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Third way architecture: Between cybernetics and phenomenology

ABSTRACT

This article in its essence aims to challenge and unfold, each at a time, two different fields of methodology – cybernetics and phenomenology – that have direct effects on the product of being *and the process of* becoming *in architectural discourse. Furthermore, this article suggests a third way philosophy for architecture that relates notions of post-phenomenology and technoscience, and considers both to be equally vital to development and speculation within current architectural discourse. First, the history of each of the two fields – cybernetics and phenomenology – will be unveiled with a focus on exploring their impact upon architecture in particular and diverse fields such as other art disciplines, computer science and psychology. Second, a critique of the historic rivalry between pioneers in each of the two fields will be unpacked through their errors and limits. Third, the article will discuss attempts at converging the two fields in order to address the relationship of notions of humanism, machinism and technology. Finally, a declaration of the characteristics of such a convergence that will lead to a third way philosophy for architectural discourse will be asserted.*

KEYWORDS

Second-Order Cybernetics
Postphenomenology
Technoscience
Techné
Architectural Philosophy
Being
Becoming

INTRODUCTION

The first documented use of the term *kybernetike* dates back to 400 BC, and is found in Plato's philosophical essay 'The Republic' in an attempt to describe the art of navigation. In 1834, this early description of the term formed the basis for André-Marie Ampère's foundation for the classification of sciences: *The future science of government should be called* la cybernétique (Mackay 1991). In 1948 Norbert Wiener (1961) subsequently adopted this later use of the term where he gave the study of control and communication in the animal and the machine the name *cybernetics*. Since then cybernetics has evolved from the first-order cybernetics concerned with the behaviour of machines and self-regulating systems, to the second-order cybernetics that extended to the involvement of the observer, his or her behaviour and consciousness as influential contributing participants in the system (von Foerster 1979). Cybernetics became widely known in the second half of the twentieth century after the series of Macy Conferences held mainly in New York City between the years 1946 and 1953, where heated debate and discussions took place, exposing relations and issues of interdisciplinarity between cybernetics as a major field of influence and the rise of other fields such as systems theory, emergence and interactive technologies (Herr 2010). This wave of interest in cybernetic thought impacted many fields in the arts and architecture. One of the early advocates and educators of the second-order cybernetics in the field of interactive arts is Roy Ascott (1961). His artwork 'Change-Paintings', exhibited in Molton Gallery in London in 1961, was one of the early pieces of art that demonstrated the need for participatory interaction from the audience for what is ultimately an open-ended piece of work. Simultaneously in architecture, the cybernetician Gordon Pask worked on several architectural projects alongside architects such as Cedric Price and John Frazer, implementing cybernetic thinking into architecture to achieve environments that respond to their inhabitants through change and interactivity.

Similarly to the history of cybernetics, the history of phenomenology was rooted in the philosophy of the early sixteenth- and seventeenth-century Renaissance before its modern use by Husserl, Heidegger and Merleau-Ponty. The Renaissance scholars' ethos of the search for humanist methods for realism and particularly in the arts has extended to Hegel's idealist account of reality that was the basis for the early involvement of phenomenology in philosophy. At the same time they expected of the field of art a constant process of technical involvement – *not in order to de-anthropomorphize art […] but in order to render its human truth complete* (Heller 1978: 411).

Throughout history, phenomenology has developed and taken different directions. The transcendental basis in particular was founded by Edmund Husserl at the start of the twentieth century, and subsequently applied to varied topics such as time, space, causality, aesthetics, psychology and sociology. This soon diverted into the level of philosophy, a philosophy of existence under the ontological and existential phenomenology of Martin Heidegger that discusses *consciousness, being* and *subjectivity*, notions explored further by Sartre. This later became the main fascination of Merleau-Ponty, who attempted to explain ontological philosophy in relation to human sciences by adopting the notion of embodiment to lay the foundation for phenomenology and perception (Macann 2007).

The phenomenological chronicle did not end with the philosophical account, but extended to reach the field of science and in particular the study of

actual statistical and mechanical analysis of phenomena known as *phenomenological thermodynamics* (Cerbone 2006: 1). Thus, phenomenology has contemplated technology and its relationship to cybernetics since its early existence; however, this relationship has become the subject of much passionate debate and discussion for decades, beginning with the writings of Heidegger (1977b) regarding the distinction between the technological and the essence of technology and fuelled by the writings of Norbert Wiener.

Until the industrial revolution of the eighteenth and nineteenth centuries the subject of *technology* was connected to mere construction techniques, and by the mid-twentieth century and with the invention of the first developed computer, technology shifted to the design tools and later on to processes of design. This is true not only in the field of art but also in architecture. At the same time, computer scientists such as Terry Winograd were focusing on the influence of cybernetic methodology, and also investigated the understanding of what it is to be human, a question deeply rooted in phenomenological thought (Winograd and Flores 1986).

> All new technologies develop within the background of a tacit understanding of human nature and human work. The use of technology in turn leads to fundamental changes in what we do, and ultimately is what it is to be human. We encounter the deep questions of design when we recognize that in designing tools we are designing ways of being. By confronting these questions directly, we can develop a new background for understanding computer technology – one that can lead to important advances in the design and use of computer systems.
>
> (Winograd and Flores 1986: xi)

Computer scientists developed arguments connecting cybernetics to phenomenology through the writings of Kant, Husserl, Heidegger, Gadamar and other phenomenologists whose work was primarily concerned with interpreting the workings of the mind by drawing a distinction between *the thing-in-itself and the phenomenon it presents to us* (Sharoff 1995).

> I cannot explore my soul as a thing-in-itself by means of theoretical reasoning (still less by means of empirical observation); hence, I cannot explore free will as a feature of a being […]. Nevertheless, I can think about freedom, that is, the representation of it is at least without contradictions.
>
> (Kant [1787] 1965)

In essence the connections between the *thing-in-itself* and its representation, the connections between our consciousness and the possibility of creating *artificial consciousness*, are exactly what computer scientists and particularly Artificial Intelligence experts are interested in exploring. Winograd asserts the involvement of phenomenology and its theory of interpretations known as *hermeneutics* in the development of understanding cognition in computer science as a field (Winograd and Flores 1986: 38). Such interests originated from the writings of Humberto Maturana and Francisco Varela through their investigation into neurophysiology, cybernetics and the organization of living systems, and their search for an understanding of the biological processes that can give rise to the phenomenon of *cognition* (Varela 1979; Maturana and Varela 1980). Similarly, Heinz von Foerster (2002) wrote extensively

about the relationship between cybernetics, cognition and perception through the involvement of technology and machine intelligence in his essays in *Understanding Understanding*.

Other disciplines that crossed between cybernetics and phenomenology with their different trajectories are neuroscience, psychology and active perception. Pioneers such as Hermann von Helmholtz (1962) and Richard Gregory (1997) stretched and blurred previously well-defined thresholds between the two methodologies in their explanations of the phenomenon known as *errors of perception* or *illusion* through brain models and theories of vision.

This brief scan over history is not only intended to provide a snippet of background of the two fields in question, but is also an attempt to assert the rootedness of their existence first alongside each other and second in opposition to one another, explained in the next section with their relation to architecture; their main conflict comes in the form of dispute over the meaning and the extent of the involvement of *technology* in our daily lives, existence and consciousness.

BETWEEN CYBERNETICS AND PHENOMENOLOGY

Previous attempts at understanding the convergence between cybernetics and phenomenology as fields of influence or their trajectories onto architecture were explored by Sanford Kwinter (2002) (Professor of Architectural Theory and Criticism, Department of Architecture, Harvard Graduate School of Design) in his book *Architectures of Time*. Such explorations might not be as explicit as this research is attempting to achieve, but nevertheless Kwinter's writings and theory are deeply concerned with the cybernetic approach of complex dynamic systems. Featured in many recent philosophical movements, and relevant to the notions of immanence and individuation derived from the philosophy of Gilbert Simondon that later influenced the philosophies of both Gilles Deleuze and Bernard Stiegler, Kwinter developed a theory of time that is based on a materialist approach to movement and time rather than space and time. Kwinter (2002: 214) asserts that the dynamism of such philosophical and cosmological systems serves as the principle of infinite potential possibilities that when combined redefine what Kwinter termed the ontology of the *event*. Kwinter's theory of *time* bridges two main networks of connections: the first on a cybernetic phenomenological level between theories of complex systems and Heidegger's ideology of time; and the second on a level of dynamic difference positioned between the philosophies of Heidegger in *Being and Time* and those of Alain Badiou in *Being and Event*.

> The event is not actually internal to the analytic of the multiple. Even though it can always be *localized* within presentation, it is not, as such, presented, nor is it presentable. It is – not being – supernumerary.
>
> (Badiou 2007a: 178)

Badiou's conception of the *multiple* parallels Heidegger's thinking regarding the terms *earth* and *world* in his exploration of difference. Badiou speaks of the *event*, which belongs to conceptual construction:

> […], in the double sense that it can only be *thought* by anticipating its abstract form, and it can only be *revealed* in the retroaction of an interventional practice which is itself entirely thought through.
>
> (Badiou 2007a: 178)

While Richard Coyne explains Heidegger's acknowledgment of the difference between *earth* and *world* as:

> […], the earth is that which is not knowable. What it *brings forth* (reveals) it also conceals. Earth offers the greatest resistance to the *openness* (truth) made possible by the work of art. World is well understood in terms of the culture of a people, in the sense of Hegel's idea of an epoch. So, the earth conceals, whereas the world reveals.
>
> (Coyne 1995: 196)

Coyne reflects on the phenomenology of virtual reality in relation to Heidegger's definition of the difference between *earth* and *world* in an attempt to not only find parallels between the two trains of thought, but also to expose Heidegger's limitations towards thinking about *technology* and the *essence of technology* in our current time. While questioning the essence of the operation of difference in the case of computer technology such as virtual reality Coyne (1995: 197, 200) asserts that:

> The technology reveals, discloses, and opens up a world, but not primarily in the sense expected by virtual-reality writers. The world is disclosed through difference. […].
>
> Recognizing difference within the play of metaphors opens up the possibility of new metaphors. The issue of difference brings us back again to Heidegger's notion of disclosure. Our discussion of virtual reality brings us to a consideration of metaphor and of difference, which clearly play a role in how we understand information technology.

The identification of the close interlinked processes, of feedback and circularity between metaphors and difference in reality and those of virtual reality identified by Coyne, has contributed a great deal to the convergence between cybernetics, information technology and phenomenology in architecture. Similarly, Christopher Hight (2008) in his book *Architectural Principles in the Age of Cybernetics* does exactly that with a clear declaration of the links and shifts found between the Renaissance and mid-twentieth-century architecture as well as current tendencies towards *post-humanism* and digital interactivity in design. Hight (2008: 194–95) put forward a discussion of the theories of form in architecture not in the sense of formalism, but in the relationship between architectural thought and production of processes that rely on the dialectic history of preserving the body of architectural knowledge formed in the late nineteenth century, as well as on celebrating its ontology through the effects of technology. Thus, Hight (2008: 195) is neither surrendering to the thoughts of the phenomenologists and their antagonistic views towards the degree of involvement of technology in the body of architecture, nor to the post-structuralists' desire to conserve it. However, he is asserting Heidegger's notion of difference in relation to Coyne's notion of metaphor and Kwinter's notion of *event* by exposing the historical ambiguity of the body in relation to architecture:

> There is no need to dream of the day that humanist architecture and its subject might be erased. The figure of the *anthropos* was never so clearly drawn. Its contours were not etched in a sandy firmament soon to be

> washed away by the tides of *history*, but are indeed more like the turbulent flow of the waves themselves, emerging as momentary singularities, vortices measurable only amidst the laminar and nonlinear flows of history. It is within this turbulent space of formation that architecture and its subjects whirl. And it is within this immanence that we can measure resistances and currents to surf alternative tangents.
>
> (2008: 195)

According to the architectural historian Alberto Pérez-Gómez (1983: 325), contemporary phenomenology has revealed that technological theory alone cannot resolve the fundamental problems of architecture disillusioned with rational utopias and obsessed with reason over imagination. Thereafter, he confirms the foolishness of denying the *ever present enigma of the human condition* that he relates directly to intuition and mystery, which he calls upon architects to directly address (1983: 326).

> Part of our human condition is the inevitable yearning to capture reality through metaphors. Such is true knowledge, ambiguous yet ultimately more relevant than scientific truth. And architecture, no matter how much it resists the idea, cannot renounce its origin in intuition. While construction as a technological process is prosaic – deriving directly from a mathematical equation, a functional diagram, or a rule of formal combinations – architecture is poetic, necessarily an abstract order but in itself a metaphor emerging from a vision of the world and Being.
>
> (Pérez-Gómez 1983: 326)

Significantly, what is in question here is the impact and the level of involvement of *technology* and technological theory in our life in general and architecture in particular. It seems that philosophers and theorists who criticized the involvement of technology in our society embraced the Heideggerian philosophy embedded in the phenomenological ideologies, and those who supported the transient evolution of technology that comes from cybernetics have accepted infinite involvement of the machine and later on prosthetic beings as agents of equal participation to humans in any system. However, regardless of the degree of involvement that technology is pursuing, this article is attempting to emphasize the importance of the integration of both ideologies – the phenomenological and the cybernetic – and the embedded significance of understanding the principles and processes of *becoming*, rather than the mere focus on the outcome as *being*.

Heidegger (1962: 2) pioneered the question of the ontological ground of *being* in *Being and Time*. He argues that we do not know what we mean by the term *Being*, as it has been overwhelmed by the preconceptions of western metaphysical philosophy since Plato's time. Therefore, in *Being and Time* Heidegger (1962: 1) embarks on a process of defining the meaning of *Being* concretely, and does so with reference to *time* as he considers it to be *the possible horizon for any understanding whatsoever of being*. A pre-understanding suggests that the meaning of *Being* is the *most universal concept* of existence for any entity. However, Heidegger (1962: 22) asserts that the *universality of Being* is not attached to a certain class or genus, but is rather a temporary condition of possibility for any entity.

> […] the concept of *Being* is indefinable. This is deduced from its supreme universality, and rightly so, […]. *Being* cannot indeed be conceived as an

> entity; […] nor can it acquire such a character as to have the term *entity* applied to it.
>
> (Heidegger 1962: 23)

> Something like *Being* has been disclosed in the understanding-of-Being which belongs to existent Dasein as a way in which it understands. Being has been disclosed in a preliminary way, though non-conceptually; and this makes it possible for Dasein as existent Being-in-the-world to comport itself *towards entities* – towards those which it encounters within-the-world as well as towards itself as existent.
>
> (Heidegger 1962: 488)

Deleuze tangles the two notions, *being* and *time*, into the concept of *becoming*. Together with Felix Guattari, Deleuze attempts, in *Becoming-Intense, Becoming-Animal, Becoming-Imperceptible*, to reinterpret the essence of *Becoming* through the memories of a *Moviegoer, a Naturalist, a Bergsonian, a Sorcerer, a Theologian, a Spinozist, a Molecule* and others (Deleuze and Guattari 2004: 256–341).

> […] a becoming lacks a subject distinct from itself; but also it has no term, since its term in turn exists only as taken up in another becoming of which it is the subject, and which coexists, forms a block, with the first. This is the principle according to which there is a reality specific to becoming (the Bergsonian idea of a coexistence of very different *durations*, superior or inferior to *ours*, all of them in communication).
>
> (Deleuze and Guattari 2004: 262–63)

To some extent, it appears that Deleuze's concept of *Becoming* is very close to Heidegger's meaning of *Being* as *Being-on-the-way* (Badiou 2007b). Contemporary continental philosopher Alain Badiou (2007a) has dedicated a great deal to mapping out the parallels between Heidegger's meaning of *Being and Time* and Deleuze's *Becoming and Event*. Furthermore, Badiou (2000) identifies the close relationships between Heidegger's and Deleuze's philosophy in that *Being* and *Becoming* are essentially interpretive thought. However, Deleuze and Guattari in *What is Philosophy?* state a clear distinction between *time* and *event*.

> It is no longer time that exists between two instants, it is the event that is a meanwhile [*un entre-temps*]: the meanwhile is not part of the eternal, but neither is it part of time – it belongs to becoming. The meanwhile, the event, is always a dead time; it is there where nothing takes place, an infinite awaiting that is already infinitely past, awaiting ad reserve. This dead time does not come after what happens; it coexists with the instant or time of the accident, but as the immensity of the empty time in which we see it as still to come and as having already happened, in the strange indifference of an intellectual intuition. All the meanwhiles are superimposed on one another, whereas times succeed each other.
>
> (Deleuze and Guattari 1994: 158)

Deleuze (1988) criticizes Heidegger's limits of the interpretation of consciousness and intentionality, arguing that intentional relations derived from the non-relational, or what Deleuze calls the *disjunctive synthesis*, are apparent between *nomination* and the *being*, or between consciousness and the object.

Thus, this non-relational synthesis suggests that thought relates to the *Being* that constitutes it.

> We can thus clearly state that what Deleuze considered as Heidegger's limit is that his apparent criticism of intentionality in favor of a hermeneutic of Being stops halfway, for it does not attain the radicalness of the disjunctive synthesis. It retains the motif of the relations, even if in sophisticated form.
>
> (Badiou 2000)

Heidegger's limit did not stop at the ontological interpretations of intentionality and consciousness, but rather extended to his attempts at explaining the essence of technology through accusing humanism (Dupuy 2008).

HEIDEGGER VS. WIENER: ERRORS AND LIMITS

The main dispute between pioneers of cybernetics and phenomenology came in their interpretation of the impact of technology on our lives, and perhaps their fear of it reaching a point of overwhelming the human being and eventually cultures. Norbert Wiener (1961: 29) wrote in critique of what he called the *modern industrial revolution* referring to the *incidental contribution* of the power of information technology:

> Perhaps I may clarify the historical background of the present situation if I say that the first industrial revolution, the revolution of the *dark satanic mills*, was the devaluation of the human arm by the competition of machinery. […] The modern industrial revolution is similarly bound to devalue the human brain, at least in its simpler and more routine decisions.
>
> (Wiener 1961: 27)

It is important to clarify the context in which Wiener derived his thoughts on the decentralized power of information technology. During World War II when Britain was under Nazi air attack, Wiener developed a computational device with automatic aiming and firing for war aircraft. Therefore, he was referring to the power of information technology used in war. Since then Wiener advocated blurred boundaries between humans and machines that open an infinity of possibilities (Rosenblueth et al. 1943; McCulloch 1974). This vision of an open-ended infinity of possibilities for the relationship between *humans* and *machines* was the concern of cyberneticians, and for Wiener it represented an incarnation between *God* and *man* (Wiener 1988).

Critics of classic cybernetic thought observed that cyberneticians have put power and control at the centre of the definition of their philosophy relating *technology* and *man* to *religion* and *God* (Haraway 1991). Peter Galison (1994) speaks of the shift from classical cybernetic thought to the *postmodernist cyborgian manifesto* addressed by Donna Haraway as she focuses on the variability and the unfixed nature of the cyborg not as the unlimited power, but rather for the partiality of what is human.

> As she put it, we are ourselves already in so many respects cyborgs through our reproductive technologies, our psychopharmacologies, our prostheses (mechanical and computational) – that we can no longer

> put any stock in essentialist definitions of the classic dichotomies of mind and body, animal and human, organism and machine, public and private, nature and culture, men and women, primitive and civilized.
>
> (Galison 1994: 261)

In essence, the writings of Wiener on the potential of information technology to devalue the human brain and at the same time referring to the integration between *human* and *machine* as an incarnation between *God* and *man* were the main points of critique that Heidegger sought. Thereafter, Heidegger (1977b) decided to take on the complex subject of untangling and explaining the difference between *technology* and the *essence of technology*, and by essence he means *enduring as presence* (Lovitt 1977: 3).

Heidegger (1977b: 13) does not explicitly state what kind of technology he is referring to when attempting to formulate the meaning of technology; however, later, he notes that according to the Greek definition, there are two meanings: the first is *Techné* relating to activities and skills of the craftsman, and the second is *Techné* that belongs to *bringing-forth* or to *poiesis*. Historically, technology has been defined as *a means and a human activity*, and can therefore be called *the instrumental and anthropological definition of technology* (Heidegger 1977a: 5). However, Heidegger (1977a: 12) relates those *means to an end* and *instrumentality* to *causality*, and establishes that technology is not a means but rather a *way of revealing*.

Heidegger (1977a: 26) connected *revealing* to *truth* and the essence of things to the origins of their causality, and argued that the destining of revealing is a mode of *Enframing* that he refers to as *supreme danger*. Furthermore, he states that technology itself is not dangerous; however, its essence is, as it is *destining of revealing* and *Enframing*:

> The threat to man does not come in the first instance from the potentially lethal machines and apparatus of technology. The actual threat has already affected man in his essence. The rule of Enframing threatens man with the possibility that it could be denied to him to enter into a more original revealing and hence to experience the call of a more primal truth.
>
> (Heidegger 1977a: 28)

Heidegger's questioning of the essence of technology is ontological rather than sociological. Despite his assumption of the lethal impact of the machine or the apparatus of technology, his main fear is that the essence of technology is *enframing being*. Andrew Feenberg (n.d.) explains Heidegger's technological concern by stating:

> Humans become mechanical parts in systems that surpass them and assign them their function. They begin to interpret themselves as a special type of machine. […]. The role of humans in the revealing of being is occluded. We no longer wonder at the meaningfulness of things. The system appears autonomous and unstoppable.

Not only Heidegger but also Gilbert Simondon, a French philosopher known for his *theory of individuation*, has critiqued Norbert Wiener's theory of cybernetics, and later developed a *general phenomenology of machines.* Simondon criticized Wiener's cybernetics as a theory of technology for

accepting classifications of technological objects operated by established means and criteria with certain genera and species, which he refers to as the main thing that any theory of technology must reject (2009a: 7, 2009b).

In his essay on *Machinic Heterogenesis*, Félix Guattari (1993: 13) criticizes both Heidegger's and Wiener's positions on technology. He notes that the relationship between *human* and *machine* has been a source of reflection since the beginning of philosophy. Guattari refers to Aristotle's consideration of *techné* as a creative mediator between *human* and *machine* to create what nature finds it impossible to achieve. He argues that Wiener believed in the mechanistic conceptions of the machine by assimilating it to living beings, while Heidegger assigned the mission of *unveiling the truth* to *techné* setting it ontologically, and by doing so has compromised on its definition as a *process of opening*. Therefore, Guattari establishes that by oscillating between the two schools of thought:

> […] we will attempt to discern the thresholds of ontological intensity that will allow us to grasp *machinism* [le machinisme] all of a piece in its various forms, be they technical, social, semiotic, or axiological. With respect to each type of machine, the question will be raised not of its vital autonomy according to an animal model, but of its specific enunciative consistency.
>
> (1993: 13–14)

NOTIONS OF HUMANISM, MACHINISM AND TECHNOLOGY: THIRD WAY ARCHITECTURE

This thesis follows Guattari's thinking regarding the conception of an oscillation between two methodologies: *cybernetics and phenomenology*. Moreover, the thesis distinguishes between Wiener's cybernetics and Heinz von Foerster's second-order cybernetics where the observer becomes part of the creative process through participation. From the previous sections above, it seems that the dispute between phenomenology and cybernetics is more fundamental than the question of technology. It is in fact a dispute over notions of *humanism, machinism and information* that this thesis takes the position of addressing, no longer as a dispute but rather as a third way conception for the architectural discourse.

To unpack this entangled prosthetic system is to involve current contributions to the fields of both *technoscience* and *post-phenomenology*. However, before attempting to reach the conclusion of this article, it is vital to clarify some crucial points that have contributed to the later development of *technoscience* and *post-phenomenology*. To continue with the build-up that this article has attempted, the question of technology and its impact on our lives has not merely been a recent concern. Early surrealist writers questioned a world where machines will start thinking (Pias 2005); this was followed by a response from the cybernetician and neurophysiologist Warren McCulloch and Walter Pitts in their famous paper on the *Logical Calculus of Ideas* (1943) where they provoked the question *what if our thinking is already done by machine?* (McCulloch and Pitts 1943). Claus Pias (2005) in his essay on *Analog, Digital, and the Cybernetic Illusion* describes McCulloch's techno-philosophy to be:

> […] subverting or deconstructing several hierarchical differences like human and non-human, subject and object, psyche' and techne', man and apparatus.

McCulloch's *techno-philosophy* challenged other philosophers' thinking of technology; from Freud to Nietzsche and McLuhan where technologies meant an extension of man, McCulloch blurred the notion of man, which was in question in Kant's *What is Man?* and Foucault's statement concerning *the death of Man* (Pias 2005). The reality is that cognitive scientists and neurophysiologists have always been concerned with *the mechanization of the mind, not the humanization of the machine* (Dupuy 2008). This question of humanization or inhumanization of man and machine was the concern of many philosophers and writers, such as the phenomenologist Hannah Arendt. Arendt (1958: 231) expresses her critique of science and technology describing it as *rebellion against human existence*:

> Natural sciences have become exclusively sciences of process and, in their last stage, sciences of potentially irreversible, irremediable, 'processes of no return'.

Jean-Pierre Dupuy, French philosopher, friend of both Francisco Varela and Heinz von Foerster, and advocate of defending the *essence of humanism* against the excesses of science and technology, relates technoscience to cybernetics and both to metaphysics through the act of *calculating*:

> Technoscience, insofar as it constructs mathematical models to better establish its mastery over the causal organization of the world, knows only calculating thought. Cybernetics is precisely that which calculates – computes – in order to govern, in the nautical sense […]: it is indeed the height of metaphysics.
>
> (Dupuy 2008)

Don Ihde, a post-phenomenologist and a philosopher of science and technology, argues that technology does not determine the human condition, but rather:

> […] humans using technologies enter into interactive situations whenever they use even the simplest technology – and thus humans use and are used by that technology, and all such relations are interactive – the possible uses are always ambiguous and multistable.
>
> (2002: 131)

Dupuy's informed view of phenomenology and cybernetics led him to the conclusion that both fields were vital for the existence of one another, as the questions that their followers raised and are still raising are fuelling a historic debate over *humanism, machinism* and *technology*. Ihde (2009: 38–39) developed the theory of *post-phenomenology* as an approach to *technoscience* revealing such theory through the history of material technology (such as Stone Age tools), through to industrial technology (such as electricity, rail systems, factories etc.) and finally information technology (such as computers, the Internet, mobile communications and other media), which he refers to as *technoscientific*.

Ihde addresses the ultimate convergence between the two methodologies in question in this article – *cybernetics and phenomenology* – where he points out that since technologies are historically older than humans and contemporary technologies are *technoscientific*, the way to critique and philosophically investigate this relationship has to be *phenomenological* – or what he finally

terms *post-phenomenological*, as it unveils the variety of the human experience of technology (2009: 43).

Implications of such convergence are already evident in the participatory art practice, interactive architecture, cyberspace, virtual realities, *neoplasmatic* designs and prosthetic/*posthuman* entities; all have contributed a great deal to creating parallel selves and other architectures where technology was and will always be at the heart of their creation. Instances of architecture, currently and historically, have had a close association with *humanism*. They were formally considered as mere sheltered environments, and towards the start of the industrial revolution the field took *machine-like* trajectories (Banham 1982). This approach was later criticized in favour of architecture that is more linked to the human *sense of space* (Bachelard 1994). Two decades ago or so, with the start of the age of information technology, architecture began to allow for collaborations with other fields such as computer science and participatory art practice influenced by the cybernetic methodology (Pask 1969). Since then, such collaborations have become widely practiced in architecture (Spiller 2006; Cruz and Pike 2008; Hensel et al. 2006), which has fuelled a phenomenological critique of the emerging architecture accused of *anaesthetization* of the architectural practice (Leach 1999) in fulfilling technological experimentation detached from the human senses (Pallasmaa 2005b). However, if we look beyond the computer-generated images that are wallpapering end-of-year shows and exhibitions, such technological experimentations are far from being detached from humanism, but rather they create constant dialogues between *humanism* (through participation and interactivity), *machinism* (through experimentations and interdisciplinarity) and *technology*, to heighten the human experience.

This article has confirmed the importance of two critical points: the first states that the dispute over technology has contributed to sustaining philosophical debates and arguments, and the second asserts the vitality of the oscillations and the convergences between the two methodological approaches adopted for this thesis to enable a third way philosophy of architectural discourse to emerge.

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