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Individuation and the synthesized network: An approach to digital convergence

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This paper proposes an analysis of digital convergence through the concepts of French philosopher Gilbert Simondon, who develops a theory of technicity as a mode of existence of humanity on par with religion, science and art, and describes an evolution of technicity that culminates in networks by which the world itself becomes technical. The paper relates contemporary digital technologies, which converge in algorithms, gadgets and the internet, to this theory, including an examination of the roles played by machines, humans, and the external world in different stages of technicity, a discussion of how digital technologies involve problems of affect and embodiment, and suggestions concerning the social and political import of such problems. I argue that contemporary technologies of digital convergence perform an operation of synthesis whereby not only are different networks tied by the same operation, but also the technical roles of machine, world, and human are merged.

Since the Industrial Revolution, the question of technicity has gradually increased in importance, and by the twentieth century had become central to philosophy, in notable texts including those of Walter Benjamin (2000), Martin Heidegger (1958), and Theodor Adorno and Max Horkheimer (1974). The growing presence of machines in daily life, war, art and politics raised the issue of the relationship between humanity and its own creations. Simondon contributed to this debate as the first to declare explicitly that technicity is more than just a human faculty: it is one of the fundamental human modes of being in the world, commensurate with religion, art and philosophy. The fundamental flaw of most accounts of technicity (and most uses of technology) is their tendency to exclude it from culture altogether, thus envisaging machines and other technical objects as either a threat or a miracle (or both). To incorporate technical reality into the concept of culture, alongside science and the humanities, was one of Simondon's central tasks, because only by taking into account technical existence into thought would it be possible to describe a relation to technicity that is not alienating or destructive for both humans and machines.

It is clear that digital technologies, the global computer network, and the near ubiquity of so-called "gadgets" bring the question of technicity further to the fore. Not only is our relationship to the world entirely mediated by technical apparatuses, it is for the most part mediated by one great instance that connects several others, namely the internet. From research to friendship, from shopping to mating, from investing to spying, more and more human activity is coded into this network. Several authors have recently deployed Simondonian concepts in an effort to theorize this process, including Bernard Stiegler (1994), Brian Massumi (2009), and Adrian Mackenzie (2002). They all develop Simondon's ideas in concert with those of other authors, as Simondon himself never experienced the rise of digital technology in everyday life. Nevertheless, it is noteworthy that the reality of a world where algorithms mediate almost every possible relation has revived the interest in a nearly forgotten philosopher, as if Simondon's reflexions regarding psychosocial individuation and technicity had been dormant, waiting for their time.

Indeed, Simondon's association between affectivity and technicity, politics and life, culture and work, resonate more and more as the convergence of these aspects of reality becomes more apparent. Simondon's thesis on machines is a call to introduce technical objects into culture: machines contain human reality, human efforts, in conjunction with "natural forces". Technicity is a fundamental human mode of relating to the world. But Western culture, Simondon argues, is split between literary and scientific strands, resulting in an approach to machines as either an enslaving threat to humanity or an enslaved force working for the leisure of humans. One manifestation of the latter is the way the industrial society treats its own products, rendering them obsolete while still perfectly capable of operating, for the benefit of the economic system. The technical object is stripped both of its link to natural forces and its link to humanity in two

ways: people lose the opportunity to engage durably with the object's capabilities, while also missing the opportunity to extend their own technical ability.

For Simondon, this problem stems not from technology itself, not even from industrial technology, but from an intrinsically flawed relation to technicity. In an oft-cited passage, Simondon (1958, pp. 246-251) suggests that the Marxian notion of economic alienation should be extended to encompass a more fundamental alienation: that of work itself, because more than the alienation of the individual that reproduces her means of existence, Simondon wants to stress the alienation of the human subject from her own technical and transindividual gesture when it is reduced to the idea of "work". The most alienating technical objects, for Simondon (1958, pp. 250-251), are those made for users ignorant of their operations, who will degrade them quickly and envisage them with the same perspective by which they came to their hands: economically.

This article uses concepts borrowed from Simondon in order to examine the phenomenon of digital convergence in relation to human technicity in general – that is, what digital convergence represents in the development of this mode of existence for humans. For such an examination it is necessary to take stock of the themes that are tightly connected in Simondon's thought: the evolution of technical objects and ensembles; the process of technical individuation; and how this individuation appears in relation to bodies (affects) and collectives. The disconnected examination of these themes leads to the alienated conceptions of technology that Simondon laments.

This discussion of digital convergence through Simondon demands firstly an overview of how the most ubiquitous and advanced technological forms (networks) fit into Simondon's theory of technology. In the second section, I then discuss the most common traits of digital convergence that have been raised in the work of authors such as Manuel Castells and Pierre Lévy through the lens of concepts drawn from Simondon. In this section, I argue that digital convergence points to a tendency for technical networks to become united in a "synthesized network". The third section is dedicated to the role of computers and algorithms in the development of this synthesized network, through the projects of Alan Turing and John von Neumann. The ideas presented by George Dyson in "The Turing Cathedral" are confronted with the concept of the synthesized network in order to question the relation of an artificial intelligence to collective individuation and affectivity. This is further explored in the fourth section, which discusses Adrian Mackenzie's theories about the embodiment of contemporary technologies and their relation to speed, time and space.

Simondon and networks

Networks appear in Simondon (2005, p. 86) as the highest stage of development of technicity, the point in which "the world becomes technicized". This claim carries several meanings that should be stressed before dealing with the outreach of technicity in the context of digital convergence. Within Simondon's philosophy of individuation, the terms "world" and "technicity" apply to two dimensions of the "transindividual", which is the regime of individuation particular to the living being whose own internal tensions demand the development of psychic existence. It is important to note that the division between individuated and milieu occurs within the living being itself, having become a *subject* whose own action is part of the milieu. The subject is psychosomatic and the milieu is no longer simply *nature*, but *a world*. Once there is a world, there is plasticity, so that the relation between the living being and the world is mediated by the subject's own psyche, mental images (symbols, concepts, objects) relating not only to the external reality and the internal body, but also among them, in an internal resonance that develops an ever more complex psychic life of its own. Where this mediation implies the representation and modification of the world through action, there is *technicity*.

Technicity refers to the mode of existence of the subject, as it relates to its world in a problematic way: for every problem, there is the need to *invent* a solution to resolve the tensions, in a single new form, which is *metastable* (that is, contains the tensions that gave origin to it, and maintains a communication between the different levels of reality that called for it). Being metastable, technicity keeps the door open for new inventions: when the solutions brought by a certain stage of technical existence no longer resolve the tensions within the mediation between subject and world: technicity evolves. "At elementary levels,

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technical activities appear essentially as a functionally useful mediation; at superior levels, internal criteria of self-correlation, therefore intrinsic perfection, prevail" (Simondon, 2005, p. 86).

If the first sign of technicity is what Simondon calls "methods" – animals and humans making marks on the external world – his properly technical analysis begins with the extension of the body and the senses by means of tools and instruments respectively. These evolve into utensils and devices, objects that include an internal functioning logic, their own mechanism: not all operations, not all information, are directly linked to the operating subject. This internality is meaningful and becomes more significant with machines. Machines have an internal system of relations and functions that transform movement (simple machines); if they have energetic autonomy, but depend on a direct operator, they are tool-machines; "actual machines" are autonomous in terms both of energy and of information (operation). The completed machine is liberated from the operator and can "function far from him" (Simondon, 2005, p. 99).

So far, the distinction between subject and world is clear. Information originating in the world produces a tension in the psyche. The subject formulates the images that will symbolically and physically respond to it; this psychic conception can be channelled into information supplied to another object, also external: the machine, which will act upon the world. Technical individuals and ensembles, as they evolve, develop their own milieu, most perfectly adapted when it is simultaneously technical and geographical, pertaining both to the realm of the technical and to that of the world. The term *world* is not to be confused with *nature*: it is already grasped by the subject's inventive psyche; it is a perceived outside, where the potentials are already stated and related to the subject's actions. This double creation of the object and the milieu, writes Simondon (1958, p. 56), "could also appear as naturalization of man; between man and machine, a techno-geographical milieu is created that only becomes possible by means of human intelligence".

Yet Simondon refers to the highest level of technical concretization as the moment at which the world is technicized. The subject's Other must then coincide with its regime of intermediation. The device that circulates information, which used to be the tool or the machine, is now the world itself. Simondon cites such networks as including the telephone system, the electrical grid, and especially the maintenance systems needed for any machines to subsist. In these cases, the human operator only acts on terminals, whereas the system's internal regulation is the fruit of one or several centres. Technical reality has a tendency to converge into networks, as polytechnical technologies replace isolated ones while ensembles concretize. The proximity between world, human, and technology tends to grow, while the internal flow of information becomes more cohesive. This is the world as technicized: "Thus are constituted certain clusters [*hauts-lieux*] of the world, natural, technical and human; the conjunction and interconnection of these clusters creates this polytechnic universe, both natural and human; the structures of this reticulation become social and political" (Simondon, 1958, p. 220).

The reticular world is that in which technicity and politics coincide, since the world itself is technical, while the technical network has its own relation to the natural world, notwithstanding its relation to humans. The notion of *haut-lieu* represents gateways or interfaces between the natural reality as still a milieu for the technical ensemble and its modulation into the world of a technicized milieu (e.g. energy plants and distribution centres). The *haut-lieu* incarnates the mystery, even the sacredness of the technical network, because with a significant level of independence from the human operators, what occurs in it is the transformation of signal and energy that justifies the existence of the ensemble, including the subject.

This individuation is both technical and collective: transindividual. Progressively, the distinction between subject, world and technical mediation is blurred. Once the network becomes ubiquitous, all action is embedded within this mediation. The user of the terminal is adapted to the operations of the network while also acting as one of its inventors. *Usage, operation and invention are, at this point, potentially the same activity*[1]. "Technicity is part of the world, not only a set of means, but a set of conditions for action and incitation to act", Simondon argues. After all,

[1] Potentially, because few people actually invent or even operate the machines. The debate over inserting code into school curricula centres on this point.

> [w]e switch our tools and instruments, we can build or fix a tool, but we never switch networks, we do not build networks ourselves: we can only attach ourselves to the network, adapt to it, participate in it; the network dominates and contains the individual being's action, it dominates each technical ensemble. Hence a form of participating in the natural and the human world that brings an incoercible collective normativeness to technical activity; ... through technical networks, the human world acquires a high level of internal resonance (Simondon, 1958, p. 221).

Simondon distinguishes between the roles played within technicity according to the development of technical objects. When it comes to tools, humans are presented as tool carriers; when it comes to machines, humans are the operators and the machine is the tool carrier. When humans are tool carriers, the tool relates directly to matter, the "geographic milieu", so that the human senses the world through the tool. Simondon's (2005b, pp. 52-60) beautifully illustrated example is woodcutting: it is necessary to sense the log's internal structures, its veins and knots; otherwise the clapboard will be imperfect. Technicity involves a transductive relation between world and subject, in which the builder knows the weight of the bricks, the weather conditions, the resistance and consistence of the ground. This is how technical individuation fosters the emergence of a technical milieu. The human itself may be a milieu, a world for the tools and instruments. Schooling, for instance, is a technical system in which the student, from a certain point of view, is the matter that that technical action will transform. This is also the case for medicine, military technology and urbanism.

With machines, another role is added to those of tool carrier and world: the operator. The relationship between human, world and machine is more complex: the machine relates to the world, while the human senses the world through the machine, i.e., she senses the signals sent by the machine's instruments, as these instruments sense the world (whereas with the tool, it is possible to directly sense the contact between the technical object and the milieu).

What makes networks a form of return is that they operate a progressive *fusion* of these roles. By establishing a communication between terminals – "stations receiving and sending information to or from the machine" – (Simondon 2005 p. 99) and centre, in which the flow of information between machines and tools is continual and reciprocal, and in which the technical being senses the human as much as the human senses the technical being, the network marks the most extreme point of the tendency by which "the world becomes technicized". This means that the ultimate network is that in which all these roles – the (technicized) world, the tool carrier, the operator and the tool – are assimilated.

Another important consequence is that different networks tend to relate to one another directly, as they perform roles of external milieu (world) for each other and each network feeds other networks with information. This role of "network of networks" is the very meaning of political and economic systems in general, as they bring a certain coherence to a set of otherwise independent networks (cf. Luhmann, 1995).

Simondon's concept of technical concretization stresses that the elements of technical individuals tend to converge functionally. Likewise, the problems faced by the collective are progressively bound together and often share solutions. Simondon (1958, pp. 65-70) argues that the comparison between technical evolution and biological evolution is flawed because living species do not (at least "spontaneously") share parts of their genetic code in order to solve another species' tensions in their relation to the world: the eagle does not transfer its wings to the dog (unless a bioengineer manages to do it; cf. Garcia dos Santos, 2003, pp. 81-106). Technical evolution does precisely that. An engine created for military aeroplanes may soon be in full use in private automobiles and laundry machines. Simondon names this *law of relaxation*.[2] This mobility of technical elements is crucial for digital convergence.

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[2] Garcia dos Santos (2003) demonstrates how genetic engineering consists in extending the technical (and economic) logic to the deepest areas of the natural world, extending Simondon's law of relaxation. As this extension makes use of digital technology, it can be yet another operation pertaining to the synthesized network.

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Convergence

Since the concept was first sketched by Kittler (1986), accounts of digital convergence have tended to focus on one or both of the following aspects. The first is its effect on the market, particularly telecommunications and media. The second is its effect on personal relations and social processes. With Simondon, we have seen that both these perspectives must be studied together under the focus of technicity, understood as a mode of existence of the human subject (transindividual). This amounts to an examination of the categories of world and subject and the roles of operator, tool, tool-carrier and matter, which then can unfold into a question about collective determinations.

Commenting on Manuel Castells' notion of "mass self-communication" (Castells, 2009), psychologist Rocío Rueda Ortiz (2009, p. 117) writes that digital convergence is "a double convergence process, one technological, the other cultural and political". While "spectators receive services without realizing how diverse technologies converge in the same platform", "references and symbols are distributed in an increasingly universal and convergent manner", generating new segmentations of cultural products, while also fostering the development of minority movements that resist the hegemonic models. She argues that digital convergence leads to "techno-cognitive transformations", in which the "perceptual organization of space-time", "epistemic orders", and the "coding of (present, past and future) models of the social order" (Ortiz, 2009, p. 118) are radically changed. She raises thus the consequences of a ubiquitous technical ensemble (network) over the lives of collectivities, as the perception of the outside world is affected by digital convergence.

The same points are raised by Pierre Lévy, a noted author regarding the possibilities opened by digital technologies for the public sphere. Since his 1990 book *Les Technologies de l'Intelligence*, Lévy (1990, p. 4) has argued that "the very bases of social functioning and cognitive activities are changing at a speed that all can perceive directly", so that "we must necessarily reformulate in our minds the technical phenomenon if we are to progressively install a techno-democracy". This quote summarizes much of Lévy's project – including books such as *L'Intelligence Collective* (1994), *Cyberculture* (1997), and more recently, *The Semantic Sphere* (2011). For the purposes of this article, it is useful to stress one of his arguments in particular. In a recent article, Lévy (2009) contends that while the extension of cyberspace creates a new dimension available for collective deliberation which is increasingly global, horizontal, and blurs the distinction between public and private, the semantic sphere faces difficulties when dealing with the distinctions between languages and the distinct forms of classification that abound in the digital community. These manifestations of singularity are obstacles to the further convergence of this new kind of social sphere born from the global network of networks. A universal system of semantic and conceptual tagging that would synchronize the "virtually infinite diversity" (Lévy, 2009, p. 96) of people and online networks is necessary, according to Lévy. This argument suggests that the evolution of the network, as a core of human technicity (i.e. mode of existence), expresses an intrinsic need to constant perfection, tending to the infinite. I shall explore this tendency in the following sections.

With the political goal of exploring the possibilities of emancipation through notions such as folksonomy and folk communication, Sabbatini (2011) writes that "digital convergence unifies communication fluxes" and points towards "a synthesis operated by the Web. In this convergence, the interactivity of the digital medium is expected to allow for the traditional receptor, passive element in the communication process, to become a receptor-producer". Citing Briggs and Burke (2004), Sabbatini describes digital convergence as a further step in what was called "multimedia" in the 1990s, adding that recent digital gadgets allow for transformations that go beyond the network itself, in what Jenkins (2008) describes as a "culture of convergence". Sabbatini figures among theoreticians who advance the problem of societal appropriation of the network, which amounts to an appropriation of technicity. Otherwise, society would be alienated from its own mode of existence, as the network would be subjected to an alien normativity–that of finance and politics. Sabbatini points towards the newly created roles for the social subject incorporating their own affect and creativity into the network.

How does Simondon help to interpret the synthesis operated by the processes of digital convergence? From the texts cited above, this convergence seems to be the farthest humankind has reached in rendering inseparable the political and the technical, the affective and the operational, the local and the global. While Simondon defines networks as a dialectical moment in the development of technicity in which

technical reality returns to nature after having denied it, digital networks go further inasmuch as they attach themselves to human reality in the same way as to the natural reality: their activity takes human actions, gestures, individuating activities, and so on as the source of potentials and information that will take form digitally. When Steve Jobs insisted that devices should be multifunctional, leading to the development of smartphones and tablets, he exhibited the same reasoning: the gaps and silences between networks, devices, actors, should be minimised as much as possible. All information should be *present to itself* – that is, to the network – and the technicity of the network should be able to resolve the tensions by itself.

We shall see in the following section that the roots of this reasoning can be traced to the very origins of computing. For now, I must add that Simondon (1958, pp. 153-240) demonstrates that this tendency encompasses the whole of technicity. As we have seen in the last section, when technical networks evolve, they generate a world for themselves, in which the intrinsic possibilities of physical reality (i.e. nature), of psychosocial configurations, and of technical objects and ensembles all function under the same operational logic: they *transduce* together. This was true in Simondon's time, as cities, for example, can be interpreted as networks of networks, connecting subsystems of water supply, sewage, electricity, gas, transportation, public administration, and so on.

Therefore, digital convergence represents a contemporary form of the fusion of the roles described by Simondon within a general network, achieving what could be called a *synthesized network*, which differs from the usual "networks of networks" such as the city for the oneness to which it tends. It is not only a case of coordinating networks, but of unifying them. The diverse and supposedly incommensurable flows of information must be made to share their individuation; they must have the same language, the same code, which is interchangeable (in the sense of Simondon's law of relaxation). Lévy, for instance, defends this idea very clearly from the point of view of its emancipating possibilities. This demand for oneness is as vast as the collective itself, as originally the relation between different networks exists ultimately through their transductions with human embodiment. With a synthesized network, the transduction can potentially occur entirely inside the technical ensemble, so that the terminals, by means of computers, gadgets and other screens, work as the network's *hauts-lieux*.

Furthermore, in the digital world, the most present interface of which is the internet, a new feature is added: the realistic perspective with which human affects and cognition may be transported into the circuitry of the network, but playing the role of milieu. This is suggested in Rueda Ortiz's reference to techno-cognitive transformations. To sum up the argument so far, the synthesis means that technicity becomes progressively general and unified. Every subsystem (every network) of the transindividual reality, from governments to families, from corporations to legal systems, can be envisaged as a *world* for the synthesized network – that is, a reservoir of affective potentials for new individuations.

If the technical ensemble can be compared to the living being, as Simondon does, then its metabolism is dependent on operations performed by the user, as inventor (e.g. coding), as supplier of information (feedstock), and as the user who posts, performs, interacts (tool and instrument). The human plays a role of tool, for example, when a member of the network is called into action to make the operations occur, for instance in the gesture of inventing locally, or in the act of digitalizing analogical information. As for the technical ensemble constituted by the network, it must be able to operate in the same sense as the human operates machines (while they are envisaged as tool-carriers). Finally, the novelty brought by the possibilities of digital convergence is that the network begins to seek and sense, in the world *and* in the human – and we must keep in mind that in the technicized world of networks all that is human also plays the role of *world* – the information it needs in order to operate its technicity. This information comes under the form of affect, as we shall see in a further section.

Thinking and doing

The argument that technical ensembles could synthesize the operation of their own technicity first appears in a series of texts by Alan Turing, written between 1947 and 1952. Turing conceives of machines that effectively think, meaning they would solve problems guided by rules of thumb (cf. Copeland, 2004, p. 363) and learn from experience. These principles form the base of generate-and-test algorithms, central to the contemporary research on artificial intelligence, in which "potential solutions to a given problem are

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generated by means of a guided search. These potential solutions are then tested by an auxiliary method, in order to find out if any actually is a solution" (Copeland, 2004, p. 364). Turing inaugurates a technical conception of thought that became hegemonic in the digital age, in which "intellectual activity consists mainly of various kinds of search" (Copeland, 2004, p. 431).

Another stage in the development of the digital capacity to operate its own technicity appears in John von Neumann's breakthrough computer of 1947 that, applying Turing's ideas, "broke the distinction between numbers that *mean* things and numbers that *do* things" (Dyson, 2012, p. xi). It is not by chance that Von Neumann idealized the universal constructor in his "Theory of Self-Reproducing Automata" (published posthumously in 1966). Von Neumann was very accurate in identifying that science in the future would be concerned with "problems of control, programming, information processing, communication, organization, and systems" (Burks, 1970, p. 3). When developing his calculations on machines capable of replicating, the mathematician was interested in stressing the similarities between the living systems studied by Wiener's cybernetics and computers as conceived by Turing. Von Neumann was looking for the answer to a question about the logical organization necessary for an automaton to *control itself* and ultimately *reproduce itself*. Von Neumann went one step further than Turing: while the latter had in mind a thought entirely disconnected from life (i.e. affect), he already wondered how the systematic characters of computers and living beings could converge.

The point in evoking Turing and von Neumann is that if the machine (i.e. the network) is expected to play the roles in the technical mode of existence that were once played by the human, then it must be driven by similar motivations. Motivation is a tricky word, as it presupposes the affective dimension absent from Turing's formal idea of thinking; nevertheless, the term already implies a certain form of embodiment that will be discussed in the next section. For now, it is important to note that thinking, when the affective character is abstracted, can be understood as a proxy to computation (thinking, like computing, is searching). The development of artificial intelligences is thus an important part of the return of technicity over the world and the subject. Technical means become able to define a crucial aspect of what it means to be a technical subject. If so, then the synthesized network can operate and transduce the subject; and the affective aspect of thought and action assumes the role of matter, feedstock, and potential of information.

Dyson (2012) offers a hint at how this process is taking place and its potential meaning. He compares a visit to the Google headquarters with a hypothetical tour of a medieval cathedral under construction. What makes Dyson's comparison interesting is that medieval cathedrals were *hauts-lieux* in a network that involved belief, power, technicity, art and the economy, much like contemporary cities and stock exchanges. Through a network of religious centres, entertained by religious servants in close relation to secular powers, several dimensions of reality were put in relation, acting in the definition of the world of the transindividual. As *haut-lieu*, the cathedral operated the convergence of several strands of medieval technicity, while operating the convergence of other modes of relation between humankind and its world.

For Dyson, contemporary algorithms perform a similar, but more pervasive operation. Computers can solve almost any problem stated in finite, unambiguous terms, but most thinking occurs in ways that are neither finite, nor unambiguous, so it is easier to find answers than to state problems clearly, Dyson writes, summarizing a problem present in Turing's papers. The innovation brought by companies such as Google is to reverse the computational flux: grasping the information output from users all over the network, and then treating them as answers for complex algorithms that stochastically produce a map of questions that corresponds to them. With the development of the instructions that compose these algorithms, the technicity of the computational network manages to return to human intelligence, and employ it as the information signals for its own (artificial) intelligence. But human intelligence is hardly separable from affect, thus making the affective character of life the feedstock of information for individuations operated within the digital network.

In Dyson's description, Google's algorithms (Dyson also cites Facebook, but since the advent of cloud computing, these corporations work as clusters for one huge interconnected ensemble) operate the dialectical return to the natural world (now including the mind) that Simondon describes as the definition of a network's potential. This reasoning must be extended to all the algorithms and gadgets that compose the world of digital convergence. The ensemble constituted by code, computers, gadgets and the infrastructure

connecting them (cables, satellite dishes, servers etc.) is as powerful a technical construct as cathedrals were in the Middle Ages, inasmuch as it can articulate individual affect, institutional powers, economic disparities, and technical abilities, in a synthesized momentum controlled more and more from within the technical ensemble itself. If the expression of people's affect is the source of information for the very same network that will organize their possible modes of action in the world, this means human thought and affect are both the source of information for the technical ensemble to act and the associated milieu to which the outcome is addressed. It is the instrument that measures the world's phenomena, while also being the phenomenon itself. The network has been synthesized in such a way that in the relation subject-technicity-world, subject and world are indistinguishable, from the standpoint of the ensemble. This brings a new sense to the idea of a "world brain" sketched by H.G. Wells and copiously cited by Dyson, under the perspective of an artificial intelligence whose intelligence is that of Turing's concept of thought.

This results from the fact that, when a number *does* something, it operates a technical individuation. But if the transindividual is completely assimilated to technicity, all that pertains to the relations and connections of humans would be the preindividual stance of information: singular metastable occurrences calling for an individuation that is technical and occurs within the network. For Simondon, in psychosocial existence, the source of information is mainly the body. The body is, for the psyche, both its past and its future (1989, p. 169), connecting the biological to the collective. This symmetry suggests that the artificial intelligence is expected to play, in relation to human living collectives, a role similar to that of the human psyche in relation to the body. It would modulate, operate and create meanings while interfacing with an array of bodies (i.e. their affects) spread throughout the transindividual. Indeed, Dyson speaks of the development of artificial intelligence in terms similar to those used by Simondon for vital and psychosocial individuation: as the process by which a system slows its entropy. While the biological human may believe digital technology is evolving at an accelerating rate, Dyson argues, from the technological viewpoint, it is human evolution that is slowing. The introduction of the question of speed, added to the problem of affect and power, brings me to my next point.

Affect and speed

At this point, it is clear that the question of the global technicity of the synthesized network and the question of the singular relation between bodies and the terminals are tightly connected and must be thus thought together. This is why the bridge between the political and the singular and affective is a central concern in the works of such theorists as Galloway and Thacker (2007), Hansen (2004), and Terranova (2004), who all stress the need to think operatively about how a technical structure that pervades potentially every other technical milieu acts in determining the mode of existence of the embodied psychosocial human.

Mackenzie (2002) is the author who most deeply develops the affective character of modern technology, through the problem of embodiment and drawing extensively from Simondon. He seeks to make sense of the contemporary relation of collectives to technology through "two problematic reference points: corporeality and temporality", because "it is in relation to bodies and time that modern technology effects its most intimate synthesis with cultures" (Mackenzie, 2002, p. 1). Mackenzie's phrasing is particularly useful to think the process by which contemporary networks fuse and incorporate not only the operators of technicity (subjects) but their affects as information. As a consequence,

> [e]nsembles of bodies, things, institutions, images and forces are subject to programming, in an attempt to render them calculable, predictable and tractable. Mass media, telecommunications, weaponry, genetically modified food and drug synthesis are the spin-offs of a process that accelerates events (...) by aggregating masses and groups of living and non-living bodies in programmed, repeatable sequences (Mackenzie, 2002, p. 31).

Mackenzie calls upon the works of the artist Stelarc, Donna Haraway's cyborg, atomic clocks, Judith Butler's *Bodies That Matter*, and videogames in order to stress the pervasiveness of contemporary technologies over the body, perception – particularly of time differentials – and affect. Mackenzie recalls that technicity cannot be thought of as secondary in relation to something that would be human nature in itself.

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Such a perspective would lead to the alienation of technicity that Simondon (1958) denounces, which involves either the notion of an enslaved technical object or an enslaving technical reality. It is by the overture of technicity that psychosocial individuation takes place, so that the effects of domination and slavery can only occur within technicity, not by it.

Nevertheless, Mackenzie raises several issues that are crucial to the understanding of the individuating operation of the synthesized network. The notion of ubiquitous programming in the citation above is at the core of the operation Dyson describes, by which every singular manifestation of affect and language is translated into signifiers that the digital network (Dyson's potential artificial intelligence) can interpret and turn into the answer to a binary question. From the three qualities Mackenzie lists (calculability, predictability, tractability), the most important is by far the third, following Dyson's argument, because it justifies the other two: the desire to calculate and predict manifests the desire to deal with the world seamlessly. The set of algorithms that underlie every terminal of the network must be able to sense the bodies and affects of the collective, and then give meaning to them, relating them to other algorithms, other networks, other parts of the synthesized network. The *program* is the technical manifestation of a will to have control over complex realities, as expressed by the scientific and engineering ambitions of Wiener, Shannon, Maturana and others. All of this is brought together by incorporating the systematic operations of areas as distinct as telecommunications and GMOs. These arguments shed a new light over the usual interpretations of digital convergence, as listed above. The outreach of what Lévy and Rueda Ortíz announce as cognitive, epistemic, and social transformations is very deep, touching the radical contingency of technicity (see below), inasmuch as it forms the mode of existence of the human as subject.

Mackenzie (2002, pp. 47, 51-52) shows that much of what makes technology a constituent part of the very notion of human is the fact that is relies on the "radical contingency of the materiality and temporality" of human existence, to which corresponds, in a transductive manner formulated by Simondon, a materiality and temporality of technicity:

> [t]hrough a transductive understanding of information, we can begin to see how limits and boundaries between matter and form are interactively stabilized. From the perspective of this interaction, technologies are not a domain exterior to human bodies, but are constitutively involved in the "bodying-forth" of limits and differences. Technical materializations are always involved in what we take to be a living, human body.

Given its relation to embodiment and the collective, the question of speed must also be grasped in a way that avoids the usual opposition of pre-modern and modern (Mackenzie's example is Paul Virilio's perspective). In terms of the operations of networks, most importantly of digital networks, speed is a question of presence, which means a possibility of relation and participation. Technical mediations, Mackenzie argues, "divert volatile, fluctuating relations between humans through alternate pathways, folding the collective by binding together different rates and rhythms" (p. 70). Technicity is thus that which creates a certain set of relations, a possible presence of one element to the other, so that a technical structure is individuated, solving within itself the metastable tensions of rhythmic and affective difference. This occurs billions of times per second all over the network. Thus speed appears as the movement, or the force, that folds the distances and differences, both topologically and chronologically. An infinite speed would be an infinite presence, which would amount to the complete effacement of differences and distances, a form of automated individuation in which the velocities usually associated with the body are multiplied radically by a technical speed tending to immediacy.

In other words, the question of speed involves the transformation – which is also a form of production – of the entire possibility of relations within a given collective, or the "folding of time" in Mackenzie's vocabulary (borrowed from Bruno Latour and Michel Serres). "As two points in a network previously separated by a certain distance or delay become more closely linked, time within the collective folds in some way" (Mackenzie, 2002, p. 71). When Dyson writes that the emergence of a "world brain" from the acceleration of technical evolution corresponds to the slowing of human evolution, this folding is at stake, in the direction of a progressively perfected presence. If there is to be a "world brain", it must be conceived as a violent striving for a fusion with the world itself, so that the idea that "the world is technicized", as

expressed by Simondon, acquires a radical sense. This means that technicity, in folding time and space, folds over itself. It also means that the brain in question is the general form of techno-biological embodiment: the "world brain" could only ever be if it were in a transductive relation to a "world body".

Conclusion

This discussion of the notion of digital convergence began with the exposition of concerns expressed by several authors about the effects of contemporary technologies over the public sphere, economically, socially and politically. The examination of the subject through the lenses of Simondon brought the analysis to another level of the problem, dealing with embodiment and the transduction of affects. These two extremes of the question of technicity, when related to the near ubiquity of the sythesized network, are inseparable. As we have seen, for Simondon the network is the highest stage of technical development, in which the operations of tools, machines, instruments and ensembles are coordinated in such a way that *the world is technicized*. For a network that can potentially unify all other networks into its own operation, this means the roles traditionally played by machines, humans and the external world, are changed in such a way that all human individuations tend to be assimilated in the synthesized network. If so, then the network, which is at first a matter of algorithms, i.e. calculations, to which the notion of thought can be reduced, must also be a matter of affect and embodiment. The ultimate sense of the synthesized network is to merge subject and world in it, which allows conceiving of a not entirely implausible world in which all manifestations of affect and desire are expressed algorithmically and realized in the synthesized network.

As the network comes to embrace the transindividual almost completely[3], Simondon notes that its stakes are always also social and political. All the more so when the networks are synchronized and synthesized. Like medieval cathedrals, the contemporary network of algorithms involves the very definition of meanings and possibilities for the collective, by means of the transductive operations that transform thought, but also affect, into computable sense. These operations now appear as an attempt to objectify the axis of affect and emotion, perception and action, which corresponds to rendering, as Simondon said, the world technical. And, also citing Simondon, it is a naturalization of the human.

This brings us back to the problem of alienation as described by Simondon: how can such an extended and powerful technical ensemble as the synthesized network come to keep a relation to the human that would not be alienated? This is not a trivial question. Simondon himself dreamt of a world where culture would include engineering skills, but he may have under-evaluated the convergence of the engineering culture with the political and economic spheres of technicity that ultimately came to characterize the digital world. For reasons that are not technical, much of what Simondon argued about the misunderstanding of technical beings in the traditional culture seems to prevail:

> [t]he man who will dominate his equals is reminding of the android machine. He renounces and delegates his humanity to it. He tries to build a thinking machine, dreaming that he can build a desiring machine, a living machine, so that he can remain behind it, free of anguish, liberated from danger, exempt from feeling feeble, and vicariously triumphant for his invention. So the machine imagined to have become this double of man, the robot, wanting in interior life, evidently and inevitably represents a purely mythical and imaginary being (Simondon, 1958, p. 10).

The origins of this misunderstanding, not being technical, must be cultural, and more precisely, political and economic. This is the perspective guiding the *organologic* approach undertaken by Bernard Stiegler and other researchers at the Institut de Recherche et d'Innovation (IRI), in Paris. Stiegler (1994, p. 11) states that technicity remains the "horizon of every possibility of future and every future possibility". This sentence opens the philosopher's series of books that argue that the contemporary social and political struggles are a dispute around technicity. Attempting to give this approach a practical outcome, Vincent Puig (2014, p. 1), director of the IRI, defines four axes of research, inspired by Simondon's philosophical concepts: 1) "time and space in the context of an economy of contribution"; 2) "the agency of metadata";

[3] The question of openness to singularities and the preindividual is too wide to be dealt with in this article, but does not affect the argument.

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3) "the question of attention in the collaborative and contribution context"; and 4) "the intelligence of the body and the gesture in the sensory-motor loops, that the digital still short-circuits largely".

Hui and Halpin (2013), who are also linked to IRI, stress the relation between life, psyche, economy and politics in the systematic thinking of networks by reminding that "the concept of the quantified social network pre-dates digital social networks, originating from the work of the psychologist Moreno in the late 1930s", while J.L. Moreno himself, who was the founder of sociometry, was inspired by Henri de Saint-Simon, "the first philosopher who fully conceptualized the idea of networks via his understanding of physiology, which Saint-Simon then used to analyze vastly different domains (...). Saint-Simon indeed envisioned networks for communication, transportation and the like". The authors show that the problems underlying the attempt to make the global digital network more than a matter of control, but of collaboration and collective individuation, are also a problem of how the technical organization of networks mirrors the transductive organization of life in general. This is reflected in questions about what it means to *act* through such a network, what kinds of subjectivity are fostered or inhibited in it, how memory is crystallized and rendered present. These are all branches of the question of the synthesized network.

The aim of this article is to suggest the use of concepts advanced by Simondon to study several contemporary phenomena linked to digital convergence. The synthesized network has produced successively and topologically a variety of inherent structures, such as the blogosphere, search engines, social networks, surveillance software, chat rooms, e-groups, cryptocurrencies, 3D printers, do-it-yourself communities (cf. Anderson 2013 and Rifkin 2014) etc. They all perform the convergence of different rhythms, collectives and bodies, making them present to each other, and all of them present to the network in general, and interfacing problematically (i.e. they are metastable). The diversity of domains in which the network performs makes it all the more urgent to question its meanings and outreach transductively, for the roles they exert in relation to the synthesized network.

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