has impact on individual agency. Individuals become dependent on the platforms, as they limit the range of options that are available to them. Think of consumer behavior, but also Google search algorithms that decide which information is shown as the first result. If you want to register you newly bought house with the city authorities, you will need to fill out a digital form and verify your identity online: it has become almost impossible to work around these mechanisms. We were always dependent on technology for survival, but in the current era, we are becoming more dependent on technology as a mediator for our communication and social interaction. Not only have we become heavily dependent on technologies, but we let them do our thinking, install ideas in our mind and make decisions upon them. Hence, individual agency is decreasing. The loss of individual agency leads to a sense of disempowerment (Stiegler 2019, 202).

IV. Case study: the Self in the Smart Home

In order to find out if we are indeed losing ourselves in technology, the aforementioned ideas are applied to a case study that constitutes a part of our new *οἶκος*, namely the smart home. A smart home is a house in which most devices are connected to the same network and hence to each other. They exchange information as to function as effectively as possible as a home. In *Smart Technologies and the End(s) of Law* (2015), Mireille Hildebrandt uses the concept of the smart home to explain the legal and political changes of the Onlife World. In this chapter, I will use the same example to examine the interaction of the human and its *οἶκος*, and find out whether Stiegler, Bratton and Hildebrandt were right about the consequences of the digital environment for the human self.

The smart home: an automated environment

Most automated devices are steered from one device which functions as a personal assistant to an individual. In Smart Technologies and the End(s) of Law (2015), Mireille Hildebrandt uses Diana as an example, who possesses a Personal Digital Assistant (PDA) that is distributed between her smartphone, her smart car, the system running the other devices in her house and her computing platform, which holds precious information about her healthcare, commercial providers and (social) security (Hildebrandt 2015, 20). Diana has a tight relationship with her PDA, which she trusts to perform many tasks for her, such as scheduling appointments, contacting the nanny, program the lights and audio in the house and deciding on what Diana should eat, based on her personal nutrient statistics.

The PDA and the connected devices constitute a *proactive* smart environment: it acts upon sensory data and stimuli; and seems to be able to make independent choices. For example, if the PDA notices that Diana is stressed, it can decide to reschedule a meeting so Diana will get more rest. This simple interaction is interesting, precisely because it is the negation of an interaction. Diana is involved in the decision because she set up the parameters in the PDA's system. But from that point, she has accepted that she will not

partake in the interaction any longer. She has embraced the PDA's authority: she lets the PDA make the decision *for* her. Hence, Diana does not consciously partake in the interaction. The proactivity of the smart home thus induces a reactivity for the individual.

When we let smart technologies think for us, more is lost than just the process of thought. It is also the creativity behind the thought, the originality preceding it. The PDA has figured things out for Diana before she was even aware that there was something going on. The speed at which smart technologies operate, surpass the speed at which we naturally think. The 'end of philosophy', an epoch with an absolute emptiness of thought, seems to be closer than expected.

However, a confutation of this prediction exists in the possibility of directing our attention more specifically. In the entrusting of smart technologies with simple tasks, we create more space for ourselves to direct our attention towards more substantial activities. If Diana lets her PDA schedule all her meetings, she wins the time she would otherwise spend scheduling them herself. The scarcity of attention in our attention economy is increasing, but smart technologies might offer a way of channeling our attention more effectively. Hence, maybe not all thinking is lost, only the 'simple' thinking that can cost humans quite some time and effort, since devices such as a PDA can solve this.

Split of the Subject

Then I wonder, if there is a significant difference in simple and deep thinking, and if we can make sure that technologies do not take over the latter form. As we have discovered in this essay, technologies are not mere tools that relieve humans from performing labor. They are also mediators for our communication and active agents in the digital ecosystem. They are as much dependent on us, as we are on them. The profiling in the environment has become threefold, and there is a constant anticipation of behavioral patterns (Hildebrandt 2015, 111). A possibly negative side-effect of this development is the dominance of the third person perspective over the first- or second-person perspective. Every agent in the Onlife World takes up the position of the observer and consequentially, the split of the self in every agential subject widens. Diana's PDA is constantly thinking for her from afar, calculating her needs and acting upon this. As a result, Diana has become the object of attention: the roles have been reversed. The PDA has a notion of Diana on which its actions are based, but this notion does not need to be congruent with Diana's notion of herself. If both versions of Diana are involved in the mechanisms enabling her life, which will be the dominant one?

If the power of the small number of stakeholders on the digital market will grow, it is more likely that the objectified notion of Diana will win over her original one. This will happen if the algorithmic governmentality becomes the leading form of governance over individual agents. Not only individual agency will decrease, but also the individual's vision of the self: it will be defined by external factors, machine agents, components of the digital ecosystem. There is not as much a loss of the self as there is a replacement: the self is transformed through the *Gestell*, through the revealing of technology that reduces it to a mere object. A mere resource even, if attention capitalism gains the upper hand.

Conclusion and Remarks

In conclusion, while the replacement of our traditional notions of self with digital identities might seem disconcerting, we should not necessarily view it as a negative outcome. Change is a constant in life, and as organisms within the larger ecosystem of the digital world, we have always been part of a larger network. Experiences of disempowerment and loss of control in this changing landscape provide necessary cause for taking action to reclaim our agency. This can be achieved through developing digital literacy skills and demanding greater accountability from platform companies and governments through collective action. As we navigate this accelerated metamorphosis, we must be willing to rethink traditional categories and adapt

to the new realities of the digital age. Most importantly, we should remember that we are still active players in this ecosystem, and that our actions have the power to shape its future trajectory. Therefore, we must engage with it responsibly and ensure that our interactions are reciprocal and mutually beneficial.

I am aware that the approach of this essay was primarily anthropological, and further research about non-human actors in the ecosystem besides the human-machine relation would be relevant. Moreover, I worked from the assumption that all humans possess a certain notion of self that is linked to their individuality, agency and creativity. A broader investigation would need to scrutinize this assumption.

A final remark must be made, since the results of the present inquiry more than anything urge us to ask further questions. Towards which developments is the current digital ecosystem evolving? Will new entities be introduced, and will old ones be eliminated? Is the split of the subject an inevitable consequence of the attention economy? Will the *Welt* and the *Umwelt* coincide, or will technology drive them apart?

These questions are important avenues for further inquiries. With the present study, I have illustrated the transformative character of the modern epoch. I have moreover aimed to offer a contribution in the debate about the human-machine relation, and put certain possibly negative consequences in a more positive light. Chiefly, I have argued in favor of maintaining an active role and a critical stance towards the relation with our environment. After all, the world is still our *οἶκος*, and we ought to treat it accordingly.

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Perennially Liminal: *Re-Enchanting the Anthropocene Through an Ecology of Sapiential and Spiritual Practices*

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The ecological crisis is often represented by governments, industry, and academia as the technobureaucratic engineering challenge of shifting society towards a sustainable path, demanding centralized expertise within monological management as opposed to distributed wisdom within dialogical, creative evolution. This essay proposes that it may be fruitful for the ecological crisis, and what is being referred to as the meaning crisis, to be brought into dialogue with each other. In doing so, it will bring to light mechanisms that lay at the foundation of both crises, at the heart of which lies the disenchanted relation between the human and nonhuman (e.g. plant, animal, fungal, climatic, cosmic). Meaning, this essay contends, is to be re-embedded, re-rooted, and re-ecologized. Ecology, then, is to be considered through the lens of meaning-making. Only by working both ways can we find re-enchantment in a world that seems to have thoroughly lost its meaning for us.

Examining ecology and meaning through the work of John Vervaeke and Wendy Wheeler, this essay argues that a consistent argument can be derived from their multiple domains of inquiry. The Vervaekean framework helps elucidate the historical, cultural, and philosophical threads leading to the eventual eruption of the meaning crisis, as well as some of the conditions that must be met by any valid solution to this crisis. It struggles, however, to develop a sustainable and scalable answer due to a neglect of the ecological in the very ecology of practices it proposes. By contrast, the synthesis of biosemiotic and complexity theory as developed by Wheeler, is able to offer an adequate account of how meaning lies at the heart of ecology and offers a non-anthropocentric kind of enchantment. Whilst laying out the basic conditions for re-enchantment, this account lacks reference to a practical domain where real and consistent change can be effected to transform our crises. Acknowledging the strengths and weaknesses of the two theories of meaning in relation to the ecological, sets us up to establish the right criteria for possible solutions and put these to the test.

In an effort to bring *theoria* and *praxis* together, this essay then considers two other strands of modern thought that each infer a mode of re-enchantment that might aid our modern affliction. Timothy Morton's object-oriented ontology becomes emblematic for a modern object-centric thinking that reinforces rather than overcomes the Cartesian subject-object dualism. David Abram's eco-phenomenology of the more-than-human succeeds in incorporating re-enchanting insight from non- and pre-modern indigenous wisdom traditions. From the eco-poetic and mythopoetic movements that have followed Abram's lead, this essay, finally, proposes they expand their scope to involve the whole of *mythos*: symbol, narrative, and ritual. Only then will they satisfy the conditions through which we can sufficiently address both the meaning crisis and the ecological crisis.

I. Making Sense of Sense

This essay claims that meaning is not some atomized, personal, or even intersubjective phenomenon, having to do with modern Romanticist notions of authenticity and self-discovery. Instead, it is never isolated but always relational, and something we partake in rather than conjure for ourselves out of thin air, like the

Baron von Münchhausen lifting himself and his horse out of the "swamp of nothingness" into meaningful existence (Nietzsche 1886/2014, 23).

When we talk about meaningfulness, we generally do not refer to purely semantic or metaphoric meaning, but to meaning in life, a notion that in recent years has gained more recognition within philosophy and psychology (Wolf 2010). At the same time, this meaning in life is more than the purely (inter-)subjective sense that life is meaningful. It is the recognition that there *is* meaning *in life.*[1] It is precisely the point at which meaning seizes to be something subjective and gains a real contextually embodied, embedded, ontological character. Life makes sense when we feel connected to the reality of ourselves, others, and the world, because we recognize there being a coherent sense and value that is not subjectively constructed, but that exists independently of ourselves. In short, there is meaning because there is sense we can make sense of, in other words, make intelligible. We typically tend to make 'meaning' into something exclusive and exceptional, grasped only in brief moments of lucidity by those few capable of experiencing it, rather than part of our everyday experience and open to all beings at all levels of complexity. Where signs are being exchanged, where sense is being made, meaning emerges.

To gain a sufficient grip on this concept, we must first answer the question of how we are able to make sense of the world at all. Our ability to make sense of the world in order to act in it is more important now than ever, and this ability is also more at risk of succumbing to information overload than ever before. Digital technology plays into our biases and weaknesses, sowing discord and discontent in increasingly sophisticated ways. Through a toxic combination of smart mobile devices, datamining, machine learning algorithms, and (arguably) artificial intelligence, it greatly accelerates processes of increasing our inability to attend to what matters most to us. This is a world where meaning itself is in crisis.

II. Meaning in Crisis

While the current meaning crisis itself has a genealogy reaching back into ancient times, the lineage of its chroniclers is often traced back to nineteenth century writers and scholars such as Schopenhauer, Stirner, Turgenev, Dostoevsky, Weber and —most famously— Nietzsche. They were the first to identify and name a historical process and existential problem, in which the increasing individualization, secularization and rationalization of modern society leads to a loss of a sense of connection to something that has a value that is not subjectively given, but that exists independently of us. Nietzsche (1882/1974)—or rather his figure of the madman—called it the death of God, Weber (1917/2004) referred to it as the disenchantment (*Entzauberung*) of the world.[2] The often-invoked concept of nihilism can be understood as the philosophical articulation of this crisis. What ultimately characterizes the meaning crisis is a loss of connection to oneself, others, and reality, and deep ambivalence about whether and how this connection can be re-established. It is not difficult to notice the degree to which such a position might relate to the ecological crisis and concomitant ways of viewing our world and its inhabitants as a mere resource to exploit as one sees fit.

Building on the groundwork laid by these first 'prophets' of the meaning crisis, philosopher and cognitive psychologist John Vervaeke develops insights from cutting edge 4E cognitive science—which takes cognition to be embodied, embedded, enactive and extended (De Bruin et al. 2018)—to diagnose and offer his own answer to the crisis, most comprehensively in a 50-part video lecture series entitled 'Awakening from the Meaning Crisis' (Vervaeke 2019). As part of his diagnosis, Vervaeke names the rising trend of the 'religious nones' (those who often describe themselves as 'spiritual but not religious') as a case in point for

1 To be sure, here this essay already departs from Susan Wolf's intersubjective conception of meaning in life, arguing instead for the emergence as opposed to construction of meaning.

2 There are of course many nuances that can be named here, but as they do not invalidate the overarching point being made, they are omitted from this brief exposition.

people intuiting that, despite the old religions having become untenable to them, they should be seeking some kind of deeper wisdom about life but do not know where to find it. While the Enlightenment set us free from the tyranny of religion and gave us the scientific worldview, this view reductively explained everything as the dead movements of mechanical pieces and left no room for us in it, effectively undermining our daily, lived experience. The sun does not rise. Love is just a chemical reaction in your brain. Nothing you see or feel is really there. In a world reducible to its constituent material parts, be they atoms, electrons, protons, neurons, quarks, reality as you think you know it to be true is 'actually' an illusion.

To further elucidate the mechanisms behind this process, Vervaeke proposes a 4P model of knowledge that distinguishes between four different kinds of knowing:

> ***Propositional knowing*** refers to knowing that something is the case, resulting in true or false beliefs, the standard of realness for which is truth, and to which corresponds semantic memory. This knowing mostly consists of propositions, facts, beliefs, rules, concepts, and so on.
>
> ***Procedural knowing*** is about knowing how to do something, captured not in beliefs but in skills (specific actions and procedures that achieve certain results), the standard of realness for which is power, and to which corresponds procedural memory.
>
> ***Perspectival knowing*** means knowing how things appear and feel to us within a given situation, resulting in perspectives on the basis of embodied, lived perception, whose standard of realness is presence, to which corresponds episodic memory.
>
> ***Participatory knowing****,* finally, stands for knowing by being, in a real relation of fittedness within a given agent-arena dynamic, resulting in dynamic participation and creative flow, allowing one to navigate complexity and ambiguity, associated with the memory of a sense of self, or, autopoietic memory.

While the latter of the four may sound like the most difficult knowledge to achieve, the opposite, rather, is the case. Children can naturally participate and be present in certain situations yet learn how to (procedurally) do and to (propositionally) know things later in their development. Vervaeke argues that each kind of knowing is grounded in (>), yet affected by (<), the other respectively (propositional < > procedural < > perspectival < > participatory). Distinguishing between them, however, enables him to highlight a key issue we are currently facing. Beginning with the scientific revolution and Descartes, and continuing through the Enlightenment and Romanticism, modernity has overemphasized a (disembodied) propositional kind of knowing to the detriment of our engagement with (embodied) perspectival, procedural, and participatory knowing; the kinds of knowing on which it depends. Modern scientific thinking overvalues propositional knowledge as the only 'true' epistemological domain, which keeps disproving and abstracting away from the perspectival, procedural and participatory models of lived reality. However hard we may try, there is no propositional answer to nihilism because the absolutisation of the propositional is itself part of the problem.

Confusion prevails when us agential beings are left without the proper means to interface with our arena. Because for that, all four kinds of knowing are prerequisite. Taken together, they enable us to intelligently solve problems, yet on their own they do not afford the cultivation of wisdom capable of overcoming the meaning crisis. For that, a theory of relevance realization is needed.

III. Realizing Relevance

The very processes that make us intelligently adaptive also make us vulnerable to self-deceptive, self-destructive patterns of behaviour, and can even drive us into alienation, meaninglessness, and despair (Vervaeke 2019). Throughout history and across all cultures, people have struggled with this perennial problem. The axis around which the double-edged sword of this cognitive machinery revolves is the notion

of relevance realization, which Vervaeke and colleagues define as "(…) a framework that conceptualizes an organism's ability to realize relevance as resulting from a dynamical system in which a cognitive agent makes use of opponent processing relationships to zero in on relevant aspects of the world." (Andersen, Miller & Vervaeke 2022). The amount of information we can perceive is combinatorially explosive, yet we still are able to home in on those aspects which are relevant to us in that instant. Relevance realization, simply put, is what enables the organism, in its relationship to its environment, to zero in on the signal and ignore the noise (Vervaeke & Ferraro 2013). It elucidates the wonder of how the world is at all intelligible to us such that we are able to act in it. Opponent processing, then, describes the optimizing process of systems with opposing goals that are interdependent in their function, thus enabling the organism (as an autopoietic, i.e. self-organizing system) to continuously evolve its interactional fittedness to a constantly changing environment. Examples of such opponent processes are the sympathetic and parasympathetic components of the autonomic nervous system coordinating to adjust levels of arousal in a contextually sensitive manner; or, more pertinently, the brain working to achieve both efficiency (selectively constraining processing activity) and resilience (maintaining sufficient flexibility for new possibilities of processing) to regulate the sensory-motor loop.

The salience landscape within which one operates, according to which some things are relevant and other things ignored, provides a degree of situational awareness. Here Vervaeke applies Merleau-Ponty's notion of maximal or optimal grip, as taken up by Hubert Dreyfus (2014). To make sense of a situation, one tries to get an optimal grip of the temporal, spatial and social dimension for the task or problem at hand, so that one is well fitted to the world in that particular situation. This optimum is not an ultimate fit (i.e. there is no *telos*), but the ratio that results from a continuous dialogue between agent and arena. To be able to skilfully manage oneself in relation to one's surroundings and navigate the world effectively—we might adequately call this *phronesis*—is a much greater part of meaning-making than we often tend to appreciate.

Hitherto, the cultures we form a part of (e.g. Buddhism, Daoism, Platonism, Stoicism, Christianity) have developed ecologies of practices: systematized sets of 'psycho-technologies' (e.g. communal rituals, language, art, alphabetic literacy, rational argumentation, meditation) as part of a cognitive cultural grammar. Together, they afford self-transcendence by training us to overcome our self-deception, thus alleviating our suffering from this perennial problem. Yet over time, we tend to grow accustomed to the cultural grammar that holds our *theoria* and *praxis*, internalize and live through it, forgetting it is even there as constitutive of our worldview. Following the historical trend of secularization, we have witnessed the advent of pseudo-religious ideologies (e.g. Romanticism, nationalism, Marxism, Nazism) that failed to deliver on integrative collections of sapiential and spiritual practices and institutions. As we bought into these ideologies, we again fell victim to a loss of the capacity for self-correction, this time inaugurating a period of worldwide violence and destruction, continuing to this day, not just by means of war and exploitation, but by large scale pollution, environmental degradation, loss of biodiversity and -connectivity, and so on.

The way to 'awaken' from the meaning crisis that Vervaeke proposes makes use of the cognitive machinery of relevance realization, opponent processing, and the 4P taxonomy of knowledge that is available to us, to build a 'religion-of-no-religion'—a home for the religious none's—composed of an ecology of simultaneously constraining and affording sapiential and spiritual practices (Vervaeke 2019; Vervaeke 2023). These include meditation, contemplation, movement, and other flow states and forms of dialogue that, through their combined complexification and consistent application to areas where self-deception may arise, enable self-transformation and the cultivation of wisdom. Wisdom, thus understood, is a complex dynamical system that counteracts self-deception and affords the autopoiesis of a meaningful life.

It would be useful, at this point, to reflect on a few criticisms to the program developed by Vervaeke. Most importantly, it continues to place a fairly narrow focus on individual attitudes and the attainment of

individual transformation (albeit supported within a community of likeminded individuals). Within this very cognitive framing, there is little concern for fostering change within complex systems that also necessarily include the nonhuman and more-than-human. There is, on the whole, a lack of engagement with the broader ecological dimension in the very ecology of practices it proposes to develop. As with the general framework of the religion-of-no-religion, the practices are isolated and abstracted away from their context in daily life and broader society. As a consequence, they lack integration with the biorhythms and natural patterns needed to transform one's relation to the environment. In addition to its anthropocentrism, the method outlined also establishes as a precondition that one first take on a wide range of complicated science and philosophical theory in order to achieve a (highly propositional) hold on the mechanisms at play. Only after having gone through this 'initiation phase,' may one hope to become capable of participating fully in the practices. As a result of this top-down, esoteric, and, to an extent, elitist approach, Vervaeke's approach does not scale very well. At its core, it aims to persuade everyone to emulate Socrates (Vervaeke 2023), but forgets that this is not a viable way to go if one wants to change not a few but many lives in crisis.

There is no place safe from the threat of self-deception. Philosophy, then, is about learning the necessary skills to deal with this perennial threat as a way of life. In contradistinction to modern academic philosophy, the ancient Hellenistic and Roman schools of philosophy readily embraced this notion, as they explicitly took philosophy to be the application of a series of sapiential and spiritual exercises (e.g. attention, memorization, meditation, reading, dialogue) in the service of an art of living (Hadot 1981/1995). Vervaeke rightfully directs our attention back to the neglected ways of our philosophical ancestors, but gets us only halfway there, leaving behind much of the world in the process. Our proper ambition, then, should not just be our own flourishing, but the flourishing of all life. To overcome the anthropocentric and elitist bias when we talk about meaning and wisdom it would be helpful to attempt to re-root our account of meaning. To that end, we will now turn our attention to ecology; first, through the lens of biosemiotics and complexity theory, second, through object-oriented ontology, and third, through eco-phenomenology.

IV. Re-Rooting Meaning

The concept of ecology, first coined by Ernst Haeckel in 1866, combines the mysterious ancient Greek words for home or family, *oîkos* (*οἶκος*), and for syntax or structure, *logos* (*λόγος*). In other words, ecology refers to the 'logic' of the household, of how it works, how it develops and articulates itself, how it is organized and integrated. At the heart, therefore, ecology is about the practice of making a home (Moore 1997).

As the logos of the *oîkos*, it is not about the study of material processes in a reductive sense, but about understanding the ways in which the world's complex ecosystems develop and express meaning. These systems have certain properties. Ecological, living systems operate on the basis of complexity and chaos, and cannot simply be engineered towards a desirable future state. Only ordered, complicated systems are predictable. Chaotic systems (e.g. weather patterns, fluid flow, stock markets) lack effective constraints and are highly random. Complex systems, then, are entangled, in such a way that everything affects everything else, and all interventions have unintended consequences.

Following insights from the field of biosemiotics, we can best think of this relational ontology not as mechanical but as semiotic—in other words, as living processes of meaning-making. The pioneering work of Wendy Wheeler, in particular, provides a framework for recognizing ecology as a series of dialogues between different meaning-making systems, in which the semiosis of human culture is a sophisticated expression of embodied, embedded processes of perpetual emergence of meaning through signs among living things (Wheeler 2006). Drawing on Charles Sanders Peirce's semiotic theory and Jakob von Uexküll's notion of the essential organism-environment coupling of *Umwelt*, Wheeler offers a biosemiotic account of

complex systems and emergence. Crucially, this account breaks open the categories of meaning and enchantment that are often only reserved for human animals, by grounding them in biological evolution.

In a 2018 essay entitled 'Meaning', Wheeler argues that "(…) 'mediated captivation' and a sort of enchantment – is a part of meaning-making in both human and non-human animals." (Wheeler 2018, 337). This enchantment follows from a creative and playful engagement with signs. Signs always indicate the dynamic being of a relationship between aspects of the world, their mode of representation, and the interpretation thereof (referred to by Peirce as the triad of object, representamen and interpretant). The natural play of sign relations is "neither wholly conscious not wholly rational" (Wheeler 2011, 179). It is a state of enchantment, whose source is an exploratory, tacit kind of logic that precedes both deductive and inductive logic, and which Wheeler, following Peirce, calls abductive.

Within our *Umwelt*, everything expresses its meaning, bound up with its structural-functional organization (a dynamic and multi-level, rather than static, uni-level concept, taken from biology). Living, embodying it, embedded within it, organisms *cannot but* continually express their meaning through signs. Affordances of intelligibility and meaningful action are everywhere we look. From the perspective of a biosemiotic ontology of sign relations, meaning thus appears as deeply non-anthropocentric, as not merely limited to humans, nor even to animals, but as continuously embodied and expressed through and between all co-shaping and co-evolving beings.

While all life uses signs, humans mediate this sign exchange through "symbolisation of their enchantments" (Wheeler 2018, 337). Specific to human semiosis, then, is the tendency to engage in symbolic abstraction. Wheeler proposes that an understanding of how human knowing is structured via stratification and emergence and is "processual, embodied and enworlded in semiotic communication", will provide crucial insight into complex systems (Wheeler 2006, 56). Wheeler offers, in essence, a "different way of framing our thinking" that may lead to different politics and policies, based on the maximisation of general creativity within which human cultural flourishing is embedded (Ibid., 56). A *praxis* for how that kind of change might be achieved, however, is largely absent.

There appears to be a strong link between what Wheeler refers to as abduction and what Vervaeke has named relevance realization. Whereas Vervaeke is concerned with determining the cognitive framework of relevance realization as self-organizing around a set of opponent processing relationships, Wheeler's biosemiotic approach emphasizes the essentially playful and creative nature of a pre-experiential, pre-conceptual, and pre-propositional process. Here the aspects that remain underdeveloped in one account, could perhaps strengthen the other. Crucially, Vervaeke's model operates on the basis of a dynamic systems theory framework from which it is assumed that a comprehensive response can be reverse engineered. From Wheeler's complexity point of view such efforts may at the very least lead to very different outcomes than expected and could even be counterproductive.

V. Semiocide and Simulacra

Positioning enchantment at the heart of an ontology of sign relations raises the question of how it is at all possible to experience disenchantment. Here Ivar Puura's concept of semiocide, to which Wheeler subscribes, provides clarification. Semiocide refer to the direct or indirect destruction of semiotic processes (Puura 2013). Modern sign systems continuously disturb or destroy surrounding sign expression and meaning-making processes. What we observe in this context is ontological disintegration. Through the biosemiotic lens, modern culture's processes of signification show a lack of relationship to wider meaning emergence, a failure expressed through the mutually reinforcing feedback loops of:

a) an increase in the experience of loss of meaning in life (made visible through the mental health crisis, eco-anxiety, disenchantment) and;

b) urbanization, polluting practices, and other kinds of large-scale environmental harms referred to by Marder (2021) as antilogos; actively destroying ecosystems and their meaning-making processes.

According to the WHO's latest *World Mental Health Report* (2022), about 1 in 8 people worldwide currently suffer from mental illness, with depression and anxiety at the top of the list. The highest levels of mental illness are consistently reported in the most industrialized and urbanized countries. In addition, the WHO signals the emergence of new terms to describe mental health impacts of climate change, including "(…) climate change anxiety, solastalgia, eco-anxiety, environmental distress, ecological grief and climate-related psychological distress." (Ibid., 34) Instances of such cases are highest in countries most affected by degradation and pollution of the environment. Both, of course, are closely correlated with modernity and its excesses.

More than 56% of the world's population now lives in cities, a figure expected to rise to over 70% in the next thirty years.[3] Puura follows Baudrillard who diagnoses this development as the construction of "(…) a world where there is more and more information, and less and less meaning." (Baudrillard 1981/1994, 161) As modelled artificial environments, cities give shape to simulacra and hyperrealities, whose sign relations reflect back on themselves, overloaded with stimuli and communicating without end, yet making little use of the semiotic affordances of the immediate environment. Though dependent on this context, the self-identified urbanite and its home no longer relate meaningfully to their exterior. For the urbanite, there is no need to engage in the semiotic practice of learning the communicative signs, gestures, and calls of the local flora and fauna. This tuned-out reality no longer bears any relevance to its increasingly simulated, virtualized, disembodied, and self-contained experience. An inability to identify simulacra of ecology is precisely what characterizes the urban state of the hyperreal: the obfuscation of the real and the model. Oversaturated with artificial signs, the city dweller consistently picks a world of simulacra over relating to a once enchanted and meaningful locality. From a biosemiotic point of view, this process of the dying out of 'conversations', leading to the collapse of both natural and cultural ecosystems, can rightly be called semiocide. In conjunction with this trend, we notice a rapid decline in the biodiversity of lifeforms necessary to maintain ecosystem resiliency and sustain our own health and continued survival (Linhares et al, 2023). Where ecological speech falls silent, ill minds within systemically inflamed and immunocompromised bodies remain.

Modern culture deeply struggles with semiocide, having undertaken various attempts to recover a natural mode of enchantment. For if, as we inferred through our analysis of the meaning crisis and ecological crisis, the state of modernity is one of disconnection and disenchantment; how, then, can we re-enchant the relation between the human and nonhuman, to realize again our fates as entangled with the movements of the climatic and cosmic (which they are)?

With Wheeler, this essay holds that enchantment is the natural mode of being, and to be recognized as a relational quality, belonging to a relational ontology. Beyond experiences of joy, wonder, and awe, enchantment indicates a relation, a *letting be* enchanted as much as an enchanting. It is what our ancestors were (and some indigenous, religious, or spiritual communities still are). It is what we naturally are as children. It is what we unlearn in adolescence and adulthood through educational and societal disenchantment. Yet, when we want our work to be fulfilling, when we build deep and lasting friendships, when we seek to find true love, when we choose to have a child, we are still seeking enchantment. Enchantment may therefore be a crucial piece of the puzzle to any attempt at addressing our crisis. By way

3 Cf. "Urban Development." n.d. World Bank. https://www.worldbank.org/en/topic/urbandevelopment/overview.

of their most prominent representatives, the next section will discuss two philosophical movements that have been influential in current conceptualizations of re-enchantment in relation to ecology, namely object-oriented ontology and eco-phenomenology.

VI. A Crack in Every Thing

Timothy Morton's brand of object-oriented ontology (OOO) is developed most distinctively in 2016's *Dark Ecology*. Here, Morton emphasizes the strange and weird aspect of knowing as a twisted loop:

> *"What thinks dark ecology?* Ecognosis*, a riddle. Ecognosis is like knowing, but more like letting be known. It is something like coexisting. It is like becoming accustomed to something strange, yet it is also becoming accustomed to strangeness that doesn't become less strange through acclimation. Ecognosis is like a knowing that knows itself. Knowing in a loop—a* weird *knowing.* Weird *from the Old Norse* urth*, meaning twisted,* in a loop*."* (Morton 2016, 5).

The concept of weirdness is important to Morton's epistemology because it emphasizes the way in which coming to know something is forever accompanied by that very thing eluding us, confronting us with an element of unknowability, and therefore inexhaustibility. Morton takes the Kantian phenomenal/noumenal distinction, but argues that, rather than privileging the subject, we are to begin our analysis from the world of objects, whose fundamentally withdrawn and mysterious nature is irreducible to human perception or cognition. Morton goes on to argue that this withdrawnness says something fundamental about the mode of existence of things themselves. Things exist independently of us, OOO concludes, and we can glimpse their reality; but only partially, never fully:

> *"In a way that profoundly differs from the demystification most popular in humanistic accounts of culture, politics, and philosophy (and so on), OOO believes that reality is mysterious and magical, because beings withdraw and because beings influence each other aesthetically, which is to say at a distance."* (Ibid., 16-17)

Inasmuch as things around us are intelligible, they withdraw from us too; those we love withdraw; we even withdraw from ourselves. Indeed, "We are unknown to ourselves, we knowers" (Nietzsche 1887/2006, 3). For OOO, enchantment already starts at the local level, with those processes closest to us. Even a cloud can seem strange, a teapot weird, a flower concealed, a stone withdrawn, a loved one enigmatic. Consonant with the Japanese aesthetic of *wabi-sabi* (侘寂) and *kintsugi* (金継ぎ), enchantment can be found in the ordinary and the everyday. Not in the furthest, highest, most ideal things, but in the nearest, most imperfectly beautiful things. These, too, are all portals opening up to different worlds, for those with eyes to see them. As Morton puts it: "If ecological culture and politics is about "the reenchantment of the world" as they say, then something like OOO could be highly desirable." (Morton 2016, 17)

Morton clearly seeks to position OOO as a countermovement to what it perceives as a pervasive nihilism present in modern thought, by turning this nihilism on its head: "In the term *weird* there flickers a dark pathway between causality and the aesthetic dimension, between doing and appearing, a pathway that dominant Western philosophy has blocked and suppressed." (Ibid., 5) Here Morton seems to be hinting at, but not fully allowing, the being of real contact, the relation preceding the relata, that is always already *there*. Instead of venturing into a notion of relational ontology, Morton proposes seeing the relation as merely aesthetic. From the point of view of the uncanny, the causal and aesthetic dimension appear as one. Indeed, Morton argues that a crucial step is "(…) accepting that a nothingness lies at the heart of things, precisely

insofar as they are real. Ecological materialism must thus urgently investigate and come to terms with nothingness" (Morton 2014, 279)

With OOO we thus reach the tipping point of a profoundly modern, object-centered, flat ontology (Hendlin 2023). In this moment of critical mass, all is equally object, yet the object, simultaneously present and not present, is not clear, and instead appears to us as strange, weird, other. It whispers unintelligibly, or does not speak at all. For Morton, this 'dark-depressing' and 'dark-uncanny' ecology may eventually become no more than 'dark-sweet', with the path towards the light, in any case, having become obscured.

VII. How the Light Gets In

In order not to fall into a flat ontology such as that of OOO, it is crucial not to deny what constitutes our human experience as differing in degree, not in absolute terms, from much of our environment. Our experience is deeply embedded, embodied, enacted, and extended within that environment: but it is not equal to the being of a forest or a factory or a flowerpot.

Nowhere is the encounter with the more-than-human captured more sensuously than in the work of David Abram. In *The Spell of the Sensuous* (1997), Abram explains how humans used to be enchanted, seeing magic and mystery in the more-than-human world around them. All of life, to ancestral culture, was suffused with magical meaning. Abram illustrates this by comparing the Homeric to the Socratic mode of being and knowing. For, in stark contrast with the former, Socrates states in Plato's *Phaedrus*: "I'm a lover of learning, and trees and open country won't teach me anything, whereas men in the town do." (Abram 1997, 102) How did this change come about? And how can we realign the two ways of seeing and being in the world?

The Homeric epics belonged to an oral tradition before they were captured in written text. In these ballads, the gods still speak directly through a landscape imbued with instructive omens and warning signs. In an oral context, practical knowledge had to "(…) be embedded in spoken formulas that can be easily recalled—in prayers and proverbs, in continually recited legends and mythic stories." (Ibid., 106) In order to increase their mnemonic power, phrases had a tone, cadence, and dynamism to them, informed by a strong connection to the landscape. The pre-Socratics, too, combined their literal reflections with "(…) a more traditional, oral preoccupation with a sensuous nature still felt to be mysteriously animate and alive, filled with immanent powers. In the words of the pre-Socratic philosopher Thales, 'all things are full of gods.'" (Ibid., 108)

With the advent of the psychotechnology of alphabetic literacy in the early fourth century B.C.E., the landscape began to lose its numinous powers, or gods. The transition from oral to written culture disconnected remembrance from place and time. Places began to be taken for granted, slowly losing their luminosity. Instead, the written text absorbed all the meaning that could find expression, gaining such power that it took away from real, embodied presence. What Abram describes is precisely the turn away from a broader participatory mode of knowing and being in the world towards a predominantly propositional kind. Moreover, when we denigrate the world, our language degrades with it. We commit a double act of semiocide. As a result, resonance is lost, the echoes die out, and speech is silenced. Defiantly, Abram writes:

> *"Yet to affirm that linguistic meaning is primarily expressive, gestural, and poetic, and that conventional and denotative meanings are inherently secondary and derivative, is to renounce the claim that "language" is an exclusively human property. If language is always, in its depths, physically and sensorially resonant, then it can never be definitively separated from the evident expressiveness of birdsong, or the evocative howl of a wolf late at night."* (Ibid., 80).

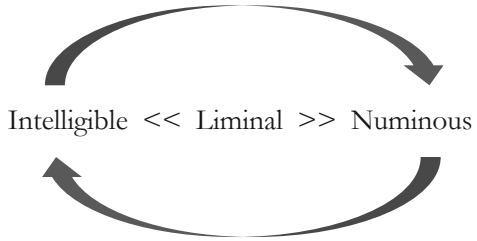
Abram thus seeks to replenish oral culture and its animism, the sense that everything is alive and awake, describing words as spells, and speech as a kind of magic. This is not to say that writing to him is something to be avoided. But it must be realized how powerfully it can both enchant and disenchant us. Language can objectify, obscure, and deafen, but it can also open up to a richness always already there. For this reason, Abram rejects the notion of empty space and nothingness that, as evinced by OOO, is characteristic of modern thinking. Instead, for the oral cultures he sides with, air is the mystery of mysteries, the breath through and with which we are able to speak, the spirit that gives life: the *pneuma, anima, atman*.[4]

Our language is not our own. It is composed of, and structured by, the speech of the earth in all its abundance. Through it, our language participates in the logos of the *oîkos* as a kind of poetics of being. Our language, therefore, is the language of the animate earth, with which we are uninterruptedly conversing, exchanging and expressing signs, letting its sights and sounds enrich our own speech. Biosemiotics, crucially, returns signs and sense to the human and more-than-human worlds, rather than construing all in the form of a text to be read and deconstructed. To this, Abram adds a mode of enchantment that can once again enable us to realize the magical and mysterious nature of the earth we belong to.

VIII. Sustainable Re-Enchantment

Vervaeke and Wheeler show how the processes of intelligibility, by virtue of affording comprehension, grounding in being and meaningful action, are themselves vitally necessary sources of meaning in life. Yet as Socrates already knew, we are, in our knowing, continually and ever more deeply confronted with unknowing. And therein lies another source of enchantment, whose limit is ever present, yet constantly shifting. As Morton and Abram highlight, the unintelligible is, and will always be, as much a source of wondrous meaning as the intelligible. Irreducible uncertainty is a fact of life in a world of complexity. Being able to live with it an essential ingredient to the kind of wisdom needed to navigate this arena. Accordingly, if we recognize *both* intelligibility and mystery as part of the *logos* of our *oîkos*, engaged in an opponent processing relationship, it becomes possible to avoid domination of either one over the other. Viewed from our liminal position between intelligibility and mystery, or the numinous (Otto 1917/1958), neither are self-sustaining modes of enchantment, but require the other as part of an opponent process of mutual affordance and constraint. This essay proposes that we can consider this opponent processing through the following schema:

Figure 1



At one end of the pole, exhaustive knowledge of something can become a substitute for a meaningful experience of it. At the other end, all-encompassing numinosity can blind and prevent meaningful knowing. Understood as opponent processes, however, the numinous constrains and affords the intelligible, while the intelligible constrains and affords the numinous. These are not mere subjective experiences of things in the world, which would reinforce the subject-object dichotomy, but different expressions of an enchanted and real relationality. The liminal, then, is the point of wise divination or divinatory wisdom in between, from

4 The ancient Greek words *psychê* and *pneuma*, the Latin *spiritus* and *anima*, the Sanskrit *atman*, all refer interchangeably to air, wind, breath, soul.

which we maintain flow. The final section of this essay will outline some of the elements that can contribute to this abductive and agonistic process in a world of complexity. It will propose cultivating the capacity to hold these opposing tendencies within one's worldview through mythos, allowing it to be embedded, embodied, enacted, and extended, i.e. sustained.

On the basis of the Vervaekean framework and Wheeler's synthesis of biosemiotics and complexity theory, we are now in a position to determine that any set of sustainable solutions should satisfy three criteria, namely:

1) be *transformative*, by facilitating knowing on all the 4P levels and enhancing the capacity for relevance realization through an ecology of practices;
2) be *inexhaustive* to sustain transformativity, by incorporating the opponent process of the intelligible and the numinous within that ecology;
3) be *scalable* to enable widespread diffusion of the ecology, by taking into account the entangled nature of complexity and emergent process of autopoiesis.

On their own, the two modes of enchantment presented by Morton and Abram, respectively, are centred on phenomenological experience and offer little in the way of reliably reproducing, sustaining, and disseminating that experience on a practical level. They thus fail to meet the criteria for a sustainable approach.

A recent upswing of movements such as ecopoetics, biopoetics, and mythopoetics (Meillon 2021), however, have followed Abram in opening us up again to the symbolic and mythological dimensions of ecologized meaning-making. Rewilding our language by tuning into and moving with the patterns, flows, rhythms, and seasons of life, these literary movements could potentially afford a spillover from the propositional and perspectival into the kind of procedural and participatory knowing that can root us in time and cosmos. Such rewilding begins with the recognition that stories and myths are always situated in particular ecosystems, and that they—to avoid perishing—have to remain connected to the cycles of composting, decay, and regeneration (Strand 2022). From the rhizomatic complexity of their mycelial roots they can then refruit as stories freshly adapted to current conditions.

Rewilded and re-rooted language alone, however, will not suffice if we want to effect real change in the world, to reliably achieve collective transformation and sustainable re-enchantment. An all-too narrow focus on narrative risks repeating the error of absolutizing the propositional that is symptomatic of modernity. To avoid this absolutization we need to involve all 4P levels of knowing by rewilding the whole of *mythos*, namely symbol, narrative, and its practical, embodied, and enacted component of ritual. These are the characteristic forms of human semiosis that bind us meaningfully to the world, re-articulating natural sign patterns on a symbolic level.

IX. Creation, Conservation, Celebration

The great challenge, the philosopher's nemesis, is the scalability problem: how do we scale our insights such that we can achieve collective transformation?

If we want to find a way out of the ecological crisis and meaning crisis, this essay argues, it is counterproductive to fixate on engineering and implementing top-down solutions. Instead, we would do better to shift our efforts towards generating the conditions that afford the emergence of many solutions. Approached from the perspective of relational ontology and complexity, the focus should lie on changing the interactions within systems rather than providing instructions for desired outcomes. What outcomes this approach will have, to be sure, cannot be known and predetermined upfront. For such is the nature of

complexity. We change complex adaptive systems by focusing on the relations between things and on the creation of novel relationships. Scalability, then, comes into play once we take the specific ingredients of human systems into account: the enabling constraints to afford such conditions, and that will make what happens at a local level resonant and scalable.

As the oldest method of cultural change, art likely preceded even language in human evolution (Miyagawa et al. 2018), and for good reason: abstraction, in human systems, is a precondition for change and innovation (and thus also scientific invention and the cultivation of wisdom). Artistic imagination is critical to humans because it allows us to shift into a level of abstraction, moving our brains from the concrete into the abstract, thus allowing us to abductively see and to sense novel and unusual connections (Snowden et al. 2021). From this liminality, this playful state of suspension, we can take the common and make it uncommon. We imagine things from different perspectives, agencies, sensitivities. Self-distancing as the decentring act that takes us out of our egocentric perspective by inhabiting those of others, has been shown by Grossman and Kross (2014) to be beneficial to the development of wisdom. Mythos, this essay contends, refers to the processes by which we can extend such decentring practices to include not just the perspectives of other humans, but of an entire ecology of nonhuman actors participating in the co-creation of relevance.

Mythos is the expression of a relationship to the land and the elements, animated by divinities, spirits, and ancestors. A relationship carved in stone, painted onto skin, danced with the wind. A relationship experienced with the whole body. Narrative, symbol, and ritual, the forms of *mythos* that always refer to one another, are the artistic forms par excellence, evolved to in turn be abductively taken up again and again, i.e. to achieve new use and expression in different contexts at different scales. From a complexity point of view, the forms of *mythos* act as relationship amplifiers and multipliers, providing the indispensable forms for which the content must always be contextually sensitive and locally rooted. They are the enabling constraints that make things interconnected and interdependent in both time and space. As a function of relationality, meaning itself is an emergent phenomenon. *Mythos*, then, is the (re)*creation*, *conservation*, and *celebration* of that enchanted relationality.

Who will read the *mythos* of our times? Rewilding, in stark contrast with the modern engineering logic, is about embracing rhizomatic complexity. Grounded in ecological wisdom through keen observation and knowledge of the rhythms and interconnections of local ecosystems, rewilded *mythos* can harness the potential of both traditional and contemporary ecological knowledge. Its knowledge base is not in the hands of an elite group of experts but with those embedded in their local signscapes. Their re-composting labour can nurture sustainable human-nonhuman relationships, embedded in both the sapiential and spiritual. Tending to the land as gardeners and stewards of the wild, they are the 'geometers' of life lived at the seams of an entangled earth (Dolphijn 2021).

As highly complexified forms of communication, *mythos* facilitates shared experiences by establishing a commonality of context and signs, enabling the (intergenerational) creation, exploration, teaching, understanding, and sharing of meaning. We tell each other stories of ancestral wisdom; divine a pantheon of gods to symbolize our affects; we share in transformative rituals. Byung-Chul Han defines ritual as "(…) *symbolic techniques of making oneself at home in the world*" (Han 2020, 2). As the domain of practical action, ritual affords linkages of procedural, perspectival, and participatory knowing, and of individual to distributed cognition. As actions imbued with symbolic significance, and performing a narrative, rituals re-enact, renew, and re-enchant human-nonhuman relationships. Intention, attention, and repetition, the three core elements of ritual, enable us to get into a liminal space of (serious) play where a difference that makes a difference

becomes possible (Schilbrack 2004).[5] By engaging memory and creating small moments of awareness, i.e. of positive feedback, rituals help us to zero in on the relevant signals and ignore the noise, thereby realizing relevance. Harvest festivals for expressing gratitude to the land; sunrise and sunset ceremonies to honour the source and symbol of life; rituals to inaugurate the change of seasons; initiation rites to guide life transitions; rain dances to celebrate abundant rainfall and fertile soil; offerings to ancestral spirits, both human and nonhuman; sacred sites to worship the spirits of trees, rivers, mountains. Indeed, to pagan, animist, and vitalist traditions, all days are filled with liminal moments imbued with significance.

As an ecology of practices operating on all the 4P levels of knowing, *mythos* offers reliable enhancement of the capacity for relevance realization. To reliably track the complexity of the world, *mythos* generates affordances of both intelligibility and mystery, as it provides us with the means to navigate their opponent process without exhausting either one. Finally, *mythos* enables its synchronic and diachronic distribution. It thus satisfies the three aforementioned criteria for a set of sustainable solutions that is consistent with both Vervaeke's framework and Wheeler's biosemiotics—leaving sufficient grounds and plenty of space for further investigation.

Conclusion – The Poetics of Being

Current characterizations of our age, such as the Anthropocene, Capitalocene, and Chthulucene, often share a sense of our time as defined by destruction, extinction, and the apocalyptic (cf. Haraway 2016; Tsagdis 2023). Indeed, the unveiling (*ἀποκάλυψις*) of the error of the modern worldview, and the renewed call to relate to our more-than-human environment eco-logically, is what this essay finds the ecological crisis and meaning crisis to converge upon. The kind of imagination our age requires, then, is the kind that can conceptualize birth and renewal from chaos and death.[6] As Mircea Eliade already wrote, humans have always shared such creation stories or cosmogonies, endowing them with a regenerative power that, through the act of re-telling and re-enacting, actualizes the conditions of life, death, and renewal in the present moment (Eliade 1949/2005). The ancient Babylonian New Year's ceremonial of *akîtu* that re-enacts the mythical beginning of the cosmos, and the Shintō twenty-year ritual cycle of rebuilding the shrines and other dwellings of the kami called *Shikinen Sengū* (式年遷宮), still practiced today, bear witness to how we, too, can become participants in the perennially present and unfolding story of creative evolution.

Nature's logic is relational, and this relationality is poetic in nature. Our very awareness, our aliveness, is a scientific instrument with which we generate meaning in an abductive, poetic interaction between ourselves and the world around us. Meaning is a verb, an activity, a becoming. An emergent, self-organizing process we participate in, in a co-shaping and co-evolving manner, as a mutual con-forming and trans-forming. It is neither pre-given, nor the final *telos* of things, but resides in precisely the way in which things are interstitially emergent in their relation to one another. Meaning exists within that co-emergent, liminal activity, as everything is born from a relation that always precedes the relata. It is what all the wisdom traditions throughout history have sought to multiply and amplify through sapiential and spiritual practices. *Philosophia*: a sense of wonder to enkindle a love of wisdom, but a wisdom that does not extinguish that flame of wonder. Vervaeke rightfully asks the vital question 'Where do we go for wisdom?', and the answer Wheeler and Abram give is: 'Nature.' Symptomatic of the modern affliction, Morton rejects nature and never converses with the 'alien' things themselves. But Abram, in befriending the local, is always among, between,

5 Note that routines and habits cannot simply be equated with ritual because their purpose is to *not* require deliberate intention and attention. Ritual action, on the other hand, is precisely what allows us to engage with subconscious habits and ingrained routines, and collectively transform the patterns of behaviour that are keeping us in crisis.

6 While growing in popularity within the humanities as a method for developing creative solutions, imagination alone does not suffice. One of the goals of this essay has been to point out that any sustainable ecology will require a combination of both sapiential and spiritual practices that necessarily includes *mythos*.

and betwixt them. Provided we do not fall prey to Romanticist, self-deceiving notions of a pure and original Nature to which we must return but integrate ecological complexity to rewild mythos in the here and now, whilst remaining open to what emerges, we might sustainably re-enchant our world.

Properly understood, true re-enchantment is about becoming aware of the meaning that is always already, and inexhaustibly, here. A reality both intelligible and numinous. Enchantment comes from the Latin *incantare*, 'to cast a spell,' and *cantare*, 'to sing,' both derived from their Indo-European root '*en'* meaning 'in,' and '*kan'* again meaning 'to sing.' Listen closely, and you might hear it: there is a singing within; from within beings, from within this rich and vast biosphere. Like an uninterrupted, eternally resonating and renewing, plurality of song, eagerly awaiting to be joined in polyphony.

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