Global Commons in the Global Brain

Cadell Last

Vrije Universiteit Brussel (VUB), Belgium

ARTICLE INFO	ABSTRACT

The next decade (present to ~2020–2025) could be characterized by large-scale labour disruption and further acceleration of income and wealth inequality due to the widespread introduction of general-purpose robotics, machine-learning software/artificial intelligence (AI) and their various interconnections within the emerging infrastructure of the 'Internet of Things' (IoT). In this paper I argue that such technological changes and their socioeconomic consequences signal the emergence of a global metasystem (i.e. control organization beyond markets and nation-states) and may require a qualitatively new level of political organization to guide a process of self-organization. Consequently, this paper proposes and attempts to develop a conceptual framework with the potential to aid an international political transition towards a 'post-capitalist' 'post-nation state' global world. This conceptual framework is grounded within sociotechnological theory of the 'Global Brain' (GB), which describes a potential future planetary organizational structure founded on distributed and open-ended intelligence; and the socioeconomic theory of the 'Commons', which is a paradigm describing distributed modes of organization founded upon principles of democratic management and open access. In the integration of GB theory and Commons theory this paper ultimately argues that an appropriate international response to the emerging technological revolution should include the creation of networks with both automated and collaborative components that function on 'Global Commons' (GC) logic (i.e. beyond both state and market logic).

© 2016 Elsevier Inc. All rights reserved.

1. Technological revolution/disruption is near (but what about our response?)

A diversity of novel technologies within the domains of robotics, machine learning/artificial intelligence, nanotechnology, biotechnology are emerging. Moreover, these technologies and their interconnection with cloud computing, big data, mobile Internet, and the Internet of Things (IoT) are increasingly enabling the formation of a global infrastructure founded upon automated smart systems and distributed social networks. These automated smart systems and distributed social networks can both self-organize from local 'bottom-up' interactions (often operating on peer-to-peer (P2P) logic), thus reducing or eliminating the necessity of central hierarchical 'top-down' control structure. Furthermore, these systems and networks have the potential to continue transforming various sectors of economic, social, and political life, including the nature of homes, factories, farms, transportation grids, hospitals, education, and even the total infrastructure of cities and countries. Thus, the purpose of this paper is to usefully engage a debate on the social, economic, and political implications of these technological changes, and specifically to engage a debate on the way these technologies will be used in relation to power and centralized hierarchy characteristic of historical organizations like nation-states and corporations.

From the purely technological perspective, the totality of these trends and developments signals the beginnings of a (so-called) 'Fourth Industrial Revolution'. This technological revolution is distinct in its speed (exponential) and scope (global) when compared to previous revolutionary waves of industrial production (which were linear and local) (WEF, 2016). Of course, the consequences of an 'exponential' and 'global' technological revolution are almost or even totally unpredictable in the sense that the structure of human life and civilization will undergo changes of a unique qualitative nature. Such a qualitative change, although without real parallel, may be considered comparable only to historical 'metasystem transitions' (i.e. emergence of higher control organization), like the transitions from (pre-historical) foraging to (pre-modern) agricultural societies, or from (pre-modern) agricultural to (modern) industrial societies (Last, 2015a,b). Consequently, when this technological revolution is considered from social, economic, and political perspectives, humanity is presented with the immanent emergence of a totally other world, and thus a contemporary situation with far more questions than answers. What is to be done?

First, we can start with the primary features of the technological shift in relation to social, economic, and political processes, which is (likely) to include the following:

A) The transition will blur the lines between the 'physical' (actual-existential) and the 'digital' (virtual) worlds challenging the logical and conceptual foundations of primarily or purely physical

E-mail address: cadell.last@gmail.com.

institutions that are constrained by geography, maintenance costs, and centralized intelligence structures; but also primarily or purely digital networks that are often isolated or disconnected from directly impacting the physical world,

B) will lead to the disruption of fundamental socioeconomic notions and organizing principles of *location*, *production*, *labour*, and *property* as many organizational forms will communicate and co-ordinate multi-locally/globally and include large-scale automated production components with advanced materials,

C) will change the human relation to public (state) and private (market) spheres of socioeconomic organization and coordination as the state constructs rigid local boundaries based on control of property and labour, whereas the market operates purely on profit-driven monetary logic without consideration for the complex and multi-dimensional spheres of human value unrelated to profit or commodity exchange,

D) will require an open, active, pluralistic, and meta-reflective dialogue between a wide diversity of actors (in all spheres of human life) about the meaning and direction of this emerging world beyond the dominant state and capitalist forms (state-capital nexus), in the hopes of finding a new level of (commons) coherence and integration, and most probably a new type of social contract (focused on a new relation between the individual's rights within the totality of the sociopolitical sphere)

Thus, the challenges presented by this emerging technological revolution are immense and in many ways overwhelming in the dimension of opportunities and problems (which both present limitless horizons from our contemporary perspective). Specifically, these technological changes offer the potential opportunity of historically unparalleled levels of productivity, abundance, and liberation – a true revolution if social and economic power can assume a distributed and open form. However, these technologies also offer the potential problem of historically unparalleled levels of labour instability, inequality, and control – a true disruption if social and economic power remains in a highly centralized and closed form. These challenges require immediate mediation as the aforementioned revolutionary/disruptive technologies and the cumulative effects of their self-organized interconnection in smart systems/distributed networks are developing quickly and being implemented within an unregulated international environment dominated by private corporate activity (international environment as structured by 'neoliberal institutions').

An international order structured by neoliberal institutions is problematic in the context of the emerging technological revolution because the systemic dynamics it engenders exhibit little-to-no common regard for social and environmental spheres, and thus no practical functional ability to manage the totality of the social and environmental spheres. Consequently, although an international neoliberal order leads to high levels of productivity and abundance, it does so at the cost of higher levels of labour instability, socioeconomic inequality, and environmental degradation. In the past it could be argued (and indeed was argued successfully in many regions) that the cost of labour instability, socioeconomic inequality, and environmental degradation was worth the price of higher levels of productivity and abundance. However, given the emerging nature of our technological horizons (of the capability to produce ecologically sustainable abundance with reduced need for human labour) it seems only logical to fundamentally re-assess the nature of civilization and the common dimension of the individuals place within it (relation between the part and the whole, the particular and the universal).

Thus, ultimately, the consequences of this emerging (exponential-global) technological revolution for human civilization is that a new understanding of geopolitics (large-scale political collectives) will be required to navigate towards a new socioeconomic world (of opportunities and problems), and that new geopolitics will require new conceptual foundations and organizational mechanisms. In order to properly situate this argument in the contemporary literature I would propose that the geopolitical problem of constructing new large-scale political collectives is the essence of the challenge presented in 'Part Four' of Thomas Piketty's *Capital in the Twenty-First Century* (2014), which is essentially a section focused on speculative geopolitical futures. The essence of this challenge is as follows:

A) global capital is out of control (private sphere),

B) nation-states cannot control it (public sphere),

C) contemporary international organizations cannot control it (pseudo-commons sphere), and,

D) if we cannot think a solution (an authentically new qualitative form of large-scale political collective), then labour instability, income/wealth inequality, and also economic-ecological instability will be seriously and potentially irreversibly exacerbated.

Piketty's now well-known 'utopian solution' would be to erect some idealized form of 'Global State' capable of regulating global markets with a progressive global tax (2014, p. 515):

> "To regulate the globalized patrimonial capitalism of the twenty-first century, rethinking the twentieth century fiscal and social model and adapting it to today's world will not be enough. To be sure, appropriate updating of the last century's social-democratic and fiscal-liberal program is essential, which focused on two fundamental institutions that were invented in the twentieth century and must continue to play a central role in the future: the social state and the progressive income tax. But if democracy is to regain control over the globalized financial capitalism of this century, it must also invent new tools, adapted to today's challenges. The ideal tool would be a progressive global tax on capital, coupled with a very high level of international financial transparency. Such a tax would provide a way to avoid an endless inegalitarian spiral and to control the worrisome dynamics of global capital concentration. Whatever tools and regulations are actually decided on need to be measured against this ideal."

Consequently, Piketty's ultimate solution for '*Capitalism in the 21st Century*' is essentially a form of '*Global Keynesianism in the 21st Century*', where we re-invent the nature of the social state and the progressive income tax, but this time instead of just reinventing these dynamics at the multi-local nation-state level, we reinvent these same dynamics for the higher global whole. Although Piketty admits that such an approach is 'utopian' in the sense of being an 'ideal' projection and thus unrealistic in the 'material' domain, he also suggests that, as the end of the above quote suggests, all attempts to solve the problem of global capitalism should be 'measured against this ideal' of what essentially amounts to a 'Global State'. The philosophical logic here is the relation between 'materialism' and 'idealism', where the 'ideal' (for Piketty) functions as an attractor state or pole for grounding materialist political construction projects. The economic logic here is that, in the same way that the inhumane consequences of free market capitalism (labour instability, socioeconomic inequality, etc.) were reduced by nation-state interventionism in the second half of the 20th century ('New Deal'), this same dynamic can be erected for global civilization in the 21st century, and ultimately save both capitalism and the state form itself, albeit at a new global level ('New New Deal').

From the perspective of the challenges posed by the emerging technological revolution (i.e. of an exponentially emerging self-organized global world founded on automated smart systems and distributed networks), these problems identified by Piketty (i.e. of global capital and its global control problem) simply accelerate the necessity of large-scale political action (~2020–2025) in order to prevent the eruption of fundamental antagonisms which are now clearly stressing the structural foundations of the world as it is, especially in relation to class struggle. In other words '*things cannot go on the way they are*': there is a real

need for a new qualitative level of political form capable of maximizing the opportunities and minimizing the problems involved in the transition to a new world that is both common and distributed in its basic power structure. Contemporary neoliberal international structure is not only insufficient, but also dangerous. The question is whether or not Piketty points us in the right direction with the 'socialist' 'ideal form' of the 'Global State' (even as an 'unrealistic' attractor state towards which we should nonetheless aim). This question is important from the traditional perspective and problem of international organizations, first identified by Immanuel Kant, which is simply that 'going above the nation-state' for a truly 'global form' is (obviously) not the 'will of the nations' (1991, p. 105):

> "States must form an international state, which would necessarily continue to grow until it embraced all the peoples of the earth. But since this is not the will of the nations, according to their present conception of international right, the positive idea of a world republic cannot be realized."

And indeed Kant's observation is, uncannily, still the foundation for the problems of international organizations, like for example the United Nations (UN), in their attempt to resolve humanist-planetary challenges that extend beyond the capabilities of both state socialism and market capitalism. As the chief of staff of the UN Susana Malcorra stated in a speech titled 'Global Cooperation Under Threat: Adapting the United Nations for the 21st Century' (2015), member nation-states lack an 'appetite' to cooperate with the UN to more fully dedicate time towards A) facilitating equal economic development, B) delivering real social justice, and C) grounding a structure of sustainable ecology. Consequently, there is no effective way for the contemporary international order to deal with multinational corporations when their activity conflicts with the interests of the real lived experiences of humans around the world. In other words, it seems that contemporary nation-states are conceding the international sphere to corporate actors, instead of engaging in an active shift to a world of 'international rights'. Moreover, the range of endemic humanist and ecological problems – CO_2 emissions, deforestation, dwindling fresh water resources, income/wealth inequality, terrorist networks, criminal organizations, political/financial corruption, unemployment, voter turnout, freedom/human rights (Glenn et al. 2014) – are simply beyond the scale of any possible nation-state (public) solutions, and beyond the interests of any corporate (private) solutions. In this situation how is a global form to be introduced and stabilized?

However, even beyond this problematic "how?" of the situation, i.e. forming a 'Global State' capable of regulating the activities of multinational corporations, is shifting state-level Keynesian solutions towards a global form of organization even the right move if it were possible (i.e. repeat the most successful populist reform of the 20th century at the global level in the 21st century)? In other words, do we simply approach the next level of human civilization with yet another hierarchical centralized form (i.e. 'Global State') when the most salient feature of our emerging technological infrastructure is of an automated and distributed networked form? Here it is important to remember that the principle feature of quantitative changes in evolution is not just a transition to 'bigger' forms (i.e. nation-state to global state) but also a qualitative change to 'different' forms (i.e. breaking state/market duality with a 'radical third'). In order to demonstrate more clearly what I mean let us consider an example from the history biological evolution: imagine a strange world where single-celled organisms formed multi-cellular organisms that simply took the form of macroscopic single-celled organisms. Of course, in actual reality, what really happened was that a transition from single-celled organisms to multi-celled organisms led to a transition, not just in *size* dimension of the form, but also in the *qualitative* dimension of the form, i.e. 'endless forms most beautiful' (e.g. protista, plantae, fungi, animalia, human symbolic sphere) and so forth.

The point here is that when integration occurs in the evolutionary process (largely as a consequence of increased communication capabilities), this 'integration' will naturally lead to the increased size of forms, but also a necessary organizational shift in the quality of the form itself that will inevitably birth novel features absent at the lower levels. Thus, like the transition from single-celled to multi-celled organisms that produced 'endless forms most beautiful', when we are thinking the transition from nation-state forms to a global form, we can expect a concomitant transition not just in the size of the form changing, but also in a *novel organizational difference of form* (i.e. "More is Different" (Anderson, 1972)). Consequently, when we are thinking about the clear quantitative increases related to the emerging technological revolution (of higher interconnection between peoples, of higher access to information, of higher production capabilities, and so forth), can we also and simultaneously think of the qualitative organizational changes – *the difference of form* – that will be necessary to navigate such a world of quantitative increases?

In this sense, instead of thinking a transition from nation-states to a global state (i.e. Piketty's 'Global Keynesianism' to combat 'Global Capitalism'), can we think a transition from nation-states to a commons (i.e. 'Global Commons')? How would a 'Global Commons' as opposed to a 'Global State' function as idealistic virtual attractor? Or said in a slightly different way, could a 'Global Commons' provide a synergistic political-economic strategy to prepare for a world founded on automated smart systems and distributed social networks in a way that a 'Global State' could not? In short the proposition here is the following one: in Piketty's clear, consistent, and thorough analysis of the fundamental problems with capitalism on the global stage, what he fails to identify and articulate is, not a problem of philosophical logic (relation between idealism and materialism), but a problem of political-economic logic: *the futuristic attractor state towards which we should aim is an attractor with a horizon beyond both capitalism and the state itself*. Piketty identifies the failure of international neoliberalism and offers international Keynesianism. But what if Keynesianism was an economic solution uniquely situated to a previous era of the historical-evolutionary process? What if the task is to think '*Commonism in the 21st Century?*'

2. Technological revolution/disruption as Global Brain singularity

Contemporary practical (elite) discourse regarding an emerging technological revolution has started to revolve around notions of a 'Fourth Industrial Revolution' (WEF, 2016), but in the general futures literature, discourse about a future technological revolution has, for some time, revolved around notions of 'Technological Singularity' (TS) (Last, 2015c, Section 3.2). The notion of TS attempts to articulate the notion that technological progress is inherently evolving via an exponential trajectory and will eventually change the human world beyond individual human comprehension and understanding. The metaphor of 'Singularity' in 'TS' theory is used in specific reference to the astrophysical properties of a black hole's 'event-horizon'. The 'event-horizon' of a black hole represents a break in spatiotemporal continuity rendering it impossible for any external observer to know the internal properties of the object in question (i.e. 'the impossible beyond' that *is* the 'black hole'). In the same way, in TS literature the 'Singularity' represents 'the impossible beyond' for human comprehension and understanding (i.e. the 'external (human) observer' attempting to discern the (beyond human) future properties of a super-technological world that is a 'black hole'). In these general futures notions the primary catalyst for future exponential change (the agent-cause of 'Singularity') is typically envisioned to be artificial general intelligence (AGI), i.e. a form of machine intelligence that vastly overpowers human intelligence, leading to essentially a 'post-human' 'future' (if such words even make discursive sense at that point).

This general AGI-TS vision, although always presented as human eschatology (i.e. end of human comprehension and understanding of the world, or end of human existence in the world), can take the form of

either a utopian and dystopian variant. Both utopian and dystopian variants were explored in the first official introduction of the term 'Technological Singularity' in Vernor Vinge's 'The Coming Technological Singularity', where he posited that (1993, p. 88):

> "Within thirty years, we will have the technological means to create superhuman intelligence. Shortly after, the human era will be ended."[1]

Thus, the introductory overview of TS ultimately concluded that, in either the utopian or dystopian scenarios, humanity was approaching an eschatological horizon (as transcendence or extinction), which set the general 'end times' tone for the literature that followed. The most popular and influential 'utopian' 'transcendence' variant is inarguably Ray Kurzweil's *The Singularity Is Near* (2005), which argues that humanity will merge with technological intelligence and 'transcend biology' for a 'super-human' or 'post-human' state of being characterized by higher love, knowledge, and organizational form. The most popular and influential 'dystopian' 'extinction' variant (at least recently) is Nick Bostrom's *Superintelligence* (2014), which argues that the further development of machine intelligence will lead humanity towards an existential 'control problem' where human beings will become eradicated by our own technological creations.

The history of this futures discourse is problematic in many dimensions. Firstly, if this literature is not totally out of touch with our future reality, i.e. AGI is either impossible (an idea with fundamentally problematic presuppositions) or will itself not lead to humanity's phenomenological transcendence/extinction (because the human brain cannot be simulated by a digital supercomputer); then secondly, it is most certainly out of touch with our approach to Singularity – the 'here to there' of exponential global technological revolution – in many crucial ways. The most important reason for this is that the theoretical emphasis in TS literature (i.e. emergence of AGI) almost completely ignores the systemic dynamics of technological revolution in relation to the emerging sociotechnological sphere mediated by the *totality of the Internet as universal medium*. In missing this systemic dynamic the TS literature fails to even confront basic issues of systemic transitions in relation to control, power, and hierarchy, and thus basic issues of systemic transitions in terms of social, economic, and political life. In short, the TS literature to date has jumped far too quickly towards an eschatological horizon (in all honesty a repressed repetition of Christian thinking and Christian notions of historical time emerging in the scientific worldview) without thinking through deeply the systemic implications of technological revolution for the foundations of human life and civilization as a total sphere.

However, in contrast to this briefly introduced and problematic notion of an 'AGI TS', the general futures literature has also been characterized by discussions of an emerging collective superintelligence in the form of a 'Global Brain (GB) Technological Singularity (TS)', where 'Global Brain' refers specifically to the *totality of the Internet as universal coordination medium*. This GB notion, founded on the metaphorical homology between global neuronal network action in the brain and global human-computer networks on earth, includes both a spatial and temporal dimension. The spatial dimension of the GB is characterized by *distributed superintelligence*, i.e. multi-agent problem solving and opportunity exploitation that occurs through horizontal communication channels (and consequently does not result in any permanent/hierarchical 'centering' phenomena) (Heylighen, 2016a). The temporal dimension of the GB is characterized by *open-ended superintelligence*, i.e. multi-agent problem solving that focuses on exploring possibility spaces and guiding immanent processual dynamics (and consequently does not rely on specifically predicting and controlling civilization development) (Weinbaum and Veitas, 2015). Thus, at its foundation, the

GB as phenomenon can be seen to consist of A) a problem of global coordination (distributed organizations), and B) a problem of global self-becoming (open-ended organizations).[2]

In this GB TS frame humanity does not face an immanent AGI apocalypse (in either a utopian or dystopian interpretation), but rather an immanent global metasystem transition founded on distributed (spatial) and open-ended (temporal) superintelligence mediated by the future Internet: of a world that self-organizes towards a planetary level via peer-to-peer platforms with no specific centers of power and of a human life that opens up towards an increasingly mysterious horizon of possibility.

Here the essence of the GB TS vision:

A) Totality of the Internet as universal coordination medium
B) Environment characterized by distributed open-ended superintelligence
C) Societal self-organization towards planetary system level

Proposed maxim for GB vision: Freedom on this sociotechnological pathway is to recognize our necessity as the beings guiding history towards the full actualization of human desire (the indestructible hard core of human becoming).

This GB TS vision can be compared and contrasted with the traditional AGI TS vision. In the AGI TS vision humanity's attention becomes focused on individual machine-learning programs that enter 'self-recursive cycles' of exponential intellect improvement towards 'post-humanity'. However, in the GB TS vision humanity's attention becomes focused on collective global issues and metasystemic transitions related to power, control, and hierarchy. This is not to say that the GB TS vision totally negates the possibility of the emergence of AGI or even post-humanity, but rather approaches the emerging technological revolution as a phenomenon that must be grounded in the totality of sociotechnological process (a conceptual shift that AGI TS cannot theoretically handle, and a conceptual shift that even GB theorists have not yet fully appreciated). Consequently, we may not be proposing too much with the above maxim to state that the GB TS theory's specific ontological function is to be a guiding tool towards a 'positive' Singularity – not as traditionally conceived AGI apocalypse (utopian/dystopian) – but as opening the possibility for the full actualization of the historical process itself as driven by humanity's (transcendent) desires (and the inherent, yet potentially immanent, adventure and mystery that will entail).[3]

Thus, and said in a different way, GB TS theory can – instead of focusing on the exponential emergence of 'post-human AGI' as an 'event-horizon-like' discontinuous break with individual human comprehension and understanding (e.g. Kurzweil, 2005; Bostrom, 2014) – make the important 'Singularity shift' and focus on the way in which distributed and open-ended intelligence can potentially self-organize from the development of automated smart systems and social networks (Goertzel, 2016a). This would, in a different way, lead to an 'event-horizon-like' discontinuous break with individual human comprehension and understanding, but only in the sense that the totality of the global sociotechnological sphere (Internet as universal coordination medium) would acquire coherent collective properties alien (qualitatively different) from any historical local sociotechnological sphere. Thus, other than the obvious local/global size difference of form between historical states and future GB, the important qualitative difference would be in the totally different qualitative organizational difference, i.e. a future GB 'state' would be distributed and open to maximizing individual becoming, as opposed to historical states, which have been (and still

---

[1] 2023 is fast approaching! On a side note, in more recent works by Vinge referring directly to his 1993 paper, he states that he would (still) be "surprised" if the Singularity had not happened before ~2030 (as long as we avoid "nuclear catastrophe", "superplagues", and a "climate crash" (2007, p. 1).

[2] To repeat, the foundation of GB Singularity as: **distributed coordination** and **self-becoming**.

[3] Including the possibility that the 'repetitive positivization' of this future utopian space/environment is an illusion covering a void (i.e. Singularity as substanceless fantasmatic projection of the non-existent 'eternal Thing' manifesting in the structure of 'modern scientific rational thought').

are) hierarchical and generally closed to maximizing individual becoming (unless it explicitly serves 'their' ends, i.e. sublimates individual minds within its substanceless (empty) virtual structure – e.g. monarchies, states, religions, corporations, and so forth).

What is missing here? In the conceptual vision of the GB, I would argue, we can see the contours of a TS theory that can make a practical contribution to the development of international institutional reforms within the context of an emerging technological revolution that has radical consequences for social, economic, and political life. However, GB TS theory has not made specific geopolitical recommendations for navigating this new world. In other words, what is missing from GB TS theory are the specific political consequences of this exponential-global sociotechnological process, in the actual capability of humanity to develop qualitatively new large-scale political forms capable of intelligently guiding the development of (already existent) human-computer networks that coordinate on a planetary level via distributed/open-ended mechanisms (i.e. horizontal communication/interaction and open-access). Thus, GB TS theory, in its identification of the possibility for totally different organizational forms within the totality of the Internet's developing structure, we gain the ability to develop an alternative political and socioeconomic solution to Piketty's 'Global Keynesianism/Global State'. In other words, can GB theorists think *Commonism in the 21st Century*?

The ground for this opening has already been presented. For example, in GB theorist Francis Heylighen's paper 'Accelerating Socio-Technological Evolution: From Ephemeralization and Stigmergy to the Global Brain', he identified globalization within GB theory as composed of two *complimentary* processes (2008, p. 284):

A) Growing connectivity between people and nations: Flows of matter, energy, and information that circulate across the globe become ever larger, faster, and broader in reach, thanks to increasingly powerful technologies for transport and communication, which open up ever-larger markets and forums for the exchange of goods and services

B) Emergence of global institutions: Fundamentally political and social these increasingly powerful flows that cross the national borders – and therefore the boundaries of most jurisdictions – need to be regulated efficiently. This requires the development of a complex, global system of agreements between all the actors involved, specifying the rules to be followed and the mechanisms to enforce them.

The first process, the 'growing connectivity between people and nations', is in some sense simply happening on its own as part of an immanent becoming of the global sociotechnological sphere. The Internet is increasing the potential flows of matter, energy, and information that circulate the globe, and this circulation is every year becoming larger, faster, broader in reach, and so forth. In the political context, this first process is totally embedded in neoliberal institutions that support the sublimation of all human life within the organizational contours of free market capitalism, a process that is principally driven by corporate forces that fundamentally seek to commodify basic necessities. However, the second process, the 'emergence of global institutions' (a fundamentally sociopolitical process), is what now requires the attention of GB theorists because the emergence of genuinely 'global institutions' does not simply 'happen' via magical coherence (i.e. the contemporary 'international community' as a 'traditional sorcerer' "left to act irresponsibly without adequate guidance or constraints" (Judge, 2015)), but instead requires conversation, reflection, and ultimately, decision-making of human actors with real structural consequences for socioeconomic development.

The issue of what are large-scale political collectives and how they could actually form will become increasingly problematic as the 'first process' of 'growing connectivity between people and nations' inevitably accelerates while the 'second process' of the 'emergence of global institutions' appears to be totally non-existent, i.e. these *complimentary*

processes identified by GB TS theory do not appear to be proceeding in a *complimentary* fashion. Even, for GB TS theory, the 'emergence of global institutions' (in contrast to the 'emergence of AGI post-humans'), could be framed as 'the impossible beyond', as tensions between various political communities rise under the pressures of planetary convergence. In other words, nation-state egos are too big and absolute for a converging world as a consequence of being subsumed into a universal sociotechnological medium at the planetary level. How do we build qualitatively new large-scale political collectives? What form will they take? What will be their internal logic? What is the chance that our idealized conception can translate into a coherently functioning intensified actuality? These are the types of questions GB theorists must confront if the consequence of '*neoliberal globalization in the age of intelligent machines*' is to be taken seriously.

The alternative to developing a coherent GB TS grounded theory of large-scale political collectives in the direction of distributed mechanisms (post-state) and open-access (post-capital) is to create the void for an AGI TS grounded theory of large-scale political collectives (a theory which, as discussed above, does not even have an elementary understanding of collective superintelligence in its distributed or open-ended form). Indeed, this is not a potential issue, but a real and already emergent issue. In the first case a type of (Kurzweilian) 'neoliberalism to the end of humanity' has been the dominant philosophy of AGI TS grounded theory of large-scale political collectives. Indeed, this was the specific political/economic formula presented in *The Singularity Is Near*, where the forces of free market capitalism are envisioned as a higher vital agent capable of producing 'god-like' machines that will in turn create utopia. Thus, in this view all we have to do is 'wait' and 'let capitalism happen' and an inclusive abundant world (and eventually transcendence) will simply happen as a natural consequence (Kurzweil, 2005, p. 74):

> "The law of accelerating returns is fundamentally an economic theory. It's the economic imperative of a competitive marketplace that is the primary force driving technology forward. By the time [this process leads] to the Singularity, there won't be a distinction between humans and technology. *This is not because humans will have become what we think of as machines today, but rather that machines will have progressed to be like humans and beyond.*"

However, besides this 'Kurzweilian variant' (i.e. free markets will take care of everything as the invisible vital agent of cosmic evolution leading us towards our 'post-human' 'utopia'), there is another emerging AGI TS grounded theory of large political collectives that is problematic in a different dimension, i.e. the 'State dimension' instead of the 'Market dimension'. To give a specific example, philosopher and AGI TS theorist Nick Bostrom (the aforementioned author of *Superintelligence* (2014), addressed issues of collective political development in relation to advanced superintelligence at the United Nations (UN). In this presentation Bostrom gave an overview of the "challenges" posed by the emergence of machine learning software (see: UN WEB TV, 2015) that focused *exclusively* on the existential risks of machine learning technologies future development and, as a result, a focus on how such advanced technological development needs to be rigidly controlled. The practical result is that we get the offer of an approach to large-scale political collectives founded, not on distributed mechanisms (post-state) and open-access (post-capital), but instead on tightly controlled and hierarchically centralized elite groups (the emergence of some form of Global State that develops advanced technology in secret and actively attempts to prevent it from being developed openly). Indeed, this was explicitly the view developed by Bostrom in *Superintelligence* (2014, p. 253):

> "[A]n international project to develop safe superintelligence would… have to be constituted not as an open academic collaboration but as an extremely tightly controlled joint enterprise. Perhaps the scientists involved would have to be physically isolated and prevented from

communicating with the rest of the world for the duration of the project, except through a single carefully vetted communication channel. The required level of security might be nearly unattainable at present, but advances in lie detection and surveillance technology could make it feasible later this century."

Ben Goertzel, a researcher with expertise in both AGI and GB TS theory, noted the massively problematic sociopolitical dimension of Bostrom's AGI TS theory that develops in this direction (2016a, p. 65):

"What [Bostrom] is advocating here, in his dry professional style, is actually quite dramatic: For the UN and all governments of the world to come together to control AGI research and development, protecting and fostering an elite AGI R&D effort carried out under the auspices by a small group, potentially even just by one person."

Thus, Bostrom's view here, although only focused on how to handle the future of AGI (and not concerned (yet) with the totality of the development of the sociotechnological sphere), is nevertheless directly antithetical to the potential GB TS vision of future large-scale political forms based on distributed mechanisms and open-access as it is possible to be. Bostrom's view, ultimately, stems from a hierarchical and closed understanding of collective intelligence (as opposed to a distributed and open-ended understanding of collective intelligence). As a consequence, Bostrom proposes an (impossible) attempt to rigidly control and predict precisely what will happen with the future development of the sociotechnological sphere in regards to AGI with the erection of a new global elite guiding technological development and implementation (which could ultimately be a more problematic 'governance control problem' than the 'AGI control problem' Bostrom intends to solve. In other words, in contrast to the Kurzweilian 'neoliberalism to the end of humanity' formula, Bostrom is starting to articulate a view that comes pretty close to 'Big Brother to the end of humanity' formula.[4] Here we can see that AGI TS theorists, like theorists in practically every other domain, have trouble thinking outside of the binary of state/market, and thus *cannot think the radical third of the commons.*

Of course, directing focus either to the productive 'utopian' potentialities of free market capitalism (Kurzweil) or the existential risks associated with the emergence of AGI 'post-humans' (Bostrom) in general is not totally unwarranted. On the one hand, free market capitalism is obviously the most productive mechanism for technological development in the history of humanity, and on the other hand, the future of AGI does indeed present us with important existential questions. Are capitalism and science – our contemporary Masters[5] – ultimately leading us towards, not the End of History, but the End of Humanity? That, at least, is contemporary Singularity ideology. However, grounding a practical geopolitical approach to Singularity in either foundation biases the conversation towards extreme positions disconnected from the realities of contemporary global evolution in relation to the totality of revolutionary technologies emerging in our sociotechnological sphere and their practical social, economic, and political consequences. In other words, from the Kurzweilian perspective we cannot simply have faith that free market capitalism will erect an all-inclusive abundant utopia when the total sphere of capitalism appears to be inherently exclusive and built on scarcity producing class antagonisms that structure the entire universal space. And, from the Bostromian perspective we cannot simply posit the paranoiac view that an AGI takeover is immanent in order to justify a reactionary position that we need a central elite

group to monitor its development in secret (and the same goes for other technologies that are presupposed as eschatological).

Moreover, and more importantly, as a consequence of these AGI TS positions there is a de-emphasis on the potential of this emerging exponential-global technological revolution to lead us towards large-scale automation (automated smart systems), radically distributed organizations (distributed social networks), and consequently, a de-emphasis on the type of conversation that would help us understand what types of large-scale political collectives would allow for large-scale human emancipation from labour insecurity and hierarchical control. In other words we have a de-emphasis on a type of conversation that would focus all of its attention on the traditional humanist attractor of (collective) 'Freedom', perhaps most articulately represented in the perfectly reasonable maxim of: 'the free development of each is the condition for the free development of all' (Marx and Engels, 2004, p. 82). Here the GB TS theoretical view can, and indeed has already, produced a much more nuanced understanding of human becoming within a world of revolutionary technologies that can organize via distributed and open-ended coordination mechanisms in relation to social (see: Veitas and Weinbaum, 2016), economic (see: Heylighen, 2016b), and political domains (see: Goertzel et al., 2016b). The step that needs to be taken now is to integrate GB TS theoretic view within the emerging discourse of the Commons. Can we imagine a *Singularity in the Commons*?

3. Towards a commonist discourse

The emerging technological revolution and its scientific-philosophic interpretation is the most salient feature that both separates and characterizes our contemporary 'here to there', i.e. the becoming space between our present moment and a totally different global world that will challenge our understanding of individual and collective human life. However, it is the *socio*-dimension in this technological revolution that is of importance for us in this section because it is in the social dimension, of political choices and decisions, which will be the difference between maximizing its latent opportunities and minimizing its latent dangers. Furthermore, considering this technological revolution is irreducibly occurring within the larger context of the Internet as universal coordination medium[6] it is a revolution with common planetary-level social, economic, and political consequences (recall the 'second process' of GB TS theory as 'global institution' formation) (Heylighen, 2008).

Consequently, in the specific identification of a lack of 'global institution' formation capable of managing the common sphere I will introduce the notion of the 'Commons Gap' (i.e. the gap from 'here to there'). In the other words, the deepest *presence* in our contemporary world is the *absence* of a universal common space: it is the lack that is *present* and the dominant phenomena structuring global antagonisms (Table 1). Thus, the 'Commons Gap' is a notion meant to identify that, in terms of geopolitics, we currently have no coherent common approach for navigating/guiding the emerging *socio*-technological revolution. First, what is the commons? The commons, in its most general formulation, can be defined as the natural (land, forests, air, water, minerals, etc.) and cultural (ideas, languages, labour, creativity) resources and spaces that all humankind shares as a result of being human and existing on planet earth (Hardt, 2010). Consequently, the commons has multiple dimensions: ecology, economy, social, political, technological, and even biological. Second, what is the gap? The gap is in the lack of common action and coordination (lack of a coherent universal common space) related to confronting problems of commons and developing common solutions (Table 1) (Here, and said again, GB theorists

---

[4] Goertzel himself has a type of 'end of humanity' formula with the notion of the 'AGI Nanny', which would consist of 'above human level' AI capable of forming a sousveillance network designed to delay/stall the Singularity itself until we realized/understood the implications of human transcendence/extinction (Goertzel, 2012).

[5] The 'big Others' of Modernity proper, the forces 'supposed to know', i.e. if we follow the 'hand' of capitalism ('circulation of profit') we will reach 'utopia', and if we follow the 'logic' of science ('observation and experiment') we will become 'God-like', and so forth.

[6] Thus making it theoretically impossible and irresponsible to analytically isolate one particular technology (AGI/robotics) in order to develop scientifically plausible (but unlikely) fantasies about its potential future consequences.

Table 1
Global Commons Gap.

Commons Gap	Examples
Ecology	Global warming (ocean acidification, disappearance of glaciers/ice sheets, sea-level rise, extreme weather events), mass extinctions (flora, fauna, diverse ecologies), resource exploitation/depletion
Economy	Income and wealth inequality, privatization of public/social goods, monopoly control of production, youth unemployment, unsustainable energy production
Social	New apartheids/State divisions, refugee crises, human rights, health and education infrastructure/access, food and water infrastructure/access, demographic divide
Political	Centralization of power, disintegration of representative democracy, State war, lone-wolf terrorism, rise of multi-local radicalism, State-corporate relations (i.e. corporate ownership of State activity)
Technological	Automation of labour from general purpose robotics, artificial intelligence (AI), and big data applications, disproportionate access to advanced technology, socioeconomic unpredictability due to emergent technology
Biological	Novel and quickly spreading epidemics/pandemics, active exploration of transhumanism (genetics, nanotechnology, robotics)

Table 2
Potential political forms of global institutions.

Global institutions	Definitions/examples
(1) Neoliberal institutions	Contemporary globalization is guided via neoliberal institutions that were originally created under patronage of United States of America, and include structures like the International Monetary Fund, World Bank, World Trade Organization which have formed/are forming a global bureaucratic structure that is essentially anti-democratic, A) enabling monopoly control of an international finance system designed to protect creditors, B) sublimating all human activity into market activity, C) creating barriers to access of basic necessities and D) failing to address issues of economy-ecology sustainability.
(2) Keynesian institutions	One potential solution to the dominance of neoliberal institutions (1) would include a 'Keynesian' institutional construction project where a global state, presumably with top-down mechanisms characteristic of nation-states at the planetary level, would form enabling the democratic election of state officials, the regulation of global market activity, creation of a common monetary union, redistribution of income and wealth, and the organization of international state projects related to social and ecological welfare.
(3) Commons institutions	Another alternative potential solution to the dominance of neoliberal institutions (1) would be the creation of 'commons institutions', which, instead of forming a 'top-down' global state bureaucracy (2), would include the creation of 'bottom-up' distributed multi-level organizational forms that operated on A) various common property regimes (essentially striving for post-property regimes), B) functioned on principles of universal access (post-monetary), and C) multiple context-specific egalitarian-democratic management organizations related to resources and services that are inherently rival (i.e. scarce), and thus need management due to 'tragedy of the commons' problems. (Further exploration of the potential nature of 'commons institutions', see: Table 3)
(4) Anarchism (no global institutional forms)	Yet another potential solution to the dominance of neoliberal institutions (1) would simply be to negate the entire notion of the need for qualitatively novel large-scale political collectives ('global institutions' in either a Keynesian or Commons form) (2, 3) and instead direct focus towards the creation and management of locally self-organized egalitarian communities. However, such an approach leaves massive questions of how to approach the real existence of neoliberal institutions, as well as how to approach planetary problems of the common sphere.

should take specific note to the *presence* of the *absence* of common action, coordination, and coherence).

Thus, to develop 'commons institutions' (in direct contrast with our contemporary reality of neoliberal institutions), is not to 'cross the gap'/'fill the lack' via hoping free market mechanisms are sufficient, nor developing a 'global state' (arguably: 'Keynesian institutions'), but rather to attempt to 'cross the gap'/'fill the lack' by developing mechanisms of common action and coordination beyond both state and market forces (introduction of a 'radical third') founded in *opening a commons/building a commonwealth* via GB-like organizational forms, i.e. automated smart systems and distributed social networks (Table 2).[7] Here, following social theorist Michael Hardt I would posit that the foundation of 'opening a commons'/'building a commonwealth' is most fundamentally about our relation to property, i.e. "what private property is to capitalism, and what state property is to socialism, the common is to commonism" (2010, p. 144).

To posit a 'Commons Gap' is simultaneously to posit that the structure of our contemporary international environment is the direct cause of a 'tragedy of the commons' that will only grow worse given the inherent dynamics of the emerging technological revolution. Ecologist Garrett Hardin first proposed the idea of the 'tragedy of the commons' (1968) to refer to the paradoxical problem that when a collective of individuals follow their own rational self-interest, this

collective rational self-interested activity can destroy the common whole. Is this not the only way to understand the contemporary state of the common whole in the age of global neoliberalism? After all, neoliberalism is foundationally structured on a belief that everyone following their own self-interest on a 'free market' will lead to harmonious and stable planetary whole and that any form of state intervention will lead to totalitarianism (Springer, 2015). However, this fantasy of inclusive capitalist utopia is now encountering the reality of common whole dissolution (Table 1), and thus, at the very least, some new form of socialist state management will be necessary, as explored by Piketty (2014) among others. Can we not say that neoliberalism is now facing the ultimate consequences of the 'tragedy of the commons'?

Consequently, in order to confront and solve 'commons problems' ('jumping' the 'commons gap' and averting an actual 'tragedy of the commons') we need to once again figure out a way to discuss common development in direct confrontation with neoliberal globalization (1) without falling into the traps of planetary state intervention (which presents us with hierarchical and closed large-scale political forms) (2) and anarchist local self-organization (which does not offer any coherent formula for solving problems of the common sphere) (4) (Table 2). Historically the political language of (authentic) common development was expressed in the (now ineffective) language of Marxism and Communism (Badiou, 2010a,b).[8] Consequently, after the 2008

---

[7] This is not to say that a successfully established commons will lead to a 'perfect world' eradicating all antagonisms (i.e. 'Eden'), *on the contrary*. The trick is to simultaneously think the overcoming of the capitalist field *and* the qualitatively higher-level structural antagonisms of the next system (antagonisms of the commonist field)… thus avoiding the naïve temptation of positing perfection.

[8] The ineffectiveness and general reluctance to return to any form of Marxist/communist theory is *totally understandable* given the historical tragedies caused by their actual implementation. However, and at the same time, the basic philosophical orientation of this paper is sympathetic with the original desires of communism, and is open to the potential to derive new ideas from a thorough exploration of their basic presuppositions.

financial collapse (an obviously crucial event in the failure of neoliberal international structure) there was a conference and edited works specifically focused on reassessing 'The Idea of Communism' in the 'post-Communist' 'post-Cold War' 'post-ideological' neoliberal age. There were several general conclusions and shared premises that united the social theorists at the conference as a whole (Douzinas and Žižek, 2010, p. ix):

A) Recent politics (1990-present) has attempted to ban/foreclose conflict by de-politicizing the idea of communism and common development

B) 'Communism' is the idea of radical philosophy and politics, but must distance itself from statism and economism, and become informed by political experiences of the twenty-first century

C) Neoliberal capitalist exploitation and domination forms new enclosures of the commons (communication, intellectual property, natural resources, forms of governance), thus necessitating a return to the concept of the 'common'

D) Communism aims at both freedom and equality, as freedom cannot flourish without equality, and equality does not exist without freedom

The general conclusion of the conference was that the historical phenomenon of 20th century communism – as a radical multiplicity of evental manifestations related to the subjective desire to overcome capitalist production for an inherently inclusive universal form of human development – was a correct intuitive impulse and may be more relevant in the 21st century than it was in the 20th century. Consequently, reviving some variation of the idea of 'communism' with coherent 'positive value' for a universal common space in the fight against a global capitalism that is 'out of control' is now the task (if we are, again, to avoid the traps of planetary state intervention and anarchist local self-organization). In my own assessment and focus of this situation I think the key shift (already evident from the above language) would be a shift from 'comm*u*nism' to 'comm*o*nism'. The shift from communism to commonism may appear a small difference – from 'u' to 'o' – but it is indeed a 'difference that makes a (meaningful) difference' because it is a difference that could have real positive consequences in the actual world (as I hope to explore more below).

However, to properly explain the shift from comm*u*nism to commonism as concept we must first confront and engage the monstrous super-organism of capitalism directly. In the theory of capitalism the foundational (spiritual) belief is that there is an 'invisible hand' moving through the world as the higher vital agent of self-organization that in-and-for-itself regulates individual self-interest related to the buying and selling of commodities in the free market. Thus, individual humans need only pursue their own material self-interest in economic exchange with others and the whole will take care of itself, i.e. market competition will solve all problems of the total sphere. And it is indeed this higher vital agent of self-organization that Kurzweil envisions as leading towards an immanent utopian Singularity as post-human transcendence (2005). But Kurzweil is not the first to have such visions of capitalist utopia. The theoretical founder of modern economics – Adam Smith – was the first to envision the 'invisible hand' as a force capable of constructing an inclusive utopian world (although he, of course, did not envision technologically-mediated transcendence).

What these capitalist utopian visions miss (post-human or not) is the obvious fact that although capitalism is indeed a universal sphere (constantly attempting to totalize the field of human relations irrespective of local cultures with the universal equivalence of money) it is not an inclusive *humanist* universal sphere (and it never can be) (i.e. it is not on 'our' side). In other words, the capitalist field is inherently structured on the exclusion of a certain exploited class of peoples (as Karl Marx first identified, class is an inherent structural antagonism of capitalist production), i.e. the 'others' in the 'invisible dystopian world' that, in their state of exploitation, stabilize the utopian and transcendent

future visions. Here we can generally imagine the person who finds capitalist production's ability to produce iPhones (for example) as 'amazing' without realizing and/or conveniently ignoring that the materials for the phone were produced by slave labourers in Congo and then assembled by slave labourers in China (i.e. the 'others' in the 'invisible dystopian world').

Nonetheless, as real (existentially) as the 'invisible dystopian world' is, it is anyway invisible to most economists (who are comfortably nested in the arms of a nation-state controlled by market forces). Thus, the idea of the invisible hand of the market coordinating individual human behaviour to holistic inclusive utopia (somehow overcoming the inherent structural class antagonisms necessary for capitalism to function) has proven to be the foundation for capitalist theory (to this very day). This logic is theoretically justified with the microeconomic modeling paradigm of '*Homo economicus*' (i.e. the rational human being pursuing individual material self-interest) (Helbing, 2013). Here directly from Adam Smith's *The Wealth of Nations* (2005, p. 286):

> "Every individual is continually exerting himself to find out the most advantageous employment for whatever capital he can command. It is his own advantage, indeed, and not that of the society, which he has in view. But the study of his own advantage naturally, or rather necessarily leads him to prefer that employment which is most advantageous to the society."

However, even a moments reflection on your own behaviour and drives (especially a reflection on your behaviour and drives before adulthood) will lead you to the conclusion that such a microeconomic foundation is a pretty pathetic foundation for a universal explanation of 'natural' human social life. It is only in an environment of 'elite experts' presenting 'sophisticated' 'mathematical models' of 'socioeconomic reality' where anyone could be convinced otherwise. At best the foundation of self-interested commodity exchange is a weak approximation/mapping of human activity in certain very specific and historically contextual socioeconomic conditions. From the purely theoretical perspective in modern economics, the idea that *Homo economicus* represents a 'universal explanation' of human behaviour is more a distorted projection of the subjective desires of economics professionals who would 'enjoy' the respect of 'hard scientists' like physicists and chemists, both of whom can formulate their subjects 'object of study' around controlled experiments that (appear to) produce 'accurate predictions' and 'general laws'.

The truth is that economics can never be formulated in the same way as physics and chemistry for the simple fact that human history is a process of subject-object (+ virtual excess) becoming, and socioeconomic context changes (quantitatively and qualitatively) over time and space, especially in relation to processes of technological evolution.[9] Indeed, it is a fact of history that subjective valuation and technological evolution affects the foundational dynamics of socioeconomic activity, which of course includes capitalism and capitalist modes of production. This is merely pointing out the obvious fact that human beings and human society cannot be understood in the same way as atoms and molecules, i.e. unconscious elements that have formed predictable configurations for millions and billions of years. The whole point of Marxist/communist theory in the first place was to posit, *not a complete understanding of a potential future world* where social-subject communistic processes ordered by aesthetics overcome economic-object commodification processes ordered by profit, but instead to posit that capitalism was not the omega of economics and human behaviour destined to dominate human life for an eternity (which is how it is often conceived in practice and in standard university discourse). Historically, this logic was not just directed towards 'moral arguments' that we can have a 'society of substance' over a 'society of profit', but also directed towards

---

[9] As was discussed above vis-à-vis the emerging technological revolution referred to in some (elite) economic circles as the 'Fourth Industrial Revolution' (WEF, 2016).

more 'practical/functional arguments' that technological evolution would eventually destabilize the foundational relation between the owners controlling production processes (the 'bourgeoisie') and the labourers controlled in production processes (the 'proletariat').

The economist Jean-Baptiste Say, for example, was one of the first theorists to realize that future technological evolution could fatally disrupt the structural workings/antagonisms of capitalist production. In what some theorists refer to as 'Say's Law', Baptiste Say posited that new more efficient and functional technologies increase productivity (more goods for cheaper cost), and that this sets off positive feedback cycles where increased supply of cheaper goods forces competitors to, in turn, create their own new technologies to increase productivity in order to compete, and so forth (Rifkin, 2014, p. 11). According to Say's Law this positive feedback cycle inherent to technological evolution within capitalist dynamics would eventually lead to 'extreme levels' of productivity in which advanced technology effectively produced abundance while simultaneously reducing and/or eliminating the need for human labour. This is the essence of the idea that the aforementioned technological revolution we are about to confront, driven by capitalist market competition, could be at its most elementary level, a phenomenon where capitalism 'hangs itself' by becoming 'too productive' (eliminating both the need for people controlling (bourgeoisie) and people being controlled (proletariat) in production processes). In other words, in order for capitalist production to function, and in order of *Homo economicus* (i.e. individual human in pursuit of material self-interest) to have even a minimal level of mapping utility (i.e. what actually happens in the real world), you first need an environment of scarcity (low production capabilities) and a culture promoting virtual profit maximization (you can never have enough money, you can never buy enough objects etc.). This is ground zero for traditional economic assumptions of human behaviour and human civilization.

However, if our technological environment is capable of (and will become increasingly capable of) producing abundance with much reduced start-up costs, maintenance costs, and labour force, as has been clearly articulated by many technologists (see: Ford, 2009, 2015; Diamandis and Kotler, 2011; Brynjolfsson and McAfee 2014), and as has also been actualized in many contemporary industries related to transportation, communications, and so forth, the simple result of these developments is that the very operating principles that have made capitalism so historically successful/dominant are themselves being undermined by the very productive forces of capitalism itself. The crucial problem from the political perspective (and for this analysis of commons institutions) lies in the fact that now, as a consequence, capitalism (or the people sublimated into virtual capital) can only dominate the economic sphere by explicitly controlling the political sphere at the nation-state and the international level, designing all policies around its own best interests (in-and-for the interest of capital). This process of capitalism universally overriding all humanist-ecological concerns (i.e. 'authoritarian capitalism') in order to preserve its own existence beyond its own necessary use-value is not a regional phenomenon but a universalizing multi-local phenomenon describing political-economic processes in Europe, the Americas, Asia, and so forth. In other words: *capitalism and democracy are going through a divorce procedure*; *capitalism is winning* via *authoritarian financial infiltration mechanisms* (*TTIP-TPP-TISA*).

Let us take one more crucial Marxist detour: the phenomenon of authoritarian capitalism attempting to continue normal profit-maximization operations in an environment of technologically mediated abundance is what the original and most effective critic of capitalism, Karl Marx, *did not foresee*. Of course, Marx was aware of the potential for future capitalism to become so productive as to render human labour obsolete (and thus 'hang itself'). In his obscure but increasingly relevant 'Fragments on Machines' – published in a section of *The Grundrisse* (1858) – he identifies what we would identify today as 'information age' trends of capitalist production (post-Fordist production), where repetitive assembly line labour would itself become

either 'fringe' or 'obsolete' due to hyper-productive machines. Here we could imagine many actual factories that exist in the world, like for example Amazon's giant automated warehouses, which are increasingly capable of self-organizing without human labour. In this world, Marx reasoned, two things would spontaneously occur related to 'manual/physical labour' and 'social/intellectual labour'. First, 'manual/physical labour characteristic of the industrial working class, forms of productive labour that can be easily privatized by owners of material production processes, would become 'objective knowledge' embedded in hyper-productive machines, and thus become socialized/collectivized. Second, 'social/intellectual labour' characteristic of what Marx called the 'general intellect', forms of labour that cannot be easily owned and privatized, would start to drive *communistic socioeconomic processes*.

In other words, Marx thought that increasing 'objective knowledge' (knowledge directly embodied and repetitively enacted in machines), would enable the emergence of a commons founded on the socialization/collectivization of large-scale automation of undesirable but necessary labour. In this vision, for Marx, we would enter a world approaching 'materialistic idealism', i.e. a world where real material 'ideal machines' – machines that 'lasted forever' and 'cost nothing' – would represent the crucial agents of the total field change from the capitalist to the communist order.[10] As a consequence of this total field change, for Marx, individual humans would experience a civilization that enabled large amounts of free time and higher levels of cultural consumption, which would in turn lead humans to become powerful holistic producers with a newly found 'power to enjoy' (Virno, 2007). Thus, in this 'materialistically ideal' communist world individual humans would be freed to act in accordance, not with the universal equivalence of money, but with social abstractions guided by the general intellect (freed of money). This focus on the future of machines was ultimately one of Marx's under-utilized formulas for a human species to practically escape both religion and capital, and thus free itself towards its own extimate virtual creation space.

However, what is clearly missing in Marx's analysis of the triumph of objective knowledge and the general intellect is that he did not foresee how – what we would now call the contemporary forces of neoliberalism in the information age – could foundationally operate on the basis of privatizing both objective knowledge and the general intellect (Žižek, 2010, p. 224). In other words, Marx thought that, once the general intellect of social production processes had triumphed over material production processes (i.e. post-Fordist 'information age' production driven by automation and cognitive labour), capitalist exploitation would be undermined on a fundamental level and communism would naturally emerge (i.e. Global Brain as Global Commons). *Why would the objective knowledge of hyper-automated machines not be socialized/collectivized*? *Why would cognitive labourers sell themselves as commodities*? These are both the crucial questions, not just for GB TS theorists, but also for society in general. Hyper-automated machines are already starting to transform our economic foundations. These machines need to be integrated into a socialized paradigm or else enormous monopolies generating insane inequalities will continue to dominate the global socioeconomic space. Moreover, cognitive labourers are increasingly selling themselves as commodities. This is destroying the potential for authentic thought and a genuinely collaborative work force.

However, the limits of Marx's imagination (i.e. not being capable of thinking a 'neoliberalism in the information age') are not the limits of the monstrous super-organism of capital (clearly). Indeed, what has actually happened (*what Marx could not foresee*) is that – instead of

---

[10] A notion that is fairly close to the arguments presented in the contemporary 'commonist' literature, like for example Jeremy Rifkin's *The Zero Marginal Cost Society* (2014), where Rifkin argues that the processes of technological mechanization related to the totality of the Internet of Things (e.g. robotics, 3D printing, solar panels) will eventually allow human civilization to produce goods and services for essentially nothing (i.e. 'zero-marginal cost'), and in the process, push capitalism to the margins, making the entire capitalist field itself 'fringe' or eventually completely 'obsolete'.

consciously erecting an autonomous universal common sphere capable of freeing the multiplicity of individual human beings to guide themselves by general intellect alone (i.e. *opening a commons/building a commonwealth* via GB-like organizational forms, i.e. automated smart systems and distributed social networks) – the general intellect has instead been parasitically shackled (by neoliberal institutions (Table 2)) via the universal equivalence of money.[11] In this very precise sense, instead of imagining the invisible hand of the market as a higher invisible other inherently on 'our side' self-organizing towards capitalist utopia (the 'Smith-Kurzweilian formula'), we should instead view the invisible hand as giving itself an 'invisible handjob' (Zupančič, 2016), i.e. virtually ejaculating on the proletariat masses by forcing the common political sphere to focus all of its attention on the exchange value of capital in-and-for-itself (maximization of profit) at the direct expense of real use value for human beings (actual maximization of well-being). This is yet another way of saying: *capitalism and democracy are going through a divorce procedure*; *capitalism is winning* via *authoritarian financial infiltration mechanisms* (*TTIP-TPP-TISA*).

However, to return to re-thinking capitalist theory (and thus eventually to move to commonist theory), we must thus start with the foundations that, instead of being an omega of economics, capitalism is in fact what the system of dialectical materialism has always stated it to be: a socioeconomic stage in an open-ended historical becoming of humanity that would eventually become characterized by higher (communistic) socioeconomic processes (enabling the human mind to explode into higher dimensions). But since the concept of 'communism' is only capable of being articulated in radical philosophical circles (having understandably lost all sociopolitical potency as a consequence of actual historical catastrophes), the revival of thinking the end of capitalism within the context of revolutionary technologies is happening within the conceptual foundation of (so-called) 'post-capitalism' (e.g. Mason, 2015). Here the 'post' denotes the inherent 'openness' to new economic processes of the 'information age', i.e. 'we do not know what the new economic system will look like, all we know is that we have to transcend the foundations of capital as commodification of the whole planet', and so forth. In these early stages of 'post-capitalist' thinking we should always remember that – at the very foundations of capitalism – is a very shaky assumption about human behaviour and our socioeconomic reality founded on principles of scarcity (thus rendering them *rival*, thus meaning we should *compete* for them, thus ontologizing *Homo economicus* as our 'natural' and 'eternal' state of being).

In other words, when 'post-capitalists' are attempting to re-interpret modern economics, we should see contemporary economics theory, not as approaching the status of a 'hard science' capable of perfectly predicting human behaviour and formulating general laws, but instead as a 'Jenga Tower' that may be one or two pieces from totally toppling to the ground. Here the 2008 financial collapse, a collapse that few mainstream economists predicted and a collapse that few mainstream economists were able to form coherent solutions for (thus necessitating the conference re-assessing 'The Idea of Communism' (Douzinas and Žižek, 2010)), can be interpreted as the beginning of the fall. To connect this to the above analysis of Marx's 'Fragments on Machines' – where he failed to identify the possibility of international neoliberalism in the information age privatizing the general intellect, instead assuming the spontaneous emergence of a universal commons guided by a collectivized general intellect (freed from privatization) – contemporary economists, like Marx in some sense, have failed to identify the possibility that we

need to *actively guide a transition* from a socioeconomic world of scarcity to a socioeconomic world of abundance. In other words:

A) Marx was wrong in thinking that capitalism would destroy itself and the commons would spontaneously emerge in the information age; and

B) Contemporary economists (Piketty, etc.) are wrong in thinking that capitalism can be indefinitely adapted to human civilization in the information age (even with high levels of state intervention).

The fight is thus the fight of figuring out how to make the Global Brain a Global Commons.[12] The axiomatic core of this fight is related to scarcity and abundance, an axiom simply not included in contemporary economics models or calculations. Economists Sendhil Mullainathan and Eldar Shafir expressed this fact most comically in their recent book *Scarcity: Why Having Too Little Means So Much* (2013, p. 10):

"We told an economist colleague that we were studying scarcity, he remarked, "There is already a science of scarcity. You might have heard of it. It's called economics.""

Thus the simple fact is that (2013, p. 10): "In economics, scarcity is ubiquitous." But, as stated, the emerging technological revolution presents us with a future socioeconomic world of abundance. This renders all standard economics obsolete. So, to the 'communists' (e.g. Douzinas and Žižek, 2010) and the 'post-capitalists' (e.g. Mason, 2015), let us throw away all standard assumptions about contemporary economics; it is in any case much more like a religion than a hard science (quite literally). As sociologist Max Weber first articulated, the *real birth of capitalism was a spiritual process*; it was about a few people thinking in a new way about money and what to do with money given the rise of a new form of industrial productive potential (Weber, 2003, p. 17):

"[C]apitalism is identical with the pursuit of profit, and forever *renewed* profit, by means of continuous, rational, capitalistic enterprise. For it must be so: in a wholly capitalistic order of society, an individual capitalistic enterprise which did not take advantage of its opportunities for profit-making would be doomed to extinction."

In this sense what is wrong with most socioeconomic or socio-technological thinking today is that it precisely ignores the most important element, i.e. the subjective dimension of *socio*-processes. At the structural 'micro-foundations' of capitalism is the subjective valuation of profit as hegemonic to all other forms of value. Thus, in the same way that a few people thinking in a new way about money and what to do with money due to the rise of new forms of industrial productive potential in the 19th century changed the socioeconomic conditions of the human world (i.e. universal subjective valuation of profit maximization via market exchange over and above all other values), we should again, simply, go back to the 'micro-foundations', think new forms of subjective valuation, and draw out their large-scale socioeconomic consequences, i.e. what would be the resulting 'macro-foundations' as 'large-scale political collectives' that developed due to new 'micro-foundations'? And in response to Adam Smith's notion that the 'natural' human state was in an endless pursuit of material self-interest (2005, p. 286), a belief that to this day forms the micro-foundation for theories of standard economics (Helbing, 2013), we can again quote Weber (2003, p. 60):

"A [human] does not "by nature" wish to earn more and more money, but simply to live as he is accustomed to live and to earn as much as is necessary for that purpose. Wherever modern capitalism has

---

begun its work of increasing the productivity of human labour by increasing its intensity, it has encountered the immensely stubborn resistance of this leading trait of pre-capitalistic labour."

Is this fact of human behaviour (that we are not just mindless automatons willing to be totalized by capitalist processes as cognitive commodities) and its inconvenience for capitalist modes of production (eternal antagonisms structuring 'class relations' as the constitutive feature of capitalist production as such) not the real reason why we are not seriously exploring geopolitical options that could create a common world founded on abundance? In other words, if we organized a world of abundance would we not be preventing the invisible hand from giving itself an invisible handjob? Is there not a way to organize the human world with a more distributed and open-ended understanding of subjective valuation so that the homogenizing dimension of 'profit-maximization as human nature' could be replaced with a multidimensional and processual understanding of human nature related to the ground of transcendental imagination? Would this not be the ultimate human project?

Indeed, actually escaping capitalism for a world of abundance would present us with an opportunity for a civilization-wide future project that resembles in many ways what philosopher Friedrich Nietzsche described as the 'transvaluation of all values'. At its most elementary dimension the 'transvaluation of values' was proposed as a systemic destruction of all foundational institutional values that seek to reduce human beings to a universal homogenizing force (either religious or capitalist); values that Nietzsche recognized as 'hostile to life' (i.e. supernature or capital as virtual pseudo-living monstrosities feeding on authentic human spirit). In the place of these universal homogenizing forces the goal for a 'transvaluation of values' would be to produce distributed and open systems inherently capable of universalizing emancipation and liberation of the human spirit to become what it can in-and-for-itself (as opposed to in-and-for supernature, or in-and-for capital as such, which are anyway basically homologous, i.e. the basic modernist formula of "God didn't die, he was transformed into money" (Agamben, 2012)). This does not mean totally abandoning virtual excess as radical other (supernature, capital) for secular humanism (all we have are relations among each other, and so forth), but instead attempting to develop and nurture a unique individual relation to the *extimate object* (*inhuman exterior in the interior*) virtual excess as such (i.e. to confront the 'innermost fantasmatic kernel', 'fantasy as necessity' etc.) (Miller, 2008). This, in some sense, would be the equivalent to what Marx understood as a communist society guided by a general intellect (and finally disconnected from religion and capital, i.e. the 'historical super-drives' shifted towards some form of 'post-historical super-drive').

Here we can now return to the importance of the conceptual transition from comm*u*nist theory to comm*o*nist theory. As discussed, in capitalism the crucial organizing unit is the 'commodity' (exchanged on the free market for a value connected to the universal equivalence of money). However, in the original formulation of communism the crucial organizing unit was imagined (idealized) to be the 'commune' (as an egalitarian site of collective emancipation from systems of hierarchy, domination, and exploitation). In the replication of the commune, so the original theory of communism presupposed, the replication of commodities and the maximization of profit at the foundation of capitalism, would be overcome by the subjective capacity of humans capable of positively catalyzing (co-producing) each other into a stable state of planetary 'species-being', i.e. a state, not just of self-actualization of collective creative potentialities, but a state of self-transcendence where the common good of the social whole would naturally be the principle and primary concern of all actualized individuals.[13] Communes would

achieve this level of collective self-transcendence through a (Badiou, 2010a):

A) Distributed structural foundation preserved via constantly renewed engagement with direct democracy, and
B) The common ownership of the (socioeconomic) productive forces of the commune as site

In *The Communist Hypothesis* (2010) philosopher Alain Badiou still identifies the 'commune' as the crucial organizing unit for the emergence of a post-capitalist world and the only true unit of organization that can break with the political binary of left and right, the economic binary of state and market, the scientific-religious binary of secular and fundamentalist, i.e. to bring forth the 'radical third' of the 'commune' capable of breaking historical binaries. Thus, for Badiou, the commune is the transcendental organization capable of freeing (historical) humanity from the external tyranny of an empty virtuality imposed by hierarchal forms in favour of a (post-historical) humanity shaped by an authentically emergent collective subjective substance. Here Badiou gives an ontological definition of the commune as (2010a, p. 200):

> "Take any situation whatsoever. *A multiple that is an object of this situation – whose elements are indexed by the transcendental of this situation – is a site if it happens to count itself within the referential field of its own indexation.* Or again: a site is a multiple that happens to behave in the situation with regard to itself as with regard to its elements, in such a way as to support the being of its own appearing."

In other words, Badiou's ontological description of the commune as site of transcendental organization is the description of a human collective (multiplicity of individuating identities) that subjectively co-produces itself. The commune thus becomes a dynamic 'object phenomenon' (meta-subject as its own object) capable of supporting "the being of its own appearing" (2010a, p. 200). As a consequence, according to Badiou, the commune as site develops according to its own higher-level internal collective subjective logic, as a site for the co-production of subject becoming (multiplicity of individuating identities), and thus derives the intensity of its own existence, not externally from virtual supernature or virtual capital, but in-and-for its own substantive relation to virtual excess: it appears in-and-for spiritual substance itself (i.e. the ultimate human 'reconciliation' with our sociocreative nature). In order to support this ontological foundation of the commune as crucial organizing unit for the future of communism, Badiou gives the example of the Paris Commune of 1871, which he regards as the true communist event, of the appearance of post-historical 'species-being' within history proper (Badiou, 2010a, p. 196–198):

> "For the Commune is what, for the first and to this day only time, broke with the parliamentary destiny of popular and workers' political movements. […] This time, this unique time, destiny was not put back in the hands of competent politicians. This time, this unique time, betrayal is invoked as a state of things to avoid and not as the simple result of an unfortunate choice. This time, this unique time, the proposal is to deal with the situation solely on the basis of the resources of the proletarian movement. Herein lies a *real political declaration*. The task is to think its content."

Here, in *The Communist Hypothesis*, Badiou gives a in-depth historical account of the Paris Commune event of 1871. From its contents it does indeed appear as a site that maps the ontological description of a transcendental organization, an organization that comes to exist in-and-for the substantive existence of the workers themselves (before becoming overwhelmed by nation-state violence). Furthermore, it is indeed possible to positively utilize this ontology of the commune as a foundation for future development, and the future emergence of a transcendental organization characterized by actualized humans in a state of species-being (even in need of revision). However – and this is a big

---

[13] And thus a far more radical notion than the 'humanist psychology' of Abraham Maslow, which focuses too much on an individualist conception of actualization, rendering it easily sublimated into the foundational architecture of neoliberalism (i.e. 'Maslow's pyramid' as brain-washing tool for bureaucratic and corporate settings).

however – in regards to this works focus on global neoliberalism and the emergent technological revolution Badiou's interpretation of the 'communist hypothesis' *must be rejected*. Specifically, Badiou's propositions for the future of emancipatory movements remain *too faithful* to the old Marxist and Communist project (i.e. "the 'we' whose virtual flag remains red" (Badiou, 2010a, p. 170)), a project that, as articulated above, could not understand neoliberalism in the information age. From my perspective Badiou fails to acknowledge A) the general consensus of 'The Idea of Communism' conference specifically in relation to the importance of understanding the 'common' in relation to the privatization of the general intellect (Douzinas and Žižek, 2010, p. ix), but also B) the implications of a 'networked world' on the historical conception of 'community/commune', as such.

First, the 'radical third' as local commune site capable of breaking and outcompeting state and market forces by transforming the entire international field via a process of self-organization appears naïve at best and almost indistinguishable from contemporary anarchist theory (although you wouldn't hear me complaining if it happened, on the contrary). The simple fact is that such a proposition puts far too much pressure on all human beings to actualize and transcend, against all odds, and against all historical evidence (save, perhaps, events like the Paris Commune of 1871, or similar sites related to the evental manifestation of self-organized territories throughout the world). The commune asks for too much subjective capacity, and thus, perhaps, makes the same mistake as the young romantic humanist Marx.

Second, can the commune as site (even as defined by Badiou) hold up to the reality of human life in networks (i.e. Global Brain as Global Commons) where *each individual is its own multiplicity of identity*? Where each individual (as a multiplicity of identity) *has its own network* and only portions of each individual's own network (at best) will overlap with another individual's network? Here various 'commune sites' may emerge from a convergence of individuals on networks but – *unlike the Paris Commune of 1871* – it will not in anyway totalize the individuated elements 'as its own object'. Instead, there will be a *radical fluidity* in regards to the individuated components even if the 'commune site' manages to 'appear' 'as its own object' over some indefinite and open temporal sequence. Do we not need a new perspective on the commune with the modern perspective of networks (an ideal GB theoretic project)? Instead of examples derived from the 19th century (i.e. the radical Paris Commune of 1871), perhaps we need a survey of how next level social networks (i.e. 'Web 3.0 social networks') could function as 'commune sites'. In other words, in the same way that Marx could not think 'neoliberalism in the information age', perhaps also the Marxist foundation cannot think the 'commune in the information age'?[14]

Thus, in contrast to the 'commune' as foundational organizing unit of 'communism', I would posit instead, along with other social theorists (e.g. Hardt, 2010; Rifkin, 2014), that we should switch our attention away from the commune and towards the common as crucial organizing unit capable of overcoming the capitalist organizing unit of the commodity (i.e. the point of this section as 'Towards a Commonist Discourse'). The potential trap of the commune is that it idealizes human social nature to unrealistic levels (i.e. gets carried away with *its own* 'inner fantasmatic kernel' of human 'transcendental subject' reconciled with its 'true substance'). Of course, it sounds romantic and

adventurous, it sounds like an ideal historical break, a true triumph of the human spirit, a true reconciliation of our social substance, and a new way to recapture the allure of the original conception of the proletariat revolution. Indeed, and here let me be clear, I think it is totally possible for the commune to emerge in a future state of abundance, as the commune could play the crucial role of meta-subject multiplicities guiding planetary transcendence. But, to say the least, it appears unlikely to be the crucial unit needed overcome neoliberal globalization in the age of intelligent machines. For that, perhaps we need a new discourse to build a Global Commons.

4. Global Brain as mechanism for Global Commons

In contrast to the commune, the common does not place the same level of pressure on idealizing human social nature. On the contrary, the common places no real burden on human social nature at all in the sense that the 'common' does not necessarily rely on the formation of new 'communal' units as such (like the Paris Commune of 1871). Rather, as stated, the common places emphasis on natural (land, forests, air, water, minerals, etc.) and cultural (ideas, languages, labour, creativity) resources that are, as a social fact, part of the common heritage of humankind. This commons can, instead of being privatized for the benefit of a few self-interested parts (neoliberal institutions and the multinational corporations that thrive under their reign), become part of a universal commonwealth that ensures the process of globalization works for the planetary whole (commons institutions) (Table 2). The commons as concept can recapture the positive sociopolitical value once possessed by communism, and in the process, perhaps, provide real substance to the contemporary lack of a universal common sphere (i.e. the most salient *presence* in contemporary geopolitical landscape is the *absence* of a commons) (Table 2).

Moreover, the commons could accomplish this without relying on the emergence of a planetary socialist state or local anarchist self-organization, and commons institutions could emerge gradually from A) democratic discursive processual mediation and B) willingness to transform the basic structural coordinates of the contemporary international sphere. In other words, in the same way that the foundations of the 'commune' were posted as 'direct democracy' and 'common ownership of property', we should precisely think the emergence of commons institutions via a similar pathway: the transformation of the international sphere towards transparent democratic engagement (i.e. castration of corporate involvement in international political sphere) and the transformation of international productive forces towards common property regimes (i.e. transforming multinational corporations into commons institutions). This could be a serious approach towards resolving the global dimension of neoliberalism in the information age/neoliberalism in the age of intelligent machines.

Thus, if neoliberalism is a problem of the 'commodification of – insert everything –' (water, food, education, health, and so on) the countermovement proposed here is the 'commonification of – insert everything –'. The crucial switch for 'communists' and the crucial positivization for 'post-capitalists' is consequently a focus on common resources and spaces: to combat institutions facilitating the dominance of rational self-interested behaviour that destroys the common whole (i.e. international neoliberalism as 'tragedy of the commons') with institutions capable of specifically organizing for the common whole. In the commons paradigm this can happen in part by dissolving the distinction between property rights and state power, and consequently opening up the space for a commonwealth based on access. To establish a commonwealth based on access would be to accept that the emerging technological revolution presents us with an immanent transition in our sociopolitical life, a transition we cannot prevent or control, but nonetheless a transition that can be *guided* towards a higher a level of planetary self-organization (or not, and likely suffer further complications related to the 'tragedy of the commons').

---

[14] In the GB literature it is possible that the paradigm of 'open-ended intelligence' (Weinbaum and Veitas, 2015) could aid in the theoretical formulation of understanding the nature of future 'communes in the information age' as it shifts emphasis away from 'higher cooperation' in 'communes' as fundamental organizing unit, and instead towards understanding how populations of 'heterogeneous individuating agents' achieve progressively 'higher levels of coordination' in network 'assemblages' (i.e. higher levels of cooperation are achieved *indirectly* via facilitating higher-levels of coordination). The task here would be to apply this paradigm to understanding the social nature of the emerging Web 3.0 world (Last, 2015d) where distributed social networks play a crucial role in connecting the virtual and actual-existential dimensions of human life, i.e. the key shift from Web 2.0 networks (Facebook, Twitter, Instagram, Tumblr, etc.) to Web 3.0 networks as getting people *away from their computer* (virtual) and *back into the world* (actual-existential) (i.e. helping humans 'rediscover' the social).

To repeat the maxim for the GB TS: Freedom on this socio-technological pathway is to recognize our necessity as the beings guiding history towards the full actualization of human desire. In other words, in overcoming neoliberalism for the commons we necessarily change our conception of freedom: freedom in the neoliberal age is the (juvenile) 'freedom to do whatever I want' (destroy planetary ecology, generate insane inequalities, and so forth), but freedom in the commons age could be the (mature) 'recognition of necessity', the necessity to grow up and organize as a species (actual international cooperation). Consequently, the commons here could present GB theorists with a political category needed to compliment the 'growing connectivity between people and nations' with the 'emergence of global institutions' if we apply to the commons the notion of 'guided self-organization' towards a 'commons in the information age' (Heylighen, 2013, p. 906):

> "[Guided self-organization means] developing schemes, programs, institutions or environments that stimulate facilitate and to some degree steer the self-organization of the Global Brain towards what appear to be the most fruitful directions, while leaving enough freedom for the system to explore a variety of unforeseen approaches."

From this perspective GB TS theory can use the commons as political category in regards to supplementing the notion of 'guided self-organization' because one of the most problematic dimensions of 'guiding the self-organization of the Global Brain' – as GB theorist Francis Heylighen has noted – is figuring out "what we want to do" (Heylighen, 2013, p. 906) with the totality of revolutionary technological processes that appear to present us with an immanent metasystem transition. *The commons speaks to this dimension of human desire*: to use the novel technological possibility space to build a common world of access where social processes dominated by substance overcome financial processes dominated by profit. In this sense the commons introduces a 'difference that makes a (meaningful) difference' because it posits that the 'self-organization of the market' is not enough (i.e. the market is not satisfying human desire towards a utopian transcendence (Smith-Kurzweil)). Thus, what we call 'utopia' as immanent 'future attractor' must be mediated/guided, but at the same time, this guided mediation must proceed without (an ultimately futile) attempt to 'close' the sociotechnological sphere with a hierarchical-centralized 'Global State'. Consequently, it is here, precisely, where the notions of guided-self-organization and the commons seem to fit together quite perfectly.

Here I would like to position two concepts that I feel can help in *guiding* the democratic mediation of a 'commons in the information age' or, as in the headline of this section: to use the 'Global Brain as a Mechanism for Global Commons'. These concepts include the *automated commons* and the *collaborative commons* to be positioned specifically in the aforementioned 'Marxist blind spot' that failed to conceptualize the necessity of consciously mediating a commons in the 'post-industrial' 'information age' (i.e. capitalism would not just be spontaneously surpassed with the rise of automated technologies and social productive forces taking a central economic position). In other words, the 'Marxist blind spot' was failing to understand the necessary mediation of the dissolution of the proletariat/bourgeoisie (controlled/controllers; Slaves/ Masters) dialectic that in some sense imprisons its analytic thought process. I would propose that the 'automated commons' be specifically positioned with the Marxist concept of 'objective knowledge' (knowledge directly embodied and repetitively enacted in machines) and the 'collaborative commons' be specifically positioned with the Marxist concept of 'general intellect' (human social and intellectual knowledge/ labour).

To construct a 'commons' with automated and collaborative components would be to set our sights on gradually working towards a 'commons in the information age' or a 'commons in the age of intelligent machines' without relying on the traditional Marxist notion of

the 'commune' as a fundamental organizing unit, and without relying on the traditional Marxist notion of the 'proletariat revolution' as universal event. Thus, both the concepts of automated and collaborative commons seek to function to 'revive the Left' (if that language even makes sense anymore) by specifically enabling progressive politics to entertain a qualitatively new approach to universality given the new technological possibility space (to overtake the political field of neoliberalism with the political field of the commons). The old Marxist concepts related to a higher political universality, both the 'commune' and the 'proletariat revolution' rely too much on an unrealistic a priori notion of a universal class of humans capable of overcoming their 'self' while simultaneously coordinating and sustaining a global solidarity movement. In other words, the traditional Marxist notions prematurely expect the emergence of a human 'species-being' (an expectations that still lingers, for example, in Badiou's *The Communist Hypothesis*). But if humanity is to achieve 'species-being' we first need a proper materialist foundation, which means a commons must be democratically mediated, which in turn means that a commons as presupposition must be posited as necessary (*this is our freedom today*).

First, the automated commons is a sociopolitical concept that is rendered possible because of the emergence of general-purpose robotics, machine learning/artificial intelligence, nanotechnology, and their interconnection with the Internet of Things (i.e. 'objective knowledge' directly embodied and repetitively enacted in machines) to compose globally networked 'automated smart systems'. Consequently, the purpose of the automated commons concept would be to establish networks with these emerging technologies related to the foundational operations of civilization (i.e. 'commons institutions' related to education, health care, transportation, farming/agriculture, energy, etc.) designed around 'commons principles' of universal access, abolition of property, and phasing out of labour (where contextually desirable) (Table 3). In other words, the function of the automated commons is two-fold: 1) to systematically prevent automated machinery/objective knowledge from being privatized and owned by small elite groups, and 2) to replace the foundational baseline of civilization functioning as 'alienated humans' with the foundational baseline of civilization functioning as 'alienated machinery'. The 'ideal-material' result of establishing an automated commons would be to free humans (universally) from basic material constraints and towards the potential for higher-levels of cognitive and social exploration (i.e. to eliminate the external-centralized institutional coercion of individual actualization potential that characterizes the historical process as such). This 'socialization/collectivization' of 'objective knowledge' with an automated commons would open up the door for the 'freedom' of the 'general intellect' in a 'collaborative commons'. Or as Marx himself noted in the 'Fragments on Machines' (1858, p. 706):

Table 3

Conceptual components of Global Commons.

Concept	Definitions/examples
Automated commons	Networks related to foundational operations of civilization (i.e. education, health care, transportation, farming/agriculture, energy) built utilizing the 'objective knowledge' of automated machinery and designed around principles of universal access, abolition of property, and phasing out of labour (where contextually desirable)
Collaborative commons	Networks of social exchange mediated by "offers" and "demands" (i.e. offer networks) facilitating the self-organization of good/services built on the foundation of social trust and reputation as primary bonding mechanism enabling the general intellect to disconnect from monetary transactions.

"[Machines] are *organs of the human brain* [...]; the power of knowledge, objectified. The development of fixed capital [in automated production] indicates to what degree general social knowledge has become a *direct force of production*, and to what degree, hence, the conditions of the process of social life itself have come under the control of the *general intellect* and been transformed in accordance with it; to what degree the powers of social production have been produced, not only in the form of knowledge, but also as immediate organs of social practice, of the real life process."[15]

Thus secondly, the collaborative commons (as general intellect) (built 'on top of' and/or 'in parallel with' the automated commons as objectified knowledge) is a sociopolitical concept that is rendered possible because of the emergence of social networks that can effectively build trust between people based on social reputation mechanisms enabling the sharing of skills, knowledge, and resources (i.e. general intellect of human social knowledge/labour bonded by social reputation instead of money). Consequently, the purpose of the collaborative commons concept is to establish social sharing networks capable of overcoming or subordinating financial transaction processes related to humanity's basic sociocreative activities. This process can be conceptualized as replacing 'market mechanisms' (buying and selling commodities) with 'offer mechanisms' (i.e. disconnecting the general intellect from money/prevent commodification of cognitive/social labour, etc.).

For the concepts of automated and collaborative commons it is important to note that both aspects of these potential future commons domains are in their earliest stages of development, and thus far from full maturation, i.e. we are obviously still at a distance from a real 'Global Commons in the Global Brain'. However, we can already see the emergence of automated commons-like infrastructures with 'automated factories' 'automated farms', or even the beginnings of 'automated transportation grids'. These are 'automated smart systems' with no need (or severely reduced need) for labour, which consequently opens up the opportunity for the establishment of 'post-property/common-property' regimes and a 'de-commodification' of the products/services they can produce. Likewise, with the collaborative commons as social 'offer mechanisms' capable of overcoming 'market mechanisms' we already see the development of sites in hospitality, transportation, energy, health care, education, goods/community services, where people can offer skills, knowledge, or resources as (beyond monetary) 'offers' bonded by a digital social community regulated by reputation (Heylighen, 2016b).

Of course, for both the automated and collaborative commons, their full maturation will be dependent on how technologies related to the Internet of Things, digital currencies, machine learning software, semantic web applications, and so forth, are socioeconomically inscribed by our international institutions (Tables 2, 3). In other words, can the Global Brain as a 'universal coordination medium' that 'self-organizes on a planetary level' function to inscribe a world that operates on 'Global Commons' logic (systems of access and democratic management) over and above both market and state logic? Would this not be a world where 'automated smart systems' and 'distributed social/offer networks' become universalized towards serving humanist-ecological use value? (see in this issue: Heylighen, 2016b). Furthermore, would this not be a 'Global Brain' aiming at the reasonable maxim of: 'the free development of each is the condition for the free development of all'?

Here we come full circle vis-à-vis 'Global State' and 'Global Commons' as 'ideal virtual attractor' (see Section 1: Technological revolution/disruption is near (but what about our response?)) If indeed 'de-

commodification' and 'opening a commonwealth' (the ideal of the 'Global Commons' as opposed to 'Global State') is the key: a commonwealth of basic human necessities: water, food, shelter, education, health, and so forth; then the focus of building commons institutions capable of 'guiding the self-organization of the Global Brain' should be on the simple yet problematic dimension of 'how?' i.e. 'how do you organize a world of access where social substantive processes overcome financial profit processes?' In other words, the problematic 'how' question is not 'how do we establish a Global State capable of regulating multinational corporations' (i.e. Piketty's ideal ground for materialist solutions), but rather 'how do we establish and manage a commons?' (the crucial shift in 'ideal pole' for 'materialist solutions'). Here a 'common' as a unit to overcome the 'commodity' as a 'system of access' (beyond money) sounds great, i.e. of access to/de-commodification of basic necessities for survival and growth:

- 'because you are a human', etc.
- 'basic necessities' are 'basic rights' (not commodities) etc.
- of the solidification of 'universal virtual/idealist rhetoric' ('universal human rights') with a proper 'universal materialist foundation' (you have a 'right' to food, water, shelter) etc.

But then we encounter the practical-actual dimension (the symbolic-imaginary encounters reality):

- there are scarce resources (rendering them 'rival'),
- these systems of access need to be established and maintained within some institutional framework,
- there are entrenched interests whose goals not only do not include the establishment and maintenance of a universal commons but whose goals are antithetical to such a phenomenon, and so forth.

Or, if 'systems of access' is the first step (automated/collaborative commons where objectified knowledge lays foundation for a society directed by the general intellect), figuring out how to practically 'establish' and 'manage' 'systems of access' is the second step.

In order to approach this crucial 'second step' (which cannot be fully articulated and solved in this paper, of course), GB theorists interested in 'guiding the self-organization of the Global Brain towards a Global Commons' should pay particular attention to the commons literature established by Elinor Ostrom (1990, 2009) for a potentially important starting point. In *Governing the Commons* (1990) Ostrom set out to articulate how the 'state/market' could be broken with a 'radical third' of a commons as 'institutions for collective action' with a specific focus on their establishment and management. In other words, instead of systems controlling property and labour (nation-states), or systems producing and consuming commodities (markets), the commons are systems for managing and distributing shared resources and spaces with a core of direct democracy (as opposed to representative democracy). For Ostrom, one of the key notions for the successful establishment and maintenance of a commons based on access is how these systems identify and properly manage "Common Pool Resources" (CPR), which she identifies as resources and spaces that are inherently 'common' but also 'scarce' and thus 'rival'. In other words, overcoming the problem of establishing and managing CPRs in a commons is the foundation for 'de-commodification' and 'opening a commonwealth', and perhaps, the key shift in transforming neoliberal institutions (and the multinational corporations that thrive under their reign) into commons institutions capable of establishing an automated and collaborative commons.[16]

---

[15] Does not this identification of Marx focusing theory on 'objective knowledge' and the 'general intellect' not reveal him to be the first true thinker of the Global Brain in materialist terms?

[16] Here, precisely, the Ostromian notion of the Commons should be posited against the (Margaret) 'Thatcherite' neoliberal acronym 'There Is No Alternative' (TINA) (to the commodification of the international space) with the commons acronym of 'There Is An Alternative' (TIAA) (to the commodification of the international space) with the commonification of the international space (commonification > commodification). As noted (8), this 'commonification' process can be understood as an alternative scheme to 'basic income' as 'commonification' simply cuts out the intermediary of money.

In this frame a resource/space can be generally defined as a CPR if one agent/persons use of the resource/space will subtract from any other agent/persons use *and* where it is often necessary, but difficult and costly, to exclude another agent/persons use outside the group from using the resource/space. Here there are numerous and extremely diverse examples of such 'rival/scarce' resources/spaces that could be classified as a 'CPR': fisheries, grazing grounds, parks, farms, transportation grids, and so forth. In Ostrom's analysis of systems for collective action that benefit the common good (i.e. higher levels of cooperation) there are always simple yet fundamental problems related to (Ostrom, 1990, p. 27):

A) Coping with free-riding,
B) Solving commitment problems,
C) Arranging for the supply of new institutions, and
D) Monitoring individual compliance with sets of rules

Furthermore, Ostrom did not just identify the problems that prevent the emergence and stabilization of commons institutions for collective action, but also identified key 'design principles' that can solve these problems, which include (Ostrom, 1990, p. 90):

A) Group boundaries clearly defined,
B) Rules governing the use of collective goods are well matched to local needs and conditions,
C) Most individuals affected by these rules can participate in modifying the rules,
D) The rights of community members to devise their own rules is respected by external authorities,
E) A system for monitoring member's behaviour exists; the community members themselves undertake this monitoring,
F) A graduate system of sanctions is used,
G) Community members have access to low-cost conflict resolution mechanisms,
H) For CPRs that are parts of larger systems: appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises

The first thing for GB theorists to note here is the difficulty in understanding and implementing the relation between the 'local' dimension and the 'global' dimension. In others words, although both the automated and collaborative functions of the commons would ideally fall within a universal medium that intelligently satisfied all human necessities – some form of 'post-monetary' 'offer network' (Goertzel, 2015; Heylighen, 2016b) – this universal medium must also be *nested* in order to meet CPR demands on multiple interacting levels, e.g. regional, continental, international, and global. On the practical level there are functions of human civilization that operate on different levels of organization, e.g. regional health facilities require different commons demands than do international transportation networks or global environmental problems, etc. But on the second societal and cultural level there is the simple fact that real groups and communities exist at multiple levels with specific needs and desires that cannot be totally ignored and replaced with a totalizing and ideological abstract universalism (i.e. 'we are all One world community, and so forth'). Thus, the point of Ostrom's commons 'design principles' is that, although they complicate the situation of establishing and maintaining a commons, they are at the same time necessary preconditions for the commons long-term viability as well the growth of pluralism and diversity within a new universal level of organization.

However, the second thing for GB theorists to note is that the Global Brain as a universal coordination medium necessarily plays a crucial role in the mediation of the transition from capitalism as universal field to the commons as a universal field (i.e. 'Global Brain as a Mechanism for the Global Commons', etc. 'commonism in the information age' as 'TIAA to TINA' etc.). First, capitalism is organized around and dependent on generating profit from the scarcity of resources, whereas the biggest problem for the commons is organizing and managing systems of access

related to scarce resources (or CPRs). Thus, the key breakthrough in the universal field transition must in some way be related to the sustainable coordination of needs and desires related to rival resources, which is precisely what the notion of 'offer networks' *intends* to address (Goertzel, 2015; Heylighen, 2016b). In this sense, can we not imagine the possibility of a universal field transition/metasystem transition mediated by a future Internet as vital revolutionary agent capable of stabilizing a commons? Does this not replace the need for a 'proletariat revolution' as vital revolutionary agent capable of stabilizing communism? In other words, instead of a revolutionary universal human class overcoming systemic alienation by overthrowing capitalist systems of exploitation and forging communities capable of higher levels of cooperation (the 'naive' Marxist notion), we have the manifestation of a revolutionary universal virtual medium (i.e. Global Brain) that intelligently coordinates the total environmental sphere of civilization functioning consequently enabling humanity to form higher levels of social organization (i.e. Global Commons).

From this perspective the problem of achieving higher-levels of human cooperation – a problem that has always plagued the traditional conception and implementation of communism – is technically solved by approaching the problem *indirectly* via the establishment of commons institutions that can successfully eliminate the material conditions that generate base-level competition in the first place. Here can we not put Heylighen (2008) in conversation with Ostrom (1990)? Or again: in 'Accelerating Socio-Technological Evolution: From Ephemeralization and Stigmergy to the Global Brain', Heylighen identified globalization within GB theory as composed of two *complimentary* processes (2008, p. 284):

A) Growing connectivity between people and nations: Flows of matter, energy, and information that circulate across the globe become ever larger, faster, and broader in reach, thanks to increasingly powerful technologies for transport and communication, which open up ever-larger markets and forums for the exchange of goods and services
B) Emergence of global institutions: Fundamentally political and social these increasingly powerful flows that cross the national borders – and therefore the boundaries of most jurisdictions – need to be regulated efficiently. This requires the development of a complex, global system of agreements between all the actors involved, specifying the rules to be followed and the mechanisms to enforce them.

This 'emergence of global institutions' can be mediated by developing the conceptual foundations of the Global Commons. Thus, on the approach to final thoughts in direct relation to 'Global Brain as a Mechanism for the Global Commons', let us reconsider the point made in Section 1 vis-à-vis the chief of staff of the UN Susana Malcorra and her speech titled 'Global Cooperation Under Threat: Adapting the United Nations for the 21st Century' (2015). Can we not interpret the problem for the United Nations in the 21st century – member nation-states lack of 'appetite' to cooperate with the UN to more fully dedicate time towards A) facilitating equal economic development, B) delivering real social justice, and C) grounding a structure of sustainable ecology as a result of an international order dominated by multinational corporate structure and ideology – as central to a focus on transforming 'neoliberal institutions' into 'commons institutions' capable of overcoming problems of cooperation with mechanisms capable of mediating a higher level of post-state and post-market coordination?

Here I would like to enter dialogue with a subtle point made by philosopher Slavoj Žižek regarding the UN that I believe needs to be engaged with in relation to the emerging technological revolution and the potential for the construction of a 'Global Commons' (Russia Today (RT), 2015):

"Although I think the UN is a totally impotent organization, sometimes great powers need such a place, where somehow, precisely

because it is impotent, everyone can state [their] position and maybe open some space for understanding."

Fair point, and in many ways I agree. *However*, this does not mean that the UN or whatever becomes of 'humanist international structure' needs to remain impotent, i.e. pathetically and hopelessly castrated by the 'invisible handjob' of the neoliberal structures of the world. Can the UN not be a democratic international space where a *commons as presupposition* is *posited as necessary*? Is there anyway to seriously discuss the establishment of a commons that is more than just 'empty humanist rhetoric', more than just a 'hysterical provocation' of 'the Master' 'by way of bombarding him with impossible demands'? (Žižek, 2006), i.e. for GB TS theory should not the 'emergence of global institutions' be represented as 'the impossible beyond' (in contrast to the AGI TS theory 'emergence of AGI post-humans')? Here we need more imagination and courage – *but also* – we need fewer intelligent minds subordinating their cognition to university discourses elaborating networks of knowledge that simply maintain the status quo of the state-capital nexus.

On a final note, when Alain Badiou spoke of the emergence of the commune as the radical site of emancipation in *The Communist Hypothesis* he spoke of it not in 'Popperian' 'scientific philosophic' 'reductive empiricist' terms (obviously), but in the terms of a radical ontological openness that focuses attention towards the transcendental constitution of reality: "note that there exists no stronger a transcendental consequence than that of making something appear in a world which had not existed in it previously." (2010, p. 220).[17] Although I in some dimensions (mentioned above) have my disagreements with Badiou in regards to the idea that the commune is *the* radical site of emancipation, I nevertheless think that we need to think precisely the dimension of: 'what is to come in practical and material terms from the 'great powers' 'stating their position' at the 'impotent UN'?' Just what 'understanding' is to be achieved here? Within what ideal pole are these materialist claims being grounded? What are the presuppositions being posited? Can we not think the establishment and maintenance of commons institutions? Can we not think the radical construction of the transcendental New within the shell of the dying Old? And if not, then I think it is time to call *bullshit* on the idea of the 'United Nations' as a useless and empty virtual structure, and even to call *bullshit* on the idea that there exists anything like an 'international community', i.e. it is just a juvenile sorcerer "left to act irresponsibly without adequate guidance or constraint" (Judge, 2015). Perhaps it is time to recognize that – in a radically converging world – we live in a structure of *Disunited Nations* (DN) (Judge, 2015).

5. Summary and conclusion

In this article I first addressed the emerging technological possibility space as possessing the latent potential for both a positive revolutionary dimension and a negative disruptive dimension dependent on whether or not humans can think new large-scale geopolitical collectives capable of guiding/mediating the inevitable and overwhelming changes that will occur within the socioeconomic sphere. Second, I posited that the processual totality of this technological possibility space was best understood within the framework of the Global Brain (GB) variant of Technological Singularity (TS) theory because GB TS theory focuses its attention on the Internet as universal coordination medium capable of generating a higher level of human organization (as opposed to a focus on AGI post-humanity). Third, I identified the crucial lack in both contemporary large-scale geopolitical visions and GB TS theory as an absence of understanding how to discuss the end of capitalism and the potential emergence of a Global Commons. And finally, I argued that the Global Brain was a mechanism ultimately capable of situating

an understanding of the emergence and stabilization of a total field change from capitalism to commonism.

In this sense GB TS theory has revolutionary political and economic potential, but only if it can think the dimension of the Global Commons and thus orient contemporary discussions of the emerging technological possibility space towards collective freedom. Considering that GB theory has at its foundation an emphasis on actualizing distributed organizations (as coordination problem) and open-ended organizations (as self-becoming problem), we can thus invite and approach the guided dissolution of hierarchical-centralized organizations that close the human mind to its own extimate potentiality, a potentiality which is each individuals own free space:

"The History of the World is nothing but the development of the Idea of Freedom" (Hegel, 1991, p. 477).

---

[17] It is in this precise sense where I invite GB theorists to think the *presence* of the *absence*.

References

Agamben, G., 2012. God Didn't Die, He Was Transformed Into Money. An interview with Giorgio Agamben libcom.orghttps://libcom.org/library/god-didnt-die-he-was-transformed-money-interview-giorgio-agamben-peppe-savà (accessed: March 21, 2016).

Anderson, P.W., 1972. More is different. Science 177, 393–396.

Badiou, A., 2010a. The Communist Hypothesis. Verso, London.

Badiou, A., 2010b. The idea of communism. In: Douzinas, C., Žižek, S. (Eds.), The Idea of Communism. Verso, London, pp. 1–14.

Bostrom, N., 2014. Superintelligence: Paths, Dangers, Strategies. Oxford University Press.

Brynjolfsson, E., McAfee, A., 2014. The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies. W.W. Norton, New York.

Diamandis, P., Kotler, S., 2011. Abundance: The Future is Better Than You Think. Free Press, New York.

Douzinas, C., Žižek, S. (Eds.), 2010. The Idea of Communism. Verso, London.

European Free Alliance, 2015. Internet as a commons: public space in the digital age. http://www.greens-efa.eu/internet-as-a-commons-13850.html (accessed: March 21, 2016).

Ford, M., 2009. Lights in the Tunnel: Automation, Accelerating Technology and the Economy of the Future. Acculant Publishing.

Ford, M., 2015. Rise of the Robots: Technology and the Threat of a Jobless Future. Basic Books, New York.

Glenn, J., Gorden, T.H., Florescu, E., 2014. State of the future 2013–14. The Millennium Project.

Goertzel, B., 2012. Should humanity build a global AI nanny to delay the singularity until it's better understood? J. Conscious. Stud. 19, 96–111.

Goertzel, B., 2015. Offer networks, A potential infrastructure for a post-money economy. In: Goertzel, B., Goerzel, T. (Eds.), Life, Society, and Economy on the Brink of Singularity. Humanity + Press, pp. 693–729.

Goertzel, B., 2016a. Superintelligence: fears, promises, and potentials. J. Evol. Technol. 24, 55–87.

Goertzel, B., Goertzel, T., Goertzel, Z., 2016b. The Global Brain and the emerging economy of abundance: mutualism, open collaboration, exchange networks and the automated commons, open exchange. Technol. Forecast. Soc. Chang. (DOI:).

Hardin, G., 1968. The tragedy of the commons. Science 162, 1243–1248.

Hardt, M., 2010. The common in communism. In: Douzinas, C., Žižek, S. (Eds.), The Idea of Communism. Verso, London, pp. 131–144.

Hegel, G.W.F. 1991. The Philosophy of History. Sibree, J. (transl.). Prometheus Books.

Helbing, D., 2013. Economics 2.0: the natural step towards a self-regulating, participatory market society. Evol. Inst. Econ. Rev. 10, 3–41.

Heylighen, F., 2008. Accelerating socio-technological evolution: from ephemeralization and stigmergy to the Global Brain. In: Modelski, G., Devezas, T., Thompson, W. (Eds.), Globalization as Evolutionary Process: Modeling Global Change. Routledge, London, pp. 284–309.

Heylighen, F., 2013. From human computation to the Global Brain: the self-organization of distributed intelligence. In: Michelucci, P. (Ed.), Handbook of Human Computation. Springer, New York, pp. 897–909.

Heylighen, F., 2016a. Distributed intelligence technologies: present and future applications. In: Burgin, M., Hofkirchner, W. (Eds.), The Future Information Society: Social and Technological Problems. World Scientific.

Heylighen, F., 2016b. Towards an intelligent network for matching offer and demand: from the sharing economy to the Global Brain. Technol. Forecast. Soc. Chang. (DOI:).

Judge, A., 2015. International community as god or sorcerer's apprentice? Strategic chaos in the absence of an interlocking temporal pattern of longer-term cyclic processes. *laetus in praesens* https://www.laetusinpraesens.org/docs10s/sorcier.php (accessed: April 2, 2016).

Kant, I., 1991. In: Reiss, H.S. (Ed.), Kant: Political Writings. Cambridge University Press.

Kurzweil, R., 2005. The Singularity Is Near: When Humans Transcend Biology. Penguin, New York.

Last, C., 2015a. Human Metasystem Transition (HMST) theory. J. Evol. Technol. 25 (1), 1–16.

Last, C., 2015b. Information-energy metasystem model (IEMM). Kybernetes 44 (8/9), 1298–1309. http://dx.doi.org/10.1108/K-11-2014-0231.

Last, C., 2015c. Big historical foundations for deep future speculations: cosmic evolution, atechnogenesis, and technocultural civilization. Found. Sci. http://dx.doi.org/10.1007/s10699-015-9434-y.

Last, C., 2015d. Offer networks. GBI Working Paper https://cadelllast.files.wordpress.com/2012/12/offer-networks.pdf (accessed: April 1, 2016).

Malcorra, S., 2015. Adapting the United Nations for the 21st Century. Brookings Institute (https://www.youtube.com/watch?v=vndTIqwjEn0 (accessed: September 22, 2015)).

Marx, K., 1858. The fragments on machines. The Grundrisse, pp. 690–712 (http://thenewobjectivity.com/pdf/marx.pdf (accessed: March 27, 2016)).

Marx, K., Engels, F., 2004. In: Findlay, L.M. (Ed.), The Communist Manifesto. Broadview Press.

Mason, P., 2015. Post-capitalism: A Guide to Our Future. Allen Lane.

Miller, J.-A., 2008. Extimity. Symptom 9 (http://www.lacan.com/symptom/?p=36 (accessed: April 2, 2016)).

Mullainathan, S., Shafir, E., 2013. Scarcity: Why Having too Little Means so Much. Macmillan, New York.

Ostrom, E., 1990. Governing the Commons: The Evolution of Institutions for Collective Action. Cambridge University Press.

Ostrom, E., 2009. Beyond markets and states: polycentric governance of complex economic systems. Nobel Prize Lecture, December 9, 2009 http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2009/ostrom_lecture.pdf (accessed: March 27, 2016).

Piketty, T., 2014. Capital in the Twenty-First Century. Harvard University Press.

Rifkin, J., 2014. The Zero-Marginal Cost Society: The Internet of Things, the Collaborative Commons, and the Eclipse of Capitalism. Palgrave Macmillan Trade.

Russia Today (RT), 2015. Untotally impotent, but world needs such a place. https://www.rt.com/op-edge/317005-zizek-ukraine-russia-un/ (accessed: April 2, 2016).

Smith, A., 2005. The Wealth of Nations. (The Originals). Hayes Barton Press, Raleigh.

Springer, S., 2015. The violence of neoliberalism. In: Springer, S., Birch, K., MacLeavy, J. (Eds.), Handbook of Neoliberalism (https://www.researchgate.net/publication/266970282_The_violence_of_neoliberalism (accessed: February 26, 2016)).

UN WEB TV, 2015. Chemical, Biological, Radiological and Nuclear (CBRN) National Action Plans: rising to the challenges of international security and the emergence of artificial intelligence. http://webtv.un.org/watch/chemical-biological-radiological-and-nuclear-cbrn-national-action-plans-rising-to-the-challenges-of-international-security-and-the-emergence-of-artificial-intelligence/4542739995001 (accessed: October 31, 2015).

Veitas, V., Weinbaum, D., 2016. Living cognitive society: a 'digital' world of Views. Technol. Forecast. Soc. Chang. (DOI:).

Vinge, V., 1993. The coming technological singularity. Whole Earth Rev. 81, 88–95.

Vinge, V., 2007. Signs of the singularity. IEEE Spectrum Spec. Rep.: Singularity 1–6.

Virno, P., 2007. General intellect. Hist. Mater. 15, 3–8.

Weber, M. 2003. The Protestant Ethic and the Spirit of Capitalism. Parsons, T. (transl.). New York: Dover Publications.

Weinbaum, D., Veitas, V., 2015. Open ended intelligence: the individuation of intelligent agents. http://arxiv.org/abs/1505.06366 (accessed: February 23, 2016).

World Economic Forum (WEF), 2016. The future of jobs: employment, skills and workforce strategy for the fourth industrial revolution. http://www3.weforum.org/docs/WEF_FOJ_Executive_Summary_Jobs.pdf (accessed: February 10, 2016).

Žižek, S., 2006. Blows against the empire? http://www.lacan.com/zizblow.htm (accessed: April 2, 2016)

Žižek, S., 2010. How to begin from the beginning. In: Douzinas, C., Žižek, S. (Eds.), The Idea of Communism. Verso, London, pp. 209–226.

Zupančič, A., 2016. Sexual is political? In: Tomšič, S., Zevnik, A. (Eds.), Jacques Lacan: Between Psychoanalysis and Politics. Routledge, New York.

Cadell Last is an anthropologist, historian, and philosopher with an interest in biocultural evolution, big history of humanity, as well as the future of humanity. His background in anthropology focuses on the divergence between apes and humans, in big history focuses on the relation between universe and mind, and in philosophy on the notions of future metasystems and metapsychology. He is currently working on his Ph.D. at the Global Brain Institute (GBI) and his research can be found at , cadelllast.com.