NATURALIZING DASEIN. APORIAS OF THE NEO-HEIDEGGERIAN APPROACH IN COGNITIVE SCIENCE

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ABSTRACT: This paper deals with the neo-Heideggerian approach in cognitive science as espoused by Michael Wheeler in his *Reconstructing the Cognitive World: The Next Step* (2005). According to Wheeler, this next step amounts to incorporating Heideggerian insights bearing on online intelligence: the kind of intelligence which is exhibited by human agents in embedded, embodied coping. However, this phenomenological reception implies also stripping Heideggerian phenomenology of its overt antinaturalistic and transcendental tendencies. The approach is indeed 'neo-Heideggerian' inasmuch as tantamount to a naturalization of phenomenological themes. I attempt to put this naturalizing aspiration to the test, and show that the approach remains 'Heideggerian' only superficially.

KEYWORDS: Heidegger, Phenomenology, Cognitive Science.

NEO-HEIDEGGERIAN COGNITIVE SCIENCE

Michael Wheeler's project for reconstructing the cognitive world (2005) can be viewed as a reflection on the philosophical foundations of cognitive science, concerned with helping in the search for a sort of Kuhnian revolution in the field (2005, p. 15). A project which is essentially Heideggerian. According to Wheeler's understanding of the field's history, this revolutionary twist has been emerging over the last few years as a response to orthodox cognitive science—basically, GOFAI[1] and connectionism, that is, "most cognitive science as we know it" (*idem*). Although the countermovement has

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[1] John Haugeland famously christened the oldest approach to achieving AI 'Good Old Fashioned Artificial Intelligence'—or GOFAI, for short. What is crucial in defining what GOFAI amounts to, as a branch of cognitive science, "rests on a particular theory of intelligence and thought—essentially Hobbes's idea that ratiocination is computation" (Haugeland 1989, p. 112).

adopted various names throughout its brief existence[2] and despite its identity being admittedly somewhat amorphous, it is customary to refer to it as embodied-embedded cognitive science. And this, believes Wheeler, because embodiment and embedding are part of "a central and distinctive theoretical tendency within the more nebulous movement" (2005, p. 11). As Clark claims, "talk of mind as *intimately* embodied and *profoundly* environmentally embedded shimmers at the cusp of the cognitive scientific zeitgeist" (2012, p. 275). In order to pin down why this new science of mind (Rowlands 2010) abjures of orthodox cognitive science, its aims and scope need some clarification.

According to Wheeler, "the embodied-embedded approach revolves around the thought that cognitive science needs to put cognition back in the brain, the brain back in the body, and the body back in the world" (*idem*). Incidentally, this purpose is substantially akin to the ambitions of Andy Clark's 1997 book titled with a decisively Heideggerian connotation: *Being There. Putting Brain, Body, and World Together Again.* On Clark's understanding, the new trend thinks it necessary "to abandon the idea (common since Descartes) of the mental as a realm distinct from the realm of the body; to abandon the idea of neat dividing lines between perception, cognition, and action; to abandon the idea of an executive center where the brain carries out high-level reasoning; and most of all, to abandon research methods that artificially divorce thought from embodied action-taking" (1997, pp. xii-xiii). Wheeler adheres overtly to the principles encompassing this novel program. His own project, construed as a reflection on the philosophical foundations of cognitive science, targets precisely Cartesian philosophy as the mindset dominating cognitive science from which the new approach needs to escape (1995; 2008). As is widely known, Heidegger criticizes Descartes boldly in *Sein und Zeit* while claiming at the same time that the *cogito sum* is no firm footing—as Descartes supposed. On the contrary, claims Heidegger, "what he left undetermined when he began in this 'radical' way was the kind of Being which belongs to the *res cogitans*, or—more precisely—the *meaning of the Being of the sum*" (SZ § 6, p. 24). Bluntly put, on Heidegger's view, the Cartesian *cogito sum* gives us no special insight into the nature of the *sum* itself. Be that as it may, Wheeler wants to revise both the traditional interpretation to which Descartes has often been subjected to in Anglo-American philosophy (as the resolute representative of a far-fetched and, for that very reason, unacceptable dualism) and—something which will be dealt with in due

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[2] For Marsh (2007), for example, Wheeler's theoretical heroes fall within a loose coalition of anti-representationalism or anti-Cartesianism under the rubric of dynamical-, embodied-, extended-, distributed-, and situated theories of cognition, or DEEDS, to use an acronym. But his is hardly the only acronym in use. The movement is sometimes referred to as 4E cognitive science, standing for embodied, embedded, extended and enactive cognitive science (Rowlands 2010), or as 4EA, adding affective cognition to the equation (Protevi 2010).

course—Heidegger's appraisal in cognitive science, which more often than not is understood as a mystical threat unable to contribute anything constructive to the field. That is to say, Wheeler wants to criticize the Cartesian assumptions underlying orthodox cognitive science but he will neither simply interpret Descartes's philosophy drawing heavily from Heidegger's own critique, nor interpret Heidegger, *à la* Dreyfus (see Dreyfus 2007), as the staunch critic who would never accept the theoretical possibility of cognitive science. It must be possible to do both: to show Descartes's pervading influence on cognitive science and to embrace simultaneously Heideggerian insights without subscribing *tout court* to the consequences of his philosophy. This is precisely what Wheeler attempts to do.

Now, first a few words on Descartes. According to the standard interpretation of Descartes, the French philosopher was a substance dualist who ascribed preeminence to the inmaterial *res cogitans* over the *res extensa* and whose work has been easily superseded by the contemporary developments of cognitive science. If the mind is inmaterial, then it follows that it cannot be subjected to scientific inquiry. But Wheeler shows how this picture is rather a simplification of Descartes and why he should not be underestimated, since he was actually one of the early proponents of the mechanization of mind. As a matter of fact, quoting from Descartes's *Traité de l'homme*, Wheeler argues that "Descartes takes a range of capacities that many theorists, even now, would be tempted to regard as psychological in character, and judges them to be explicable by appeal to nothing more fancy than the workings of the bodily machine" (2008, pp. 312-313). It is but stressing the accent on Descartes's dualism what has given rise to covert Cartesians within cognitive science, since it does not suffice simply to claim, for instance, that Descartes's neurophysiology was wrong—which it certainly was—nor even that it would be preposterous to suggest a similarity between the Cartesian soul and the contemporary scientific attempts at a theory of consciousness. The point is rather that deep explanatory principles and assumptions underlying work in contemporary cognitive science are decisively Cartesian. Therefore, one had better map out the course of these presuppositions of Cartesian descend.

On Wheeler's view, a series of Cartesian principles comprising Descartes's cognitive psychology must be identified in order to investigate as to what extent they remain parasitic in cognitive science. The Cartesian foundations bedeviling the cognitive enterprise are, however, exhibited by Wheeler as entering a period of quite dramatic reconstruction (for instance, in dynamical systems research), and his idea is that this reconstruction requires a more fundamental transformation in the philosophical foundations of the discipline. Wheeler's argumental strategy consists in pointing out eight principles of Cartesian psychology, and then argue that these

principles "define a conceptual position toward which orthodox cognitive science tends overwhelmingly to gravitate, and at which it regularly comes to rest" (2005, p. 56). These principles include the following claims:

· The subject-object dichotomy is a primary characteristic of the cognizer's ordinary epistemic situation (p. 23).

· Mind, cognition, and intelligence are to be explained in terms of representational states and the ways in which such states are manipulated and transformed (p. 24).

· The bulk of intelligent human action is the outcome of general-purpose reasoning processes that work by (i) retrieving just those mental representations that are relevant to the present behavioral context, and then (ii) manipulating and transforming those representations in appropriate ways so as to determine what to do (p. 38).

· Human perception is essentially inferential in nature (p. 42).

· Perceptually guided intelligent action takes the form of a series of sense-represent-plan-move cycles (p. 43).

· In typical cases of perceptually guided intelligent action, the environment is no more than (i) a furnisher of problems for the agent to solve, (ii) a source of informational inputs to the mind (via sensing), and, most distinctively, (iii) a kind of stage on which sequences of preplanned actions (outputs of the faculty of reason) are simply executed (p. 45).

· Although the informational contents carried by bodily sensations and certain primitive perceptual states may have to be specified in terms that appeal to particular bodily states or mechanisms, the cognitive-scientific understanding of the operating principles by which the agent's mind, given that information, then proceeds to generate reliable and flexible intelligent action remains conceptually and theoretically independent of the scientific understanding of the agent's physical embodiment (p. 51).

· Psychological explanation is temporally austere, in that it is neither necessary nor characteristically typical for good scientific explanations of mental phenomena to appeal to richly temporal processes (p. 53).

It goes without saying that Wheeler is not arguing that the aforementioned principles of Cartesian psychology are shared *verbatim* in its entirety by every program and model in cognitive science. The 'Cartesian-ness claim'—the claim that orthodox cognitive science is founded on Cartesian principles—is that it is a modern species of Cartesian psychology. So as it happens, the neurophysiological facts between what we

now know and what Descartes knew might differ, but the conceptual framework can, however, be kept intact. Accordingly, the Cartesian principles do not need to be shared identically but it must be possible to present evidence that each of the eight principles of Cartesian psychology are either "(i) an assumption made by at least the vast majority of orthodox cognitive scientists, ahead of the business of constructing specific explanations, or (ii) a core feature of certain paradigmatic, influential, or flagship examples of orthodox cognitive-scientific research" (Wheeler 2005, p. 56).
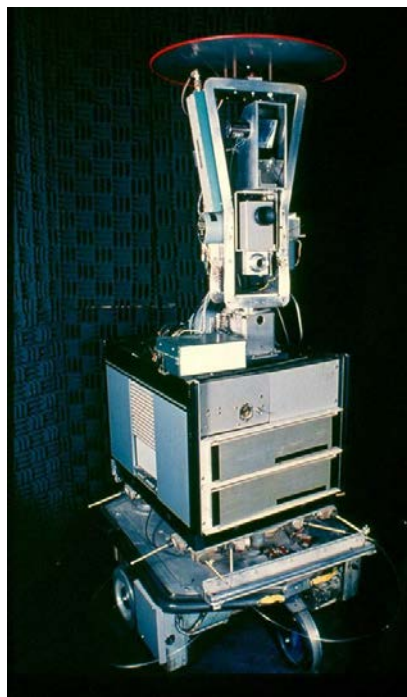
Shakey, manufactured by SRI

Typically, systems designed from the standpoint of orthodox cognitive science take perceptually guided intelligent action to be a series of sense-represent-plan-move cycles (Wheeler 2005, p. 67). The architectural blueprint behind this conception of action is what Brooks (1999) called the sense-model-plan-act (SMPA) framework: a cognitive architectural framework that Brooks rejects for it dissociates perception and action. Take Shakey: a robot designed in the late 1960s at the Stanford Research Institute (Nilsson 1984) that embodies the typical technological implementation committed to SMPA. Shakey has visual images that are received via a black-and-white television

monitor, it represents images based on a model of the world built as a set of first-order predicate calculus, and the world model is delivered to a central planning system called STRIPS based on a GPS architecture. Finally, in order to move, STRIPS-generated action-specifying expressions are decoded into a format appropriate for driving the motors (Wheeler 2005, p. 69). For generating action, Shakey must appeal to its internal world-model, where conventions have been established for representing doors, wall faces, rooms, objects, and the robot's status (Nilsson 1984, p. 19). Under such robotic world-modeling, the environment is understood as no more than a source of problems, obstacles, ambience information, and settings for action, but not as constituting cognition or playing any distinctive role in the formation of intelligence. From this follows an important conclusion for the philosophy of mind pervading orthodox cognitive science: what is important from the point of view of cognition must be then located in the head. Hence cognition is essentially intracranial.

A further example provided by Wheeler as evidence of the 'Cartesian-ness' of traditional cognitive science is Marr's computational investigation into the human representation and processing of visual information (2010), according to which the underlying task of vision is to reliably derive properties of the world from images of it. On Poggio's view, "the central tenet of Marr's approach is that vision is primarily a complex information processing task, with the goal of capturing and representing the various aspects of the world that are of use to us" (1981, p. 3). Most importantly, for Marr these representations are to be conceived of as context independent, given that they are not the product of any fundamental embedding or a result of the specific context of action, but rather of mere neural activity. This intracranial environmentally detached 'neurocentrism' is an essential tendency at work within orthodox cognitive science:

> According to such a view, although both the agent's nonneural body (e.g., muscular adaptations, the geometric properties of limbs) and the agent's environment are clearly essential, in some sense, for intelligent action to occur as it does, the processes that account for the richness and flexibility that are distinctive of such behavior remain fundamentally neural (e.g., neurally realized mechanisms of inference, discrimination, estimation, and route planning). Put another way, the message is that the causal factors that explain the adaptive richness and flexibility of naturally occurring intelligent behavior are located neither in the agent's nonneural body nor in her environment, but pretty much exclusively in her brain. (Wheeler 2005, p. 81)

The dispute behind this rejection of neurocentrism is between contingent intracranialism and contingent transcranialism (Adams & Aizawa 2009). According to the former, tool use—a commonplace in situated cognition and the extended mind

hypothesis[3]—is a matter of intracranially localized cognitive processes interacting with extracranial biological, chemical, and physical processes (Adams & Aizawa 2009, p. 78). So vision, for example, is essentially cognitive and begins in the retina. The transcranial approach, on the other hand, emphasizes noncognitive processes which span the cranial boundaries and extend into extracranial space. As such, due to its noncognitive emphasis, it tends to be regarded by intracranialists as a threat to cognitive science. Whereas for the former approach meaning is decisively in the head, for the latter "we do not store the meaningful inside ourselves, but rather live and are at home in it" (Haugeland 1998, p. 231). The intracranialist would reply that that is beautiful poetry, because the condition for living and being at home in such a way presupposes the primary contribution of neural activity.

It is true that Descartes did not (and could not) have any developed neuroscientific knowledge at his disposal. Rather, his explanations were modeled on the basis of a system of hydraulics: nerve fibers stretching organs, tensions and relaxations closing or opening brain cavities releasing a flow of animal spirits through a corresponding point of the pineal gland (Wheeler 2008, p. 310). But that does not annul the fact that, on Wheeler's words, "if we shift to a more abstract structural level of description, what emerges from that theory is a high-level specification for a control architecture, one that might be realized just as easily by a system of electrical and biochemical transmissions—that is, by a system of the sort recognized by contemporary neuroscience—as it is by Descartes's ingenious system of hydraulics" (2008, pp. 310-311). The point is that neurocentrism is committed to the Cartesian view of the explanatory disembeddedness of intelligent action, whereby the environment is one of two things, or both at the same time: (i) a furnisher of problems for the agent to solve (as exemplified by the typical tasks entrusted to robots designed on the basis of the SMPA framework, like Shakey), or (ii) a source of informational inputs to the mind via sensing (as exemplified in Marr's computational theory of vision). From the standpoint of orthodox cognitive science, explaining vision is understanding how the brain builds up an internal model of the world based on light reception and inference from external traits. In contrast, "the subject of the new vision science is explaining why it seems to us as if the brain does this, when in fact it does not" (Noë 2002, p. 140). Consequently, Noë—another apostle of the new science of mind—defends a radical anti-

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[3] The fundamental reference regarding the extended mind hypothesis is, of course, the famous paper penned by Clark and Chalmers titled precisely 'The Extended Mind' (2010; originally published in 1998). This hypothesis is the first formulation of transcranialism: "an *active externalism*, based on the active role of the environment in driving cognitive processes" (Clark & Chalmers 2010, p. 27). In another paper, Adams and Aizawa (2010) have defended the bounds of cognition, that is, the fundamental intracranial character of cognition.

Cartesianism: "my position is simple: Cartesian neuroscience has no empirical support for its basic assumption that conscious experience is an exhaustively neural phenomenon" (2002, p. 173).

So Descartes stands firm in the middle of this dispute. He can certainly be mocked for postulating the pineal gland as the interface between mind and matter, where physical stimuli are converted into perceptions and representations, and where motor instructions are turned into physical processes due to its involvement in important processes such as imagination, sensation, memory, and the causation of bodily movements. This is the typical arrogance of our contemporaries: they can look back in the past and laugh at how wrong philosophers of foregone epochs got the facts. However, Wheeler reminds us that even though for contemporary orthodox cognitive scientists Descartes's pineal gland does not exist and even arouses derision, an explanatory interface responsible for the conversion of physical stimuli into representational and perceptive processes does! (2005, p. 85). That is to say, the refinement of the facts does not revoke the underlying explanatory framework. On Wheeler's account, today's pineal gland can be located over the point of the body where sensory transducers convert physical stimuli into representational states and where motor transducers convert representational states into physical processes producing bodily motions (*idem*). To say it with Haugeland, transducers are AI's answer to the pineal gland: "the relevant transductions would have to take place *within* the brain, between one part of it and another—not so far from the pineal gland, as luck might have it (1998, p. 228). Central to this underlying explanatory framework is the Cartesian idea that the mental is an ontologically independent domain—and hence the need for transducers doing the coupling between the physical and the mental. But it must be granted that this necessity is an artefact arising from the assumed Cartesian framework. It seems that there has to be a conversion between the symbolic contents of the mind and the physical processes of the body, but only because the separation between the ontological domains is supposed to be fundamental. The assumption of neurocentrism as well forces one to conceive of an intelligent agent as responding primarily to internal representations when coping, rather than to the environment or to the world, which most certainly biases the orientation toward representation and away from perception.

Looked more closely, not only abstracting Dasein from the worldhood of the world (*Weltlichkeit der Welt*) is preposterous. Take, for instance, the move or play in a game as pointed out by Haugeland:

> pushing around a little piece of plastic shaped like a turret could only amount to a *rook* move in an appropriate spatial and temporal context of other chess pieces and moves. To call it a rook move apart from such context is simply nonsense.

> Likewise, so the reasoning goes, to regard any phenomenon as intentional or normative in isolation from the relevant whole, is also nonsense. And since, in the case of mental attribution, the relevant whole must include the individual's environment and/or community, the Cartesian independence of the mental is impossible. (1998, p. 208)

It should then not come as a surprise that Heidegger's phenomenology of world is invoked in conjunction with the attempt to escape from the Cartesian mindset. The idea of a neo-Heideggerian framework, from whence to rethink the cognitive enterprise away from Cartesian ways of thinking, has cavorted Wheeler's mind at least ten years (see 1995) prior to publication of his *Reconstructing the Cognitive World* (2005). But Wheeler's idea is not only critical but, above all, constructive. His framework is neo-Heideggerian because Wheeler cannot simply buy the 'anthropocentric tendencies' in Heidegger's philosophy (1995, p. 69) and wants to extend accordingly the consequences of the Heideggerian framework to the animal kingdom. This is due to the *Muggle constraint*, which guides obligingly Wheeler's investigation:

> In J. K Rowlings's Harry Potter books, there are two coexisting and intersecting worlds. The first is the magical realm, populated by wizards, witches, dragons, dementors, and the like. This is a realm in which, for example, getting from A to B can be achieved by flying broomstick, flying carpet, or more dramatically, teleportation, and in which one object can be transformed into another by a transfiguration spell. The second world is the nonmagical realm, populated by Muggles—Muggles like us. Muggles, being nonmagical folk, are condemned to travel by boringly familiar (to us) planes, trains, and automobiles, and to operate without the manifest benefits of supernatural object-altering powers. Now, if you want to understand of how Muggles work, you had better not appeal to anything magical. (2005, p. 4-5)

The point is simple: "no spooky stuff allowed" (2005, p. 5). So Wheeler is ready to incorporate Heidegger's phenomenology of agency within the context of the environing world (*Umwelt*) to bear on cognitive science, but he is not willing to abandon what he calls an intellectual marriage of philosophy and science (2005, p. 4). No 'spooky stuff' means also, in Wheeler's terms, that no occult entities unbeknownst to scientific inquiry are to be let in: "if philosophy and natural science clash (in the sense that philosophy demands the presence of some entity, state, or process that is judged to be inconsistent with natural science), then it is philosophy and not science that must give up" (2005, p. 5). This can be couched in the following terms: philosophy is all right, but in this intellectual marriage demanded by Wheeler, it is science the one with preeminence when it comes to the postulation of existing objects. Escaping the Cartesian mindset does not impose on us an obligation of forsaking the grounds of a

scientifically informed philosophy. We are, after all, Muggles, and must abide by nonmagical methods and by the constraints they impose.

For the aforementioned intellectual marriage between philosophy and science to be effective, the phenomenology of agency in the environing world cannot simply have emerged out of nothing. On Wheeler's account, to suppose so would be 'spooky.' So somehow sense has to be made about how such an instance of meaningful structures, like Dasein's environing world, has arisen from more primordial biological structures. According to Wheeler, evolutionary biology provides a treatment of other animals which does not consider them under the light of value-free objects (that is, as present-at-hand entities) but rather as creatures immersed in their natural niches that can also be said to carry out intelligent, at least meaningful, activities. On Wheeler's view, Heidegger's conception of animals is not far from Descartes's derogatory idea that animals are mere automata. It is no secret that, for Heidegger, animals have no world and do not exist in the sense of Dasein's existence. Instead, animals are 'world poor' (*weltarm*) and are absorbed in captivation (*Benommenheit*):' "captivation is the condition of possibility for the fact that, in accordance with its essence, the animal *behaves* [benimmt sich] *within an environment* [Umgebung] *but never within a world* [Welt]" (GA 29/30, pp. 347-348). But this Heideggerian opposition between *Umgebung* and *Welt*—which Heidegger imports from biologist Jakob von Uexküll—appears rather extravagant and untenable to Wheeler, who does not shy away from accusing Heidegger of anthrochauvinism (2005, p. 157). Perhaps the human *Welt* is more elaborate than the animal *Umgebung*, but one cannot be dismissive of the fact that humans are also animals.

This is the step forward towards naturalism that Wheeler invites his readers to take: the world has to be somehow a continuation of the biological environment. An abismal gap between Dasein and other animals can be granted on the basis of human cultural evolution, but it cannot be forever unsurmountable, for Dasein was once a 'mere' animal. Dasein, to be clear, is still an animal, albeit provided with a set of tools for thinking which function as imagination-extenders and focus-holders (Dennett 2013). Neither can be supposed that all living beings are encapsulated in their own irreducible worlds which do not communicate with other worlds—as Jakob von Uexküll (2010) would have it—since evolution requires continuity between species, interrelationship, and kinship between all species; an idea that von Uexküll would nevertheless pin on the illusion founded on the belief in an unitary world shared by all existing creatures (Agamben 2002, p. 50).[4]

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[4] On von Uexküll's view, animal worlds are not only unknown worlds but, more importantly, they are invisible and inaccesible from our own human perspective. A mechanistic view of nature contributes to

Rejecting Heidegger's claim to human exceptionalism, Wheeler now turns to a difference between the physical and the biological sciences that can be couched in terms of a distinctive treatment toward behavioral ecology: "this area of biology (at least) cannot be treated as equivalent to the physical sciences. In fact, it seems that for the discipline of behavioral ecology to make sense, the capacity of animals to open up domains of significance has to be assumed" (Wheeler 1995, p. 72). And again, even if these domains are not as rich and manifold as the ones opened up by humans, they are nonetheless evolutionary antecedents of human existence. Wheeler's argument is the following: one can certainly concede that there is an abstraction of meaningful contexts in physics, for which *Vorhandenheit* can, no doubt, be said even to be its sole business, but this is incorrect in the case of living organisms. After all, it is thanks to evolutionary theory that a continuity between animal species must be granted, so that human intelligence—for all its distinctiveness—can be traced back to more primitive forms of interaction with the environment. Human beings and their creations (including knowledge, language, and morality) are a byproduct of evolutionary history.[5] The meaningful structures constituting Dasein's world are no exception. Wheeler has it that even if we consider living organisms to be objects, our scientific findings are not up to us, since animals are "autonomous agents who adopt strategies with fitness consequences for both the strategy adopting animal itself, and the other animals with whom it interacts" (*idem*). We might want to theorize animals as if they were mere objects, but they are rather living organisms with coping and survival strategies. They might be *weltarm*, but they are not *weltlos*. For this very reason, we cannot conceive of animals as though we were dealing with inanimate things, for our objective (present-at-hand) stance towards them is just our stance, but not theirs. A real science of living organisms must provide a detailed account of how animals behave and develop, and not just envisage them as something they are not. So this explains Wheeler's piecemeal approach to Heideggerian philosophy: Dasein, as an evolved creature, has also had to learn to cope with its world and this is why it would be a mistake to attempt to abstract it away from an evolutionary approach. Now it is clear why Wheeler's approach is neo-Heideggerian: it accepts Heidegger's phenomenology of Dasein's world as an accurate description of the structures of coping within the practical context of human agency, but Wheeler does not see why simpler forms of animal intelligence cannot be integrated into a more encompassing picture. What impedes one from conceiving of meaning as pervading the worlds of other animals?

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this inaccessibility: "whoever wants to hold on to the conviction that all living things are only machines should abandon all hope of glimpsing their environments" (2010, p. 41).

[5] For a succinct account of evolutionary theory bearing on knowledge, language, and morality, see Ruse (2012).

Why would anyone think that Dasein is the only exception in the whole of the animal kingdom?

It is worth remarking that this line of thinking can also be applied to artificial life (A-Life for short) research: the field of study associated with systems related to life, its processes and evolution by means of computer simulations, robotics, and biochemistry. Wheeler takes A-Life in the restricted sense of being an attempt to explain evolutionary and adaptive systems, including phenomena customarily grouped together with labels such as intelligence, mind, and cognition (1995, p. 65, n. 1). Wheeler addresses this possibility via the example of cellular automata. According to Varela, Thompson and Rosch (1993), Bittorio, a ring of eighty elementary processing units (cellular automata) in a random soup of 1s and 0s endowed with a network architecture and coupling properties, can illustrate how very simple organisms—even artificial ones—can begin to enact a world by exhibiting emergent properties. As a cellular automata, Bittorio can demonstrate various kinds of fantastic emergent behavior according to the state of neighboring cells, since the state of one of its cells is replaced by a perturbation when one of the two alternatives (0 or 1) is encountered. So the experimenter needs only to stipulate the possible states into which each unit is able to move, the rules governing the way the units change as a result of local interactions with neighboring units, and the way in which the network is coupled to a random milieu. What is interesting is that a Bittorio "picks up or singles out from the milieu a very specific subset, namely, finite odd sequences, since only these sequences induce a repeatable change in Bittorio's configuration" (Varela, Thompson & Rosch 1993, p. 152). The conclusion is rather surprising: "given its rule and given its form of structural coupling, this Bittorio becomes an odd sequence recognizer" (*idem*). For what is worth, Wheeler thinks that here the system's activity can be understood as a sort of minimal interpretation, meaning that Bittorio "selects or brings forth a domain of significance out of the background of its random milieu" (Varela, Thompson & Rosch 1993, p. 156). Varela et al. do not refrain a single step back from speaking of 'Bittorio's world:'

> It should be apparent that this world is not pregiven and then recovered through a representation. We did not design Bittorio to be an odd sequence recognizer; we simply provided Bittorio with certain internal dynamics and then dropped it into a random milieu. Nevertheless, given the history of coupling between the internal dynamics and the milieu, *odd sequence* becomes a significant distinction for Bittorio. For this reason, we describe Bittorio's world as enacted through a history of structural coupling. (Varela, Thompson & Rosch 1993, p. 156)

According to Varela, Thompson and Rosch, Bittorio can be conceived of as "a minimal example of how an autonomous system brings forth significance from a background" (*idem*). The point reinforces Wheeler's idea that such a simple system's

activity performs a minimal kind of interpretation and, what is more interesting, it might help us understand how an agent's ongoing activity brings forth significance from an essentially meaningless background (Wheeler 1995, p. 70).

So basically, the neo-Heideggerian approach demands that Heideggerian philosophy meet the Muggle constraint. Orthodox cognitive science restricted itself to offline intelligence, that is, to phenomena involving propositional knowing-what, like weighing up the pros and cons of carrying out a certain action in a specific situation (Wheeler 2005, p. 12). In contrast, the new approach is ready to do both: subsume GOFAI by allowing it an authoritative place in offline phenomena research (Wheeler 2005, p. 249), while at the same time investigating the largely unexplored dimension of online intelligence comprising the sort of phenomena characteristic of agents that produce a suite of fluid and flexible real-time adaptive responses to incoming sensory stimuli. And this sort of intelligence—albeit more complex and sophisticated in humans—is not a privilege of Dasein alone but is scattered in the chain of being, from nonhuman animals to cellular automata.

It can scarcely be said that Wheeler's approach is objectionable from a purely Heideggerian point of view. Therefore, the next section will attempt to exhibit the kinds of objections that can be presented to the neo-Heideggerian approach in cognitive science. But this shall not only be attempted from the viewpoint of 'pure' philosophical musings. The point is rather to show that the naturalization of Heidegger—and the naturalization of intentionality which underlies it—is a glaring error which belittles human experience. This results from an analytic reception of Heidegger. 'Analytic' not only in the sense that Heideggerian philosophy is appropriated by analytic-trained Anglo-American philosophers, but also in the decisive sense that the Heideggerian philosophy which is appropriated for the purposes of advancing the new paradigm, pays only attention to specific parts of Division I of *Sein und Zeit*; parts which, in the same vein, are also appropriated very selectively. The reception is 'analytic' in that it constitutes a very schematic version of Heidegger taking precisely his thought out of context (Rehberg 2012, p. 160). In order to complete the purposes of this paper, I now turn to the aporias of what can be deemed the 'analytic' reception of Heidegger's philosophy. This will let us exhibit some criticisms directed to Wheeler's approach explained so far.

APORIAS OF THE 'ANALYTIC' HEIDEGGER

The heavy import of Heideggerian vocabulary into the new movement in cognitive science has, of course, not gone unnoticed for Dreyfus: the pioneer in introducing Heideggerian philosophy into the cognitive landscape. Dreyfus's position on the so-

called neo-Heideggerian approach is, however, rather critical. According to Dreyfus, the approach is plagued with problems and misunderstandings, although he is enthused over a "positive account of how Heideggerian AI and an underlying Heideggerian neuroscience could solve the frame problem" (2007, p. 254).

For Dreyfus, Wheeler's approach can be deemed critically 'pseudo Heideggerian AI.' According to Dreyfus's assessment, this approach has a fake character which is revealed by its use of representations. And this sole fact makes it hard for one to deem it really Heideggerian in scope. Indeed, Wheeler presents his global project as requiring "a defense of action-oriented representation… action-oriented representation may be interpreted as the subagential reflection of online practical problem solving, as conceived by the Heideggerian phenomenologist. Embodied-embedded cognitive science is implicitly a Heideggerian venture" (2005, p. 222-223). Wheeler admits to having been influenced by Dreyfus's critique of artificial reason, but not without adding one important caveat: Dreyfus's focus on the problem is wrong because his position is a controversial negative assessment of the empirical achievements of orthodox AI peppered with arguments against Cartesianism. So more than wrong, Dreyfus's critique of artificial reason is incomplete. That Dreyfus's critique is inconclusive can be confirmed in that it does not offer a way out from the most recalcitrant theoretical shortcomings of the traditional approach. So Wheeler has it that Dreyfus's is a purely philosophical take on AI, since a truly cognitive approach should offer solutions for those aspects of the traditional way of doing things. If a mistake is shown—so seems to be Wheeler's argument—then solutions leading to improvement must be presented as well. Therefore, "it is not any alleged empirical failure on the part of orthodox cognitive science, but rather the concrete empirical success of a cognitive science with Heideggerian credentials, that, if sustained and deepened, would ultimately vindicate a Heideggerian position in cognitive theory" (2005, p. 188-189).

However, Dreyfus doubts of the Heideggerian credentials of Wheeler's approach and retorts that merely in supposing that Heidegger is concerned with subagential *problem solving* and action oriented *representations*, Wheeler's project reflects not a step further but a regression to some assumptions of traditional cognitive science (2007, p. 254). Dreyfus's critique of Wheeler's use of Heideggerian philosophy consists in pointing out that being-in-the-world is more basic than thinking and solving problems. Wheeler's preoccupation with how to accommodate Heideggerian insights into a representational framework is just an artefact created by his theoretical convictions, which are cognitive all too cognitive in that they suppose as fundamental the existence of a mind which essentially characterizes what human beings are. Wheeler's anthropological motto seems to be thus: *human being is cognitive, therefore his essence lies in*

cognition. In contrast, cognition is for Dreyfus just a derivative product owing its existence to the more fundamental social dealings of a practical coper: the human agent concerned with her own existence.

However, it is important at this juncture to draw more general conclusions from the appropriation of Heidegger's philosophy in cognitive science, since both Wheeler and Dreyfus share at least the idea that something like a Heideggerian cognitive science and a Heideggerian neuroscience is possible. Indeed, that Heidegger's philosophy or phenomenology in general can enter in dialogue with cognitive science implies a certain capitulation to some sort of naturalism. In the work of neuroscientist Walter Freeman (1999), for instance, Dreyfus finds the key for liberating the mind—or in this case, the brain—from the necessity of representations. As such, this is a true step forward, according to Dreyfus, in the right direction of founding a Heideggerian neuroscience. Let us recall that the brain, according to Freeman, is a nonlinear dynamical system which can find and augment significance in the world. On Dreyfus's interpretation of Freeman's neurodynamics,

> the important point is that Freeman offers a model of learning which is not an associationist model according to which, as one learns, one adds more and more fixed connections, nor a cognitivist model based on offline representations of objective facts about the world that enable offline inferences as to which facts to expect next, and what they mean. Rather, Freeman's model instantiates a genuine intentional arc according to which there are no linear causal connections nor a fixed library of data, but where, each time a new significance is encountered, the whole perceptual world of the animal changes so that the significance as directly displayed is contextual, global, and continually enriched. (2007, pp. 260-261)

His great expectations concerning such project in neuroscience explains why in the end Dreyfus has not been able to resist a sort of naturalism according to which being-in-the-world can be traced back to perception-action loops taking place in neural activity. Dreyfus might doubt of the Heideggerian credentials of other philosophers, but his are in no way established. For Dreyfus, the point is to get the right underlying neuroscience with Heideggerian credentials and thus he seems to ignore that such expectations are not phenomenological. This agreeable approach with Heideggerian credentials, Dreyfus finds in Freeman's neurodynamics, since Freeman conceives of intentionality as requiring "acting to create meaning instead of just thinking" (1999, pp. 38-39). On Freeman's view, neuronal processes are not just computational tasks being carried out by billions of semantically blind nanobots, but are instead in themselves meaningful-creating processes. This idea—which Freeman thinks is shared by philosophers like Heidegger and Merleau-Ponty, by psychologists like Gibson, and

pragmatists like Dewey—"is crucial for interpreting my observations in experiments on neural mechanisms of perception in animals" (1999, p. 40). Heidegger's appropriation in neuroscience consists in supposing that the structures comprising Dasein's world can somehow be brought to bear on systems that are found in the natural world. This is, incidentally, a perfect contradiction to Heidegger's Uexküllian conviction that the world is exclusively a human phenomenon.[6]

The preceding points bring to the fore the problematic character of Dreyfus's hopes for a Heideggerian neuroscience. He seems to think that the difference between machines, animals, and humans can be sorted out, if not by sheer adding a bit of complexity to computational machinery, at least by parting from the right neuroscience and then from a correct conception of embodiment and embedding: "to program Heideggerian AI, we would not only need a model of the brain functioning underlying coupled coping as Freeman's, but we would also need—and here's the rub—a model of our particular way of being embedded and embodied such that what we experience is significant for us in the particular way that it is" (Dreyfus 2007, p. 265). So Dreyfus sets a high standard for the Heideggerian alternative to be fruitful, but the possibility of designing a program of being-in-the-world is not declared as forever unviable, nor is the underlying assumption that being-in-the-world starts in very basic natural processes, ultimate denizens of brain activity, denied intelligibility. The typical objection against Dreyfus that his critique of artificial reason is just an in-principle argument is then completely false.

However, there are more critical factors at work from the phenomenological point of view than Dreyfus has been able to reckon with. As a matter of fact, according to a fundamental phenomenological insight, there is something profoundly misleading in attempting to naturalize consciousness. Indeed, Husserl has been vocal over and over again against the perverseness (*Verkehrtheit*) of the naturalization of consciousness, because it obfuscates (*macht blind*) "not only the I but everything that is characteristic of consciousness" (Hua VII, p. 105 ff). The subjective is, for Husserl, unreal from the point of view of the real ("gegenüber der Realität eine Irrealität," [Hua IV, p. 64]). Moreover, "as long as naturalism suffices, there reigns… the theoretical blindness for the specificities of the mind [*das Spezifische des Geistes*]" (Hua XXXVII, p. 122 ff). In sum, Husserl does not dither from speaking of a nonsensical naturalization of the mind (*widersinnigen Naturalisierug des Geistes*) or a reification of consciousness (*Verdinglichung von Bewusstsein*). Both naturalism in the form of the natural sciences and historicism and

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[6] To be more precise, Jakob von Uexküll holds that "every animal, no matter how free in its movement, is bound to a certain dwelling-world…" (2010, p. 139). This dwelling-world is incommensurable with the human world. Therefore, Heidegger's denial of a shared world between humans and other animals reverberates with Uexküllian overtones.

worldview philosophy (*Weltanschauungsphilosophie*) naturalize respectively consciousness and the ideas. As such, naturalism and historicism are nonscientific: not *per se* but only in reference to their absolutism regarding their own methods (Rinofner-Kreidl 2000, p. 752).

Be that as it may, Dreyfus conceives (wrongly) of a profound breakthrough between his beloved Heidegger-style phenomenology and Husserl's, and so goes on to affirm that since Husserl "put directedness of mental representations at the center of his philosophy, he is also beginning to emerge as the father of current research in cognitive psychology and artificial intelligence" (1982, p. 2). But given the aforementioned Husserlian critique of the naturalization of mind and consciousness, it strikes one as puzzling how Husserl can seriously be considered the father of cognitive psychology and AI. So if Dreyfus designates Wheeler's approach pseudo-Heideggerian, it must be granted that his own approach is not less *sui generis*, when not equally pseudo-phenomenological.

For similar reasons, it is difficult to see how Heidegger's phenomenology can be accommodated into a naturalistic framework that can meet Wheeler's Muggle constraint. It is Wheeler's idea, however, that the Heideggerian credentials of his project are fully intact (2005, p. 190) and that Heidegger's philosophy can serve as a 'conceptual adhesive' binding together a well-anchored research program (2005, p. 191). In order to ground out this marriage between Heidegger's philosophy and cognitive science, Wheeler entertains a rather strange interpretation of *Vorhandenheit*. Although on occasion Heidegger himself seems to refer to present-at-hand in derogatory terms ("*sondern setzt… die Seinsheit purer Vorhandenheit nur wieder voraus*" [SZ § 21, p. 99], etc.), Wheeler does not think *Vorhandenheit* is to be interpreted with contempt. Instead, Wheeler has it that Heidegger has shown that scientific objects are discovered in the world as 'deworlded' entities, and because they are only the business of science alone, philosophy cannot claim a right to postulate occult entities unknown to science. If the business of science is the investigation of deworlded entities, that is, inasmuch as they are not dependent on human context bias, philosophy on its part must dedicate its efforts to world contextuality and thus can serve as an adhesive accompanying scientific endeavors. To put it bluntly: philosophy can clarify the world of the deworlded entities of empirical science. Hence, here lies a difference between philosophy and science which, according to Wheeler, must not be missed: a difference that is also an interplay between the two that clarifies as well how they relate to each other. Taking into account a distinction introduced by McDowell (1994), Wheeler maintains that empirical science provides an *enabling understanding*, which reveals the causal elements and the organization of the systematic causal interactions between

those elements. In contrast, philosophy is characterized by a *constructive understanding*, which concerns the identification, articulation, and clarification of the conditions that determine what it is for a phenomenon to be the phenomenon that it is (2012, pp. 182-183).

Under the last distinction, Wheeler thinks that Heidegger's philosophy can be depicted as seeking a particular sort of constitutive understanding. Namely: "the understanding in question concerns an account of the conditions that determine what it means to live a human life" (Wheeler 2012, p. 183). And the recognition of this transcendental role of philosophy and the clarifications it brings forth might be also illuminating to empirical science. On Wheeler's view, constructive understanding does not have to be reduced to enabling understanding, for that would be tantamount to a kind of *scientism* (2012, p. 185). Rather, "our two kinds of understanding (and thus philosophy and cognitive science) will standardly engage in a process of mutual constraint and influence that McDowell tags with the enticing phrase a perfectly intelligible interplay" (*idem*). This view of the interplay between empirical science and philosophy and thus of the complementariness of phenomenology and cognitive science is supplemented by a minimal naturalism: "because it stops a long way short of reductionism, minimal naturalism does not demand that a complete cognitive science of Dasein would be a complete understanding of Dasein, although it would be a complete enabling understanding" (Wheeler 2012, p. 191). At the behest of this interplay between the transcendental conditions presupposed by any empirical science and Wheeler's minimal kind of naturalism, it is possible to hold that transcendental conditions "are not immune to revision, or even perhaps rejection, in the light of the results of the empirical scientific research that they make possible" (Wheeler 2012, p. 192).

However, for the phenomenologist, this empirical revision of the transcendental sphere—the sole suggestion that empirical results might modify the transcendental conditions pervading our understanding—is as absurd (*das ist ein reiner Widersinn*, as Husserl would surely hold) as if one demanded causal properties and relationships etc., for mathematical numbers (see Hua XXV). It is important to note that this Husserlian transcendental stance has also been thoroughly assumed by Heidegger in *Sein und Zeit*. Heidegger does not refrain from criticizing his phenomenological master from time to time, nor from secluding himself from the way Husserl practices phenomenology. But Heidegger is surely no pre-Husserlian philosopher, which most certainly means that his entire work is not even understandable without the impulses he received from Husserlian phenomenology. Precisely, Ratcliffe has criticized Wheeler's naturalization

of Dasein by extracting the following transcendental argument from Division I of Heidegger's *magnum opus*:

· Empirical science enquires as to what is the case. In order for it to do so, the distinction between being and not being the case must already be intelligible. In other words, one must have an understanding of what it is to *be*. This presupposed understanding need not be restricted to the Being of the present-at-hand, to the kind of Being that empirical science is concerned with, but it does at least include it.

· We are the beings that have an understanding of Being… Hence any comprehensive account of human understanding needs to include an account of our understanding of Being.

· Empirical science is concerned with the present-at-hand, rather than with what is presupposed by the intelligibility of presence-at-hand; it addresses only what kinds of things the world is populated with. Therefore it cannot incorporate an adequate account of Dasein.

· In addition, empirical scientific theories cannot adequately encapsulate the having of a world, a characteristic that is inseparable of Dasein. The world we find ourselves in, which is made intelligible by our understanding of Being, is a world *in which* we encounter the present-at-hand. It is not itself encountered as present-at-hand. The sense of belonging to a world cannot be reduced to an encounter with some object.

· Hence empirical scientific understanding is limited to a restrictive sense of what *is* and fails to accommodate how we already find ourselves in a world when we engage in scientific inquiry. (Ratcliffe 2012, pp. 144-145)

Furthermore, Wheeler errs by supposing that science gives us access to completely deworlded objects. On the contrary, "presence-at-hand does not escape readiness-to-hand but is a kind of abstraction from it" (Ratcliffe 2012, p. 141). It can be said with certainty that the possibility of abstracting deworlded things presupposes the world: the background in absence of which abstraction does not even makes sense. So the question must be raised: how can empirical results concerned with present-at-hand objects affect the world precisely presupposed in those endeavors? This shows that Wheeler is committed so blindly to the present-at-hand, that his project seems to dissociate readiness-to-hand from the world in which it is intelligible, to then situate it within a scientific (present-at-hand) context, along with adding an interpretation of it in terms of environmental nudges, to finally call it 'Heideggerian' (Wheeler 2012, p. 150). Therefore, the prospects of a Heideggerian cognitive science are criticized by Ratcliffe as a confused undertaking: "the project of seeking to understand our being-in-the-world in cognitive science terms is nonsensical" (2012, p. 138). Two more points

can be considered in this regard: (i) Heideggerian topics, when appropriated by a naturalistic cognitive science, remain Heideggerian only in a fairly superficial way (*idem*). And (ii) the latter is confirmed by the fact that the same themes cannot be incorporated into cognitive science without losing sight of Heidegger's philosophy and their place within it (Ratcliffe 2012, p. 139).

What is more: when it comes to reading strategies, it appears even more exact to designate this *sui generis* reception of Heideggerian topics into cognitive science as an 'analytic interpretation' of Heidegger and phenomenology in general. Indeed, as Rehberg (2012) has argued, the interpretation is selective and schematic in what it takes from Heidegger and in what it ignores. So it is not only that analytic-trained philosophers are interpreting Heideggerian themes to incorporate them into a cognitive science discourse—thus overlooking that it was not Heidegger's intention in the first place to give an account of human cognition or to develop a theory of knowledge or a philosophy of mind. It is also that by analytically abstracting some selective topics that belong to the whole fabric of *Sein und Zeit*, the matter of Heidegger's thought is inevitably eradicated. As Rehberg has argued:

> to put aside the issue of Dasein, to translate it into 'human agency' as happens in the service of the new model of cognitive science, or to re-translate it into subjectivity (the very conception from which Heidegger seeks to distance his work), is simply to eliminate the meaning of being-in-the-world, whose import in *Being and Time* is precisely to show the derivative nature of any conception of human being in which it is reduced to human agency or (any kind of quasi-Cartesian) subjectivity. (Rehberg 2012, p. 160)

CONCLUSION

At least from the phenomenological point of view, there is a nonreducible and noncognitive core with which phenomenology concerns itself. The existence of a nonreductive core which is safeguarded by phenomenology does not only demonstrate that consciousness is irreducible to whatever physical processes but, more importantly, that philosophical questioning is nonisomorphic with the theoretical attitude of the natural sciences.

The problem of Wheeler's approach seeking a close connection with empirical findings is precisely that this nonisomorphism, the crucial and unique place that is to be conferred to philosophy alone, might go astray when confronted with the seductions of naturalism. For it is the assumption of naturalism what led Wheeler to warn philosophers of not postulating occult entities. However, the critical question must be asked: is this really what philosophy is about? It would be interesting to note—and I say this with outright irony—which entities and natural processes have been

introduced by phenomenologists that are inconsistent with empirical science! We can be sure at least of this: Husserl did not offer a neuroscientific theory of phenomenality and Heidegger's cognitive psychology is nowhere to be found. So it is rather striking that someone would suggest that one should beware of the theoretical objects being postulated by phenomenology, when certainly neither Husserl nor Heidegger were in the business of populating their 'theories' with objects challenging those processes investigated by empirical science. Neither Husserl nor Heidegger presented scientific investigations. So let us be clear at this juncture: there is no phenomenological theory of mind, if by 'mind' one understands an ontic region, whose law-like physical processes have to be addressed and explained by means of empirical methods. If we are not aware of Heidegger's theory concerning the neural correlates of consciousness or Husserl's ideas on how to design a quantum computer, the reason is because they do not present us with any kind of theory regarding natural (not even artificial) phenomena. Phenomenology does not postulate entities whatsoever, neither natural nor cultural, and it certainly does not concern itself with the law-like causality governing natural processes. Instead, its task is to investigate the very basis that makes it possible for science to construct theories populated by such objective invariances and the very constitution of the experience which allows for those objects to appear as meaningful. Following Husserl, this transcendental field that is revealed by phenomenology also discloses a transcendental subjectivity that cannot simply be identified with any constituted entity, whether natural or cultural. The transcendental sphere is, then, always relied on when postulating theories about consciousness or the mind, "while not realizing that we are doing so, since whether acknowledged or not, it is the unspoken concomitant of everything we think and believe" (Olafson 1987, p. 256).

I think in conclusion that Wheeler's work is full of interesting insights and he is certainly one of the most important researchers involved in the new wave of cognitive studies with a phenomenological bent. However, as I have attempted to show in this paper, Wheeler's Heideggerian credentials are not incontestable, nor Dreyfus's. So maybe it is time for *detranslating* Heidegger in order to show not only that he did not concern himself with the cognitive but above all that his philosophy was so decisively anti-Cartesian that he even deconstructed the subject-based philosophy which first and foremost provides the basis for the cognitive discourse.

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