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HUMAN INTELLECT VS. ARTIFICIAL INTELLIGENCE: A THOMISTIC PERSPECTIVE ON COGNITION, UNITY AND QUANTUM POTENTIALITY

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Abstract

In the Thomist view, human knowledge far surpasses the capacity of any machine. Unlike artificial intelligence (AI) and cameras, that merely capture and process data, the human intellect interprets, organizes, and assigns deep meaning to sensory experiences. Thomas Aquinas emphasizes two essential faculties in this process: the senses, which collect data, and the intellect, which transcends the physical to understand the essence of things. AI follows algorithms, but the human mind is capable of abstract reasoning and discovering metaphysical truths. Thomas Aquinas distinguishes intrinsic and extrinsic unity, in a philosophy that moves away from reductionism (understood as radical materialism). Intrinsic unity — essential to the identity of a being — exists within itself, while extrinsic unity depends on external relations. Thomas Aquinas criticizes Democritus' atomism and emphasizes that the essence of a being cannot be reduced to its material parts. Intrinsic unity is fundamental to the existence and function of a living being (particularly humans), who act as cohesive wholes — form and function are inextricably linked to their essence. Artificial objects do not have an intrinsic unity. Machines can record sensitive data such as colors and shapes, but they cannot discern the meaning and essence of things. True human cognition goes beyond data manipulation; interprets universals, categories and transcendental truths. For Aquinas, human intelligence, as an immaterial faculty, discerns deeper meanings such as beauty and existential meaning; transforms sensitive data into meaningful concepts — a process beyond the reach of machines. Even in its most advanced forms, AI cannot comprehend essences, reflect on universals, or experience self-awareness. AI can simulate intelligence, but it does not have the depth of human cognition, which, for Aquinas, is linked to divine reality. The Thomistic view challenges reductionist views of human intelligence; highlights the uniqueness and complexity of human consciousness. This distinction is relevant in psychology, which seeks to understand cognition, consciousness and being. Psychology benefits from philosophical reflection on human capacities, especially with regard to the role of the intellect and the soul in the perception of reality. In this context, quantum superposition can be interpreted as Aristotelian potentiality. In quantum mechanics (QM), superposition allows particles to exist in multiple states until they are observed. This recalls Aristotle's notion of potentiality as an unrealized capacity. The measurement cancels the superposition, and updates a state of many potentials. This interpretation unites modern physics with classical metaphysics and aligns quantum indeterminacy with Aristotelian principles.

Keywords: *Cognition, intelligence, consciousness, abstraction, metaphysics*.

1. The denial of substantial form and teleology in modern thought: Implications for the concept of intelligence

In modern philosophy, concepts such as substantial form and teleology have been rejected. The universe and human beings have been reduced to mere quantities. By eliminating any qualitative and teleological dimension of reality, this approach takes on an ideological character. In a (radical) materialistic view, there can be no fundamental difference between human intelligence and what we now call AI.

For Aquinas, human intelligence is spiritual. Contrary to the mechanistic view, we can grasp essences and have access to the reality created by God. Human intelligence participates in divine reason in a relative way.

2. Understanding beyond data and machine

Descartes' philosophy reinforces a rigid separation between *res cogitans* and *res extensa*. The mind is considered immaterial, but the separation between mind and body ends up, gradually, subordinating the

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immaterial to matter, which ultimately culminates in materialism. This view struggles to explain the human capacity to act, know, create, reflect and understand the world in a deep, spiritual, intuitive, intentional and subjective way. It is difficult to think of a machine/artifact that truly grasps the nuances or the depth and richness of a reality that, in the Thomist view, transcends both materiality and quantity.

2.1. Overcoming Reductionism: The soul as the formal principle of human unity

According to the Aristotelian-Thomistic view, the soul is not a substance separate from the body, but as the formal principle that unifies and gives purpose to the human being, and this also provides a better understanding of human agency itself.

3. Essence and existence. Intelligibility of modern physics

Essence and existence are inseparable. Writing this text is an expression of a divine essence realized in existence, in a dynamic that offers a compelling explanation of a world imbued with purpose and meaning. This perspective can provide intelligibility to some discoveries of modern physics, which, due to its lack of a metaphysical vision, struggles to address the philosophical problems they raise.

4. Discovery, not invention

G. K. Chesterton criticizes Descartes's world (made exclusively of formal and mathematical abstraction). He writes:

> The intellect is not purely creative in the sense of painting pictures on windows and then confusing them with the external landscape. Instead, it is active, and its activity consists in following, as far as the will desires, the external light that truly falls upon real landscapes. This is what gives an indefinitely vigorous and even adventurous quality to this way of viewing life, compared to the view that material influences impose themselves on an entirely inert mind, or that psychological activity creates and projects a fantastic world without foundation (Chesterton, 1958, pp. 248–49).

Mathematics is an instrument that reflects the rational order, but is not reality itself; reveals aspects of the underlying order without exhausting its full depth. In Cartesian dualism, the mind (separated from matter) is capable of imposing order on material reality through rational and abstract control; but is it true that human action transcends the natural order or alters essences? As determined by substantial form, essence is independent of human action. We cannot properly claim that we invent mathematical truths. We discover them, as they reflect a preexisting order in nature.

5. From the tree to "tree-ness"

John Searle wrote in 2004:

> The robot does not have intentional states at all; it simply moves as a result of its wiring and its program. Moreover, in instantiating the program, I do not have intentional states of the relevant kind. All I do is follow formal instructions on how to manipulate formal symbols (Searle, 2004, p. 243).

> In artifacts, we extend our own intentionality; our tools are extensions of our purposes, and for this reason, we naturally make metaphorical attributions of intentionality to them (Searle, 2004).

AI systems process data and identify patterns. It is algorithmically "learning", but this does not equate to understanding, intentionality, or genuine freedom. An AI that recognizes a tree in a dataset differs from a human recognizing the tree as part of a larger, meaningful, profound reality (the scientific revolution of the 17th century attempted to quantify without full success). Human knowledge transcends computational processes and embraces metaphysical richness. While algorithms operate in a mechanical and cold way, human knowledge is more than that: it means participating in deeper instances. This is why we can recognize universal moral principles, such as justice and kindness, that go beyond mere data processing and are rooted in a higher metaphysical understanding.

6. A Non-Reductionist view

Physics tends to reduce reality to the domain of quantity. Edward Feser writes that "the absence of a feature in the mathematical description of nature is not evidence of the absence of that feature in nature itself" (Feser, 2018: 36). We must differentiate between mathematics and nature — one cannot be reduced to the other. Wigner questioned "the irrational effectiveness of mathematics in the natural sciences" (Wigner, 1960) — as one reflects another, but this does not require us to mistake an instrument for reality; or necessity, contingency and teleology. Substantial form "is a physical principle of every material substance that makes the substance the kind of thing it is, by actualizing or determining the potentiality of

being a particular substance" (Dodds, 2012, p. 21). If science can measure phenomena without presupposing the existence of metaphysical essences, without this concept, skepticism finds it easier to impose itself. The same happens with the concept of metaphysical time related to real change, without which any conceptualization of time becomes more challenging.

Radical materialism, from Democritus to modern reductionism, ignores quality and reduces reality to the measurable. This leaves Immanuel Kant to recognize that we need the Metaphysical Idea of the World (also "God" and "soul") but Kant placed it only as a postulate, while at the same time emphasizing the transcendental subject and the intersubjective conditions of knowledge, such as space and time, as *a priori* forms, which compromise the human capacity to grasp reality. For Aquinas, time cannot exist without change — "it is the measure of what is before and after in motion" (Aquinas, STh, I, q. 10, a. 2) — and reality cannot be reduced to a "static" thing or *noumenon*— the universe is a dynamic interaction of contingent substances with potentiality and actuality, matter and form: intrinsic purposes.

7. The intellect as an immaterial principle

It is true that the intellect needs the senses in order for there to be knowledge, but in Aquinas' view, the intellect goes beyond this dependence, as it is the immaterial soul that includes the intellect, by allowing the knowledge of universal essences.

The well-known "Hard Problem of Consciousness", initially formulated by David Chalmers, emphasizes that the correlations that exist between sense data and neuronal activity, expressed quantitatively, do not theoretically exhaust the qualitative subjectivity experienced.

8. Thomas Aquinas vs. Locke and Descartes

Locke and Descartes reject the objectivity of secondary qualities, arguing that they exist only as qualities perceived by the mind. Aquinas sees them as having a place within an objective reality that does not arise by accident, and the act of perceiving is not simply an individual and subjective matter. As Wolfgang Smith notes, "if there is a competent observer who looks at a red body illuminated by white light, it is red — without exception!" (Smith, 2011: 36). Color, like essence, reflects an objective reality accessible to the human intellect.

We are part of a human essence that defines us. Essence does not belong to the measurable domain, but that does not mean it does not exist. The ultimate metaphysical foundation of reality is *Esse* (existence), which is not reducible to what is sensible to the human body — to what is perceived — but rather to what ontologically sustains what is perceived. *Esse* is more fundamental than the essence, as it updates the essence.

9. Quantum Mechanics and the Philosophy of Thomas Aquinas

Heisenberg has the following critical insight: "good science is being discarded because of bad philosophy" (Heisenberg, 1976: 5). He saw, in the probabilities that result from QM and the Schrödinger equation, an opportunity to discard what he considers to be bad philosophy, that of Descartes — who thinks of the material world as consisting of merely physical and mechanical entities — and revitalize Aristotle's thought. In fact, Heisenberg finds, in the probabilities of QM, echoes of the metaphysical concepts of potency and act:

> Perhaps it could be called a tendency or objective possibility, a potentia in the sense of Aristotelian philosophy. In fact, I believe that the language actually used by physicists when they speak of atomic events produces in their minds notions similar to the concept of power. [...] Language has already adjusted itself, at least to some extent, to this true situation (Heisenberg, 1958: 180).

He adds emphatically: "every interpretation of quantum phenomena that differs from mine seeks to 'return to the concept of reality in classical physics or, to use a more philosophical term, to the ontology of materialism'" (Heisenberg, 1958: 129). Not only is there a rejection of materialism, but also the realist assumption that, as Chesterton had already described, reality is never just what it already is, but also what it could become (Cf. Chesterton, 1958: 226).

An AT interpretation of QM cannot be idealist; it cannot place consciousness as a determinant in what is called the collapse of the wave function. Contrary to what Wigner suggested — in the well-known phrase that it is not possible "to formulate the laws of QM in a fully consistent form without reference to consciousness" (Wigner, 1967: 169), — a Thomistic interpretation cannot endorse this creative view. It is true that quantum phenomena are shaped by the methods we use to apprehend them, but this does not imply that reality itself is dependent on the human mind. Reality is objective, rooted in first causes and substantial forms.

If Heisenberg's engagement with wave-particle duality (and with results contingent on measurement methods) led him to recognize parallels with Kant (we do not access reality independently of our way of perceiving it), he also revitalized Aristotle, with a suggestion that we are talking about an ontological reality and not just epistemological. He did not commit himself to a teleology in a strong sense, but we can say that QM gives us clues to an ontology of potency and act. Heisenberg recognized the need for QM to adopt a new perspective to think about existence; he saw reality as a complex set of relationships and possibilities, where concepts such as potentiality and actualization play a crucial role in explaining nature.

9.1. Quantum actualization and the role of the measuring instrument: A Thomistic interpretation of potentiality and teleology

A metaphysical view in which the measuring instrument, as an extension of human intelligence, plays an essential role in quantum actualization, is more in line with a Thomistic philosophical view, especially because "the essences closer to matter would be those with less actuality and, therefore, greater potential" (Silva, 2013). A quark is more open to becoming something — it has more potential — than a measuring instrument, which has a more actualized reality.

These powers are more associated with teleology than with a collapse of the wave function that results from a random process. "There is an order of probabilities that defines the system as a physical reality" (Silva, 2013: 638). Spontaneity is "ontologically sterile," of little use for understanding the actualization of quantum potentialities (Kožnjak, 2020: 460). On the one hand, we keep talking about updating of quantum states, then we use the concept that is little associated with it: that of accidental cause.

For Kožnjak, the final cause, mediated by the formal cause, offers a richer — or less sterile — structure by allowing a relational understanding of quantum phenomena. The final act is seen as the full realization of potency, which can be understood as "guided" by the internal structure of the system itself, whose realization depends on this structure and contact with the measuring instrument. This quantum formalism "remains open to experience, through which it cannot deny the existence of a certain causal indeterminism which, as Heisenberg declared, is not reducible to the epistemological order, but is rooted in the ontological order of things, given mainly by the potential of matter" (Silva, 2013: 652).

The probabilistic structure of QM suggests a type of specific open. This interpretation allows quantum indeterminacy to be integrated into a philosophical vision in which causality is neither mechanical nor deterministic limitation, but rather an ordered actualization of potentialities according to broader metaphysical principles.

10. The relationship between per se causes, accidental causes and the collapse of the wave function: A Thomistic perspective

For Aristotle and Aquinas, an effect *per se* requires a cause with unity and formal determination, while an effect by accident results from a coincidence of independent causes, but without an order of intrinsic causes. When several independent causes act simultaneously, an accidental meeting of these causes may occur. A river with a strong current may knock down a nearby tree (natural cause) at the moment someone is passing by and is hit by the falling tree (another independent cause). The encounter between the fallen tree and the passerby is accidental, as there is no direct relationship between the two causes that explains the event by itself, it happens because chance, without a formal unity that links the causes in a logical or necessary chain. The event is contingent because the various independent causes are not coordinated or organized to produce this effect. Wave function collapse in QM cannot be merely accidental. The Schrödinger equation, which describes the deterministic evolution of wave function, implies a formal order and a set of structured conditions that govern the system.

Even though the deep mechanisms of this relationship are not yet fully understood by QM, my argument suggests that the collapse cannot occur by chance, since the Schrödinger equation already contains some degree of formalism. "The new form was in the potentiality of matter and is brought to actuality through interaction with the measuring instrument during the act of observation" (Silva, 2013: 652–53). Thus, the cause of the collapse appears to lie in an orderly interaction rather than mere chance. Neither the collapse nor what precedes it nor the concrete manifestation of the particle has to be necessarily accidental, but rather it can be interpreted as part of a teleological process (cf. Kožnjak, 2020). "Becoming is for the end, and actuality is the end, and it is for this reason that potentiality is acquired" (Arist. Met. 1050a7–10). AT philosophy integrates the notion of determinism based on form and reality, while recognizing the inherent potentiality of matter as the basis for contingent and open causality. By revealing the indeterminacy of reality at fundamental levels, QM offers fertile ground for dialogue with Thomistic metaphysics. Both address profound questions about what it means to exist, to be fulfilled, and to be fully realized. Although this dialogue requires caution, nothing currently limits this Thomistic approach. Schrödinger's equation not only describes the probabilities of a system, but a deeper reality where

potentiality is a fundamental principle, and reality results from something structured -- a dimension non-deterministic or mechanistic.

The notion of observer should not be understood as something solely linked to human consciousness. The collapse of the wave function occurs through the act of the measuring instrument, which acts as an extension of human intelligence. The instrument serves as a mediator between potency and act, analogous to the role of the agent in actualizing raw material in Aristotelian philosophy. The instrument is not the efficient cause in the traditional sense of generating or controlling the change, but is the means through which the potentiality of the particle is actualized, becoming manifest. Thus, the actuality of the instrument awakens the actuality of the potential matter, without falling into the implications of radical idealism, preserving the distinction between the real and the merely mental.

11. Quantum mechanics and teleology? Revisiting potency and act in light of contemporary science

QM is a field that suggests the presence of qualitative and not just quantitative potentialities, which is to say: intimately connected with forms and essences that refer to a world with teleology.

Only human beings are capable of understanding this qualitative and teleological (mataphysical) dimension. No machine, however sophisticated, can achieve this understanding, since its structure remains entirely confined to the domain of quantity and efficient causality. Far from confirming the mechanistic view of reality, contemporary science itself can provide evidence that human intelligence transcends any attempt to equate it with AI.

12. Mathematics and metaphysics in Aquinas: A reflection on Schrödinger's equation

Schrödinger's equation reflects not only mathematical relations but a formalism that reaches its full actuality through a teleological transition from potentiality to act. The teleology does not just describe a probability of states, but can be thought of as oriented towards carrying out a concrete act of measurement, in a similar way to form that directs matter towards an end.

The formalism of the equation already implies a destiny or a potentiality that is realized. Ultimate causality can never be reduced to purely mathematical or quantitative explanation. A metaphysical principle or first efficient cause, is what guides and accomplishes what mathematics describes in terms of possibility. The wave-particle duality brings a complexity that can be interpreted in ways that are not limited to the purely mathematical or probabilistic domain. By introducing probabilities in place of certainties, QM opens up an interesting space to reflect on the relationship between efficient causality, teleology and metaphysical action. At the fundamental level of reality, particles can behave in indeterminate ways, depending on the conditions of observation. This behavior cannot be fully described by deterministic and precise logic, which leads to a probabilistic interpretation of reality. This can be seen as a limitation of the purely materialist and mathematical explanation. Reality is composed not only of efficient causes but also of final causes. Indeterminacy is a space where divine action acts, orienting the phenomenon, guiding probabilities in a way that is beyond purely physical or mathematical explanation.

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