Placing the Commons in a Temporal Framework: The Commons as a Planetary Regeneration Mechanism

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The Commons As A Perennial Mode Of Exchange

This text centers around the importance of a perennial human institution, that of the commons, which is one of the four basic modes of exchange identified by anthropologists.

Alan Page Fiske, in his landmark book *Structures of Social Life* (1991), offers a fourfold typology of modes of exchange. A mode of exchange focuses not on how things are made and what the relations are of productive communities, as Marx did when he talked about a 'mode of production', but look at what the criteria are for the exchange of value, i.e. the allocation methods for who gets what in a given society. Fiske called them: Communal Shareholding, Equality Matching, Authority Ranking and Market Pricing.

Commoning occurs whenever human groups exchange with a 'whole', following the logic, 'give a brick, get a house'. Commoning, doing something for the tribe, clan and family rather than for one's own, is the primary way in which value was exchanged at the dawn of humanity. A hunter or gatherer would bring back the proceeds of their search for food, but this was done on behalf of the family, and there was a pre-established way in which these proceeds would be shared. Later on, human communities would collectively manage natural resources on which they were codependent, such as forests, estuaries, fishing rights, mountain slopes, grazing rights, etc… In the European Middle Ages, farmers would have access to a family plot, would have to work for their lord, but would also have access to common fields, managed by the village as a whole.

As tribal arrangements became more complex and grew in scale, the gift economy became more important, over-shadowing commoning. In this allocation method, a individual, family or clan would make a gift, which would create gratitude and a sense of obligation in the recipient, which would at a later time, want to give another gift and return, so as to re-establish the 'equality' which had been disturbed by the gift, hence the concept of Equality Matching to denote this type of exchange.

However, once we see stratified class societies emerging, the primary role of allocation becomes distribution according to rank, under the adage, "rule, protect and distribute", hence 'Authority Ranking'.These were the tributary or feudal modes. Since the 1600s, the primary mode of allocation has been "Market Pricing', i.e. the capitalist form of the market.

While these modalities have co-existed across regions, cultures and epochs, the relative importance has evolved over time, as we already indicated. One modality dominates and the other modalities adapt to its dominance, and find new niches where their persistence makes sense.

Kojin Karatani, a Japanese philosopher, has provided an account of these changes in the relative hegemony of the different modes of allocation, in a remarkable book called *The Structure of World History: From Modes of Production to Modes of Exchange* (2014). Karatani posits a succession of modes of exchange in terms of relative dominance, in other words, he

attempts to historicize more precisely how the different modalities posited by Alan Page Fiske, evolve over time.

In a review, McKenzie Wark (2015) summarizes it briefly: '*Mode A is association, or rather the reciprocity of the gift. Mode B is brute force, or rule and protection. Mode C is commodity exchange. There's also a Mode D, which transcends the others*.' Mode A consists of 2 phases, which correspond to the distinctions made by Fiske: the first modality of intra-tribal exchange is 'non-reciprocal exchange', in other words 'commoning', exchanging with a whole. The second phase, used for inter-tribal trading when these societies become more complex, is the reciprocal gift, used to create mutual social obligations and therefore also 'peace'. When sedentarization occurs, and conflict cannot be avoided through nomadic strategies, the gift logic becomes necessary for inter-tribal peace-keeping. Mode D, emerging today, then combines the historical modalities A, B, C but under the coordination of a 'new associationism', a concept that is very close to commoning as I could confirm in a private email exchange with Kojin Karatani.

Of special interest in this specific context is Karatani's treatment of mode C, commodity exchange, where he introduces the idea of the simultaneous emergence of a triarchical system of institutions, i.e. the State, the Nation, and the Market, with each of them supporting each other.

It also introduces a cyclic pattern within capitalist evolution. In this vision, which comes close to the ideas of Karl Polanyi which we will introduce shortly, the Nation is what remains of community under a capitalist political economy, and the State continues to exist with an arbitrage function between the People and the Market forces.

As we agree with this interpretation of human history, we can apply these insights for a stylized summary of the history of the commons:

- In early tribal societal forms, commoning is the central mode of allocation, and is used for all resources pertaining to the survival of the kinship group, and it remains important in gift economy systems
- In feudal and state forms (Authority Ranking), the commons and the gift lose their dominance, but the commons retain an important function, for guaranteeing the collective management of vital natural resources; commons-based communities compose with the feudal order but also defend themselves. For example in European medieval history, the most important communal ritual was the Rogantide Procession, or the 'Gang Days', in which the community, under the leadership of the parish priest, did a walk around the village and their commons, to reconfirm their borders and importance for the community. This ceremonial pilgrimage was also called 'Beating the Bounds'. It was only abandoned after the Reformation, i.e. after the emergence of the capitalist social order.
- Under capitalism, a massive amount of common lands and other common resources have been privatized, the so-called 'Enclosures of the Commons', a process that started in the UK.
- But the exodus of the farmers from the countryside, in order to become workers in the cities, coincided with the emergence of a new form of commons: barring control and access to common natural resources, workers commonified their life risk, through a massive mutualization of income and health resources,which became the basis of the welfare state. Thus we could claim that capitalism privatized the natural resource commons, but state-ified the social commons.

With the emergence of digital networks, the commons are again emerging as a substantive practice, starting with the emergence of knowledge and open source commons after 1993, with the invention of the web and the browser, which democratized access to the Internet.

At the current moment in history, after a period of eclipse under the capitalist mode of production and allocation, the commons seem to be re-merging, particularly using the mechanism of what we call 'peer production', using "peer to peer" modalities. Peer to peer is any social and technical system, in which peers can connect with each other, in order to communicate, exchange, but also self-organize and even create new 'value circuits'. Decentralized and 'distributed' computing systems, such as the internet, have enabled many people in the world to self-organize in open collaborative systems, which are also able to create shared resources, i.e. commons. Open source communities consist of communities of developers which freely associate themselves to create 'free' software, free in the sense that everyone is able to use, share and transform/improve them; but they are also creating joint open designs, shared knowledge, and more. Since the crisis of 2008, we also see the emergence and growth of urban commons, which have grown tenfold in a decade.

Finally, we see the emergence of eco-systems of material production, which are also inspired by commons-based logics. For example, the multifactory-model, used by a network of 120 craft-based maker spaces across Europe, works around a common ecosystem for shared knowledge, their 'Invisible Factory'. We could say that if the internet of communications stimulated the 'peer production' of so-called immaterial goods, i.e. knowledge, software and design, then the 'internet of transactions', which came into being with the blockchain, represents, through its shared and distributed ledgers which can be used for coordinating production flows, the possibility of material peer production.

But the new technological affordances are only part of the explanation. We want to show and argue, in this paper, that there is a historical pattern in the ebb and flow of commoning in human history. Why are commons sometimes weakening to the point of disappearance, while they make strong comebacks at other times. This is why we believe, and posit with some confidence, that we are now entering a 'new age of the commons' , in which we expect them to take center stage.

The basic idea of the 'pulsation of the commons' is the following. Throughout history, even as the arrow of time proceeds and societies become more complex and evolve, an idea that was expressed in the sometimes mechanistic and deterministic social evolution theories that were popular in the 19th cy. and the early 20th cy, there is also a cyclic pattern. The full pattern has two different moments:

1) in the expansive/degradative phase, competing entities in a peer polity system (which can be a system of tribes, kingdoms, empires or nation-states), enter into an expansive but also degradative phase of consumptive expansion, but they do this by over-using both their core territories and frontier areas, leading to inevitable overshoot and then decline and collapse
2) as a reaction to this degradative phase, local productive communities, rooted in their territory which is degrading, seek to resist and eventually to redress, linked to religious and spiritual movements which express this discontent and desire for social harmony; if this movement overtakes the degradative forces, the commons, the mutualizing of resources to create abundance within a context of sufficiency, recreate old and new commons which had been degraded and weakened in the

expansive phase. At some point, the health of the system is restored to such a degree that the desire for expansion grows again.

This dynamic is what we like to call: the pulsation of the commons.

Perhaps a word here for the visually oriented readers: what do you get when you combine a successive evolution of systems, each more complex than the other overall (which doesn't mean superior in any moral sense, nor progress, but only: a tendential complexification of the social systems over time), but which are also determined by polarity switches ? The answer is: a spiral. In a spiral we can visualize each phase of complexity but at the same time, the line moves between polarities and the downward direction of the crisis moment is also visible.

The Temporal Ebb And Flow Of Commoning

Introducing Pogany: The Time for The Chaotic Transition Has Begun

The first temporal framework we present is that of Peter Pogany. Pogany is a very original but rather unknown Hungarian-American thinker who published two books (Pogany 2006, 2015). *Rethinking the World* (Pogany 2006) is an arduous but rewarding new view of the world system and its structures. Pogany is one of the very few thinkers who links the thermodynamic basis of our world[1] to the socio-economic system. More importantly, he links both these levels to a third one, the 'mode of apprehension': how human cultures see the world, what they can 'see', and most importantly, what they cannot 'see'. This is important, since typical left of centre analyses usually focus on material structures, but often ignore a systematic vision of human agency; right of centre analyses usually focus on human agency and responsibility, but often ignore the structural constraints on human and natural systems. Pogany offers a sound integral theory which holds the three levels of reality in an organic and holistic embrace.

Based on findings of biophysical economics and complexity theory[2], Pogany concludes that our world, i.e. human society embedded in nature, is a 'complex adaptive system' and reminds us that such systems change through 'punctuated equilibrium', 'chaotic transitions', and 'bifurcations'. This is a huge statement as it means that humanity does not adapt to radically new situations through reasoned debate, but through shocks in the system. First, the old system disintegrates and the old institutions lose legitimacy. Then, a Cambrian explosion[3] of alternatives emerges, carrying the seed forms of the next system, but these alternatives need to fight themselves out before a new stable system emerges.

This also means that societal transitions are about the instalment of new logics rather than a re-arrangement of the old system. For example, the Christian feudal society that replaced the imploded Roman Empire, believed that work was positive and sacred. Christians and monks

[1] (i.e. how much matter and energy is at our disposal in the medium and long term, given the second law of thermodynamics, which states that the quality of matter degrades in a 'isolated' system like planet Earth (we get energy from the universe, but hardly any new matter),

[2] books on the self-organizing of the universe and humanity

[3] 'The Cambrian Period marks an important point in the history of life on Earth; it is the time when most of the major groups of animals first appear in the fossil record.'

believe in the adage, 'ora et labora', pray and work. This view was fundamentally opposed to the Greco-Roman vision of work as a degrading activity fit for slaves. They believed that people who depended on work to survive, could not become autonomous beings able to think for themselves.

So, a new mode of organizing productive life in more harmony with the limitations of the material planet and its living beings will require more than a 'business as usual' adaptation. The new system must either disintegrate to a lower level of complexity or 'transcend and include' some of the achievements of the previous system while addressing its problems at a higher level of complexity and integration. The two may of course coincide, i.e. an initial regression is needed for the new system to be able to reorganize itself at a higher level.

Pogany explores our current context based on his analysis of three succeeding 'global' stable systems. Global System 0 (GS0), or a proto-global society, was the mercantile system that dominated Europe under the absolute kings of the 17th-18th centuries. This stable system had ended with a period of 'chaotic transition': the French Revolution and the Napoleonic Wars (1789-1815).

The second stable system, which emerged after the chaotic transition period, was the first truly global system. Global System 1 (GS1), also called the 'Smithian' capitalist system, had been based on the full domination of Capital over Labour. GS1 and its institutions have been in turn interrupted by the period of chaotic transition between WW1 and WW2. During this transition, 3 different systems fought for dominance: democratic capitalism, fascism, and (Soviet) communism.

The third stable system, Global System 2 (GS2), emerged after 1945. This system of 'weak multilateralism' (GS0 had no multilateral institutions) was based, at least in the Western countries, on a contract between capital (Fordist capitalism) and labour (the welfare system). GS2 was based on a hyper-exploitation of natural resources and neo-colonialism. While the Global South had largely obtained its political independence, new countries had been locked in unfavourable terms of trade and had little or no power in new international institutions dominated by the winners of WW2.

Here is what Pogany wrote after the onset of the global systemic crisis of 2008:

> It is hardly a mere coincidence that the collapse of the global financial casino coincided with the divorce between cheap oil and the full utilization of the rest of productive resources. We will never see the two of them together again — a situation loaded with the awesome implication that the world will be knocked back and forth between recession and aborted recovery as the oil price roller coaster alternatively encourages and discourages profligacy with our body economic vis vitalis. This emergent cyclicality reveals that the collision between humanity's material ambitions and the planet's physical constraints is not a single dramatic event as symbolized by the more than three decades-old 'overshoot and collapse' meme. Rather, it is an extended, micro-historically recognizable temporal process. (Pogany 2009)

Note the important historical shift that follows from Pogany's conclusion: whereas the earlier cyclic patterns were always local and regional, leaving room for growth in new frontier or regions, this crisis is planetary: there are no frontiers left. Humanity is facing a closed earth system, which receives energy from the universe, but no matter, and that matter is subject to the

degradative effects of the second law of thermodynamics. This time, there is no escape, no 'elsewhere'.

It is fair to say that the GS2 started to dissipate in 2008, when a deep crisis of the financial system has been followed by the weakening of the multilateral system based on US dominance; social unrest eventually resulting in right-populist victories; and rapid realization of the physical unsustainability of our current systems of production. Thus, the world has entered the beginning stages of a new period of chaotic transition. After the 1980s, social contract between capital and labour has slowly dissipated due to neoliberalism. The social contract is still not entirely destroyed, but has been weakened, together with the multilateral system.

Covid-19 has since reinforced the crisis, showing that the weakened public systems under neoliberal austerity regimes, left the public sector in the West very ill equipped to deal with the crisis.

Pogany is quite clear that the next system, Global System 3 (GS3), must be based on a renewed contract with nature – we must learn how to produce for human needs within planetary boundaries. To retain social stability, this process needs to be accompanied by a degree of social equity – the social contract cannot be abandoned because it is the precondition of a successful ecological contract. This requires a strong two-level multilateralism. A form of global governance needs to embed human production into relatively coercive planning frameworks reflecting the availability of resources for the long-term survival of humanity. This view is expressed for example in the r3.0 (2021) proposal of a 'Global Thresholds and Allocations Council' aimed at establishing 'an authoritative approach to reporting economic, environmental and social performance in relation to generally accepted boundaries and limits'. In this 'multicapitalist' approach, the market and public entities must all learn to become accountable, not just for financial capital, but also for human and natural capital. For each stock of capital, of which the flows of use and value to humanity are dependent, there are real physical thresholds, after which a stock starts degrading, and this must be prevented. Therefore, each threshold is accompanied by 'allocations', that determine the fair share of each entity of what is essentially a set of scarce resources. Kate Raworth's Doughnut shows a system in which humanity must produce below an ecological ceiling, i.e. objective limitations of vital cycles and resources, the so-called planetary boundaries, and a 'social floor', the minimal needs of humans as well as the conditions for a stable society. Within those two boundaries lies the 'safe operating zone for humanity'.

For Pogany, it is uncertain whether humanity will succeed in this coming transition. We may be headed towards regressions to lower levels of complexity that are no longer able to sustain today's population. A much deeper collapse is also within the realm of possibility. Nevertheless, Pogany's view of world history as a 'pulsation' between stable systems and chaotic transitions is very much in line with other understandings of long-term human and natural history, and offers a clear meta-historic vision of the priorities we need to pursue in our current chaotic transition.

The HANDY Project[4] and Mark Whitaker's Ecological Revolution

[4] Human and Nature Dynamics Project (HANDY) is a 4-variable thought-experiment model for interaction of humans and nature (Motesharrei, Rivas, and Kalnay 2014).

It is our hypothesis that our current period of chaotic transition pushes towards a re-emergence and eventual centrality of the commons. This hypothesis can also be supported by a 'cyclical' argument.

Alan Page Fiske (1991) has established a relational grammar for the allocation of resources in society. In *The Structure of World History: From Modes of Production to Modes of Exchange,* Kojin Karatani (2014) has examined the evolution of modes of exchange (unlike Marx, who examined the modes of production), and historicized their development.

- The original modality of humankind is commoning, which is when everyone contributes and partakes in a common pool; it is a prime mode in hunter-gathering bands.
- The gift economy, in which the gift creates social obligations for a counter-gift becomes the dominant modality in more complex tribal societies.
- Authority ranking, when in a class-based polity, the rulers must legitimize their domination through the redistribution of resources.
- Market pricing, where prices allow for the exchange of resources deemed of equal value.

These four modes have co-existed for a long time, but their relations have evolved. Nomadic and horticultural societies predominantly practised commoning and gift economy. State-based societies practise redistribution through taxation (Turchin 2018). Today's redistribution is dominated by the capitalist market and the state is largely at market's service (Bobbitt 2002).

The commons has always had an important role in class societies, until its recent marginalization by capitalism. But there is a strong historical evidence of a pulsation of the role of the commons vis-à-vis the extractive economic systems. The HANDY report on human and nature dynamics (Motesharrei, Rivas, and Kalnay 2014) examines human societies since the Neolithic through a predator-prey hypothesis. This refers to the biological reality that a predator species will over-eat prey, until the population of the prey starts declining, depriving the predators of food, which then starts a new and opposite phase of the cycle. The report concludes that all class-based peer polities, which are locked in a competition with each other, routinely (in fact: always) end up over-using their resource base. At this point, the extractive logic stutters and there is a strong pressure to provide the commons with a more important role in the overall mix.

At such moments of crisis, reducing carrying capacity through mutualization is one of the most efficient ways to avoid, soften, or recover from societal collapse. Pooling of resources is a keyway of reducing matter-energy footprints (Motesharrei, Rivas, and Kalnay 2014). The report stresses that equality is a key predictor of crises' depth and severity. Egalitarian societies are more sensitive to the signs of coming collapse, so their transitions are reasonably smooth and their recovery periods are shorter. By contrast, authoritarian and extractive societies insulate the ruling class from growing environmental problems, which means they fail to capture the signals in time, and so the fall of such societies is deeper and their recovery time is longer.

These conclusions correspond to Turchin et al.'s (2009) research of 'secular cycles' which combines two factors: the evolution of demographics i.e. the increase and decrease of the raw numbers of the population, and the evolution of state and elite extractive mechanisms, i.e. how much more is consumed by individuals in the elite. Peter Turchin and the cliodynamics school of historical research, study the temporal dynamics of large societies using a vast set of databases containing historical records[5] (wars, conflicts, famines, political and social revolutions,

[5] See the **Seshat: Global History Databank , which "** was founded in 2011 to bring together the most current and comprehensive body of knowledge about human history in one place", http://seshatdatabank.info/

etc.). They conclude that there are long-term oscillations that are related to how population numbers tend to exceed the local carrying capacity of the societies in question, and how ruling class extraction aggravates those conditions. So far, these scholars feel confident to assert that these secular cycles do occur systematically in agrarian societies (Abel 2007). Although we are unaware of similar studies related to capitalism, we posit that within those oscillations, at times of crises, mutualization contributes to remaining within local carrying capacity boundaries.

Mark Whitaker's (2009) work seems well suited to testing this hypothesis. In his 3,000-year review of ecological crises in Europe, Japan and China, the commons have repeatedly played a crucial role in their overcoming. This is expressed in political, social, and religious movements of the past, where the productive classes would follow the lead of religious reformers and/or revolutionaries, who insisted on a new balance between people and nature[6]. Whitaker posits a 'slow ecological devolution', referring to the slow but constant ecological degradation under elite leadership, and 'fast ecological revolutions', the result of popular mobilizations, which in the past, took the form of spiritual-political movements. He writes:

> Most argue environmental movements are a novel feature of world politics. I argue that they are a durable feature of a degradative political economy. Past or present, environmental politics became expressed in religious change movements as oppositions to state environmental degradation using discourses available. Ecological Revolution describes characteristics why our historical states collapse and because of these characteristics are opposed predictably by religion-ecological movements. As a result, origins of our large scale humanocentric *axial religions* are connected to anti-systemic environmental movements. Many major religious movements of the past were *environmentalist* by being health, ecological, and economic movements, rolled into one. Since ecological revolutions are endemic to a degradation-based political economy, they continue today. (Whitaker XXX)

A paradigmatic case study in Whitaker's work is the mutualization of knowledge by the Catholic monastic communities during the crisis of the Western Roman Empire. According to Jean Gimpel (1977), Catholic monks were responsible for nearly all technical innovations of their era. Catholic monasteries functioned as commons at three important levels. One, they acted as knowledge commons. Two, they mutualized shelter and common productive units, thus providing shelter, culture, and spirituality at a dramatically lower footprint than the Roman elite. Three, they relocalized production through the feudal 'manor'.

Another example he summarizes in his book concerns China: The Zhou kingdom is the first state to emerge in the rice-basins of the Yellow River, and they use ritualistic forms to be performed by the ruling royal family, but as the royal system expands and degradation ensues, there is a first reaction, that of first Confusian movement, which according to the authors cited by Whitaker, represent the urban middle classes, the shi that want to be part of the system by being recognized by merit and not by blood. A new degradative phase, at the time of the consolidation of the first Qin Empire, created the counter-movement of the Mohists. This movement of urban craftsmen, allied with the dissatisfied farmers, is based on a doctrine of universal love, calls for welfare systems, and specialized in military technology to defend independent cities against imperial and royal expansion. The movement is repressed but the next imperial system will

[6] Whitaker's work does not remain in the past, and also includes an analysis of the contemporary Green movement in Germany.

integrate the welfare demands, theorized by Mencius. Whitaker shows how each revolt first shakes up the system but is then 'de-fanged' and integrated in the next phase of civilizational development.

Resemblance with today's conjuncture is uncanny. One, faced with ecological and social challenges, we see an exponential rise in knowledge commons under the form of free software and open design communities. Two, we see a strong drive towards mutualization of productive infrastructure, for example the emergence of fablabs, makerspaces and coworking spaces, and the emerging multifactory model (Salati/Focardi, 2018). Rapid developments in capitalist 'sharing economy', which is focused on creating platforms for underutilized resources, partake in this trend. Three, new technologies around distributed manufacturing, prototyped in makerspaces and fablabs, point to a re-organization of production under a 'cosmo-local' model (Kostakis et al. 2015; Ramos 2017b). The cosmo-local model combines a relocalization of production, with global technical and scientific cooperation through shared designs and technical knowledge.

A recent study on urban commons in the Flemish city of Ghent shows the existence of nearly 500 urban commons active in all areas of human provisioning (Bauwens and Onzia 2017) – as compared to 50 urban commons existing only ten years earlier. The difference with earlier cyclical re-emergences of commons in times of crisis is that the current exhaustion of resources and dangers to our ecosystem are global in nature, requiring transnational and globally coordinated responses which are at the same time local – hence cosmo-local.

There is also some historical evidence that the commonification response to over-extraction of resources was not just restorative; it also created the conditions for prosperity. Adam Arvidsson (2019) relates the remarkable integration of commons and markets after the 11th century. The 'First European Revolution' that started in 970 (Moore 2000), with the so-called Peace of God movement, was a social revolution that united monks and peasants in France and neighbouring countries. It established a social contract (the Peace of God charters were signed in several hundred cities and regions) that pacified both inter-elite and class conflicts and so allowed for a productivity rise in the countryside, creating an exodus to re-emerging cities which had shrunk in the preceding period between the 5 to 10th century. City workers created productive commons in the form of guilds, and free farmers created agricultural commons through land contracts (de Moor 2008). This contributed to development of a new ethical economy that had strong elements of redistribution and solidarity. During the next 3 centuries, European population doubled, and in Western Europe, it tripled.

Another example is the Tokugawan period[7] (Lane 2014) in Japan (between 1600 and 1868), which started after the emperor retook control of a largely deforested Japan and protected the land as imperial commons. This period was known not only for its prosperity but also because it succeeded in creating a long term stable ecological society, with a stable population level.

Other authors have made similar observations. William Irwin Thompson (1985) identified the tendency to overshoot natural limits across Babylonian, Greek, Roman and European civilizations. When a civilization's core growth comes at the expense of its peripheries, it begins to undermine the viability of the core civilization itself. Thompson pointed toward a commons framework as a solution, an arrangement he termed "enantiomorphic" - which implies a transcendence of binaries, in particular the way in which civilizations generate dualisms and dis-ownments that need to be reintegrated. Thomas Homer-Dixon's (2010) detailed analysis of energy use within the Roman civilization also arrived at a convergent view: growth dynamics

[7] For some details, see https://wiki.p2pfoundation.net/Tokugawan_Period_in_Japan .

were early on based on large energy returns on investment (the amount of energy needed to exploit new energy sources), but diminished over time as social and ecological externalities mounted up.

Civilizational crises are linked to a number of related dynamics. The image of the future that helped to animate the extant civilization may begin to lose power. Images of the future may become dystopian, and narratives that are civilization-contradicting emerge and serve to unravel the core belief and logics that have wedded people to the old system. A creative minority from a variety of perspectives produce new seed visions that attempt to offer solutions amidst crisis. Some of these may be 'fantasy' visions and solutions that reiterate the core logic of the empire without addressing its contradictions, giving people a false sense of hope. Some visions and solutions, however, are based on a square reading of limits of their civilization's contradictions (in our contemporary context, growth), and invite new pathways that are outside of the epistemological orbit of the empire.

This comparative review provides an understanding of the non-exceptionality, or even regularity, of civilizational overshoot. For example, Whitaker argues that every class-based system based on competition between elites creates a 'degradative political economy' and an overuse of internal and external resources. Against this, in predictable fashion, eco-religious movements arise that stress the balance between humans, the human and the divine, and the humans and the environment. These ideas lead to temporary re-organizations of society. It is these commons-based transformations that allow overshooting systems to find new ways to work within the biocapacity of their own regions. By now, this dynamic has played out locally and regionally. In our age of the Anthropocene, it moved to a planetary scale. Much can be learnt from general world history, yet these cycles and rhythms also need to be carefully examined within capitalism. The two authors that can help us here are Karl Polanyi and Carlota Perez.

Karl Polanyi's Double Movement vs Carlota Perez's Adaptation of The Kondratieff Cycles

Kondratieff cycles, cycles that are related to 50-year patterns in commodity prices, were first remarked upon by the Russian agricultural economist Kondratieff. Although they remain controversial amongst economists, they remain a constantly discussed (i.e. controversial!) cyclic pattern in capitalism, that was taken up by the economist Schumpeter and neo-Schumpeterian economist Carlota Perez. These analytical schools link these waves to technological innovations that create new techno-social systems. Karl Polanyi's classic work on the history of capitalism since the end of the 18th cy., The Great Transformation (1944), sees these cycles at work in the social and political history of the system as well, and he coined the term 'the double movement'. While Polanyi stresses the social and political impacts, Perez focuses on technological and financial infrastructures. The next account fuses the two explanatory frameworks.

Indeed, Polanyi sees this 'double movement' as periodically challenging the balance between the market and the state. This pulsation is accompanied by the ebb and flow of the commons. In *Technological Revolutions and Financial Capital*, Carlota Perez (2002) similarly notices that capitalism is marked by waves of economic progress and stagnation, ending in crises, which last 50-60 years on average. At some point in the economic arc, a particular combination of energy use, geopolitical domination, land use, and managerial practice, accompanied by specific forms of technological infrastructures, sets a high-growth phase in motion. In this phase capital needs a lot of labour, which strengthens the power of workers, and is therefore accompanied by

pro-labour reforms. As a result, the market becomes strongly embedded in societal needs and demands. The welfare advancements typically made in such a period are not top-down inventions and innovations, but generalizations of mutualized seed forms that had been created during the previous crisis. Thus, both the Attlee and Roosevelt New Deal reforms were inspired by the forms developed as commons, but were then bureaucratized by the state. During the previous era of destruction of the commons, the Enclosure movement which 'fenced' in common pastures, woods, and fields, the dispossessed farmers had to flee to the cities, where their only option was to become the 'proletariat', i.e. they had to sell their labour power to the factory owners. Within a context of total lack of social protection, and without access to natural resource commons, the workers, mostly under the leadership of the craft workers which had retained a memory of their guild-based solidarities, started mutualizing their life's risk, creating all types of social insurance systems. It is this civil-society based structures which were 'statified' and generalized as social rights, during eras of welfare reform.

However, when the first 'ascending' part of the Kondratieff cycle peaks, it is because there is a supply crisis, as capital makes less profit at the end of such an era of social redistribution. The political form of this cycle is a conservative revolution in favour of capital. The conservative revolution 'frees' the market from societal constraints and sets in motion a period of lower growth accompanied by financialization, which creates higher profits. This eventually results in a crisis of demand, which will bring to an end the second phase of the cycle, as citizens/workers/consumers are suffering from stagnant incomes and high levels of debt. The crisis of demand causes social unrest and pressures to re-embed the market into society. As the conditions of the working and middle classes deteriorate, it also sets in motion a renewal of commoning. This double movement is also called the lib-lab pendulum (Polanyi 1944/2001), lib meaning the phases of deregulation/privatisation/marketisation, and lab referring to re-regulation. In our own interpretation, we can therefore conclude that the oscillations in capitalism are closely connected to oscillations of the commons.

So where are we now? Capitalism's long-term trend towards exaggerated extraction, which has created the conditions for the Anthropocene, merges with the short-term ending of a capitalist Kondratieff cycle. A radical transformation of capitalism is very likely not in the cards in the short run, so it is to be suspected that capitalism itself makes various attempts to integrate the commons into the next Kondratieff cycle. While there is no guarantee that these attempts will succeed, elements of social commons (such as P2P, climate change and energy scarcity reforms) are on the agenda. Today's world simultaneously experiences a global loss of balance with nature and a change within the cycles of capitalism. These trends converge in a single global process, which leads to a re-strengthening of the commons. Note that in our view, the commons are an instrument of both the productive classes and the elite.

Revolution, Phase Transition, and Seed Forms

Following the iconic examples of the French and Russian revolution, some of the radical left traditions, in particular Marxist-Leninism, have focused on how to strategize the final assault on the bourgeois state. Other left traditions (e.g., anarchism and autonomism) emphasize an exodus from the state. And still other left traditions such as the social-democratic and christian-democratic traditions, take a more gradualist approach. However, a closer examination of phase transitions towards industrial capitalism shows a greater variety in the radical processes of change, with many different kinds of actors. This more complex narrative shows the French and Russian revolutions not to be universal norms for a political and social revolution. Examples

include Bismarck's introduction of a welfare state in Prussia/Germany, the liberation of serfs by the Tsar in Russia, and the constitutional civil wars in England and the US.
Earlier phase transitions, such as the transition from the Roman system to the feudal system, took many centuries. These transitions were originally based on seed forms that slowly emerge, then start interacting with each other, and only then do they finally create the conditions for a phase change that can take on multiple forms. For example, the seed forms of the capitalist system such as mercantilism emerged as early as the 11th century in Italian city-states, where a relatively autonomous merchant class started to adapt the social and political systems to their own needs. There would be no capitalism without the prior existence of capitalists and their practices, and there would be no commons-centric society without the existence of commoners and their practices, and their efforts to adapt the societal context to their own needs.

Seed forms for a post-capitalist commons-based political economy are much more recent. They appeared in the 20th century, in the distributed experiments (involving commons and commoning) that bring forth a new organizational logic. It is impossible to say whether humankind will experience more revolutions, yet if they appear, they will result from these long-term changes in the productive systems and structures, and the social forces they create. So what is the nature of seed forms for a post-capitalist commons transition? For an insight into the nature of the transition process, we turn to Peter Pogany.

Pogany (2006, 2015) shows that societies change through chaotic phase transitions, where old binding elements disintegrate, and new seed forms, preconfiguring potential futures, compete in a Cambrian explosion. Therefore, it is impossible to predict with certainty which seed forms will succeed in building the successor system. However, given the crucial role of planetary limits to growth, and the equally important role of mutualization in lowering human footprint, we expect that currently emerging P2P and commons-oriented seed forms will play a crucial role in creating the society of the future.

The Commons as Mutualization for the Anthropocene

Much is now written about the Anthropocene – a new epoch that signifies an active relationship between human beings and the planet. For the purpose of following discussion, we can distinguish three main understandings of the Anthropocene.

The first understanding is the significance of humans as a species with planetary impacts. This is the popular definition of the Anthropocene — humanity has become such a powerful aggregate force that we can assign a geological era to ourselves! If this were the only dimension of the Anthropocene, however, then human beings would be no different than anaerobic cyanobacteria. Approximately 2.5 billion years ago, anaerobic cyanobacteria caused the so-called Great Oxygenation Event by rapidly increasing its population. Rising amounts of its waste product, oxygen, have significantly changed Earth's atmosphere, causing extinction of many species.

However, the Anthropocene also signifies an awareness of ourselves as a planetary species with planetary impacts. We have the power to reflect on who we are and what we do. While the first understanding of the Anthropocene — human instrumental power — is far more advanced than the second understanding — reflective planetary awareness — this second understanding rapidly catches up.

The third understanding, reflexive planetary response, signifies humanity's capacity to leverage reflective planetary awareness towards coordinated, intelligent responses to

Anthropogenic challenges. Reflexive planetary response is the most embryonic of the three understandings, yet it has the capacity to ensure long-term viability of human survival.

At a planetary scale, these three understandings play out a classic action learning cycle – act — reflect — change. Theory of the commons is a critical part of the second understanding of the Anthropocene – human capacity to interpret and understand ourselves in the current era. Praxis of the commons, or commoning, is critical to the third understanding of the Anthropocene – human reflexive planetary responses. The Anthropocene is a crucial time for humanity, in which our very survival is at stake, and the commons have an important role in human collective responses. This hypothesis is one of the key reasons for the creation of the P2P Foundation based on following premises:

1. Our current political economy proceeds from the point of view of permanent and unlimited growth, which is both logically and physically impossible on a finite planet. We call this the 'pseudo-abundance' of the material world.
2. Our current political economy proceeds from the point of view that marketization and commodification are the best way to manage and allocate immaterial resources via intellectual property. This creates an artificial scarcity of objectively abundant digital resources. We called this 'artificial scarcity in the world of immaterial resources'.
3. Pseudo-abundance and artificial scarcity are compounded by the fact that our economic organization produces more and more inequality.

Commoning as the Third Movement of the Anthropocene

Our capacity to see ourselves as interdependent with other people and species for our wellbeing and common futures brings forth a reflexive planetary response. In this movement of 'implication', a person is 'plied into' a shared concern through emerging relational awareness. In the Anthropocene, the commons has shifted from an implicit, real but unidentified concept and has acquired its explicit, relational formulation, as the domain of humanity's shared concern.

Commons arrive in many forms. Elinor Ostrom gained fame for her analyses of natural entities (woods, river, pasture, etc.) which become a commons because they are valued by local inhabitants who want to protect it for their own use. Then there are public and social commons, created by political entities such as municipalities, states, and federal systems, which are meant to extend a common good to a whole political community. One example of such commons is universal healthcare. Seeing these resources as commons in a more narrow definition, does require that these resources are managed to some degree with community involvement or multi-stakeholder governance models. We also have peer produced commons created by networks of participants, such as open source software and sharing networks. The latter are new since they are made possible only through digital networking. A very short evolutionary history of the commons would see them emerging as natural resource commons, moving to the life-risk commons organized by the working class when the 'enclosed farmers' lost access to productive resources under capitalism; a revival of citizen-produced digital commons after the invention of the Web and the browser; a powerful re-emergence of urban commons after the crisis of 2008; and an emergent commons of material production, through the cosmo-local form of productive organization, which combines relocalized production with planetary cooperation. An example of the latter is the network of multi-factories in Europe, where craftspeople cooperatively unite locally, and share their designs more globally through their common knowledge commons, the Invisible Factory. One of the next steps in the institutional evolution of the commons is the

necessity for global governance of vital resources, which cannot be the subject of militarized competition by nation-states.

The value of planetary life support systems is implicit — they do not appear valuable as commons until their value is activated by a contextual shift. For instance, when the ozone layer was depleted by industrial pollutants, threatening human collective well-being, the ozone layer has become a commons and an object of commoning. The climate as commons represents the awakening of the individual to the fact that each person shares an atmosphere with seven billion others (and countless species). With this awakening, the planet's atmosphere has shifted from an implicit commons to an explicit commons. This movement of self-awareness is mirrored by commoning as an act of governance, because those who share this commons need to make a shift toward becoming its protectors, shapers, and extenders. This is the movement from a commons-in-itself to a commons-for-itself. With respect to Earth's atmosphere everyone is a commoner, and this implies a radical democratization of planetary governance.

The transformation of subjectivity in the 21st century, of the experience and the definition of self, is the reawakening of our embodied relationality in respect to multiple categories of the commons, and its expression through our emergent practices of commoning. This can be from our connection to our local community or the resources that the local community manages for its well-being, but can also be in connection to what we experience in relation to the future of Earth's atmosphere and its suitability for human life, through which the community which is enacted is a global one in which all of us, and our children and/or grandchildren, are all critical stakeholders.

The emergence of the Anthropocene changes something vital about our understanding of the 'pulsation of the commons', i.e. the cyclic patterns of degradative and regenerative moments in human history. Before the Anthropocene, the cyclical pattern applied to particular territories and regions. What this means is that when faced with degradative ecologies and overshoot, balance could be created within a territory, and that territory could be over-run by more powerful neighbours, or the core area of civilizational management could move to a different geographic focus. For example, this pattern, shown by 'moving capitals', can be seen both in China and Maya, but also at the end of the Western Roman Empire. Under 400 years of capitalism, since it emergence in the 16th cy. as solution to the crisis of feudalism, frontiers were always available to keep the global dynamic going. But today, these frontiers are gone. Those that believe in the endless march of technological innovation might believe that the extensive growth might be changed with more intensive growth, but studies like those of Carlota Perez would indicate that the dynamic periods of growth within the capitalist cycles are combinations of many factors, and that a technology alone cannot be possibly sufficient to solve the ongoing meta-crises that we are facing.

From this follows an important conclusion: it is not enough to change from a degradative to a regenerative cycle, we must abandon the cycle altogether! In a context of global overshoot, there can be no continuation of the cycle, no return to degradation. The solution therefore, is to aim first of all for degrowth, i.e. the process of lowering the matter-energy cost of production for human need. The second new logic is that of achieving a steady state economy, a stable relation between the needs of humanity and the ecological planetary balance. And thirdly, there is an immense need for restorative and 'regenerative' activities.

Why Will the Transition Be Cosmo-Local? (Conclusion:)

One of the effects of this necessity is the change towards a new 'geographic regime'. Premodern and pre-capitalist systems were regional in scope, not global. Capitalism globalized our geographic regime, with huge transfers of people and resources all over the globe, and a transport system that costs us three times as much resources as those needed for production. This type of 'neoliberal' globalization is not sustainable. However, a pure retreat to the localwould also create huge problems.

The challenge therefore is to find ways that combine:

1) a subsidiarity of material production, with a preference for 'smart and sensible localization', since the local is the only dimension to do anti-entropic work
2) a strengthening of global knowledge commons.

The basic adage is: "Everything that is heavy is localized to the extent possible; everything that is light is shared globally".

The transformation is from 'economies of scale' through centralized mass production, to "economies of scope", i.e. "doing more with less", bringing the maximum amount of contextualized knowledge, the best insights and innovations from the whole world, at the local point of production.

We believe that cosmo-localization transcends and includes the best of the previous socio-economic systems, while also negating its degenerative aspects.

1. Cosmo-local production requires global and collaborative knowledge production, based on free association; it is a guarantee that ecological and social problems can be solved both locally and globally, without endangering local specificity, adaptations, and differences; it recognizes the true abundance of knowledge and cultural resources that should not be endangered by artificial scarcities.
2. Cosmo-local production is based on the subsidiarity principle in material production, i.e. intelligent localization, which dramatically reduces the footprint of material transport; local communities can choose wisely within their concrete resource boundaries.
3. The local production units are based on solidarity and mutualization

Indeed, it negates:

1. Artificial scarcity regarding knowledge, which excludes those without means from using the best solutions for the ecological and societal problem solving.
2. It fully recognizes the material limitations of our planet and the need of other beings as well as our mutual interdependence, by radically reducing the human footprint.

3. It fully recognizes that a successful ecological shift cannot happen without sufficient social justice.

Towards Magisteria of the Commons

As we mentioned before, Peter Pogany explained how the welfare-state / neoliberal cycle, was marked by 'weak multilateralism' and a social contract between capital and labor, and he indicates that the new 'stable system', Global System 3, would be characterized by 'strong multilateralism' and a 'compact between humanity and nature'.

The emergence of new commons-centric seed forms may give us an indication of how this could be achieved.

First of all, we have seen today the emergence of global open design communities that co-construct common knowledge, free software and open designs. These communities are digitally self-organized for producing knowledge commons through global common platforms. But with blockchain we have seen the emergence of open collaborative ecosystems that are based on open source code and community dynamics that operate at the global level, using incentive systems that attempt to align the multiple stakeholders. A number of these communities have been successful in creating socially sovereign crypto-currencies, a prerogative that used to be reserved to nation-states. They could be in effect considered to be 'virtual nations' that are constructing their own infrastructures.

But people do not live in cyberspace alone, and this instantiates the realization of our cosmo-local principle: permaculturists for example, have their feet in the mud when they do the local regenerative agricultural practice, but AT THE SAME TIME, they are cosmically connected to permaculturists in the whole world!

This hints at the possibility of creating new layers of institutions, which we could call magisteria of the commons. Magisteria are interlocking sets of institutions that govern a particular domain at multiple levels. We have functioning magisteria for science, for politics, economics and culture. What we do not have are magisteria for the commons, i.e. interlocking sets of trans-local institutions that can protect human and extra-human institutions.

R30.org has proposed a 'Global Thresholds and Allocations Council', an institution of materials scientists that can keep track of the available stock of resources, that is aware of the negative thresholds that would endanger the continued existence and possibility of the production of a continued flow of services for the present and future generations. From this knowledge of thresholds follow the establishment of criteria for developing fair allocations of these resources. This would therefore require a 'magisteria', an institution that provides valuable enough services, so that competing entities wanting to avoid war and conflict over dwindling resources, would be motivated to join, just as European nations found it useful to join the EU after a generation of intense warfare on the European continent. This implies that the management of vital resources would no longer be solely determined by Westphalian state logics and corporate markets, but

would at least be partially managed as commons for humanity and the living planet. The post-transition stable system will be a world that is no longer purely territorial and Westphalian, but has integrated accountability for the web of life, vital ecosystems and scarce non-renewable resources. It is likely the world described by Kate Raworth in her Doughnut Economics, a safe space for human development, in alliance with extra-human nature, that respects both the social floor of human wellbeing and the ecological ceiling of natural well-being, managed through commons magisteria powerful enough to protect human and extra-human communities.

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