Knowledge - Discovery or Revelation?

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Received 9 December, 2021; Revised 16 February, 2022; Accepted 17 February, 2022

Available online 17 February, 2022 at www.atlas-tjes.org, doi: 10.22545/2022/00179

The term "knowledge" is difficult to understand when we want to define it. This is why "knowledge" has been reconstructed as a cluster concept that points out relevant features but that is not adequately captured by any definition. As long as knowledge can only be situated in forms of time, it is doomed to remain truncated and to manifest disjointly. Knowledge's lack of unity is expressed into different forms of knowledge. Fragmented by the cutouts that allowed its manifestation, knowledge is - whatever type of knowledge we talk about - incomplete, subjective, limited and fragmentary and, in most cases, it is not possible to understand exhaustively a specific domain. That is why, in this paper, we pursue a transdisciplinary exercise, involving science and religion, and an interdisciplinary one, involving disciplines and theories found in the complex systems theory.

Keywords: Transdiciplinarity; External knowledge; Scientific knowledge; Self-knowledge; Paradigm; Axiomatic systems; Cognitive perception

The only true wisdom is in knowing you know nothing.
Socrates

To know that you do not know is the best.
To think you know when you do not is a disease.
Recognizing this disease as a disease is to be free of it.
Lao Tzu

1 On Knowledge... or, from Lightning to DNA and, Maybe, *Beyond*...

Knowledge - is that discovery or revelation?

Perhaps, considering things at a higher level of "reality", this paradox disappears? Or, on the contrary, perhaps we shall accept that the human brain will not evolve enough to discover its own origins. Who gives us access to knowledge? Intellect, imagination or intuition? All of these together, in a still undefined concept?

What is the way in which the imaginary can be involved in the process of knowledge? Can the reason/spirit disjunction be taken to another level, through the spiritual-imaginary-rational triad, in which the imaginary, initially a gap between the intuitive approach and science, functions as a bridge between them? Man is creating more and more new things, but unfortunately he has fewer and fewer new thoughts...

In his 1983 reference book, *The Modularity of Mind*, the philosopher Jerry Fodor stated that there exist "thoughts that are beyond our comprehension". How can we ask ourselves such questions, though?

Philosopher Colin McGinn believes that the reason why some philosophical problems (such as the relationship between mind and matter, or how the physical processes in our brains lead to the emergence of consciousness) prove unsolvable, is that the answers are simply inaccessible to the human mind. McGinn is convinced that, in fact, there is a solution to such problems, including the relationship between mind and matter or body, except the human brain will never find it. Some researchers claim that this is already true of theories such as quantum mechanics. Richard Feynman states: "I can say with certainty that no one understands quantum mechanics." Does it appear that we are "cognitively closed" to the quantum world?

On the other hand, psychologist Steven Pinker argues that, "if our ancestors did not need to understand the universe to spread their genes, why would natural selection have given us a brain capable of doing this?"

The human mind, implicitly the brain and consciousness, is the greatest mystery of the Universe, of humanity and of each of us. The brain is the only organ that studies itself, the only organ that raises the problem of its functioning... In the area of neurosciences and transpersonal psychology, the ability of the matter to mirror itself through the human brain is considered today to be the most challenging subject in the world of science.

We can trust that the way we think, the way we represent and perceive reality represents reality itself, but this is, as Plato described it, only an apparent reality, because we are limited by senses, prejudices, finitude... Do we thus enter in a vicious circle, or do we filter everything through an endless series of mirrors? For instance, Schopenhauer's idealism was expressed in his famous formula: "The world is my representation", and his belief that all objects of experience are dependent, for their existence, on the brain, or on a knowing subject, was influenced by Kant and by George Berkeley:

> *"... if accordingly we attempt to imagine an objective world without a knowing subject, then we become aware that what we are imagining at that moment is in truth the opposite of what we intended, namely nothing but just the process in the intellect of a knowing being who perceives an objective world, that is to say, precisely that which we had sought to exclude. For this perceptible and real world is obviously a phenomenon of the brain; and so in the assumption that the world as such might exist independently of all brains there lies a contradiction."*
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> (Schopenhauer, *The World as Will and Representation*)

So, why do we think the way we think? What exactly generates the ideas of the beginning and of the end, of 0 and 1, of everything and nothing, of irreducibility, indivisibility, of minimality... of atomicity? Is it because of our tendency to fragment, to parcel, to divide?

> "Here I stand, atoms with consciousness, matter with curiosity. An universe of atoms, an atom in the universe."
>
> Richard Feynman

But how many types and forms of knowledge and truth do we "know"? Knowledge can be common, scientific, philosophical, political, legal, etc. We can also talk about empirical knowledge and theoretical knowledge, direct (immediate) knowledge and intermediate knowledge, tacit knowledge and explicit knowledge, a priori and a posteriori knowledge, etc.

Is the way our brain is built responsible for all these divisions, or is there something else beyond this level, something that gives us the impetus, the desire, the aspiration, the need to finally integrate things, after having initially fragmented them? This seems to be the purpose of transdisciplinarity that we are going to evoke in this paper and without which we consider that knowledge cannot be conceived.

2 On Self-Knowledge

He who conquers himself is the mightiest warrior.
Confucius

The awareness of being alive, as the first manifestation of knowledge, triggered the history of man and his world, the entire civilization and culture. Unfortunately, however, human culture, when based on appearances - as Yuval Harari observes in *Sapiens - A Brief History of Humankind* and in *Homo Deus: A Brief History of Tomorrow*, can be confusingly artificial.

The sensible-latent distinction was the starting point for contemporary psychology. Thus, in the myth of Plato's cave, to which we referred above, we find as *sensitive* - the shadows on the walls of the cave, and as *latent* - what they deduced as existing in the real outside world. In the psychoanalytical method developed by Freud, based on the myth of the cave, we also find the *sensitive* - the dream, as we remember it in the morning, and the *latent*, which represents the meaning of the dream...

The philosopher Plato famously pointed out the need for a distinction between knowledge and true belief in the *Theaetetus*, leading many to attribute to him a definition of knowledge as "justified true belief". In the process of knowledge, an important part is represented by the self-knowledge, which usually refers to a person's knowledge of their own sensations, thoughts, beliefs, and other mental states.

From a mental and moral point of view, self-knowledge is the first step in knowing the world at large. Not coincidentally, Eastern and Western cultures claim essentially the same thing, namely that the purpose of life is self-discovery, self-knowledge. This is also because knowing the other and the world in general begins with self-knowledge. Although we are separate individuals, we are (inter)connected with everyone else, in a vast network in which, for each of us, the external, concrete world is a reflection of our own inner universe. This allows knowledge, but also recognition in others, or of the others in us..., a vast network of "mirrors" to the inside and outside.

In the history of psychology, the method of introspection has long dominated, introspective psychology being a way of knowing the self, which starts from the idea that man can have direct access to the knowledge of his own psyche. David Hume famously expressed skepticism about whether we could ever have self-knowledge over and above our immediate awareness of a "bundle of perceptions", which was part of his broader skepticism about personal identity. Or, from another perspective, what does it mean to know yourself, is it you being the subject of your own subjectivity?

Each of us has, along with positive aspects, a characteristic negative aspect, an inner tendency, called "specific compulsion". This is rooted in the idea, in the false image we have of ourselves and which greatly influences our behavior. Thus, the specific compulsion prevents us from understanding ourselves, from being aware of our deep motivations, so that we can objectively evaluate the tensions of our own personality.

It is given by the presence of a dominant psychic tendency, by an irresistible force, especially when it remains hidden, unconscious. This is not a mere obsession or a fixed idea or conscious concern, but rather the dominant force of a certain behavior. The identification of this personality compulsion consists in bringing to light a defensive mechanism, generally hidden, subconscious. Its roots are in layers of the personality so deep that they are almost imperceptible. Based on a strategy of self-defense and self-protection, compulsion is fundamentally a way to avoid, to hide a certain unwanted state we face. Thus, unconsciously, everyone comes to believe that it is his compulsive mechanism that makes him superior to the others.

Authentic inner knowledge is transformative, it changes our perceptions of everything, it opens the way to consciousness. It is our evolution to finally get to know what *I am* means. It is a fascinating journey inside the being, towards our wholeness, in search of the true inner self, with all its meanders, with immense consequences on the self-image, on others, on the world, on spirituality.

Unlike all other types of knowledge, spiritual knowledge is, the *actual* knowledge, in a "reality" where time - without which our existence cannot be conceived - does not exist. But how can we *know* such knowledge? And of what is it the knowledge? We should not expect an answer. The important thing is, the road, the state of travelling to (in) a "reality" that frees us from limits, closure, finitude, time and space. These are the apparent paradox, the apparent tautology. Bounded by our own finitude, we travel

along an infinite path to ourselves and to the essence, towards the... One, because the essence of man is beyond time and space...

3 External Knowledge on Scientific Knowledge and the Necessity of a Transdisciplinary Thinking

In his work, *On the Trinity*, St. Augustine distinguishes between *scientia* and *sapientia*, science and wisdom. Science (*scientia*) is knowledge of the outside world, while wisdom (*sapientia*) is knowledge of the inner world and the eternal reality. Hence two diametrically opposed ways: in the first case we reach reality through the *senses*; in the second, by *contemplation*. Through the Fall, man lost his *sapientia* and was left with *scientia* alone...

The term "knowledge" is difficult to understand when we want to define it. This is why "knowledge" has been reconstructed as a cluster concept that points out relevant features but that is not adequately captured by any definition. Ludwig Wittgenstein sought to bypass the difficulty of definition by looking to the way "knowledge" is used in natural languages. He also observed, following Moore's paradox, that one can say "He believes it, but it isn't so", but not "He knows it, but it isn't so". He goes on arguing that these do not correspond to distinct mental states, but rather to distinct ways of talking about conviction. What is different here is not the mental state of the speakers, but the activity in which they are engaged.

As long as knowledge can only be situated in forms of time, it is doomed to remain truncated and to manifest disjointly. Knowledge's lack of unity is expressed into different forms of knowledge. Fragmented by the cutouts that allowed its manifestation, knowledge is - whatever type of knowledge we talk about - incomplete, subjective, limited and fragmentary and, in most cases, it is not possible to understand exhaustively a specific domain.

Scientific knowledge, especially in the field of physics, has reached an increasingly obvious stalemate, as noticed, very disappointed by the state of affairs in fundamental physics (especially in elementary particles physics and in cosmology), Sabine Hossenfelder, in her book *Lost in Math: How Beauty Leads Physics Astray*. Thus, in the last half century, a number of tempting ideas have appeared in fundamental physics (such as supersymmetry theory, string theory, etc.). Unfortunately, none has been experimentally confirmed so far, as there is a lack of experimental data, the obtaining of which would require very high energies.

Once again, one sees, paradoxically, how subjective scientists can actually be, in the desire to obtain "beautiful" theories, perfect, unitary, even ultimate, and how human science is, despite the image we usually have of it. In modern thinking, in the disciplinary approach of scientific research, the space between disciplines and outside the disciplines can be likened to the vacuum in classical physics, which is lacking, as we know, or believe, in content.

Transdisciplinarity, as a form of integrated learning, aims precisely at exploring space not only inside, but also between and outside disciplines, a space that, like the vacuum in quantum physics, unlike in classical physics, is shown to be dense, and therefore potentially investigable.

As Basarab Nicolescu stated, transdisciplinarity "will be the era of translators - of those who translate into our macrophysical language what is happening at another level of Reality". Stephen Hawking said: "I think the next century will be the century of complexity", while Fritjof Capra speaks, in the same context, about the simplistic way in which man configures his existence, referring to the deterministic concepts of Cartesian-Newtonian thinking, while quantum mechanics, the anthropic principle and the holographic paradigm open a new vision of the world, man and knowledge, the discovery of the small infinity, of Planck's quantum causing the most complex mutations since Copernicus. Reductionist simplicity is nullified by multidisciplinary complexity. "A complex multischizophrenic reality seems to replace the simple one-dimensional reality of classical thinking."

Therefore, at least in scientific knowledge, beyond the study of each scientific discipline, the interdisciplinary and transdisciplinary approach can provide a more complete and integrative vision of reality, or more precisely, of our projection on reality. So far, the development of the scientific method has made a significant contribution to how knowledge of the physical world and its phenomena is acquired.

Contemporary research paradigms have shown significant changes dictated by the evolution of the theory of knowledge, as well as by the new techniques and technologies. The hyperspecialization developed in the late 19^{th} century and in the early 20^{th} century was a stage when scientific disciplines crystallized. This allowed a positivist and analytical approach, which in the end proved to be too restrictive and simplifying. A holistic approach to the knowledge of reality from the Renaissance encyclopedists' point of view has proven to be increasingly necessary, which has led to the emergence of interdisciplinary approaches among research disciplines, allowing the integration of knowledge into a complex epistemology, which is closer to reality.

Interdisciplinary approaches have increasingly evolved into a broad coverage uniting different disciplines, but that needs to be seen together, in order to integrate knowledge of reality. In the last half of the 20^{th} century, certain theories and concepts were developed (such as fractals, chaos, nonlinear dynamics, etc.), which are recently found in the complex systems theory. This enables a holistic approach from the atom to the cosmos, including brain structure and human brain functions.

The need for an interdisciplinary approach emerged some decades ago, as it has been functioning since the time of the great discoveries at the beginning of the 20^{th} century, between physics and mathematics, then between physics and chemistry, chemistry and biology, etc. In the second half of the 20^{th} century, interdisciplinary approaches appeared in all fields, with different scientific disciplines, but also between science and art or science and philosophy.

Nowadays, physics together with quantum mechanics, biochemistry, cell biology, meteorology and cosmos can be addressed by theories that describe the essential mechanisms of functioning. There still remain phenomena of reality that cannot be covered by the scientific methodology. Art, religion and culture, in general, represent forms of knowledge that have been circumvented by science. Transdisciplinarity aims to include all of them (Nicolescu, 2002, 2012, 2014; Cilliers and Nicolescu, 2012; Russell *et al.*, 2008).

From theoretical discussions, transdisciplinarity starts to have practical consequences in the development of programs that include consortia of universities, bringing together professionals from a large variety of fields. In this paper, we pursue a transdisciplinary exercise, involving science and religion, and an interdisciplinary one, involving disciplines and theories which appeared in the second half of the 20^{th} century (topology, chaos theory, fractal geometry, nonlinear dynamics, all of which can be found in the complex systems theory). The latter required the reformulation of quantum mechanics theories starting with the beginning of the century, based on fractality and the substance-energy-information triad.

4 The Change of Knowledge Paradigms in the Last Century

In recent decades, research has evolved from the study focused on disciplines, to an interdisciplinary study. Thus, the notion of interdisciplinarity emerged in a much broader sense, linking different disciplines of fields of knowledge. Starting with the great discoveries at the beginning of the 20^{th} century in physics, a whole series of hypotheses and developments emerged in the fields of chemistry, mathematics, cosmology etc., but especially in technology. Many fields of science have shown resistance to the relativistic, quantum or nonlinear approach, that physics, together with mathematics had previously theoretically described even before the 20^{th} century.

The evolution of science in the second half of the 20^{th} century lead to the development of fractals and fractal geometry, of topology, of the chaos theory as well as of nonlinear dynamics, which started to provide better explanations to the phenomena in various fields, previously only explained by Newtonian physics.

All these theories were grouped under what, over the last decades, has been called the science of complexity or the complex systems theory. The principles of this theory can be applied via specific properties at any scale or reality level, from the theory of strings to cosmologic models and to meteorology.

In the last decade, numerous works have been published where the attempt is to apply this theory also to biological systems, on the human body and the human mind. The evolution of research in the field of studying the brain and its functioning underwent a series of stages throughout the 20^{th} century, 35 from the age of the great anatomical discoveries, through phrenology, to the behaviourist and now cognitivist stage,

so that in the last decades neurosciences have attempted to encompass the phenomenology of psychological reality, within an interdisciplinary approach.

However, in the last years neurosciences have had to extend interdisciplinarity and also transdisciplinarity, to include specialists in quantum physics, information technology and even cosmology, along with traditional specialists in psychology, neurology and psychopathology.

This widely interdisciplinary necessity comes from the need to apply the principles of complex systems to brain activity as well. In order to do this we need to overcome the paradigm according to which psychological activities are solely the product of neuron activity, and by a detailed understanding of the functioning of the main types of neurons we will understand the functioning of the brain (the mental aspects).

The complex systems theory comes with totally different assumptions. In the complex systems formed by a great number of elements, the properties of the systems are not to be found in the sum of the properties of their constitutive elements. The property of emergence creates a link between the multitude of components and the properties of the complex system. As a result, even if we were to describe all the properties of all neurons, we will not be any closer to understanding the mental aspects of the brain.

On the other hand, an approach to science from the perspective of theology was a less used solution, even though a series of authors, with both scientific and theological training, attempted to bring both fields to a common, non-contradictory line; this attempt takes also an institutionalized form, as the Vatican has theologians who are specialized in exact sciences.

The apparent contradiction and competition between theology and science is due to the two currents of opinion: deism, which considers that everything is explained through an omnipresent and all powerful Creator, God the Creator Who, by divine mercy, maintains and upholds nature, and the other opinion, atheism, which appeared in the 19^{th} century and is determined by the mechanist way of thinking, that was specific to the then scientific theories, marked by Newton and Kepler's views, in which the Universe is a great autonomous mechanism in its functioning. The same causality principles, determinism and linearity, were to be searched and discovered in all empirical fields, man himself being a complicated mechanism, yet a wonderful one (the man-machine).

At the beginning of the 20^{th} century, the atheist current gradually underwent, through discoveries in physics, great fractures. The clear and deterministic world of Newtonian physics was replaced by unpredictability, nonlinear dynamics, a-causality and a series of nonintuitive concepts, not only for the common person, but also for scientists.

The theories of the second part of the 20^{th} century, chaos theory, fractal theory, the theory of nonlinear dynamics, which constituted the science of complexity, all come with a model of reality, at all its scales, that is completely different from the model of the classical period of science.

In this model, unpredictability, acausality, aspatial and atemporal realities are found in nonlinear dynamics, with the structured, causal part, with the type of information that we customarily saw described by Newtonian theories and which represent the so-called objective, conventional and current reality. Though the process was not too obvious, in less than a century, the certainties that science had been accustomed to offer people came to be so relative that the empirical phenomena studied always needed interpretations from different gnosiological perspectives.

These new ontological problems raise epistemological questions, and they require the understanding of phenomena to have more and more interpretations of a metaphysical nature, as it was the case with the ancient Greek philosophy or in the German classical philosophy, as well as in oriental philosophical-religious views, in Taoism, Buddhism, for instance. Not accidentally, specialists from quantum physics (among whom the first was Fritjof Capra, 1975, with his Tao Physics) directed their search towards the approach of these conceptions in order to understand the phenomena of quantum physics.

Phenomena such as complementarity, non-localization, Heisenberg uncertainty relations from quantum physics, which are to be found under equivalent forms in the unpredictability and nonlinear dynamics of the complex systems, have forced the way to interpretations which should provide them with coherence. In spite of conceptual difficulties and of their character, which is non-intuitive for the human intellect, they can acquire coherence from a metaphysical interpretation and, why not, from a theological one.

5 The Axiomatic Systems in the Scientific Knowledge and in the Cognitive Perception of Reality

Generally speaking, axiomatization appears like an *ars inveniendi*, a crucial stage in the knowledge process. The axiomatization guarantees the abstraction, the generality, the systematicity and the exhaustivity of this process.

Based on logic, an axiom, or postulate, is essentially a statement considered to be obvious. Axioms and postulates are supposed to be true without any proof or proof. Basically, something that is obvious or stated to be true and accepted, but that has no evidence for it, is called an axiom or a postulate. Axioms and postulates serve as a basis for deducing other truths.

However, there are some differences in the nuance between the two concepts, captured from the beginning by the ancient Greeks. While axioms are independent hypotheses common to all branches of science, the postulates are strictly related to private science. Unlike axioms, postulates capture what is special about a particular structure. For axioms it is impossible to derive from other axioms, but the postulates are probable in axioms. Axiomatization, as a process in itself, is therefore essential to scientific knowledge, while in the case of other types of knowledge it may prove to be irrelevant, even undesirable. Thus, in psychology for example, the concept of axioms is not very relevant, since axioms arise in formal systems that employ proofs. Psychology is not a formal system and the only real formal systems are mathematics, logic and computer science, which are all closely related.

Initially, the term axiom was used in the sense of "to evaluate, to appreciate, with reference to a commodity", or, in another context, "to judge with dignity, to value someone for his dignity". Aristotle is the one who outlines in Metaphysics the meaning we recognize and use today, especially in mathematics: "obvious principle in itself, the basis in a demonstration".

The greatest impact on science and knowledge is attributed to the Euclidean axiomatic system, which is still used nowadays, although it is completed by the non-Euclidean geometrical axioms. Hilbert set himself a goal to build a complete system of axioms in mathematics, but was stopped in his endeavor by the incompleteness theory formulated by Gödel.

In mathematics, an axiomatic system is a set of axioms from which some (or all) axioms can be used in conjunction to logically derive theorems. A mathematical theory consists of an axiomatic system and all its derived theorems. An axiomatic system is called consistent if it lacks contradiction, i.e., the ability to derive both a statement and its denial from the system's axioms. In an axiomatic system, an axiom is called independent if it is not a theorem that can be derived from other axioms in the system. A system is called independent if each of its underlying axioms is independent. An axiomatic system is called complete if for every statement, either itself or its negation is derivable.

Let us observe that not every consistent body of propositions can be captured by a describable collection of axioms. A set of axioms is called recursive if a computer program can recognize whether a given proposition in the language is an axiom. According to Gödel's First Incompleteness Theorem, there are certain consistent bodies of propositions with no recursive axiomatization. Typically, the computer can recognize the axioms and logical rules for deriving theorems, and the computer can recognize whether a proof is valid, but to determine whether a proof exists for a statement is only soluble by "waiting" for the proof or disproof to be generated. The result is that one will not know which propositions are theorems and the axiomatic method breaks down. An example of such a body of propositions is the theory of the natural numbers. Stating definitions and propositions such that each new term can be formally eliminated by the priorly introduced terms requires primitive notions (i.e., axioms) to avoid infinite regress. This is called the axiomatic method (Hazewinkel, 2001). A common attitude towards the axiomatic method is logicism. In Whitehead and Russell, 1963, it is shown that all mathematical theory could be reduced to some set of axioms.

Mathematical methods developed to some degree of sophistication in ancient Egypt, Babylon, India, and China, apparently without employing the axiomatic method. Euclid of Alexandria authored the earliest extant axiomatic presentation of Euclidean geometry and number theory.

Many axiomatic systems were developed in the 19^{th} century, including non-Euclidean geometry, the foundations of real analysis, Cantor's set theory, Frege's work on foundations, and Hilbert's "new" use of axiomatic method as a research tool. For example, group theory was first put on an axiomatic basis towards the end of that century. Once the axioms were clarified (that inverse elements should be required, for example), the subject could proceed autonomously, without reference to the transformation group origins of those studies.

Classical physics is generally concerned with matter and energy on the normal scale of observation, while much of modern physics is concerned with the behaviour of matter and energy under extreme conditions or on a very large or very small scale. For example, atomic and nuclear physics studies matter on the smallest scale at which chemical elements can be identified. The physics of elementary particles is on an even smaller scale since it is concerned with the most basic units of matter; this branch of physics is also known as high-energy physics because of the extremely high energies necessary to produce many types of particles in particle accelerators. On this scale, ordinary, common sense notions of space, time, matter, and energy are no longer valid. The two chief theories of modern physics present a different picture of the concepts of space, time, and matter from that presented by classical physics.

6 Conclusions

The transdisciplinary approach appears as a necessity related to the compartmented and unilateral character, specific to scientific knowledge, with the multitude of disciplines that have emerged over the years. The cross-cultural approach is necessary in order to underline the presence of the same themes, concepts and ideas, found in practically most major cultures, from ancient times to the present day. What is specific to Western culture and has generated the culture of modernity is the character of scientific knowledge, based on mathematization and experimental verification.

Mathematics, seen as a form of knowledge, was promoted by Renaissance encyclopedic intellectuals, but its premises can be found as far as the ancient world, especially in Greek culture, which imposed axioms and theorems, facilitating calculation in practical problems. Thus, it was possible to separate fictionalization from reality, through verification by mathematical logic and experimental tests. In this manner, the way for a certain type of knowledge was opened, which was the basis for the development of technology and which allowed the construction of tools that extended and enhanced our capacities to know Reality. But scientific advances in recent centuries have led to the neglect of other forms of knowledge.

Cross-cultural analysis demonstrates however that, at human level, there are similar forms of understanding various concepts and notions, with definitions and descriptions that are similar in essence, even if they are expressed in different narrative ensembles. Many of the ancient views are rediscovered by modern science, thus raising the issue of the form of intuitive knowledge or of knowledge outside of science.

Science has corrected and specified more precisely an entire series of representations about the world of Antiquity (the shape of the Earth, the Universe, geocentrism, atomism, etc.). However, some principles are found in modern models of Reality (the Big Bang, the theory of everything, the wave-corpuscle duality, the ontological role of information). It remains a challenge to understand how intuitive knowledge works, as well as what its role may be.

Many of the great researchers of science, as well as the great creators of other fields, claim that their revolutionary ideas or creations apparently came out of nowhere, unexpectedly, after certain moments of "enlightenment", during a dream or a conversation, etc..

Unlike the religious, philosophical or artistic field, scientific methodology takes these intuitions in the shape of hypotheses, based on which, in the context of other knowledge, it builds theories, which are then verified using a physical-mathematical or computer model, to have them validated or invalidates experimentally.

Beyond these methodological aspects, some of the basic principles of modern science are found, in an intuitive shape, as having been inspired or revealed by various ancient philosophical-religious concepts. The idea of the immortal soul, for example, appeared practically with the human being development both

on the plane of various religions and beliefs, and on that of (proto) scientific research, since the soul cannot be destructured, as it is not composed. One such experimentally obtained structure is the hologram, hence the holographic principle.

One of the mysteries of Christianity is represented by the dual nature of the Saviour, in whom the two hypostases coexist, God and man.

In many expressions of Christianity, knowledge is considered to be one of the seven gifts of the Holy Spirit. The Old Testament's tree of the knowledge of good and evil contained the knowledge that separated Man from God:

> "And the LORD God said, Behold, the man is become as one of us, to know good and evil..."
>
> (Genesis 3:22)

The transformation of God, eternal and infinite, into man, with a finite spatio-temporal existence, represents the essential aspect in Christian dogmas, an aspect that underlies the notions of Resurrection and transcendence, as well as the possibility of the connection between man and God. We find this principle in de Broglie's view of the wave-corpuscle duality, which underlies field theories and, in general, those of quantum physics.

Another mystery of Christianity is the Holy Trinity, in which the one God exists under three hypostases: God the Father, God the Son and the Holy Spirit. The science of the last decades highlights, in a scientific narrative this time, the primordial role of information, within the *information-substance-energy* triad.

While in terms of physical reality, epistemology has shown its usefulness and importance, things become much more complicated and difficult in the knowledge of the psychical reality, that of the soul. The difficulty stems from a number of prejudices about the nature of the psyche, which seems to be something other than what we observe in the surrounding reality.

The dual conception of the mind established by René Descartes through the differentiation between *res cogitans* and *res extensa* is preserved to this day in the vision of many researchers.

The immaterial nature of information and of the various programs we find in information technology has been an impediment to approaching psychism from a scientific perspective. While the brain is an organ made up of biological, biochemical, and physical levels, and the laws specific to each level can be applied to it, the mind was considered to be something outside of physics, something ineffable, beyond our knowledge ability.

Information technology has proven in recent years that these data packets, algorithmically structured in programs, are the functional source of various artificial structures in very complex dynamics.

The network science born from the observation of physical reality, but also of artificial computer networks has led to a current representation in which networks represent the general scaffolding of reality, which is nothing but a complex network of networks. The Internet and data networks are thus a true experimental model, useful for researching the properties, operation and dynamics of networks.

Many neuroscientists did not accept the comparison of the brain to a computer, but they currently adhere to the view that the brain, like reality as a whole, is a complex network of networks. Like any network, the brain has, in computer terms, a physical topology (hardware) and a logical topology (software). It also has the ability to reconfigure the network, store, process and learn, as evidenced by artificial computer networks. Even though the brain and the mind (hardware and software) seem to be of maximum complexity, and a whole number of phenomena specific to neural networks and, in general, to the biological ones, are still to be clarified, in principle, the mind does not seem to be something other than a computer program attached to the neural network and thus to the whole body and the whole physical reality.

This representation already manages to explain a whole series of psychological and psychopathological phenomena, but the field is just in its early days. It is possible that intuitive knowledge can be better understood and elucidated from this perspective.

We already know that genetic information contains programs that at the level of the neural network generate behavioural patterns manifested in what we call instincts, but also a number of very complex behaviours, observed and highlighted by ethologists over time, behaviours related to fight-or-flight reactions,

pro-social behaviours, mating and nesting rituals, which are also present in humans, in a culturally modulated and sublimated form. Man is more or less aware of them, since the thoughts and actions that determine said behaviours seem to come from somewhere inside us, somehow intuitively.

According to the same principle, new ideas, inspiration or hypotheses in the field of science may be nothing more than the expression of the patterns of structure and functioning of our brain, the same as those encountered in physical reality.

Topology, fractality, the complex systems theory, along with the network science, are fields that emerged or developed in the second part of the twentieth century; they will allow, perhaps, the evolution of knowledge in the field of mind and psyche.

Fractal geometry and topology, with the property of scale invariance, represent expressions of energy patterns that structure reality from an informational point of view. They are found in the description and operation of networks, as basic properties, in a causal chain that crosses through the levels of reality.

Quantum agitation and the wave-corpuscle dual nature determine, in our opinion, the fractal character, which is expressed in various topological forms and configurations, within network structures. The increase in the complexity of the networks ultimately leads to the holographic (holonomic) structure, characterized by the fact that each point concentrates in itself all the information of the whole (see also Bohm, 1993). Thus, science can bring supporting arguments for man's millennial intuition about atomicity and holonomy, often expressed in the phrase "in every grain of sand the whole universe can be found".

This is the ontic point of singularity, in which their existence and non-existence, their potentialities and their explicit expression overlap, here 0 is confused with 1, yin with yang, the beginning with the end.

From an epistemological point of view, everything we have discovered about physical reality and the Universe first appeared in someone's mind in the form of an idea, a challenge, a question, a hypothesis. Subsequently, verification with the help of experiments did or did not validate those hypotheses.

The issue of the connection between subject and object raised by the experiment of double-slit in quantum physics showed the participatory character of the subject, whose perception of reality presupposes the existence of a program, a software (the hypothesis, theory), which can then be found or not in reality (the experimental method).

Information technology, increasingly present in today's world, shows how important is coding, informational coherence - which allows the link between sender and receiver - for connection. The entire reality is in a permanent and total connection, all the systems are in an emerging integration, all the points of the Universe being connected to each other. Man is part of the Universe, he is connected to it, which allows him to know the Universe.

Today's informational paradigm facilitates the understanding and confirmation of these ancient intuitions, which already existed in various cultures. But it is very well expressed today by the diagram of the physicist John Archibald Wheeler, a diagram in which man, as a constitutive and conscious part of the Universe, is able to reflect it, to know it, to integrate it and to signify it, giving it thus a teleological purpose.

Contributions: Co-authors contributed equally.

Funding: This research article received no external funding.

Conflicts of Interest: The author declares no conflict of interest.

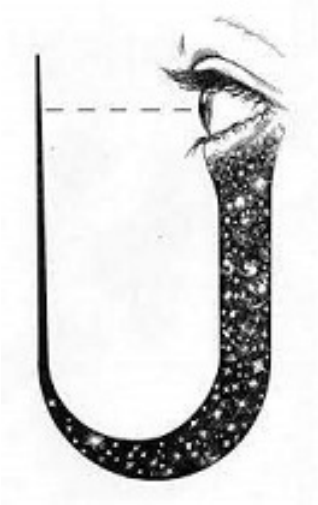

Figure 1: *Los portadores de la antorcha (The Torch-Bearers) - Sculpture by Anna Hyatt Huntington, symbolizing the transmission of knowledge from one generation to the next.*

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