

The Axe and the World: An Essay on Cosmotechnics

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This essay explores some of the ideas of Bernard Stiegler, Yuk Hui and Martin Heidegger as a framework to understand technology in our contemporary world. It pairs key concepts from these philosophers (such as *Gestell*, *pharmakon* and *exosomatization*) with traditional cosmological views in China (such as *Daosim*) and tribes in the Amazon (particularly the Yucuna people), in order to analyze the compatibility between cosmology and technics. By providing a view rooted in non-euro centric interpretations of technology, it explores ways to reframe the understanding and possible development of the digital information and computation systems we engage with, particularly regarding data as a key tool that can enable this transformation. It was written as part of the *Technology and Aesthetics* research group, conducted by Bernard Stiegler and Yuk Hui during spring of 2019, at the China Academy of Art.

The spring research group on *Technology and Aesthetics* showcased part of the research of Bernard Stiegler and Yuk Hui, one that had an expanded notion of *technology* as an axis point, and that encompassed wide and varied aspects from the fields of art, science, medicine, informatics, engineering, and politics; making evident the fundamental connection between these concepts, as well as tracing back the relationships of *techne* up to a fundamental level on each field of knowledge.

Both Hui and Stiegler have common conceptual ground in the *Question concerning technology* by Martin Heidegger. The work of this philosopher doesn't only provide an analysis on the essence of technology and how we should understand such notion, but also since first being written in 1935 proved to be premonitory of the way contemporary society functions. In broad terms, this work engages in displacing the instrumental and anthropological notion of technology professed that far into the 20th century, and replace it with a more complex and critical model. For him, *techne* (the Greek root for technology) as well as *poiesis* (meaning creation) are both ways to bring into presence what is not yet present, bring into appearance and concreteness¹. However, modern technology goes on a different direction, one whose essential nature is determined by *Gestell* or *enframing*, which is the 'way of revealing'² the real as a potential resource, or *Bestand* (standing-reserve). In such a way, every element is understood only in relationship to its latent functionality regarding human value creation. The modern human enframes nature by entrapping it as a 'calculable coherence of forces'³, and as proven by slavery, or the contemporary 'human resources' division in companies, humans themselves are also subject to be understood as standing-reserve. Modern technology brings-forth in a challenging⁴ way, "which puts to nature the unreasonable demand that it supply energy that can be extracted and stored as such"⁵. The only element escaping this enframing is the *Gestell* itself, and tackling that contradiction is Heidegger's main goal with his essay.

¹ (Heidegger, 1977: p.10)

² Idem, p.20

³ Idem, p.21

⁴ *Heurasfordern*, which is "to call forth or summon to action, to demand positively, to provoke". Idem, p.14

⁵ Ibidem

From this common conceptual background, both authors stem their research in different directions, and despite the divergent orientation, they prove to be ultimately complementary and mutually nurturing. Stiegler's work complements Heidegger's ideas by discussing them in an organic context defined by Schrodinger's notion of life as *negative entropy*, which basically is any system that goes against the universal tendency towards maximum entropy, or death⁶. This is all set in the current age of the *Anthropocene*, a new age on a geologic scale that has been product of the *Gestell*-driven interaction with the world since modern times. As closed systems are entropic, and the imposition of human systems based on *enframing* have expanded during this era, Stiegler better characterizes it as the *Entropocene*, one defined by entropy and which will inevitably tend towards decay. In such a scenario, we should rely in human's abilities of *noesis* (or ability to think), of desire, critique, analyse and dream, in order to open up the entropic systems. Nevertheless, we should be wary of confusing reason with a mechanistic treatment of reality as *standing-reserve*, and of the potential dangers of craziness (*folie*) disguising itself as reason. Those dangers are mitigated not by means of relegating craziness to the background pretending it doesn't exist, but rather by bringing it forward and treating it in the same way as cartesian or enlightened reason has been treated throughout modernity. In this struggle to open up, technology plays a key role that ends up being connatural to humans by means of *exosomatization*, or the production of objects analogous to our organs but outside of our organic bodies, shaped and maintained by human activities which underlie how our ways of living evolve⁷. As such, the role of technology can be described as *pharmakon*: a drug that simultaneously has "curative and toxic dimensions"⁸. All of this demands we treat technology in a *pharmacological* way, assessing both its positive and negative effects, so as to achieve an era that is based on a better negotiation between the human, the non-human and the inhuman, or *Negentropocene*.

Yuk Hui's work also highlights the dangers of the current situation by forecasting a convergence in a single *global axis of time*, a closure of systems resulting in similar decadent fashion, characterized by a singularity of absolute lack of diversity in the cultural backgrounds behind technological creation. To counteract this condition, he focuses on a research about *technodiversity*, or on the problematic of the universality of technics. He champions the idea that technology is not anthropologically universal, but rather it is enabled and constrained by particular cosmologies and cultural contingencies. As such, the escape from the current mechanized *Gestell* world-view would lie in the study and consequent development of different *cosmotechnics*, different ways of understanding and enacting technology based on the cosmologies of different social groups and their respective physical environments; hence, not merely having a universal concept based on the imposition of western models. In this new model or new episteme, western notions cease to be translated into equivalences with other terms, and instead have a plurality of terms based on difference, allowing *transduction*, or the progressive and structural transformation of a system triggered by incoming information⁹. Only in such a way could we open again the narrative lines and models of the world in a way that can expand the boundaries of knowledge and the way it affects the environment.

Both Stiegler and Hui paths to solve this conundrum presents compelling and useful frameworks. How can they be materialized? Do they present conceptual tools to navigate current or past practices that can serve as examples? How could these concepts be applied to a wider cultural framework?

Answers to those questions may be partially accurate, or hard to pin-point, as the *enframing* of the world inherently cancels out the spawning of alternate models. Nevertheless, I would like to propose some examples as possible study cases, as well as to take on ideas that will help on navigating them. First, I would like to recall the fundamental relationship described by Yuk Hui in *The question concerning technology in China* between *Qi* (器) and *Dao* (道), the two main principles by which technology and the cosmos are compatible. *Dao* is a principle that is omnipresent but cannot be described, yet it could be considered as "the supreme

⁶ (Schrodinger & Kauffman, 1944: p.24)

⁷ (Montévil, Stiegler, Longo, Soto, & Sonnenschein, 2020 : p.6)

⁸ (Stiegler, 2013 : p.4)

⁹ (Simondon, 2010 : p.185)

order of beings”¹⁰, or “the original harmony of the productive force of the cosmos”¹¹. *Qi* are the “tools”, or the instrument that “must be compatible with *Dao* to attain its highest standard¹²”. This relationship is inseparable and complementary: “*Dao* needs *Qi* to carry it in order to be manifested in sensible forms; *Qi* needs *Dao* in order to become perfect (in Daoism) or sacred (in Confucianism) since *Dao* operates a privation of the determination of *Qi*”¹³. This relationship is not unidirectional, and has had several meanings throughout history, but their unity and duality constitute one of the core concepts of Chinese *cosmotronics*.

Dao could be translated as “the way”, a word that connotes its dimension as an unquantifiable vector¹⁴ of ‘path of least resistance’ that applies to all things. From this standpoint, the natural and technical are not understood as antithetical, instead, the latter is a vessel for the manifestation of the former, while only attaining perfection when it conforms to its principles. A perfect example of this is the story of PaoDing, an incredibly skillful butcher who, when complimented about his perfect and rhythmic skill to dissect a bullock, replied that it was his love for *Dao*, far greater than his skill¹⁵, which laid the path to perform his movement with the knife. As he always followed this path of intuition, and never encountered hard tendons or bones, his knife still preserved its original sharpness after 19 years of use. The craftsman depends on *Dao* rather than on his tools, and the tools achieve perfection when applied in sync with the *Dao*. Yet *Dao* is not only interpretable by humans or present in them, as indeed it “is present and every being, yet escapes all objectification¹⁶”. According to Zhuangzi, we may even be more subtracted from *the way*, as “we do not experience self-emerging life (*sheng* 生), for we are too preoccupied with bringing things to completion (*cheng* 成)”¹⁷. In here he refers on how we enclose ourselves in a world of men (*ren* 人) and ignore the world as it is. *Dao* is ubiquitous, and the behavior we call natural, present in all things, emerges from it. In essence, we are not separate from them, as he assures that “[t]hings are fine – and we too are just things among things – just as they are¹⁸”. Thus, we may be better off in overcoming that enclosure, and act effortlessly (*wuwei* 无为), according to self-emerging life.

The compatibility of cosmos and technics is consequent with other cultural traditions, such as certain Amerindian cultures as the Yucuna, Matapí, Misak, Tikuna, among others located within the Amazon greater region in the borders of Colombia, Brazil and Ecuador. It may be tricky to bundle together a diverse group of tribes with linguistic and cosmologic differences, but some of them share a common approach to technics, either by cosmology or by practice. The Yucuna people in particular, conceive the territory as a memory device: to name and travel the rivers are memory practices¹⁹. Their ability to rememorate both their lives and their ancestors’, is directly linked with concrete places, vegetal and animal species in the forest. This could be considered either an exosomatization of memory unto their surrounding environment, or rather an understanding of the somatic as an extended and uninterrupted whole that encompasses the forests and rivers. Concerning technical tools, they think of them as intrinsic to creation itself. Their universe was born as a scorched earth, with all water contained by a single tree. The *Karipulakena* or original

¹⁰(Hui, 2016: p.65)

¹¹ Idem, p.66.

¹² Ibidem.

¹³ (Hui, 2016: p.101)

¹⁴ This dimension of direction and movement instead of substance is characteristic of many descriptions of *Dao*, including Zhuangzi when he mentions: “Things flourish and decay, but *Dao* (the Way), which is the movement of this flourishing and decay, does not itself flourish and decay (22/51). Things complete and destruct, but *Dao*, which is the movement of this completion and destruction, does not itself complete and destruct (2/35–6). (Mollgaard, 2007 : p.22)

¹⁵ (Hui, 2016: p.43)

¹⁶ Idem, p. 68.

¹⁷ (Mollgaard, 2007 : p.15)

¹⁸ Idem, p.17

¹⁹ “In shamanic chants, we start by naming from the mouth of the Amazon river, identifying each river, the owners of each place, the high, mid and low forest: to keep balance, in harmony, with the nature and humanity’s life. In this way, we preserve thought to make a plan of environmental management from our cosmovision: the management is made according to the life-plan. We cannot fail or tangle up, we have to follow river by river, estuary by estuary, identifying the aquatic world and spatial world: in this way, thought is preserved with each supernatural owner and with nature.” (translation is mine) (Matapí & Yucuna, 2012 : p.13)

people, used axes (the first tool) in order to cut down the tree, which upon falling turned into water and gave life to earth²⁰. It is through tools that life was possible, thus being part of becoming. In this case, there is no perfection of the tool by means of the cosmos, but rather one enables the other, one reflects the other constantly. The maloka (multifamily houses where entire clans live) resembles the world in design and the diversity it contains, the biconical base²¹ for shamanic rituals mimics the symmetry and balance of the universe. There is no tool that goes against the cosmos, as they emerged alongside. As mentioned by Uldarico Matapí, “We cannot ensure the operation of our knowledge in front of our world with other particular concepts that do not keep the logic of the evolution of the world”. Concepts evolve from, and make the world, as well as tools did. This co-evolution of cosmos and technics assumes a compatibility and complementarity between them, while setting a crucial symbiosis between *world-reading* and *world-making*.

This vision of harmony does not necessarily only fulfill in pre-modern²² societies, or only applies for low-complexity technologies. It may be compelling to romanticize times begone and the ‘simplicity’ of their technical devices, but we shall face the fact that this simplicity is an illusion, as ever since agriculture began being practiced, technology already undertook a scale transformative of entire ecosystems. Instead, a case can be made to find this complementarity of *Qi* and *Dao* in contemporary cybernetics and informational systems. Data, as an exosomatization of memory, constitutes the basis for informational and computational infrastructures that span the globe, which themselves are an exosomatization of noetic capabilities. Data is the token, the common language if you will, for systems to open up and communicate. Data is heterogenous, and by no means unified. Its differences go from type of storage, medium of transmission, and even to the technical minutiae of being written in strings, lists, floats, or in any given programming language and format. Either when considered as a series of pulses that trigger further actions in real time, or as magnetic polarities in storage memory, data is the organization of a series of signs that can be communicated and decoded²³. Putting aside technical compatibility issues, data is this common language that can be shared by weather stations, measurement of bird migratory patterns, pollution indicators, traffic flows and consumer product demands. It is perhaps a basic ground, a unified language that makes stimuli and events translatable across space, as well as cumulatively through time. Under this scenario, data needs to be coupled with algorithms, which are those who preserve the sequential workflow of action. If we are to consider data as series of signs descriptive of objects and events, algorithms are series of signs that enable the data’s agency by means of sorting, selecting, coupling, deleting, grouping, executing, and so on. Information, coupled with associative actions, are the basis for meaning to emerge.

Data is still far from an objective representation of the real systems it is extracted from. Either as an input by humans through terminals, or measurements of pressure, light, temperature, or any other phenomenon quantifiable by artificial nerve endings for computers, data is a proxy for the world. This calculated representation, regardless from the fact that is being sourced from ‘real phenomena’, it is an abstracted measurement that fits onto the world of man, which focuses on completion instead on the self-emerging life. Data is only possible as a concept because there has been a process of enframing of the world, one that considers that organized consignment of events bears some useful purpose. Even if this may be true, data still has one capability that the mere human action has fallen short of overcoming: the ability to put a different being as the one who *enframes*. It enables to surmount the impossibility to *enframe* the system by which we *enframe* everything else, all by means of allowing third parties to enframe the world (us included). When data about river pollution levels drive decision-making instead of mere reproduction of capital, or

²⁰ Idem, p.30

²¹“The world is also represented symbolically, the biconical support known in Yucuna as *umichiripucueste*, is an artifact that corresponds to what they now call in physics as black holes. Is a balanced piece that is used to keep balance in the use of nature. The (thought) bench is used to manage the world in interaction with all the other benches; this means that we are *all* and also part of it, and by properly managing each part is how we properly manage *all*.” (Translation is mine)(Conchacala et al., 2015: p.40-41)

²² We may consider using the term *a-modern* instead, as the prefix *pre-* sets all cultures in modernity’s timeline, thus implying ideas of less and more development, as well as development as a univocal concept.

²³ Signs, memories and positions are the means by which information processing is ‘materialized’. Leibniz would conceptualize this theoretically in his observation that memory was a function of the position of signs. (Chabot, 2003 : p.61)

when deforestation rates drives the creation of legal representation for forests²⁴, we see a collective of agents such as organizations, technical devices and data-processing software subverting the logic of enframing as a standing-reserve, and instead representing non-human entities in the act of balancing out the negative effects of enframing by using its own means of action. If mechanic action conducted by mankind has driven enframing and imbalance, and if completion-focused action has taken us away from being in sync with the world, then the intervention of other entities through data-driven participation may address some of the more salient issues, without necessarily trying to restore a primeval and ascetic state of technical dispossession.

Under this scenario, the ensemble data-algorithm can be interpreted as a *Qi* that attains its highest standard, the perfect technique through which the path of least resistance can materialize and become manifest. This ensemble is an immaterial *Qi* (technics), consisting of organized and serialized signs, that can lay down the path which the tangible and mechanical *Qi* (tools) can follow to carry out *Dao*.

Stiegler poses the following question regarding technical enframing: “Now, is technics a means through which we master nature, or rather does not technics, becoming the master of nature, master us as a part of nature?²⁵” Given the path explored so far, we may come to the realization that this division be more semantic than practical. Technics are an extension of “us” as exosomatized noesis, and the previous logic of enframing has made us think we lay outside of nature, although the incorporation of data from distributed parts of the global system has made us realize we are *inside* nature, even perhaps indissociable from it. When including what we have traditionally called nature in the systems that exert control and agency upon it, may indeed be considered losing mastery, yet ultimately may represent the only possible path for the negentropocene.

Mastery of both nature and information remains, still, as the greatest limitation in order to consider data as a balancing element rather than a tool for further reification of the world. A case for letting-go of mastery is made in *For you/For you not: The hole of representation in machine vision* by Benjamin Bratton. The essay addresses the problems that arise when engineers have to create models understandable by humans that represent how machines take in the data for machine vision. In that process, he proposes *ethical inhumanism* as an appropriate way to deal with some Artificial Intelligence (AI) models. As an example, Machine learning algorithms trained to automatically dictate legal sentences (designed in order to alleviate the congested judicial system), turn out to be significantly more likely to convict black people than white people, disregarding whether the amount of evidence is the same or not. That happens because the machine learns from past convictions, which just replicates the preexisting bias in human judges. This is why *ethical inhumanism* rises as a way to change the human-centered criteria by which design is considered to be good, proposing the alternative: “for AI to be more generally beneficial, including to us, we may instead wish to ensure that is less humanlike, not more²⁶.” If we understand data in this post-humanist approach, we would have the potential to overcome the bias that humans inherently have towards short term goals, and design systems that limit our behavior as a species by having into account wider sources of data, based in biotic cycles other than ours.

Data can be collected from practically anything, and with current tools is increasingly easy to collect as well as to process it. The problem with contemporary society is that it chooses to collect certain measurements that only enhances our ability to execute actions upon a world that serves us a *standing reserve*, neglecting other measurements that makes us aware of such behavior. We can also consider that both sets of measurements exist, but they just aren’t computed in the same model. If instead, an *ethical inhumanist* approach is taken, if AI is modeled in a way in which it can re-design itself and correct the biases inherited from humans, as well as to measure and collect data that is not only instrumental to us, then we would have a situation in which *data* is a super arching and constantly flowing representation of all (or most) beings,

²⁴ Article 71 of 2008 Ecuadorian Constitution grants to *Pacha Mama* (Mother Nature) the rights of integral respect, sustenance and regeneration of its vital cycles, protection and respect to the elements that compose an ecosystem. (Translation is mine)

²⁵ (Stiegler, 1994 : p.24)

²⁶ (Beech et al., 2017 : p.65)

which begets models that scan and sort different priorities before materializing through actions or manifestations in the real world.

This sounds as an unrealizable utopia by current standards, but there are small examples that even framed within the context of a global capitalist system, show ways in which that shift of paradigms could occur. The phenomenon of the *Taobao villages*²⁷ which are rural communities that specialize in the production of certain marketable goods which are in turn commercialized through *Alibaba's* platform *Taobao*, show a model which have re-distributed industrial production (that used to be centralized in big urban centers) into a more consequent allocation of natural resources, labor and capital gains, following a path of least resistance. In China we find as well the cooperation between *Alibaba* and the city government of Hangzhou²⁸, in a partnership to design a smart city using real time user location data and speed to regulate the city's traffic flow. Even if both examples mentioned can't overcome the built-in problem lying within the design of the system, they show ways in which data channels and distributes nodes of action in a way that supersedes each individual's capacity to foresee the situation in all of its complexity. This may constitute an example of an incipient consolidation of a real-life, real-time organism of multiple and subsequently smaller organisms that act according to a higher, yet more diffuse and distributed principle. In this way, networks can be repurposed to drift away from the extraction and storage characteristic of *Gestell*, and pivot towards flow and friction reduction, not as mere means of 'economization' under market logic, but as a distributed best practice that leaves every component (even those outside market interests) better off. Leaving aside the very important concerns about centralization of such data and the vulnerability that such a system could have if directed according to single individual desires (*folie*) it could become the path for a version of the *negentropocene*, as a more balanced model for technological mediation between human and the non-human, a model for *world-making* less in the sense of *enframing* and more in line with the Yucuna cosmivision. An undoubtedly richer model based on *technodiversity*, grounded in diverse ways to map out cosmos and human action, which hopefully open up the axis of future timelines.

In conclusion, we see how a conceptual framework made up by both academic and ancient knowledge is necessary to build a new model for understanding the role of technology in the current world. Is evident how diversity of thought and localities is necessary in order to drive the decisions for technological development if we are to correct course. By looking at the past with contemporary tools, we can track the clues for the new epistemes necessary to interpellate system design and the concrete tools of world-making.

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²⁷ Here I refer to the conference by Wang Jian, Head of Alibaba's Technology Committee, and Li Hao, Head of the center for Technological Creation in Qing Hua University, Beijing, during the Annual Conference of Network Societies, in Hangzhou, China. <http://caa-ins.org/archives/2983>.

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