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I. INTRODUCTION

Contemporary *technical experience* imposes on philosophy in general, and ethics in particular, reflections on issues that have never been considered, either in the sciences or in technology, because they have never been put in the terms in which they are announced today: among them, the most prominent and worrying, proof and greatest achievement of *technical evolution to date,* is the notion of *artificial intelligence*.

Roughly speaking, this is a *machine simulation* in hyper-powerful computers, based on data accumulated over decades, to reproduce elements that make up human *rationality,* which is accompanied by the expectation that machines with *high* cognitive *performance will be able* to autonomize themselves independently of what we call *intentionality*, a characteristic that is apparently *exclusive* - at least until now on the mammalian evolutionary scale - to humans. This expectation is perhaps the most persuasive aspect of the futurological discourse of computer scientists and programmers today, a contagious rhetoric that looks ahead to the revolution that will be promoted in the field of Neurosciences, when they join forces to reverse- engineer the brain, in order to move towards the *humanoid incorporation of* so-called *strong artificial intelligence* (John Searle), made possible by the computational power applied to the field of Robotics.

In this context, it is important to reflect on the foundations from which the area of *Cognitive Computing* was formed, whose most exuberant achievement is precisely the architecting of the area known today as Artificial Intelligence, which in the past was simply called *Computer Simulation, in the* same way that what we now call the *Computer* was once called the *Electronic Brain*. The idea that the brain can be artificially reproduced and even emulated in new forms of *machine intelligence* is a new inspiration for re-reading the traditional *man-machine* relationship, which has long been reported in the history of philosophy, particularly in the figure of the *automaton,* since Aristotle.

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It so happens that in this century, traditional rationalist philosophy has lost much of its space in the analysis of unprecedented machinic phenomena in our historiography, impacting on the very conception of the *human,* now dissected as an *object subject to* scientific *verifiability* like any causal phenomenon. When it comes to human cognition, it is the *brain* that takes center stage in this process, replacing the unfathomable *human nature* presupposed by traditional philosophy.

The fact is that the emergence of a new area of cognitive computing, namely *Artificial Intelligence*, has radically changed the human *ethos, which is* why, in addition to the approach relating to the *scientificity* that shapes theories of the *mind* and *brain, we* also intend to point out the need to reflect on such occurrences within the scope of Practical Philosophy (or Ethics), otherwise we will reduce human wholeness to biological mechanisms, denying it any *spirituality, in which* we would equate it to *machine entities* that artificially *simulate the mechanisms of* human cognition.

II. THE PAST AND PRESENT EPISTEMOLOGICAL SCENARIO IN THE DISTINCTION BETWEEN BRAIN AND MIND

The dispute between the metaphysical version of mind as *irreducible to* the brain and the new tendencies of *neurophysiology* and *cognitive computing* to reduce *mental states to cerebral metabolism* goes back to *Cartesian dualism* and the inference of the state of *consciousness* as an *immediate* fact of human experience that is independent of demonstration-through the evidence of the Cartesian "*cogito, ergo sum*", that is, the experience of thinking leads us to the *inference that* we exist. As Descartes proposes (1657, p. 17-32), I can doubt any item that is *thought,* but I cannot doubt that I *am thinking*. This is exemplified by Gerard Lebrun's comment on the philosopher's reflections in *The Second Meditation*:

> When I perceive the piece of wax, either by clearly and distinctly understanding its nature, or just by imagining it or touching it, only one thing is certain at the point where I find myself. By showing that this 'thought' was indispensable to the knowledge of the thing, the preceding analysis confirmed this truth. (DESCARTES, 1983, p. 106).

The search for the *organic* basis of the faculty of thinking is nothing new in the history of philosophy, and Descartes himself would have recognized the existence of a connector (*pineal gland*) between body and spirit, according to which human *spirituality,* independent of the body, could influence it. As referenced in John Cottingham, Descartes expresses himself in *The Passions*:

> [...] it must be recognized that although the soul is united to the body as a whole, there is a part of it in which it exercises its functions more particularly than in all the others [...].That part is not the heart, or the brain as a whole, but only the innermost part of the brain, which is a small gland, situated in the middle of its substance and above the channel through which the spirits of its anterior concavities communicate with those of its posterior concavities" [...] Sensory awareness takes place when the soul "inspects" an image that is literally imprinted on the gland. (COTTINGHAM, 1995, p. 74).

Kant also dealt, albeit within the strict limits of his *transcendental criticalism*, with the problem of the formation of knowledge in a *mediating* instance between experience and concept, which is recorded in one of the most obscure chapters of *The Critique of Pure Reason,* which was reserved for *Transcendental Schematism*. In it, Kant outlines the notion of *image* and *model*, perhaps the closest version to the formulations of a *Philosophy of Mind,* obviously without the *empirical* scientific connotation that influences it, as we shall see. In any case, this is a relevant reference in the *rationalist* philosophical tradition, given that, in the context of his transcendental philosophy, Kant admits an *instance in which* images are formulated, which allows the connection between *sensible intuitions* and *categories of the intellect,* an instance he calls *transcendental imagination*. However, evidently

because he had no scientific basis for discussing the *structure of the brain* and the formation of mental states (at his time there was only *rational psychology*, whose assumption is *logical,* not *observational*), the philosopher postulated the existence of a *connective instance* between sensible and intelligible experience, although this type of approach was not the purpose of his criticism, which was unthinkable at the time, which is why Kant considers this instance unfathomable, *inexplicable,* and the theme is little explored in his work. The philosopher devotes only a few pages to it in the monumental structure of The Critique of Pure Reason.

In a nutshell, we can see that the theme is presented by Kant as the *ability of* human beings to *set up general schemes for* perceiving *real* objects based on the *image they* formulate of them. However, the *mental scheme is* not to be confused with the various *images* that inspired it and on which it *returns*. For example, an image of *five points lined up* leads me to an image of the *number five,* but when I think of any number, it is not linked to any image. This is why I am able to think of the number 1000, but it is impossible for me to encompass the image of a *thousand aligned dots*. The very image of 1000 is a representation of the general process of the *imagination* to give a *concept to* that image, regardless of how many *dots* we can imagine. This image that represents a concept and that will serve to adapt to *any other image* it represents is what Kant calls a *schema*, the object of his reflections on *transcendental schematism*. He therefore distinguishes between image and schema (KANT, 2014, p. 224).

Kant rarely gives an example when he is expounding his arguments, but he brings up an example to better elucidate this capacity of the human *intellective faculty* to formulate images and general schemes from them, schemes that are not restricted to any of the images to which they apply. For Kant, this phenomenon of human intelligence is inexplicable, "an art hidden in the depths of the human soul, the secret of whose workings we can hardly ever wrest from nature and lay bare before our eyes". Here is an example to elucidate the scheming capacity he attributes to the human "soul":

> The concept of a dog means a rule according to which my imagination can draw in a general way the figure of a certain quadruped animal, without being restricted to a single particular figure that experience offers me or also to any possible image that I can represent in concrete [...][1].

We can only say that the image is a product of the empirical faculty of productive imagination, and that the schema of sensible concepts (such as figures in space) is a product and, in a way, a monogram of pure a priori imagination, by which and according to which images are possible; these, however, must always be linked to concepts, only by means of the schema which they designate and to which they are not in themselves entirely adequate. (KANT, 2010: 183/B180- A141)

After Kant, at the end of the 19th century, *biological* theories of knowledge were developed, such as that proposed by Richard Ludwig Avenarius and Ernst Mach. They presented a *biological reading of the process of knowledge, which was* a *vital* function like any other. We also find theses that defended the *law of the heterogeneity of ends* (Vaihinger) and that even dealt with the hypothesis of *reducing* human *rationality* to biological and *phylogenetic* processes (BROCHADO, 2021; MORA, 2001, p. 2965).

It is worth remembering that it was in the 19th century that *positivism* flourished, which evolved

[1] In the original: "Der Begriff vom Hunde bedeutet eine Regel, nach welcher meine Einbildungskraft die Gestalt eines vierfüßigen Tieres allgemein verzeichnen kann, ohne auf irgend eine einzige besondere Gestalt, die mir die Erfahrung darbietet, oder auch ein jedes mögliche Bild, was ich in concreto darstellen kann, eingeschränkt zu sein. [...So viel können wir nur sagen: das Bild ist ein Produkt des empirischen Vermögens der produktiven Einbildungskraft, das Schema sinnlicher Begriffe (als der Figuren im Raume) ein Produkt und gleichsam ein Monogramm der reinen Einbildungskraft a priori, wodurch und wornach die Bilder allererst möglich werden,die aber mit dem Begriffe nur immer vermittelst des *Schema*, welches sie bezeichnen, verknüpft werden müssen, und an sich demselben nicht völlig kongruieren. (KANT, 2014, p. 224-225, emphasis added)."

from works initially on *mechanics* (such as Ernst Mach's) to an interest in symbolic *logic,* two trends that, when combined, led to a new movement around professors at the University of Vienna (such as Mach and Moritz Schlick), whose philosophy became known as *logical* positivism, a specific type of positivist movement led by a group called the *Vienna Circle*. According to this tradition,

> [...] the sum total of our knowledge is provided by science [and] old-style metaphysics is strictly empty verbiage. There is nothing we can know apart from experience. In this we find a certain affinity with Kantian ideas, if we omit the numbers. The insistence on empirical observation is accompanied by a criterion of meaning somewhat linked to the routine pragmatism of the laboratory scientist. This is the famous principle of verifiability, or verificationism, according to which the meaning of a proposition is its method of verification. It derives from Mach, who used this type of procedure when defining the terms used in mechanics (RUSSELL, 2017, p. 399).

This conception, which demands the *verificationist* method in scientific work, is the basis on which the Philosophy of Mind will be built, which goes back to the apparently irreconcilable distinction between the rationalist (or *continental)* tradition and the empiricist (or *analytical*) tradition (RUSSELL, 2017, p. 392; D'AGOSTINI, 1999, p. 90). In Bertrand Russell, we succinctly find a traditional distinction in the history of Western philosophy: *rationalism* and *empiricism*, which are distinguished even in terms of territorial influence, since *continental* European philosophy and *British* philosophy followed radically opposite paths in philosophical thinking, choosing different starting points to think about reality, arriving at irreconcilable points of view, particularly in terms of *human ontology*.

The origin of this split, according to Russell, can already be found in the work of Descartes, from which two currents of thought were formed: *British empiricism,* represented by Locke, Berkeley and Hume, and the *old rationalism* revived by Descartes, whose most expressive legatees in the 17th century were Leibniz (in Germany) and Spinoza (in Holland). In his *Essay*, John Locke tries to establish, for the first time, what the *limits of* human knowledge are and what research is within our reach, against the optimistic and uncritical conviction of the rationalists, who postulated a perfect knowledge accessible to us. The philosophy proposed by Locke is *empirical* in two senses, the basis of a critical philosophy: firstly, because it *does not prejudge* the scope of human knowledge, which was undertaken by the rationalists; secondly, because it emphasizes *sensory experience,* basing knowledge strictly on experience, in other words, rejecting the innate ideas of Descartes and Leibniz. In Russell's words,

> It's widely accepted that from birth we have some sort of innate baggage that can develop and enable us to learn a certain number of things. But it's pointless to assume that the uneducated mind possesses a dormant content. If that were the case, we would never be able to distinguish between this and other knowledge that genuinely comes from experience. Then we could say that all knowledge is innate. This is precisely what is said in the theory of anamnesis mentioned in the *Ménon*. So, to begin with, the mind is like a blank sheet of paper. What fills it with mental content is experience (RUSSELL, 2017, p. 281).

There is a tendency for *philosophers of the mind to base* their theses on sources from the *empirically-based analytical tradition*, following the divergence pointed out by Russell, in what diverges from the rationalist tradition, which assumes an empirically *undemonstrable* human nature. The point is that the empiricist tradition depends on *scientific success* in order to base *its philosophical critique* around it, which at the moment doesn't add anything to the philosophy of mind, given that the mind/brain relationship as a backdrop for discussing *artificial intelligence* is as empirically fragile as the rationalist postulate of a *human nature* unscathed by natural causalisms, or Cartesian inatism, since the brain

is still far from being fully known by the empirical sciences. Adopting the thesis of a *human nature* or a *supposed* functioning of the brain not yet accessed by science is, *mutatis mutandis*, no proof at all: both are presuppositions that aim to *justify* the existence of an instance, without being able to *demonstrate* that existence. Defeating the classical conception of *human nature* without having anything to rely on in terms of an empirical explanation of the functioning of the brain *that generates* the activities of the mind does not seem to be a plausible scientific attitude.

Corroborating Russell's statement, there is a very evident tendency at the beginning of this century to believe that philosophy should be submitted to the scrutiny of science, which is understood as *empirically based knowledge,* generating a certain ideologization of scientific practices, denoting a kind of "disenchantment" with the supposed discovery of reason in *modernity*. In Russell's words: "as scientific theory attempts to encompass the whole world, it pursues a goal similar to that of metaphysics. Where science differs is in its greater responsibility for complex and recalcitrant facts" (RUSSELL, 2017, p. 388). Replacing the metaphysical explanations of reality, including the reference to an unfathomable human nature, with the alleged scientific precision of an observational basis does not seem to have corresponded to the ambition of the moderns. At this point, it's important to bring up some of Ulrich Beck's reflections on the aforementioned scientific disenchantment.

According to him (BECK, 2011 p. 231, 235), a legend invented in the 19th century defined industrial society, in its schema of life and work, as modern *society,* which hides the fact that modernity has not fulfilled its *telos of* being a source of solutions to human issues. Dangers that were previously attributed to forces external and superior to humanity, whether in the form of natural or divine events, are now, with the advent of the scientific explanation of phenomena, referred to human rationality *itself,* which has the task of justifying all occurrences, in all instances of human experience, in terms of a *universal* truth that can be reached directly by reason (a *concrete* universal, therefore, no longer abstracted into myths).

If before the existential weight of human beings was softened by reference to a destiny *outside of* them, natural or divine, in the form of myths and religions (MAYOS, 2021, p. 691), the process of scientificization promises to replace these references and be able to deal with all the dangers that arise from the natural and social situation of human beings, which ends up making science a victim of its own *criticality*. This is because, by setting out to explain nature, man and society as *pre-existing* data, science moves from a phase in which it simply confronts these phenomena to a second phase, in which it is forced, out of consistency with its essence and principles, to impose its claim to rationality on *itself*, causing a *disenchantment of the* claims to truth and enlightenment insofar as this self-rationalized exercise finds no ultimate answer on the plane of *understanding* (in Hegel it will be reached on the plane of reason, outside the limited horizon of the sciences).

The first phase of science's journey is what Beck (2011, p. 235) calls the *simple* phase, in which science has only been *half* realized; and in the second phase, which he calls the *reflexive phase,* when *complete scientification* takes place, the methodical use of scientific *doubt* about "its own products, shortcomings and tribulations, is thus faced with a second genesis of civilization", the expansion of which presupposes the extension of the *critical bases of* science itself to its own *specialists*.

In this perspective of the subjectivities that represent and embody scientific knowledge (scientists who are specialists in the various fields), there is a curious destabilization of the foundations of science, and its *self-understanding* (originally legitimized by the self-criticism of the specialists themselves) becomes vulnerable in the form of *publicly* mediated self- criticism, generating in the society of this *scientific civilization* a "process of *demystification of* the sciences, through which the structure that integrates science, *praxis* and public space undergoes a drastic transformation" (BECK, 2011, p. 236).

This transformation is the imposition of an insurmountable contradiction with regard to the position of science, which has been placed in a fragile condition, since it, a victim of its own daring to explain everything by reason, becomes a reference, at the same time always *necessary* and increasingly *insufficient*, to provide a *socially* binding definition of what *truth* is (BECK, 2011, p. 231, 235-237).

In this context, in which it is no longer possible to deal with the hyper-complexity of hypothetical knowledge according to the *verifiable* methods advertised as the only way to obtain scientific rigor in the search for truth, scientific insecurity causes an inversion of positions with regard to the *actors* in the process of scientification, making the *recipients of* scientific production, the layperson, the non-scientist, their own *co-producer* in the process of *social* definition of knowledge, which will be considered valid or invalid according to *social* and non-scientific *legitimation*. As science is no longer a *reference* for validation, it opposes itself, clashing in its various claims to validity and receiving prescriptions of what the truth *should be* from other *legitimizing bodies*. Instead of being resisted by laypeople, as has invariably occurred in history at times of rupture between mythical and scientific knowledge, resistance is now exercised among *scientists themselves* in the form of a corporate blockade, competing among themselves for what is not the main value in this process: resources for their research.

As truth has become a social construction (ideology, therefore), scientists succumb to another type of dispute, the dispute over the mere distribution of resources, creating selective criteria no longer based on their own verification rigor, but on various other reasons, such as "sympathies in terms of political views, interests of funders, anticipation of political implications, in short: *social acceptance*" (BECK, 2011, p. 236-237, 241, 247, 253-254).

> On its way towards methodological conventionalization in the face of the super-complexity it has generated, science is threatened by a *tacit feudalization of its* "*cognitive praxis*". As a result, a *new particularism* emerges on the outside: groups and groups of scientists, who mutually isolate and regroup around primates of utility. Fundamentally, this is not in retrospect or in practical contacts, but in the research laboratory, in its chambers of thought, in the most sacred tabernacle of the production of scientific results [...] [Since] science is less and less sufficient for the production of knowledge, the most diverse forces of faith can nestle. So much becomes possible: fatalism, astrology, occultism, celebration or abandonment of the self coupled and mixed with partial scientific results, with radical criticism of science and scientific faith. These new *alchemists* are rarely immune from the critique of science, for it was not pre-scientifically but in contact with science that they found their "truth" and their followers (BECK, 2011, p. 254-255).

With no alternative path to follow in this failed horizon, *observational-based* scientification is the trend of reflexive scientification and the evolution of technology, with the consequent application of its artifacts and methods to the experimental sciences, presenting itself as an effective increase in contemporary scientific practices, the result of the *techno- scientific union*. Powerful tools for the *computational measurement* of biological and mental activity, such as *CT scans* and *MRI scans,* have revealed much about the functioning of *the parts of the brain and their interactions, which has made it* possible for new areas of knowledge to emerge. This has been made possible by the intersection between traditional sciences and new empirically-based versions, such as the exemplary Cognitive Computing, broadening the dialogical range between *biological, exact and human sciences,* including philosophy, which is now widely rejected in its *rationalist* version, precisely because of the verificationist starting point that is announced as a substitute for metaphysics itself, decreed *dead* in this context of the sacralization of *technologized* empirical knowledge.

III. MIND READING AS CEREBRAL METABOLISM: THE PROMISING FUTURE OF ARTIFICIAL INTELLIGENCE

The *first* reference to the cerebral reading of the mind has its roots in the work of Willard van Orman Quine, one of the most important figures in the philosophy of the mind, who, between the 1960s and 1970s, published the provocation that epistemology, instead of restricting itself to answering what *knowledge is*, should scientifically explain *how we acquire knowledge*. Quine proposed that epistemology should no longer occupy the position of an integral theory of philosophy, but become an integral part of empirical research into the *physical human* subject, part of experimental psychology, focused on the study of the human being as a phenomenon subject to natural conditioning factors, including the functioning of its brain (RAMALHO, 2010, p. 14). According to Ramalho, Quine blames the compendium of the *corpus Aristotelicum* for the misunderstanding of the meaning of metaphysics and its separation from science, as it was placed beyond physics in the compilation of Aristotle's work.

> Since the books of the "Metaphysics" are dedicated to explaining the foundations of all the particular sciences, the beginner should have prior knowledge of the texts dedicated to these sciences before starting to study those of a more general nature. Furthermore, it seems that it was the greater abstraction of the topics concerning "first philosophy" that led Aristotle to choose the latter expression to designate them, and not the fact that he considered them epistemologically prior to those concerning the natural world. According to Paul Churchland, the perpetuation of this misinterpretation in academia is one of the main causes of the historical friction between philosophy and science, in that it tends to base the origin of this friction on Aristotelian authority: Aristotle's ethics, his logic, and his theory of perception, for example, tend to be learned in much greater detail than his cosmology, biology, the way he understood space and the vacuum, or his theory of movement. (RAMALHO, 2010, p. 10-11).

This distinction is important because Quine wants *epistemology to* become a *science*. Now, epistemology was the ultimate scientificization of philosophy in modern times, since it was precisely with the task of breaking with naive classical philosophy since the Greeks and bringing unity to philosophy from the rationalist discoveries of modernity that it was born. It seems a gross contradiction to think that epistemology is averse to empiricism. The radical break with modernity, which left deep marks in the Kantian turn towards the philosophy of the subject, was a giant step for *positivism,* a legatee of the Kantian split between *understanding* and *reason*, to establish itself as an empirical- observational philosophical movement in the 19th century. This happened in the human sciences, since the *split* between body and soul was indelibly installed in Western civilization, preceded by the notion of original sin introduced by *Christianity*. According to Marilena Chaui:

> Ancient philosophers considered that we were entities participating in all forms of reality: through our body, we participated in Nature; through our soul, we participated in divine Intelligence. Christianity, by introducing the notion of original sin, introduced a radical separation between humans (perverted and finite) and divinity (perfect and infinite). With this, the question arose: how can the finite (human) know the truth (infinite and divine)? (CHAUI, 1999, p. 113-114) [...] Given our nature (matter and spirit), how can our intelligence know what is different from it? That is, how can corporeal beings know the incorporal (God) and how can beings endowed with an incorporeal soul know the corporeal (world) [...] The first task that the moderns gave themselves was to separate faith from reason, considering each of them to be destined for different and unrelated knowledges. The second task was to explain how the soul-consciousness, although different from bodies, can know them? (CHAUI, 1999, p. 113; 114).

The philosophers "of the mind" who see it as a metabolic product of the brain (*Neurophilosophers*) forget that the advance of Neuroscience and the scientific evolution that made it possible in no way clash with the philosophical discourse of the 19th century, which had already broken with *classical metaphysics* since the *Copernican revolution* attributed to Kant. They forget, above all, that the Kantian reading of scientific phenomena, even if unified by *synthetic judgments*, requires the incidence of the categories of *understanding on* the forms of *sensible* intuition, space and time, thus affecting *sensibility*. It's safe to say that there would be no empirical science of the mind *referred to* the brain without the giant step taken by Kant, awakened from his Wolfian dogmatic slumber not only by David Hume, but by the *fact* that *Newton's Physics* was a clear and incontrovertible fact: the fact that there already existed, in his time, a *model science* that excelled in the descriptive rigor (and mastery) of *empirically* observable phenomena.

> The notion of the mind as a *metabolic data of the brain* is the nodal point of the illusions about the expansion of artificial intelligence as a general intelligence that is potentially superior to human intelligence. Understan ding that the brain is the only basis of the mind, it is up to science to reproduce its mechanisms, simply by mapping the brain and discovering its functions through empirical observation. But here we must not miss an important distinction: the concepts of *immanence* and *emergence* cannot be confused in the mind/brain discussion. The concept of emergence points precisely to the peculiarity that there are phenomena that are not merely *the result of joining together* the parts of a system that is quantitatively connected by its parts. In this sense, the mind is not located in the brain any more than music is in the parts of a radio, which, if disassembled, will not produce any sound from the parts: the mind has a material basis, but it is not observable in the elements that make up this matter (TEIXEIRA, 2010, p. 22).

The theory of the *extended mind*, which "incorporates technology into the very concept of *mind*", understands that the mind "is spread throughout the world, including cognitive processes that depend on it" (BODEN, 2020, p. 207). As Veridiana Cordeiro explains:

> The hypothesis of the extended mind proposed by Clark and Chalmers (1998), which has unfolded into various strands [...], the most radical externalist position in the Philosophy of Mind by proposing a principle of isomorphism or parity between external objects and mental capacities. In this sense, strands based on the principle of complementarity, such as distributed cognition, i.e. that different properties can work together, are more appropriate and coherent in the defense of distributed and mediated knowing. Distributed cognition defends the idea that cognition is based on means other than just the mind, such as the social environment and the technological environment. This approach understands that there is coordination between individuals, artifacts and the environment in the production and propagation of representations through certain means. In this sense, mental content is considered not to be reducible to individual cognition, but to be the product of a collaborative system of interaction between individuals and external artifacts. Many cognitive processes, which would previously have had to resort to material support that wasn't always available at all times, today find unconditional external support that can be mobilized at the touch of a cell phone. (CORDEIRO, 2021, p. 218-219).

A prominent advocate of a multidimensional approach to the mind/brain phenomenon is Edward Wilson, known for spearheading the *Consilience* movement among the sciences, which he says is an attempt to circumvent a traditional misconception in scientific practices: the fragmentation of reality by its epistemological sections, partial views that do not address the integrality of phenomena. As he proposes, this tendency should be replaced by *consilient knowledge*, that is, by the coherent union of

scientific postulates in the investigation of any and all phenomena, starting with overcoming the split between the biological sciences and the human sciences (WILSON, 1999).

Obviously, *consilient knowledge, in terms of* investigating human actions, implies putting biology, psychology and neuroscience into dialog with ethics. In this sense, it is essential that we dedicate ourselves to the study of moral feelings, according to the postulates of Biology, understanding the evolutionary processes that triggered the mental phenomenon in humans. Regarding the scope of investigation into these relationships between feelings, moral rules and the biological evolution of the species, Renato Cardoso and Thaís Oliveira indicate some approaches, inspired by Wilson's work, from the search for a definition of what a *moral* feeling is, investigating neural and endocrine processes, from the discussion of the genesis of feelings based on research into physiopsychic heredity and its relationship with the environment, as well as the cultural variables that condition human cognitive development, to the situation of feelings as relevant data in the preservation of the species, as can be seen in the synthesis presented by Cardoso and Oliveira:

> a) the definition of these moral sentiments, in which a precise description is sought through experimental psychology, followed by an analysis of the neural and endocrine processes that underlie this response; b) the genetics of these moral sentiments, in which a measure is sought of the heritability of the psychological and physiological processes of ethical behavior and, if possible, the identification of the genes that participate in this manifestation; c) the development of these moral sentiments as a product of interaction between genes and the environment, in line with research already carried out by Psychology and Anthropology, focusing simultaneously on the histories of ethical systems as part of the emergence of different cultures, and the cognitive development of individuals living in various cultures; d) the deep history of these moral sentiments, in which the aim is to discover why these sentiments exist, on the assumption developed by Wilson (and endorsed in this article) that these sentiments represent a gain in the success of survival and reproduction since prehistoric times (when they first manifested themselves). (OLIVEIRA; CARDOSO, 2018, p. 132-133).

This experimental approach marks the scientificity of our time and the cognitivist approaches, under this inspiration, have succeeded in the field of computer science as *cognitive computing,* Artificial Intelligence being a sub-area of it.

IV. THE EPISTEMOLOGICAL REALITY OF ARTIFICIAL INTELLIGENCE TODAY

Talking about cognitive computing presupposes that cognition can be reproduced computationally, which eliminates the *transcendence* attributed to human intelligence, an approach characteristic of 20th century philosophy. The innovation at the end of this century, intensified in the current one, is the progress made in Neuroscience research, optimized by computational processes, which has made it possible to laminate and map the human brain and reproduce its activities, although "in the 1980s, although we already had greater knowledge about the brain, it [had] become irrelevant to the new generation of AI researchers, whose goal was to write a program equivalent, in practical terms, to brain processes" (SEJNOWSKY *apud* RODRIGUES, 2021, p. 27). 27).

However, the steps taken by the cognitive sciences, based on observation, have not yet reached a *consensus* on the *specific* evolutionary traits of human creativity that make it capable of such contradictory experiences at times, as occurs in human attitudes, with their erratic nature, which, unlike the essential *pattern* that guarantees the preservation of other species, is capable of the most ingenious constructions, the most perverse and criminal attitudes, of turning against the species itself, affirming the *ontogenetic* independence of the individual. This issue is far from being settled in the dialog

between computer scientists and the philosophy of the mind, or even psychology, for that matter:

> In the same way that researchers in the humanities have difficulty with the mathematical language widely used in works on Artificial Intelligence, scientists in this field are mostly unwilling to face the endless (and contradictory - which is unbearable for professionals seeking accuracy to reproduce human capabilities in machines) philosophical theses that have been trying for over 25 centuries to understand unfathomable human nature. The connectionist attempt to imitate the brain doesn't solve the questions of the mind and, in order for a truly human-like AI to be possible, it would be necessary to access all aspects of the human psyche, which has not been achieved either by psychology, psychiatry or anthropology, which immediately brings us back to the disciplines involved in human enhancement: neuroscience, cognitive sciences and related sciences, but they are fraught with controversy, are not fully developed and their exhaustion (if any) is not on the horizon. (CRUZ, 2017: 49).

Another issue that cannot be overlooked is that Neuroscience is far from understanding the *functioning of* the brain cells of living beings, and even further from the human brain, which has more than 100 billion neurons. In this vein, Blay Whitby considers that we still "lack enough science" to understand the brain processes of natural life, which creates a clear deficit of scientific knowledge and mastery of physical reality for us to start conjecturing about a sophisticated artificial life, inspired by our own functional brain pattern. Research is still focused on insects (*neuroethology*) and these are major challenges because they are very complex biological constitutions.

> There is still a lot we don't know about the biological processes that permeate natural intelligence. We still don't have a complete picture of how a single neuron (brain cell) works. We don't fully understand what happens at the synapses (junctions) through which neurons communicate. We still don't understand how the many chemical compounds flow through the brain (WHITBY, 2004, p. 102).[2]

As Boden points out: even if all human neurons were mapped, this would be far from revealing *how* they work, what they *do*. "The tiny nematode worm *C. elegans* has only 302 neurons, whose connections are precisely known. But we can't even identify whether its synapses are excitatory or inhibitory" (BODEN, 2020, p. 212).

Much has been invested in applying computational power to simulate the human brain instead of dissecting it in its entirety, such as the *Human Brain Project* (HBP), funded by the European Union and part of the Swiss *Blue Brain* project. Led by neuroscientist Henry Markham, the HBP aims to simulate the human brain on supercomputers that perform around six quadrillion operations per second. The point is that computational speed and the accumulation of billions of pieces of data do not guarantee that an *emergent property* is simulable. The most advanced computational model is not capable of this feat, because these properties do not arise from functional *summation,* not to mention that, as far as data accumulation is concerned, there is not even agreement among neuroscientists about where, how and how much memories are stored in the brain.

According to Joel Frohlich, emergent properties are one of the most important topics for understanding the complexity of brain functioning, because, unlike simple phenomena that can be broken down, such as the swing of a pendulum, the properties that emerge from the brain (intelligence and consciousness) are complex and therefore cannot be broken down,

[2] In the original: "This problem of "missing science" is an important one for the fast-maturing field of Artificial Life. There is still an awful lot we do not know about the biological processes that underlie natural intelligence. We do not yet have a complete picture of how a single neuron (brain cell) operates. We do not fully understand what hap- pens at the synapses (junctions) through which neurons communicate. We do not yet understand how the various chemicals which flow through brains affect their performance." (WHITBY, 2003, p. 115-116).

are not comprehensible in the same way as the parts of a simple functional system. We don't know why a particular pattern of neural connections triggers language, for example, and not another property. Mapping brain cells and their synaptic connections is certainly a good start, but maps only "describe which communication routes are possible", and that's not enough.

> Although the brain does not exhibit a truly infinite range of complexity, it does exhibit structure and activity over a vast range of different space and time scales. Complex connectivity patterns are observed from microscopic synapses to the scale of the entire brain. This facet of brain complexity demands that we not only build our understanding of the brain on cells, but all relevant scales. Indeed, the "functional unit" of the nervous system is sometimes identified as the neuron, but also as larger structures known as cell assemblies and neocortical columns. [...] A true reverse engineering approach requires understanding the brain at its most abstract level.[3] This holistic understanding transcends knowing that a gene or brain region is necessary for memory or cognition - it explains how and why. An article published in the journal Neuron in February asks neuroscientists to consider how a circuit in the brain could or should work before dissecting it with a multitude of tools, just as one needs to understand concepts such as aerodynamics and lift before studying a bird's wing, [being] first need[ed] a theory of how language or consciousness might arise from neurons and synapses before blindly simulating billions of them. (FROHLICH, 2017, *online*).

Artificial Intelligence and Robotics follow the ideal of *cumulative progress*, typical of modernity, which is very different from the *biological evolution of* creativity, made up of various uncertainties, since it is precisely the virtues of beings tending towards perfection that cause the evolution of creativity to stagnate, stabilizing itself on that ontic scale. As Rodrigues Cruz ponders,

> [...] what enables creativity is the imperfect and contradictory nature of human beings, capable as they are of choosing exactly what can be harmful to them [...] The development of individual identity by each person includes becoming different from the crowd by creating an individual *self* and a unique identity, [which] requires resisting the pressures of the surrounding society to fit in... the creative individual must fight against society's pathological desire to "be the same", [so that] it is not perfection that drives creativity, but the harsh pains of generating the new, in which the arrogance of someone going against the tide can cause both good and evil - both permanence and novelty demand each other, in constant tension. (CRUZ, 2017, p. 58).

In addition to the question of the conditions that made the evolution of human creativity possible, it is also important to consider that there are certain types of cognition that are not expressible in logical terms, and it is precisely these that are most essential for our stay in the world, such as our way of establishing contact and getting to

[3] In the original: "While the brain does not exhibit a truly infinite range of complexity, it does exhibit structure and activity over a vast range of different scales of space and time. Complex connectivity patterns are observed from microscopic synapses to the whole-brain scale. This facet of brain complexity urges us not to build our understanding of the brain only on cells, but all relevant scales. Indeed, the "functional unit" of the nervous system is sometimes identified as the neuron, but also as larger structures known as cell assemblies and neocortical columns. [...] A true reverse engineering approach requires understanding the brain on its most abstract level. Such holistic understanding transcends knowing that a gene or brain region is needed for memory or cognition-it explains how and why. A paper published in the journal Neuron in February calls for neuroscientists to consider how a circuit in the brain could or should work before dissecting it with a plethora of tools, just as one needs to understand such concepts as aerodynamics and lift before studying a bird's wing. This idea, which originated with the late neuroscientist David Marr, implies that HBP first needs a theory for how language or consciousness could emerge from neurons and synapses before blindly simulating billions of them." (FROHLICH, 2017, *online*).

know the *physical world,* the so-called *psychomotor* learning. This type of knowledge is acquired through complex learning that involves our motor conditions integrated with our mental states. In Boden's words:

> Although logical reasoning and some aspects of scientific reasoning can be developed according to rules, this is not the case with everyday thinking[4]. For example, our tacit knowledge of the physical world is acquired through psychomotor learning, which has nothing to do with the abstract principles of physics. Since this non- verbalized knowledge is imbued not only with our motor behavior, but also with the use of language, the wide range of computer- processed conversations is impossible from this point of view. (BODEN, 1994, p. 19) .

Empirically dissecting the details of the formation of knowledge, which involves relations between mind and body, is not restricted to mapping the brain, as the resulting mind/body synergy is much more complex. In this direction, Bergson points out that the mental process of thought, when addressing the details of reality, is always focused on the final term, on which the intended activity will rest, and it is only this end, on which the activity rests, that is explicitly represented to our spirit. All the movements that integrate the action with the whole escape consciousness or reach it very confusedly. Let's imagine a simple act: raising the arm. It is simply impossible to imagine all the elementary contractions and tensions involved in this act in advance (let's remember here the Kantian schematism as a model that integrates all the imagery we can access), just as it is equally impossible to perceive each one of them during the process of raising the arm upwards. What happens, in fact, is that thought is immediately transported to the *goal, which boils* down to a *schematic and simplified view of* the act considered as performed:

> In such a case, no antagonistic representation neutralizes the effect of the first one; the appropriate movements themselves fill the schema, aspired to, in a way, by the emptiness of its interstices. Intelligence, therefore, only represents to activity objectives to be achieved, in other words, resting points. And from one attained objective to another attained objective, from one rest to another rest, our activity is transported by means of a series of leaps, during which our consciousness turns its eyes as far away as possible from the movement that is taking place in order to gaze only at the anticipated image of the movement that has taken place. (BERGSON, 2005: 323-324).

This is a dispute that cannot be resolved at this moment in the evolution of research into the *mind and brain,* and therefore cannot be resolved within the scope of *theoretical reason,* which, on the level of science, acts according to categories that govern *understanding,* including the principle of *causality*. This is why we are directing the debate to the field of Practical Philosophy (Ethics).[5]

V. ARTIFICIAL INTELLIGENCE BROUGHT TO THE LEVEL OF PRACTICAL REASON

To discuss empirically-based science is to admit that if science fails to discover and master *causal* processes, there is nothing left for us to do but accept the limitations in the scientific field and look for new hermeneutic keys on a philosophical level. Here we bring Claude Bernard's critique of the mismatch between the *purposes of* science and philosophy:

> To make scientific observations, experiments or discoveries, philosophical methods and procedures are too vague and impotent; for this, there are only scientific methods and

[4] In the original: "Although logical reasoning and some aspects of scientific reasoning can be designed according to rules, this is not the case with everyday thinking. For example, our tacit knowledge of the physical world is acquired through psychomotor learning, which has nothing to do with the abstract principles of physics. Because this non-verbalized knowledge is not only imbued with our motor behaviour but also with the use of language, the wide range of computer-processed conversations is impossible from this perspective. (BODEN, 1994, p. 19)"

> procedures, often very special, which can only be known by experimenters, scientists or philosophers who practice a specific science [...]: they can only follow the march of the human spirit, and do not contribute to its advancement, only opening the way of progress more widely to everything that many may not realize. But in this they are the expression of their time. It would be absurd for a philosopher, arriving at a time when the sciences are taking a fruitful turn, to conceive a system in harmony with this march all the scientific progress of the time is due to the influence of his system. In a word, if men of science are useful to philosophers and philosophers to men of science, this does not mean that the man of science ceases to be free and master of his house, and for my part, I think that men of science make their discoveries, their theories and their science without philosophers (BERNARD, 2005, p. 156).[6]

Of course, scientific activity does not depend directly on philosophical reflections, but this kind of split is artificial, since the evolution of science is accompanied by reflection on its discoveries. It is not the purpose of science to seek its *self-foundation*, and it seems to us that Bernard's narrow view is unaware of the importance of epistemology's analysis of the *meaning* and *effectiveness of* scientific methods, for example. This conception of philosophy fails to understand that the sciences that have developed since modern times have only been successful because there was an intellectual environment formed (including the philosophy of Locke and Hume) to serve as fertile ground for the various empirical sciences to flourish.

In this vein, Evandro Agazzi points out that, since contemporary reality is permeated by science and technology, we need to reflect deeply on what this *techno-scientific presence* means, which is an undeniable condition for solving the existential problems of this moment. The philosopher warns that science itself cannot be trapped in *radical empiricism*, which denies the *synthetic* use of reason, proving the "cognitive legitimacy, in particular, of a metaphysical discourse and an axiological connotation of technoscience itself". Quoting him:

> Given that contemporary reality is permeated by science and technology, it is inevitable that I realize that an adequate knowledge of the science that "signifies" this presence - worth a deep philosophical understanding of current science and technology - is the essential condition for solving the problems of today's world. In particular, by showing that this science does not intend to limit itself to a view of radical empiricism and deny the synthetic use of reasoning. I believe I have succeeded, working in an "analytically" impeccable way (and in fact there are no objections of a methodological nature, for my part I have never been motivated by analytical philosophers) to show the legitimacy of knowledge, in particular, of a metaphysical discourse and a psychological connotation of this technoscience of ours. (AGAZZI, 2012, p. 5).[7]

[5] In the original: "Alors, if any antagonistic representation does not neutralize the effect of the first, the appropriate movements themselves come to replenish the schema, aspired to, in some way or other, by the sight of their interstices. Intelligence doesn't represent any more to the activity than goals to be achieved, that is to say, points of rest. Et, d'un but atteint à un autre but atteint, d'un repos à un repos, notre activité se transporte par une série de bonds, pendant lesquels notre conscience se détourne le plus possible du mouvement s'accomplissant pour ne regarder que l'image anticipée du mouvement accompli." (BERGSON, 2013, p. 199).

[6] In the original: "To make observations, experiments or scientific discoveries, philosophical methods and procedures are too vague and are powerless; for this there are only scientific methods and procedures, often very special, which cannot be known more than by the experimenters, scholars or philosophers who practice a particular science [...]: They can only follow the march of the human spirit, and they don't contribute to its advancement, but open up to everyone the path of progress that many would not even realize. But in this they are the expression of their time. It would be absurd for a philosopher to arrive at a time when science is taking a fruitful turn, to discover a system in harmony with this march of science, and then shout that all the scientific progress of the time is due to the influence of his system. In a word, if the men of science are useful to the philosophers and the philosophers to the men of science, it is not because of this that the man of science ceases to be free and the owner of his home, and for my part, I think that the men of science make their discoveries, their theories and their science without the philosophers. (BERNARD, 2005, p. 156).".

Bernard's position denies the very dialectic that permeates the relationship between the sciences and philosophy, given the evidence that the process of knowledge, at any level, is historically situated, so that this independence concerns *purposes and* not the *ontology of* the process of knowledge itself.

At this point, we are moving towards the end of our approach, restricted as it is to the limits of this article, by noting that there is a broad spectrum of discussions on artificial intelligence within the scope of *theories of the mind* or *computer psychology*, which is dedicated to architecting a detailed computer model of human mental processes (BODEN, 1994, p. 15). The brain and mind debate is proving fruitless as knowledge of how the brain works in order to improve artificial intelligence is still a chimera. Even Churchland questions the analogy between *cognitive activity* and *computer processing*, given that the reproduction of the brain presumes that the emergence of the human species meant a *qualitative leap* on the phylogenetic scale, since the *symbolic* conception of cognition requires that the *functioning of the* human brain is totally *different from* the brains of all *other species that are* not capable of developing language. But the truth is that there was no leap, because the evolution of the *sapiens* brain was subject to a *continuous* evolutionary process, like that of any species: the assumption of a leap *without* empirical *confirmation* is a *metaphysical bet* like any other. According to Ramalho, Churchland's criticism of the attempt to read the brain as *similar to a computational process* did nothing more than replace the Cartesian *mind with software,* in any case denying the complexity of the brain's constitution and metabolism, which should be subject to empirical research:

> This belief in the uniqueness of human thought and the sidelining of empirical brain sciences in its study, conclude Paul and Patricia Churchland, are expressions of a philosophical atavism that is not sustainable in the light of the history that culminated in naturalism: "[...] functionalism averse to the study of the brain is methodologically close to Cartesianism. In the place of Descartes' non-physical mental substance, functionalism put 'software'". (RAMALHO, 2010, p. 16-17).

Our purpose here is to bring the problem of intelligence and the possibility of its *artificial projection* into a philosophical discussion that transcends the epistemological approach on the level of a theoretical philosophy, because it doesn't seem to make sense to us to continue discussing the relationship between brain and mind, which is the *task of the* empirically-based *sciences and* which, as we have seen, are still taking slow steps towards decoding human brain complexity. We think that the approach that can be useful in philosophical reflection is to move the debate to the plane of *practical reason* and, instead of denying the possibility of duplicating the mind, try to understand how *mental states govern* human attitudes. Similarly to Kant's proposal, when he turns the unsustainable contradictions of reason in the *Transcendental Dialectic* towards the postulates of practical reason, the object of a *metaphysics of morals,* we believe it is opportune to tackle the issues of technical experience in this century, whose point of arrival is the technical phenomenon of *artificial intelligence.*

We believe that this phenomenon, beyond eschatological fictional elucubrations about the domination of humanity by *intelligent machinic entities*, should be reflected upon according to the statutes of Ethics (*Practical Philosophy*), even

[7] In the original: "Realizing that contemporary reality is permeated by science and technology, it seems inevitable to me that a proper awareness of what such a presence "means" - that is to say, a profound *philosophical understanding of* current science and technology - would be the indispensable condition for solving the existential problems of today's world. In particular, by showing that science itself cannot be understood by limiting itself to an ethics of radical empiricism and denying the synthetic use of reason. Credo di essere riuscito, lavorando in modo "analiticamente" impeccabile (e di fato nessuna obiezone di natura metodologica mi è mais stata mossa da parte dei filosofi analitici) a mostrar la legittimità conoscitiva, in particolare, di un discorso metafisico e di una comnotazione assiologica della stessa tecnoscienza. (AGAZZI, 2012, p. 5)".

though there is currently also a clear trend towards the scientificization of philosophical Ethics itself in the various versions of so-called applied Ethics. In the current context, Ethics is also on a *verifiable basis, which has* an impact on *Philosophy of Mind, which* now has the task of explaining cognitive processes that are also *moral in* nature. Traditionally, *moral actions have been the* object of study of Practical Philosophy (Ethics), which supposes an intentional instance that *transcends* the physical basis of the brain. Depending on empirical tracing of brain functions, the Philosophy of Mind takes on the currently unachievable task of explaining why excitatory and inhibitory neuronal triggers *cause* good or bad behavior, *provoking* personalities subject to both moral rigorism and moral laxity. Fernandes Teixeira concludes that:

> For centuries, philosophers have been trying to figure out what thought is without reaching a final conclusion. In the 20th century, a specific philosophical discipline appeared that seeks an answer to this question: the *philosophy of mind*. It investigates whether thought is a product of the brain or whether the brain is just the biological host of the mind. This is the mind-brain problem, which divides philosophers into materialists and dualists. For materialists, there is only matter, and the mind is really just a side-effect of the brain's metabolism. The dualist says that mind and brain are different things, even though they communicate (TEIXEIRA, 2009, p. 24).

Even so, we believe that there is a double gain for Artificial Intelligence research in bringing this area of Cognitive Computing into the ethical debate. Firstly, it can bring up issues that go unnoticed by *technoscientists and programmers with* regard to the properties of human *rationality,* which can be valid for inspiring them to design *new* machine *tasks* with fewer flaws (*biases*). In addition to this dialogical possibility, taking the subject of AI, which is so arid in humanities research, on an ethical philosophical journey, could be revealing in the following sense: in this new context of human *technicity in* which doubts arise about the boundary between human intelligence and *machine intelligence* (something that would not have occurred in the history of machines until the advent of the computer), the most essential thing is to reflect on human *behaviour itself* in this new horizon of the traditional man-machine relationship, which ceases to be *abstract* and becomes *effective* (concrete universal) as a *humanized machine,* since *thinking technicity is* realized, projected as artificial intelligence.

This is not about discussing *whether* the machine thinks; it's not about that, because if computer science defines thinking as exceptional *performance* promoted by machines, this is not a question that interests the philosophy of technology. It is merely a technical reference or a functional starting point for the field. From an ethical point of view, what is of scientific value is to understand the historical meaning of *technicity* at the level of civilization at which we find ourselves, a time when the ancient human desire to project oneself into automaton machines that replicate one's characteristics and faculties is the most important event in technology so far.

From an ethical point of view, it is important to consider the consequences of this event on human *praxis*, how it will be impacted and, above all, *denatured*. Technological unemployment, for example, which today calls us to urgent reflection, is a problem that is situated in this decade and is difficult to tackle immediately. However, in the medium term, could the liberation of the human body and mind from repetitive labor tasks that will be performed by machines, tasks of negligible intellectual quality, bring better conditions for *homo sapiens to* explore other *levels of* cognitive experience, other spectrums of *creativity,* through the new convergences of research into *genetic manipulation* and *nanorobotics*? The ultimate question is: will there be any substantial change in the evolutionary scale of the only animal endowed with rationality, as this animal begins to project its rationality into hyper-powered machines that replace it in various tasks? Or will these machines, in the end, help him to expand his own *rational nature*, thus freeing him from the causalities imposed on his biological constitution?

VI. FINAL CONSIDERATIONS

Human technical experience, supposedly liberating man from the projection of his organs (Ernst Kapp) into the most rudimentary and essential *instruments*, through the projection of the *sound signal* produced by the body in the form of *speech and* language, to the projection of the *mind itself* in the form of artificial intelligence, will lead us to what stage of intellectual development and ethical autonomy? To put it succinctly: what essentially changes the trajectory of our technical experience, which shapes both *logical* and *praxeological* behaviors, with the advent of artificial intelligence as the emblematic end point of technical progress towards the reproduction of the brain in machines?

Our reading of the phenomenon tends towards an undisguised optimism: if *sapiens* has been experimenting and *freeing itself from* nature through its rational faculties, the culmination of this process is the incorporation of the rationality it has *manufactured* into its own ontology; that is to say: the possession of technique not just as the manufacture of *instruments* to placate the natural, causal hindrances imposed on the evolutionary process peculiar to humans. We are now dealing with an achievement that is different from all the instruments or machines that have ever been designed and produced, because it was with the advent of the *computer* machine that the projection of the *human essence* itself, defined by its *intelligence,* became possible.

At the crossroads we find ourselves at, the challenge persistently announced by *experts* in the field of cognitive computing is the reproduction of the brain organ, beyond the mere *simulations of* cognitive processes (mainly memory and reasoning) achieved today by the gigantic efforts of scientists and programmers, through decades of hard work. Whether such replication is even possible is a technical-scientific question. Whether it will have irreversible consequences for our species is a debate that will flood the coming decades. What we want to claim as the scope and limits of this process, with the consequent accountability of each social actor involved in it, is the giant struggle that *Ethics has* to face in this first quarter of the century.

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