

CONSCIOUSNESS COMES FIRST

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Why then will you not admit the universe to be a conscious intelligence since conscious intelligences are born from it?

—Cicero, *De Natura Deorum*¹

My interest in consciousness was sparked in 1987 when I was studying neuroscience as background material for the research-and-development work on artificial neural networks that I was conducting at Synaptics Inc. As co-founder and chief executive officer of that Silicon Valley company, I wanted to develop silicon chips that could *emulate* neural networks, thus creating the basic building blocks for cognitive computers.

All the neuroscience books I was reading were describing brain operation in terms of electrochemical activity as if that movement of molecules and signaling were identical to sentient perception. Surprisingly, the word “consciousness” was never mentioned, and I was asking myself, “How can electrical and biochemical signals become sensations and feelings? Clearly the two cannot possibly be the same thing.”

For example, let’s consider how a rose is recognized by its smell: the specific mix of odoriferous molecules emitted by the rose produces tiny electrical signals in the olfactory cells in the nasal epithelium. These signals are sent to the neural networks of the olfactory cortex, whose output signals correspond to the *name* of the identified object: “rose” in this case. By imitating the same process, a machine can also recognize a rose by its “smell.” However, a machine does not “feel” anything, while we not only recognize the rose but also *feel* its scent.

The scent is something completely different from the electrical signals produced by the neural networks. It is related to them, of course, but it is not

identical, nor can it be produced directly from them since it is a completely different *quality* than electrical or mechanical activity. The scent is a *feeling* that makes electrical signals conscious: we “know” the rose exists because we “feel” its scent in our awareness. Consciousness is then what translates physical data into qualia that can be perceived and comprehended.

The computer can neither be aware nor consciously know anything. It can only translate the complex pattern of electrical signals generated by the sensors of the odor molecules into another electrical signal: the name “rose.” The *comprehension* brought by consciousness is not accessible to a computer. And herein lie the crucial limitations of artificial intelligence.

Science cannot explain why we have feelings. Based on science, consciousness should not exist either in computers or in humans.

AWAKENING

During the time I was struggling to understand how to make a conscious computer, I also found myself in a deep existential crisis. I had achieved everything that common wisdom says should make me happy, and I was beset with a deep dissatisfaction. I had reached a stage of quiet desperation. I was wondering, “What do I live for?” And, at the same time, I felt compelled to maintain a facade given my responsibilities as husband, father, and head of a promising company. But I almost felt dead inside.

I realized that I was preventing myself from experiencing my despair. I lived hiding in an artificial cocoon that I had constructed to protect myself from feeling my deepest and most genuine feelings. I only *imitated* being happy.

I asked for help. I prayed, not verbally and not even consciously, searching for an answer to my fundamental questions: “What is the meaning of *my* life?” and “Is death really the end of everything?”

In December 1990, while I was with my family at Lake Tahoe during the Christmas holidays, I woke up around midnight to drink a glass of water. When I went back to bed, while waiting in silence to fall asleep again, I felt a powerful rush of energy-love emerge from my chest, the likes of which I had never felt before and couldn’t even imagine possible.

This feeling was clearly love, but a love so intense and so incredibly fulfilling that it surpassed any possible idea I had about what love is. Even more unbelievable was the fact that *I was the source* of this love. I perceived it as a broad beam of shimmering white light, alive and beatific, gushing from my heart with incredible strength.

Then suddenly that light exploded and filled the room and then expanded to embrace the entire universe with the same white brilliance. I *knew* then, without a shadow of a doubt, that this was the “substance” of which all that

exists is made. This was what created the universe *out of itself*. Then, with immense surprise, I knew that I was that light!

The entire experience lasted perhaps less than one minute, and it changed me forever.

My relationship with the world had always been as a separate observer perceiving the world as outside of me and separate from me. What made this experience astonishing was its “impossible” perspective, because I was *both* the experiencer and the experience.

For the first time in my life, I was simultaneously the world and the observer of the world. I was the world observing itself! And I was concurrently *knowing* that the world is made of a substance that feels like love. And that I am that substance!

In other words, the essence of reality is a substance that knows itself by self-reflection, and its self-knowing feels like an irrepressible and dynamic love.

This experience contained an unprecedented force of truth because it felt true at all the levels of my being: at the physical level, my body was alive and vibrant like I never felt it before; at the emotional level, I experienced myself as an impossibly powerful source of love; and at the mental level, I knew with certainty and for the first time that all is “made of” love. That experience also revealed the existence of another level of reality never before experienced: the spiritual level, in which I felt one with the world.

This was *direct knowing*, stronger than the certainty that human logic provides—a knowing *from the inside* rather than from the outside, one that involved for the first time the concurrent *resonance* of all my conscious aspects: the physical, emotional, mental, and spiritual. I like to think that I have experienced my own nature both as a “particle” and as a “wave,” to use an analogy with quantum physics impossible to comprehend with our ordinary logical mind.

The particle aspect was the ability to maintain my unique identity despite being also the world, which was the wave aspect. Thus, my identity is that unique point of view with which One—All that is, the totality of what exists—observes and knows itself. I am a point of view of One.

This experience maintained its original intensity and clarity over time, and it changed my life *from the inside out*, continuing to have a powerful impact to this day.

EXPLORATION

After the awakening experience, I started reading books like the *Tao Te Ching* and the *Bhagavad Gita*. These ancient texts were reflecting and enriching the understanding of my own awakening, revealing that since time immemorial,

humans' personal journeys had been illuminated by experiences like mine. Prior to my awakening, those books would have only fed a superficial literary interest since "soul" had little real meaning to me. Afterward, *soul* meant that alive, scintillating, loving, and self-knowing substance of which everything is made: it became a *lived experience* rather than an intellectual idea.

That awakening also opened the door to a stream of other spontaneous and extraordinary experiences of consciousness that have continued to this day. They included vivid dreams, deep intuitions, expansions of consciousness, out-of-body experiences, and other states of consciousness that greatly expanded my previously limited concepts about reality, constrained by pre-conceived ideas.

A little at a time, I began to realize that the truly important journey is the inner one. And with the same dedication I had showered on my technological and scientific research, I committed to discovering the truth about myself beyond the perceptual distortions fostered by prejudices. I had the opportunity to see how deep my "rabbit hole" was and how much my life had been conditioned by false beliefs and ideas. These experiences also made me relive many emotions and events I had repressed and forgotten.

I realized that I had almost always repressed my true feelings. I had denied the pain and hid the truth about what I felt to protect myself. I had worn the mask of one who is ready to joke about everything, letting the hurts slide off me with a laugh and a pun. In this way, I had convinced myself that I was strong, when all I did was estrange myself from my own heart by pretending that everything was fine.

After twenty years during which I spent 30–40 percent of my time doing personal work, I began to take seriously the idea that consciousness could be a fundamental aspect of nature already present in some fashion in the atoms and molecules of which everything is made. This idea emerged gradually due to the impossibility of explaining how consciousness could arise from the material complexity of our brain. I kept thinking, "How can a physical inert structure that possesses only outer aspects give rise to inner experiences?" The concept of complexity has nothing to do with the sensations and feelings that populate our inner world. In fact, today's computers, which are very complex, do not have a shred of consciousness.

There was no logical alternative: the inner world of meaning must also be an *irreducible* property of all that exists from the very beginning. *Meaning* and *matter* must be like the two faces of the same coin.

This topic fascinated me because it had the potential to explain and unify the existence of the outer and inner realities that I had been experientially exploring for twenty years. Science and spirituality, until now irreconcilable, could find a deep union rather than a simple juxtaposition of convenience. So,

I decided to withdraw completely from all my other activities and focus on developing a model of reality based on the assumption that consciousness is fundamental rather than deriving from matter.

The model I will describe is based on *quantum field theory* (QFT)—the most accurate model of reality we currently have—adding to it the idea that consciousness exists before the Big Bang, which is considered the beginning of our universe.

REVISITING THE FUNDAMENTAL HYPOTHESES

Classical Physics

Starting in the seventeenth century, the scientific method has given us the best answers about the nature of reality, achieving a level of consensus never dreamed of by philosophers or theologians. Classical physics, together with mathematics, slowly built a solid foundation on the basis of reasonable postulates and logical proof of theorems, corroborated by the experimental verification or falsification of the predictions made by the mathematical models.

By the end of the nineteenth century, the conceptual framework formulated by physics to describe the inanimate world seemed to be infallible in its predictions. However, there were some *anomalies* that appeared unimportant.

It took a quarter of a century to explain these “little” anomalies, but doing so required the overturning of almost all the fundamental assumptions of classical physics! This process gave birth to *quantum mechanics* and *general relativity*: new physics that replaced the deterministic and reductionistic world of classical physics with the *uncertainty* and the *holism* of the new framework.

Within classical physics, the elementary particles were conceived like the original atoms of Democritus: very small, irreducible, bounded, indestructible, and separate from each other. In this vision, free will could not exist. There was only one objective reality, the same for everyone, because reality was completely determined by the mechanical interaction of these atoms obeying immutable and deterministic laws.

According to this model, the strict laws that specify the behavior of the particles also determine how we act *regardless* of what we think or feel. We are simply *mechanisms* mistakenly believing that we have real feelings and free will. In the world of classical physics, there is no free will at any level. We are a small gear made of even smaller gears inside a giant clockwork run by immutable laws. In short, although we may think we make free decisions, we are instead completely controlled by the impersonal laws governing the

behavior of the atoms and molecules of which we are made, the same atoms that “make us think” we made a free decision.

Everything Is Made of Fields

The idea of *field* is one of the most fertile ideas in physics. It was introduced by the genius of Michael Faraday in 1831 to explain puzzling electromagnetic phenomena. Forty years later, James Clerk Maxwell generalized Faraday’s magnetic field idea to the electric field with the first mathematical treatment of the electromagnetic field. This seminal theory surprised the scientific world with the prediction of *electromagnetic waves*.

To imagine the electromagnetic field, think about the entire three-dimensional space of the universe filled by an invisible and immaterial “substance” in which ripples or waves can form and propagate. These waves are everywhere and are what we perceive as light. They are also what we use to cook our food in a microwave oven and what allows us to communicate wirelessly.

The next major revolution in physics started in 1900 with the discovery by Max Planck that the transfer of energy is not continuous but occurs in discrete lumps, or *quanta*. This radical idea led to quantum mechanics in the mid-1920s and to QFT in the 1950s. It eventually became the Standard Model of physics in the 1970s by generalizing the idea of field. Based on QFT, there are seventeen quantum fields in superposition in spacetime. These fields are not continuous, like Maxwell’s field, but quantized, meaning that the interactions between fields occur in lumps.

According to QFT, each elementary particle does not even exist as an independent and separate entity but is in fact an *excited state* of a quantum field. In other words, the ontological primitive is no longer the particle but the field. Matter is a property of fields and doesn’t exist as we once thought. A particle *is not an object*. It is just an *informational state* of a field. Within QFT, all the electrons of our body together with all the electrons in the rest of the universe are “quantized waves” (states) of the same underlying field.

A crucial aspect of QFT is its probabilistic nature, meaning that its equations can predict only the probability of observable events, not which specific event will happen. The lack of determinism makes QFT *compatible* with free will, even though most physicists do not claim that free will exists.

According to QFT, elementary particles, atoms, molecules, proteins, living cells, organs, and animals constitute ever-growing hierarchical levels of *organizations of states* belonging to the quantum fields. These fields have space and time in common and are the fundamental entities that, interacting with each other, create all that physically exists.

The Universe Is Dynamic and Holistic

QFT postulates the perennial probabilistic creation and annihilation of elementary particles from the quantum vacuum and, in conjunction with Einstein's general relativity, describes a universe that started with a "fluctuation" of the quantum vacuum from which spacetime and the quantum fields emerged in an explosive expansion. This theory—known as the Big Bang—describes the evolution of the universe, starting from a "singularity" of almost infinite density and temperature that expanded to achieve the universe we observe today, 13.8 billion years later.

QFT and general relativity clearly show the *irreducible dynamism* we observe in the universe at both small and large scales. That same dynamism exists also in our inner worlds as our sensations, emotions, and thoughts constantly change.

The universe is not only an irreducibly dynamic system, however. It is also an *indivisible whole*—that is, a *holistic* system.

Imagine an infinite "ocean" in which forms keep on emerging, changing, and disappearing without leaving a trace. This would be a holistic system in which no identification of any part would be possible. The universe described by QFT is less general because it consists of many fields in superpositions in which each field produces *states that can be identified* because they always have the same properties—for example, "electrons" or "up quarks."

However, the fields are *inseparable* from each other and therefore cannot be called parts. I will call a field a *part-whole* to distinguish it from the separable parts of classical physics. A part-whole must emerge from the whole, and thus it must share all the key properties of the whole *and* simultaneously must have a unique *identity*, a permanent individual property that distinguishes it from all the others. A part-whole is not like the parts of a machine enclosed by boundaries that can be taken apart.

The persistent identity of a field manifests in the *indistinguishability* of its quanta. Think of the electron, for example, as what gives a unique identity to the field. The electron is like a unique symbol with which the field communicates with other fields and is recognized by them.

The states of the fields, in addition to combining from the bottom up into hierarchies of states, can also be influenced by the whole, top down. This whole-to-part feedback is represented by *quantum entanglement*, a remarkable property in which interacting fields create states (what we think of as particles) with joint *nonlocal* properties that are independent of space and time. This means that when two entangled particles are separated by vast distances, the measurement of the state of one particle will instantaneously determine the entangled state of the other particle.

Another general feature of our holistic universe is that the states of the quantum fields self-organize hierarchically to create complex systems like living organisms and the ecosystem of our planet. Out of this process, subatomic particles, atoms, molecules, cells, organs, organisms, and so on emerge. These are ever more complex *hierarchies of connections* between groups of states within the quantum fields.

Notice that ontology resides only in the quantum fields because the “stuff” of which all hierarchical levels are composed is ultimately the stuff that makes such fields. What we conceive as “atoms” and “molecules” exist only as particular combinations of *connections* (or *relationships*) among the dynamical states existing within the fields of the elementary particles.

Conscious Entities Communicating

Let’s imagine a large town square where there are hundreds of people, animals, and objects emitting vibrations that are perceivable as sounds. Each entity contributes a small amount of vibrations to the overall vibrations of the square. The vibrations propagate everywhere and are superimposed at each point in the space of the square. Each conscious entity can choose to pay attention only to a small fraction of these vibrations, and the selected ones constitute an *observation* that is *experienced* as sound sensations and *comprehended* to some extent. The entity, then, may *respond* to its inner experience by outputting new vibrations that are added to the others.

If we now consider only the conscious entities, the outer vibrational reality in the square is the sum of the vibrations produced by all those entities. The inner semantic reality of each entity is thus affected by the entity’s decisions as to which subset of vibrations to observe and experience. Then, in response to its inner experience, the entity may make a free-will decision of which meaning it wants to communicate next, outputting new vibrations that symbolically represent the intended meaning, thus affecting the outer vibrational reality once more. In general, each entity constantly repeats cycles of observation (qualia), experience (comprehension), and response (action).

In this example, we see clearly that the outer reality affects the inner reality and that the inner reality affects the outer reality. There is symmetry. We also see that the vibrations emitted in response to the entity’s inner experience represent a *top-down influence* on physical reality because they affect the motion of the air molecules, contrary to the worldview of classical physics in which only bottom-up influences and no free will exist.

I should stress here that when I say “inner reality,” I do not mean the *physical* reality inside the body—that is, the atoms and molecules of which the body is made. That physical reality is still part of the outer reality even though it is not visible from the outside. Inner reality means instead *what we feel*: the qualia

that constitute our conscious inner experience, in addition to the capacity to communicate with free will to other conscious entities by shaping symbols.

In other words, my conscious choice of what *meaning* I wish to communicate is not made by the atoms of my body, even though my conscious experience leading to that choice was affected to some extent by the physical configuration of my body's atoms. Once my choice has been made, my conscious command will affect a subset of the atoms of my body. These in turn will affect my physical behavior in such a way that the sound I emit will represent the meaning I wish to communicate. Said differently, the sound pattern has both a *symbolic* (air vibrations) and a *semantic* (qualia, meaning) content belonging, respectively, to the outer and the inner realities. And there must be a *two-way communication* between the inner semantic and the outer symbolic levels.

Let's now return to the square full of conscious entities producing vibrations. At any one time, each entity observes only a small subset of the overall vibrations, neglecting the rest of them, which are considered "background noise." For example, my experience will be quite different from that of my neighbor, who is listening to a different person than I am, not to mention the experience of the dog nearby, which pays attention only to the barking vibrations of other dogs and considers human voices background noise. If I were interested only in the conversation with my interlocutor, the barking of the dogs, the conversations of other people, and all the other "potentially meaningful sounds" would all be part of my background noise.

Notice that in the sound reality of the square, there are neither *objective symbols* nor *objective noises*. What is signal and what is noise are determined by the free-will choices of each entity (observer). Furthermore, since each observer has ordinarily only a single point of view, no entity can simultaneously experience the vibrational reality of the square from two or more points of view.

We could now generalize this example to the electromagnetic field created and observed by the particles, atoms, molecules, macromolecules, cells, organs, ants, dogs, and men, each contributing to creating the same vast electromagnetic field and each observing only an infinitesimally small portion of it. If we considered electromagnetic vibrations rather than sound vibrations, we would indeed be closer to what's happening in our world. However, the narrative would be much more complicated, though it would not add much to the basic conceptual ideas contained in the simpler example with sound.

A Quantum Physics Interpretation

Within classical physics, *everything* is outer reality because the properties of the elementary particles are the only determinants of the properties of any

hierarchical structure made of them. Therefore, the inner reality cannot exist in any organization of classical particles.

Within quantum physics, however, there is the possibility that each hierarchical level might have some degree of freedom not entirely accounted for by the behaviors of the hierarchical level immediately below it. For example, the properties of a water molecule are more than the sum of the properties of the hydrogen and oxygen atoms. A water molecule has new properties that involve some kind of *integration* of lower-level properties into something new (not a sum), with new freedoms accessible to the whole that are not available to the parts.

Furthermore, whereas classical physics allows an observation to be made without affecting what is observed, with quantum physics it is impossible to observe without disturbing what is observed. Therefore, if we imagine that consciousness and free will were holistic inner properties of each quantum field, then the outer physical states of the field could be changed from within itself, and the outer reality would then be the dynamical result of the interplay of the inner semantic and the outer symbolic realities of all the interacting entities.

Those outer states would then resemble the vibrations imposed by a conscious entity on the air molecules in the square example previously described. As such, the states would have to obey probabilistic physical laws since their structure would carry a freely chosen meaning encoded onto them.

The reality made of interacting conscious entities, impossible within classical physics, may, however, be compatible with quantum physics *if we grant to the quantum fields the capacity to be conscious and to act with free will*. This is my fundamental hypothesis, which attributes to the quantum fields new properties unacknowledged by physics. In this view, we may *interpret* the appearance of an elementary particle at a specific location in spacetime as a communication symbol, and we may interpret quantum entanglement as evidence that the entangled particle is a part of a larger organization. The quantum state of a quantum system may then be interpreted as having a dual nature: to the outside world, it is a *quantum symbol* and to the conscious entity it is a *meaning*. The appearance of specific organizations of quantum states must then be probabilistic to ensure that a free-will decision has been made to communicate the symbol represented by that organization of states.

The theoretical physicist Giacomo Mauro D'Ariano (personal communication) thinks that free will can be explained by a quantum theory of consciousness. He says, "It is a theorem of quantum theory that quantum randomness cannot be interpreted as 'lack of knowledge of a pre-existent local reality.'" The consequences of this theorem are, in his words, that "quantum randomness is an act of creation," and "free will is compatible with a theoretical description as a 'quantum outcome.'"²

The only additional assumption needed for quantum physics to explain the existence of conscious entities is to hypothesize that the quantum state of a field has a meaning to the field itself. That meaning can be communicated with symbols made by organizations of states that can be perceived and comprehended by other quantum fields, as I will next attempt to explain. If this conjecture can be proven, QFT may be sufficient to explain the nature of consciousness. Otherwise, we may have to develop a new theory that is more general than QFT, as long as it contains QFT as a special case when certain restrictive conditions are met.

A NEW CONCEPTUAL FRAMEWORK

One and the Consciousness Units

To explain how a universe containing conscious beings like us might emerge from the quantum vacuum, we must postulate that the quantum vacuum is inherently conscious as well. During the past five years, I have endeavored to formulate a conceptual framework with the potential of explaining why reality has the inner and the outer properties it displays. This is a highly speculative model at this point, and I present it because I believe it has the potential to unify the inner and outer realities and explain the evolution of both, starting with the assumption that *all realities emerge from the free-will communications of a vast number of conscious entities.*

In the conceptual framework I am proposing, I call *One* the totality of what *potentially* and *actually* exists.

To manifest a universe like the one we know, *One* must be dynamic and holistic and have both interiority and exteriority. Interiority is what's needed to explain the existence of consciousness and free-will actions. These are the crucial properties that are missing in the current physical theories. In the model I propose, they express the "capacity" and "desire" of *One* to *experience* and *know* itself. The human words I am using in quotation marks are clearly inadequate to describe the "urge" and "curiosity" of *One* to "know itself," but I must use what we have.

Dynamism, holism, and self-knowing must then be intertwined aspects of *One*, *facets of an indivisible whole* rather than "independent variables." This means that self-knowing must be dynamic and holistic and must deepen itself, connecting itself evermore with all the other instances of self-knowing. This also means that any new instance of self-knowing is a transformation from *potential* existence into *actual* existence, where potential existence is the "reservoir" of self-knowing that has not yet manifested.

Dynamism means that One cannot stay the same but must continuously grow its self-knowing, instant after instant. Holism means that One has no separable parts—that is, within One, everything is connected. Finally, *the capacity, desire, and curiosity of One to know itself is the true “cause” of all manifestation and evolution.*

In other words, actual existence and self-knowing are two faces of the same coin in the sense that coming into existence is simultaneous with being known for the first time. *To exist is to be known* and vice versa. And, once known, the self-knowing of One can never be annihilated. Therefore, the *memory* of the self-knowing must exist within the “substance” of One.

With this characterization, each new self-knowing of One brings from potential to actual existence “something” I call a *consciousness unit* (CU). This unit reflects the totality of One (One has no separable parts), and yet it is also a part of One because One is never done knowing itself (dynamism), and thus there must be continuing instances of self-knowing. Each CU must then be a wholeness, share all the properties of One, and have a unique identity that distinguishes it from the other CUs. Thus, each CU is a *part-whole* of One. Like One, a CU cannot be the same from instant to instant (dynamism), it can never be separated from One and from the other CUs (holism), and it also must continue to deepen its own self-knowing and the knowing of the other CUs.

I should point out here that in this framework, the CUs exist before space, time, matter, and energy. Thus, they constitute the quantum vacuum out of which our universe emerged.

The Properties of the Consciousness Units

The CUs are conceptually similar to the *monads* described by Gottfried Wilhelm von Leibniz in his famous book titled *Lehrsätze über die Monadologie* and published in 1720 (Leibniz, 1965).

In summary, each act of self-knowing of One gives birth to a CU. Each CU is a *self*, endowed with three fundamental properties: consciousness, identity, and agency. Consciousness is the capacity to perceive and know (comprehend) itself and the other CUs. Identity is the inherent ability to identify itself within itself and to be identifiable as a CU by the other CUs. Agency is the capacity to *interact with free will* with the other CUs to deepen both its own self-knowing and the knowing of the other CUs. Action requires the CU’s capacity to *shape symbols* out of itself to communicate with other CUs. The totality of the symbols created by all the CUs represents the outer informational reality of One.

A crucial feature of this framework is that each CU has an inner *private* semantic reality and an outer *public* symbolic reality. The outer reality of a CU symbolically represents its inner self-knowing and the voluntary symbols that represent its actions. Furthermore, when a CU observes another CU, it can perceive as qualia only the outer symbolic reality of the observed CU, whereas its inner reality is strictly private and cannot be known directly.

The essence of One is its capacity and desire to know itself through the many CUs it manifests. *Only One knows the interiority of every CU and combinations of CUs.* In fact, One knows all manifestation from the inside and is also *what connects All from the inside.* One is the interiority of all that exists, innocent of the outer reality, which is only a representation of its self-knowing necessary for the CUs to know each other.

Since each CU is a part-whole of One, the CU perceives the other CUs as both self and not-self, a contradiction only if one believes that each consciousness is separate from the others. In the awakening experience described in the introduction, I experienced myself as both the world and the observer of the world, allowing me to state with confidence that this understanding not only is possible but also opens the mind and the heart beyond what any ordinary conscious experience can.

Essential to this framework is also the idea that the symbolic aspect of each CU stands in some correspondence with its meaning, and that this correspondence is the same for all the CUs. Therefore, it becomes possible to bootstrap a *universal* communication language between the CUs, an indispensable tool for each CU to know another CU like itself, thus deepening their mutual self-knowing (Faggin, 2015).

This deep communication is also what leads to the *combination* of CUs into a hierarchy of selves, just as the quantum fields “combine” to create atoms, molecules, macromolecules, and so on.

The CUs are the *ontological* entities out of which all possible universes are “constructed,” and therefore the quantum fields of our universe are organizations of CUs. What physicists call a quantum field, however, is only the outer aspect of an organization of CUs. Therefore, the quantum fields of physics and the conscious quantum fields I am proposing are very different entities. By adding “selfhood” to the quantum fields, the nature of reality changes in a fundamental way.

A CU is a *self*, and so is any coherent combination of CUs. A self is an entity with identity, consciousness, and agency, sharing all the attributes of One (dynamic, holistic, and self-knowing). Agency is the outer expression of the free will of a self, and free will implies *intention* and *purpose*, acting like a vector in which intention corresponds to the magnitude of the vector and

purpose corresponds to its direction. Through agency (communication) and consciousness (perception, comprehension/meaning), each self increases its own self-knowing and the knowing of the other selves.

The Combinations of CUs

In this framework, the self-knowing of a CU is a *direct* comprehension of itself because the qualia that carry the meaning to the CU cannot be distinguished from their meaning. Each CU can also perceive as qualia the outer symbolic reality of the other CUs and comprehend their meaning to the extent that a similar meaning is already known. In this case, the CU's comprehension is *indirect*, mediated by symbols, and the CU can discriminate qualia from meaning. Action is the capacity of a CU to freely create symbols to communicate *meaning* with other CUs.

Through their voluntary communications, the CUs deepen their mutual self-knowing, collectively creating a universal language with symbols of growing complexity as their self-knowing and joint knowing grows.

Through repeated cycles of observation, comprehension, and action (response), meaning is organized in successive "layers" and comprehended by the CU as a *gestalt*, a whole that is more than the sum of its parts. Yet the same gestalt reveals also the presence of some *unexpressed* meaning. It is this awareness of "unfinished business"—knowing of not knowing—that provides the impetus to the CU to always seek further comprehensions. In this model, the meaning not yet understood is felt as something that remains elusive. Therefore, the outer symbols can only express the inner structure of the meaning that is understood.

Two CUs, A and B, that have a similar self-knowing will have similar outer symbolic information whose qualia perception will produce a gestalt meaning that feels "familiar" to each. This familiarity may lead to the desire and decision to communicate with each other. Repeated cycles of symbolic communication with each other will deepen their own self-knowing and the knowing of the other through a dialogic relationship.

When A and B reach their *maximum* mutual comprehension, a portion of the meaning of A is *identical* to a portion of the meaning of B. From the perspective of One, this is a *single meaning*, not two, even though the *same set of symbols* appears twice; once in the outer reality of A and once in the outer reality of B (because symbols and meaning stand in the same correspondence for all CUs). But now there is one meaning with two identical sets of symbols.

Once the maximum joint self-knowing of A and B has been reached, it can no longer be increased by the individual actions of A and B, causing *a new self to emerge from One* to continue the deepening of the joint self-knowing

in response to the urge of One to know itself. I call this new self AB, the combination of A and B. AB has an independent existence from A and from B, though it does not subsume A or B, both of which continue to have their own independent existence. AB is a self at a higher hierarchical level than A and B, and it will seek to relate with another self at its same level of comprehension to increase their joint self-knowing, eventually creating the next-higher hierarchical level.

If DP (the combination of D and P) and AB sense having much in common, they may decide to communicate by creating new symbols that are combinations of the symbols of A, B, D, and P. This process will lead to discovering all the possible self-knowing common to AB and DP through their individual free-will actions. When their *maximum* joint self-knowing has been achieved, a portion of the meaning of AB is identical to a portion of the meaning of DP. As in the previous case, a new self, ABDP, will emerge from One with the task of deepening the newly acquired joint meaning.

In summary, the sets of symbols at the CU level form the ever-growing vocabulary of a universal language. The symbols of the higher levels in the hierarchy are combinations of these basic symbols that may appear multiple times in the fields of the CUs. And the selves belonging to a specific hierarchical level can comprehend the symbols of lower hierarchical levels but only partially the symbols of higher levels than theirs.

The ever-growing number of public symbols of all the CUs and their combinations forms a public *informational space* called I-space. The totality of the inner semantic realities forms a *semantic space* called consciousness space, or C-space. C-space and I-space form a holistic structure that describes the irreducible semantic-symbolic nature of One.

I should remind readers here that C-space and I-space are not physical spaces like the space of our universe. They are realities existing prior to the birth of any universe.

I will describe later how physical worlds may be constructed through organizations of I-space symbols. These physical worlds are called P-spaces, and I am calling the overall conceptual structure the “CIP framework,” where C stands for C-space, I stands for I-space, and P stands for P-space.

Notice that our concepts of space, time, and quantum fields represent how we currently *imagine* physical reality to be constructed. However, we don't really know *what* these entities are. Scientists have postulated certain mathematical relationships to exist among them, which we take seriously because they predict much of what we can measure. However, these entities, as currently defined in physics, can neither predict nor explain the existence of consciousness, meaning, purpose, and free-will action, which are irreducible *qualities* of existence according to the CIP framework.

The Creation of Physical Realities

So far, I have described the creation of CUs and combinations of CUs motivated by the abiding desire of One to know itself. This explosion of communicating conscious entities, each with its own free will, gives birth to hierarchies of selves, hierarchies of meaning, hierarchies of symbols, hierarchies of syntactical rules, and, finally, hierarchies of languages. In so doing, the conscious selves create various organizational structures, layer after layer, in which to experience themselves and increase their self-knowing.

Since each organization must be held in place by the free-will *cooperation* of the selves rather than through the *coercion* of physical laws, the more complex the structure, the more improbable its construction would be. Therefore, the self-knowing of the individual intentions and motivations of the selves that wish to create a coherent organization may be lower than what's achievable in the unconstrained environment of C-space and I-space. The needed comprehension may be achieved only by the creation of an interactive "educational system" in which each self can safely discover what keeps it from voluntarily collaborating with other selves.

I venture to say that the earth ecosystem could be this educational system, an environment that allows selves to learn the subtle give-and-take necessary to create and maintain ever more complex organizations. Not surprisingly, human beings have also discovered the same need for a sophisticated educational system in modern society to create and maintain their own complex organizations.

The task of creating a higher level of order through the *voluntary* cooperation of many hierarchical levels of units, each unit free to choose, is clearly daunting. This sounds like an impossible problem, and yet *life* has solved it, not through the coercion of deterministic physical laws, but through the free-will cooperation of all the hierarchical levels of elementary particles, atoms, molecules, macromolecules, organelles, and so on, leading to a hierarchy of organisms, each with a high degree of freedom and all cooperating in a gigantic and evolving ecosystem.

In the CIP framework, the earth ecosystem has been voluntarily and cooperatively created by a hierarchy of selves of which we are an integral part, with the purpose of learning how to create ever more complex *collaborative* structures.

Thinking about how to create an advanced educational system, the image of a highly sophisticated *simulator* comes to mind. After all, a simulator is what we had to build to learn how to land a craft on the moon, for example, because this process had to work the first time and required knowing much more than the equations of motion of the lunar craft. The human pilot had to *experience* as closely as possible the *gestalt* of the landing process as the controller of an unfamiliar craft in an unfamiliar celestial body.

The Physical Universe as a Simulator

In the simulator metaphor I have in mind, our body is conceptually similar to the avatar in our primitive virtual reality games. However, the avatar that appears on the computer screen is not who we are. We control the avatar, but we exist *outside* the computer.

In the CIP framework, our physical body is animated and controlled by our conscious self, but the conscious self is not our body. And just as we do not exist *inside* the computer that creates the virtual reality, we do not exist *inside* the physical universe that creates the body we control.

When we get engrossed in a video game, we may almost believe for brief periods that we are the avatar we control. In the game of life, we are completely identified with our body because the interface between our conscious self and our body is *seamless* compared with the crude interface between our body and the avatar.

In a video game, we don't cease to exist if the avatar dies, and we can start a new game by simply "wearing" a new avatar. The avatar is just an *interface* allowing us to interact in the virtual reality created by the computer. Likewise, our body is just an interface to the physical world that we currently believe is the only reality. However, the real entity is not the body but our conscious self who's wearing the body to act in the far more sophisticated virtual world we call the physical universe.

Nested inside our quantum physical universe, there is a classical computer in which we have created another virtual reality with avatars controlled by our quantum-classical bodies. Notice that since each body is controlled by a conscious self, each avatar is controlled by a *portion* of the same consciousness that controls the body.

I therefore surmise that the conscious self that controls each body may also be a portion of a larger self whose existence we have yet to recognize. If so, each one of us may be a portion of a vaster self who is the one who decided to wear the body each believes itself to be. Without realizing it, we are simply repeating the same pattern at different scales.

Notice also that we are the ones who have cooperatively imagined, constructed, and programmed the computer to produce the virtual reality that is giving us an enriching experience. Likewise, those vaster selves may have cooperatively imagined, constructed, and "programmed" what we perceive as the physical universe.

In the CIP framework, the vaster selves we actually are are the ones who have collectively created the physical world, the earth ecosystem, and the bodies we wear in this remarkably immersive virtual reality experience we call life.

In other words, our consciousness exists neither inside the physical universe nor inside the computer that exists inside the physical universe. In fact,

the image of the physical universe created by the sensory-brain system of our body is not even close to representing what's truly "out there." We have in fact no idea about what's out there (Hoffman, 2016).

It's time to wake up from the illusion of being our body in a universe that is "pictured" based on the signals sensed from the environment and produced by our brain and body. Our species has developed enough that such a transformative realization can now be achieved while in this life: we are not the bodies we wear, and we are not "inside" the physical universe in which our body exists any more than the body that controls an avatar is "inside" the computer in which the avatar exists.

I think we are conscious beings existing in C-space and I-space, the irreducible and fundamental semantic-symbolic reality of One, and a small portion of our consciousness is controlling a body made of I-space symbols, just as an avatar is made of the far less expressive *Boolean* symbols that belong to a digital computer.

I think we are here to learn how to voluntarily cooperate with each other at a much higher level of comprehension than we have ever known, to be able to collectively build the next hierarchical level of being that requires far more coherence with each other than we now possess.

In a video game, a portion of our consciousness is concentrated on the game while the remaining consciousness pays attention to the physical reality outside the game—what we believe is the only *real* world. In the game of life, our consciousness has been almost entirely hypnotized by the illusion of being the physical body, unaware that our physical reality may itself be a vaster and more sophisticated virtual reality.

Mankind is about to awaken. In the current condition of half sleep, most of us would like to continue sleeping, while some of us are beginning to open our eyes to a new reality. As we become aware of a greater world, each of us can develop our consciousness to the point that only a portion of it will be focused on the business of controlling the body, while the rest can become aware of the vaster self with whom we can explore the greater reality in which we truly exist.

The Embodiment of Conscious Selves

The notion that we might be living in a simulator constructed by some alien civilization has appeared in several science fiction novels and movies. This hypothesis has been taken seriously by the philosopher Nick Bostrom (2003), a conjecture that has received lots of attention. This idea, however, would require the existence of a computer as complex as the universe. How is that possible?

The way I imagine the evolution of such a “simulator,” as a computer scientist, is by recognizing that the structure of any human language is roughly like that of a high-level computer language. The big difference is that the latter is extremely precise, whereas the former is *ambiguous*, requiring conscious comprehension to be understood. A computer language, once expressed by a properly trained programmer, can be *mechanically* translated by a “compiler” program into several hierarchical levels of languages, terminating with the actual binary program that typically runs in the same computer in which the compiling was done.

Imagine now a language made of *thoughts*, by which I mean not the mentally verbalized thoughts we normally think a thought is, but rather the “multidimensional image” that is the real thought before it “collapses” into a string of mental words (symbols). This image comes closer to the idea I have about the I-space symbols used by the organizations of CUs to communicate with each other.

Imagine now that this kind of thought expressing a *desire* could be broken down into several lower-level images comprehensible by several conscious beings belonging to a lower hierarchical level. Each of these entities could then break down its own sub-image further and pass the pieces down and so on until the lowest-level description is reached—the level corresponding to the basic instructions of a computer. At this final level, a very large number of conscious selves would respond to this set of symbols with a set of “Lego-symbols” representing their answer to the query. Moving up the hierarchy now, Lego-symbols will automatically *construct* step-by-step the symbolic virtual reality expressed by the original prescriptive thought.

I am introducing two different kinds of symbols here: the top-down “live symbols” that *describe* the reality to be constructed and the bottom-up Lego-symbols (L-symbols) that are the “interlocking” symbols necessary to *construct* the virtual reality prescribed by the high-level thought. L-symbols are the closest that I-space symbols can get to mechanical symbols. I imagine the elementary particles in their semiclassical behavior to be a good analogy to the L-symbols.

In essence, the top-down process lays down the abstract *pattern*, and the bottom-up process fills in that pattern with “matter.” In this process, thought comes before matter. The task of matter is simply to automatically “fill in” the mental pattern. Notice that the *crucial task of laying out* the detailed pattern is accomplished by *conscious selves*, not by *mindless* laws of physics. The laws of physics only describe the behavior of the L-symbols. That’s why the laws of quantum physics are probabilistic: they can predict only the statistical behavior of atoms and molecules, not the specific behavior of each individual atom. This is also why, if we change a few atoms in

statistical inert matter, nothing much changes, whereas in living conscious organisms even a single atom misplaced in the genome can make the difference between life and death.

Here is the big surprise: *within I-space, the construction of a simulator can be done without a central computer.* The interplay of the various hierarchical levels of these two classes of symbols led by *cooperating conscious selves* plays the same role as a computer program without requiring an actual computer to run the program.

In this conjectured organization, each relevant live symbol has a free-will intelligent agent behind it to determine the appropriate L-symbols to use instead of relying on a deterministic mechanical computer that mindlessly manipulates meaningless Boolean bits. This is also the way in which cooperating human beings are able to put a man on the moon or design a computer before one existed even in concept: through the interplay of conscious creative thinking with the concurrent construction of material structures that reflect those thoughts.

In this view, our thoughts and emotions represent high-level prescriptive symbols that will guide the production of the “reality” we will experience. That reality is constructed with L-symbols to respond to our collective *true* desires, doing the best to optimally navigate the possibly conflicting aims of the various entities involved.

To create realities that satisfy *all* the conscious selves, we have to learn to formulate “pure” thoughts and emotions, and this requires becoming aware of our true intentions and purposes and correct any distortion and misunderstanding. I believe that’s what we are here to learn.

The Nature of P-Space

With this background, we can now further explore the nature of P-space (physical space in the CIP framework): imagine a virtual reality in which there are several avatars interacting with each other and with *inert* objects in accordance with a set of rules run by a digital computer. Inert objects have no degrees of freedom controllable from outside the virtual reality, whereas each avatar has several degrees of freedom that must be controlled by a human body existing outside the virtual reality. Therefore, a specific set of the avatars’ behaviors can be determined by the decisions of the bodies. In other terms, each avatar is a subroutine within the virtual reality program *inside* the computer, partly controlled by a body *outside* the computer.

I will now describe the process occurring between one avatar, A, and the body A*, recognizing that this same process occurs for all the other avatars and bodies in the virtual reality. In this example, the “connection” between

A and its controlling body A* is made through direct implants to the brain of A*, wirelessly exchanging information. This is a much more advanced technology than is currently available, though it is possible in principle. Notice, however, that the algorithmic rules that govern the virtual reality cannot fully determine the behaviors of the avatars because the commands of A* to A don't have an algorithmic origin, as we will see.

A* is in bed, undisturbed by physical reality, receiving classical (Boolean) information generated by avatar A. A* responds to that information to act as he pleases in the virtual reality through the free-will commands he sends to A. The information A* receives is entirely processed by the computer, based on the simulation of the signals his avatar exchanges with the virtual reality world. That information is then transformed by the brain of A* into new symbolic information that gives rise to the experience of the virtual reality within the consciousness, A**, that controls the body A*. This is consistent with the CIP framework, in which the consciousness of the body is “outside” the physical reality in which the body exists.

The body A* is both quantum and classical, interfacing quantumly with the self A** and classically with the implants in its brain. Notice that the self does not exist “inside” physical reality any more than the body exists inside the computer. The computer is strictly a classical structure existing within the quantum-classical physical reality in which the bodies also exist. A body is then like a “subroutine” running within the quantum-classical “computer” that is our physical universe, controlled by a purely quantum structure existing “outside” the universe. This is the self A** with free will and consciousness, existing in C-space and I-space and experiencing *both* the physical and the virtual realities in superposition. A** acts in physical reality through a quantum-classical body and in virtual reality through a purely classical avatar.

P-space is then the *experience* of the virtual reality within the experience of the physical reality that emerges in the consciousness of A**. If A** were focused primarily on the virtual reality, his experience of the physical reality would be “reduced” like the experience of our emotions when we are focused on physical reality.

This analogy shows that we can simultaneously exist in nested realities because virtual reality exists inside a vaster reality, physical reality, and physical reality exists inside an even vaster reality: I-space and C-space, the fundamental symbolic-semantic reality of the selves. Before computers existed, this example would have been unimaginable. The possibility to create virtual realities with computers has allowed us to experience and comprehend the fundamental *informational* nature of our physical universe in contrast with the materialist view of old.

Physical reality is just information, but information alone is not enough: the “stuff” of which everything is made must be able to freely use information to communicate and must also be capable of self-reflection, through which information is *experienced* and *known*.

P-space is the experience of a self in C-space obtained by perceiving a set of I-space symbols produced by the body the self controls. The body is a special informational structure made of the same set of I-space symbols that constitute the physical universe in which the body exists. Thus, the nature of P-space depends on the nature of the sensory and information processing system that each physical body is provided with.

Each animal species has a different representation of the world. And each phenotype of a specific species will experience a variation over the generic representation common to that species. Each body creates its own I-space symbols that the self experiences as its P-space. Only the P-spaces produced by bodies of the same species can be expected to be highly correlated.

The physical universe is then like a giant quantum virtual machine nested inside the sea of I-space symbols, and each body is a virtual machine nested inside the universe to which it belongs. I-space, universes, bodies, computers, virtual realities, and avatars are successive *nested levels* of informational systems, ultimately all made by I-space symbols. Figure 8.1 illustrates the model.

Within the CIP framework, there is no separate computer anywhere. We truly exist in C-space and communicate with I-space symbols. Since C-space and I-space are two irreducible aspects of a holistic reality, we are the “programmers,” the “programs,” and the “experiencers” of our collective creations, without any separate “hardware” hosting the programs. All physical realities are created by hierarchies of languages shaped by cooperating hierarchies of selves. In this conceptualization, it is relatively easy to imagine a virtual universe nested inside another virtual universe and so on to create universes inside universes in bewildering complexity.

The Scientific Study of Inner Reality

The current scientific method is based almost exclusively on *third-person* observations and experiments. These experiments cannot adequately deal with the inner world of sensations, emotions, thoughts, and spiritual feelings that are exclusively *first-person* experiences.

By making outer measurements on a person’s body, it is impossible to determine the deep subjective meaning of what’s measured. Only the embodied conscious self can know that meaning. For example, when scientists scan the brain with functional magnetic resonance imaging to find correlations

the deep meaning of that state for any individual cannot be revealed. Often, even the person who experiences anger doesn't know the true meaning of his state of mind, for only with a careful conscious introspection is it possible to understand such hidden meaning. This fundamental limitation of the scientific method has led many to minimize or even to deny the reality of our inner world, equating us with computers. Denial of the crucial difference that consciousness makes is equivalent to stripping human beings of their humanity.

Physics assumes the existence of matter, energy, space, and time (MEST) with certain properties and seeks to derive all other observables by using mathematical theories that postulate relationships between those fundamental variables. These relationships define the basic laws of physics that are held to be universally valid and immutable. The soundness of this approach is predicated on the experimentally verifiable predictive capacity of the theory when applied to any phenomenon.

Centuries ago, humans invented deterministic laws that "atoms" obey, from which all physical reality could mindlessly be constructed bottom-up only. This "command and control," *coercive* view in which only the *impersonal* laws of physics determine what happens gave birth to classical physics and appeared to work until the end of the nineteenth century. But when the real atoms were found to disregard those precious laws, the universe stopped being the clockwork mechanism we had imagined because its smallest "gears" didn't behave like gears at all.

Quantum physics was born to explain the strange behavior of the quantum particles, and with it our representation of the nature of reality had to change completely despite our attachment to the idea of a clockwork universe. Quantum physics is compatible with free will, but we resist looking into the consequences of a world in which the quantum fields have free will. Few venture there because admitting free will opens a Pandora's box! With free will comes "interiority," the place in which free will exists, a place that doesn't look at all like MEST, the matter-energy-space-time out of which everything else seems to be made.

Free will is just the tip of the iceberg, however, because it carries into physics everything else that belongs to the inner world: selfhood, consciousness, qualia, purpose, and meaning. Physicists generally deny that the meaning and purpose we experience have any direct impact on physical reality. Focused only on the outer symbolic reality, they assume that consciousness *spontaneously* emerges only from complex organizations of inert matter devoid of any interiority, even though no one has ever given any plausible explanation of how this can possibly happen. It is time that free will and consciousness be taken seriously by the scientific community.

Taking a diametrically opposite position, many spiritually oriented people believe that only the inner reality of spirit or of mind exists and downplay or deny the reality of matter.

To create a framework that unites the inner and the outer realities, I decided to *extend* the experimentally verified ideas of quantum physics. According to them, physical reality is holistic, dynamic, and probabilistic. I have taken holistic and dynamic as fundamental principles and added a third principle: *One is seeking to know itself*. The probabilistic aspect of quantum physics is then a consequence of this principle, and One could be imagined as the “quantum vacuum” out of which our universe emerged.

However, contrary to the purely mathematical idea of quantum vacuum devoid of any meaning, I imagine One as the *interiority* of all existence whose immense love, curiosity, and desire to know itself causes everything to emerge into existence out of itself.

If we start from the hypothesis that CUs exist before any physical reality, we must then explain the concepts of space, time, matter, and energy—so far held to be fundamental—with new primitive concepts that derive directly from the nature of the CUs. From this different conceptual structure, we must then recover the laws we already know as special cases of more fundamental phenomena expressed with the new concepts.

This new vision requires a complete new interpretation of the nature of reality that needs to be fleshed out with the contributions of many other thinkers who share similar ideals. The payoff will be a new theory that unites inner and outer realities and portrays a *meaningful* and *purposeful cosmos* rather than a dystopian universe. This endeavor will make the difference between life and death for mankind.

WE ARE NOT MACHINES!

Today we read that artificial intelligence based on artificial neural networks will soon surpass human capabilities. Some scientists even predict that in less than forty years, computers will become conscious. Is this true? Are we simply biological computers? If we think we are only information processing systems, what crucially distinguishes us from our machines? Let’s take a critical look at these questions.

Information and Symbols

When scientists talk about information, they almost always mean Shannon’s information, described for the first time in a famous article published in 1948.

Shannon, however, never defined information. He only defined “quantity of information,” and that depends on the probability that a specific symbol may appear next in a sequence of symbols. In his definition, the quantity of information carried by a symbol is inversely proportional to the probability of the appearance of that symbol.

Shannon called the average quantity of information carried by a sequence of symbols *information entropy*. Surprisingly, by changing the sign of the information entropy formula, we obtain the same formula that defines thermodynamic entropy, a fundamental concept in physics. This strange “coincidence” has brought the concept of information into physics, where it has been highly influential.

In Shannon’s concept of information, the meaning of information is completely absent and irrelevant. What matters are only the probabilities of the appearance of the symbols. This is perfectly adequate to describe certain core aspects of the behavior of computers and communication systems. However, for human beings, the concept of information is inextricably linked to the meaning of the symbols. In fact, a symbol without meaning is just a *signal*, something that doesn’t necessarily imply a meaning.

Notice that in the CIP framework, the meaning of a symbol is irreducibly linked to the nature of comprehension and exists only because there is consciousness. In a computer, the meaning does not exist because abstract symbols (signals) are transformed into other abstract symbols according to *explicit* rules (the algorithms) or *implicit* rules (data correlations) acquired via the “mechanical” learning process of artificial neural networks. But without consciousness, there is no real comprehension; there are only algorithms and data correlations.

A Universe Without Meaning

Theoretical physicist Giacomo Mauro D’Ariano and his collaborators have shown that quantum mechanics and QFT are entirely derivable from six purely informational postulates (D’Ariano, 2017). Quantum physics therefore tells us that matter is simply “made” of organizations of *qubits*, which are the quantum mechanical generalization of the Boolean bits used in classical computers. Matter is purely abstract information—information without any meaning.

Thus, current physics describes a completely meaningless reality, whether it be an atom, a stone, a computer, or a living organism. But just because meaning has been eliminated, by definition, doesn’t mean that reality is meaningless. Meaning can be obtained only by a conscious self directly observing itself and by “decoding” outer symbols into meaning *within itself*. By declaring consciousness epiphenomenal, meaning has been excluded from reality.

How can a physics entirely based on abstract information, in which abstract symbols can be transformed only into other abstract symbols, explain the existence of consciousness? How can the meaning each of us knows exists within our consciousness be brought within physics?

Live Information and Live Symbols

As described in the previous section, to explain the nature of consciousness, we should start with a new conceptual framework in which the quantum fields of elementary particles must be *conscious selves*. The concept of field must then be extended beyond its current definition within QFT.

The abstract quantum information that describes the current quantum fields of physics cannot describe information that is *inseparable* from its meaning to conscious selves. The two concepts are different. I will use the term “live information” to distinguish this latter information from its abstract counterpart. Abstract information must then be a “reduction” of live information.

I should also point out that the matter of our physical world can only symbolize the abstract Boolean information describable with bits. It cannot represent the *abstract* information of the quantum fields that requires qubits in superposition and is currently denoted with vectors in a complex multidimensional space called *Hilbert space*. In other words, live information is even more general than abstract quantum information. And quantum information is more general than the binary Boolean information that can be represented by the observable matter of our physical universe.

The formalism of quantum physics includes the superposition of all the possible states that could manifest in our physical reality and describes their collective temporal evolution. Then the *miracle* happens: when the conversion from the many possible states *reduces* the many to the *one* state that we find when we perform a measurement. Here hides the presence of free will, which is compatible with QFT and predicts true creation.

The mathematical formalism of QFT cannot tell us when and how this conversion occurs or which state will manifest. It can tell us only *the probability of manifestation* of each possible state. This phenomenon goes by the name of “collapse of the wave function” and is part of the so-called *measurement problem*, whose interpretation is still obscure nearly one hundred years after it was first advanced.

In the CIP framework, the collapse does not exist as we have imagined. There is instead the solution of an *optimization problem* that takes into account all the *free decisions* of all the conscious entities that are involved in the creation of the common reality. This problem cannot be solved by the

Boolean matter of our physical universe, for it requires another level of reality out of which our physical reality emerges.

Quantum physics cannot give us the solution because the decisions of the conscious entities are *free* and thus *cannot be known* a priori. Within CIP, with the “collapse” of the wave function, a live symbol containing many possibilities will manifest with a certain probability as a Lego-symbol at a specific location in space and time.

Coherent and Incoherent Live Symbols

Let’s imagine the conscious field of electrons and the conscious field of protons as two selves communicating with each other. Their interactions manifest in our physical reality as electrons and protons appearing in spacetime. With our instruments, we can observe only the *projection* in our spacetime of *processes* occurring in a vaster reality about which we currently know very little. Therefore, “electrons and protons appearing in spacetime” is how we currently describe within our reality the observable aspects of free communications occurring among conscious entities in a vaster reality.

These communications employ live symbols, which we imagine as particles after the quantum wave function collapse. Before the collapse, they are special informational states in superposition.

The free electrons and protons are the manifestations in our physical world of the live symbols of the electron-self (the conscious field of electrons) and the proton-self (the conscious field of protons), respectively, because each live symbol is “controlled” by a different self.

In the CIP framework, when an electron and a proton are combined into a hydrogen atom, it means that the electron-self and the proton-self have maximized their joint self-knowing and have created a new higher-order self, a hydrogen-self, and a new live symbol that manifests in our reality as a hydrogen atom. The hydrogen-self is a field of fields, existing within both the electron and the proton fields. The live symbol of the hydrogen-self is the *integration* of the live symbols of the electron-self and the proton-self.

I use the expression *coherent live symbol* to indicate a symbol that integrates lower-level symbols and is controlled by a single self. I use *incoherent live symbol* to indicate the *sum* of two or more coherent live symbols, each controlled by a different self and thus “disconnected” (incoherent) from each other. An electron and a proton interacting in close proximity without forming a hydrogen atom are the manifestation in the physical world of a live incoherent symbol because it is the sum, or juxtaposition, of two distinct live coherent symbols, one controlled by the electron-self and the other controlled by the proton-self.

There is therefore a special connection (the shared meaning) between the electron-self and the proton-self, producing the hydrogen-self and forming the new live symbol (the hydrogen atom) at a higher hierarchical level. This also means that the proton-self and the electron-self no longer have control over their respective symbols when these have been integrated into the hydrogen-symbol.

Most of the *objects* surrounding us are the manifestations in our spacetime of incoherent live symbols.

The Consciousness of a Stone

Take, for example, a stone. A stone is made of a jumble of small crystals composed of different atoms mixed with other amorphous materials. The crystals are of various shapes and sizes, and each of them is more or less regular within its interior.

A stone is therefore the physical manifestation of an I-space *incoherent live symbol* composed of the set of live coherent symbols that are the outer aspects of the many discrete selves that compose what we perceive as “that stone.” Each live coherent symbol is controlled by the free will of its respective self. However, there is no *unified* and *coherent* stone-self that can perceive itself, know itself, and control the stone with its free will, as would be the case if the stone were the live coherent symbol of a unified self. A stone is the juxtaposition of different selves whose interactions appear in our physical reality as an incoherent collection of separate parts in close spatial proximity without any evidence of a unified consciousness. Therefore, no corresponding live coherent symbol can represent the stone.

This situation is similar to a crowd of people and animals in which each entity is conscious and yet the crowd is not a coherent conscious self even though each entity in the crowd knows itself to be part of the crowd and interacts with other entities, both in the crowd and in the environment, with free will. In a stone, as in a crowd, many different selves coexist and communicate with each other and with the surrounding environment without *integrating* into a higher-order self that has “stone,” or “crowd,” as a new live coherent symbol.

In other words, the stone is not a self with the capacity to perceive, comprehend, and act with free will and with a unified point of view or perspective. To have a stone-self, the ensemble of the selves forming the stone would have to *integrate* to produce a single self, in which case these selves could no longer control their respective symbols because the symbols would be now integrated into the new live symbol. For a stone-self to exist, it would require the creation of many new “inner connections” (joint self-knowing) among the

various interacting selves that would integrate their respective live coherent symbols into a new and unique coherent symbol.

The integration of various selves to produce a live coherent symbol capable of being controlled by a C-space self while manifested in our physical world would produce a *living organism* with the capacity to self-reproduce and show a level of dynamic interaction with the environment incommensurable with the interactions possible by stones and man-made machines.

Life exists in a deep and irreducible symbiosis with the environment, with which there is a constant exchange of matter, energy, and information in a profound *dynamical equilibrium* in which the symbol is never the same throughout its lifetime.

Computers Cannot Be Conscious

The binary digit, or bit, is the simplest abstract symbol used to represent two possible states: “1” or “0,” “true” or “false,” “on” or “off.” A computer bit is represented by a *convention* that must be strictly respected in all electronic circuits. The convention could be the following: “If the number of electrons present in a node of a circuit is more than 1,000 above the average, the state of that node corresponds to ‘1.’ If the number is less than 100, the state of the node corresponds to ‘0.’ If the number is between 100 and 1,000, the state is undetermined and could cause errors.” The bit is an abstract symbol. It is a “collapsed” quantum bit, or qubit, where the qubit is another abstract symbol obtained from the *quantum superposition* of two possible quantum states: “1” and “0.” The qubit cannot exist in our physical reality because in our world it can manifest as only one of two possible states—that is, as a Boolean bit.

The bit can exist physically only by *forcing* a representation of it over a suitable man-made material structure. This type of information has nothing to do with the live information indivisible from its meaning and controllable by the free will of a self. The matter of which the computer is made represents a live *incoherent* symbol, as in the case of the stone in the previous example. The computer, as a physical body, cannot be controlled from within itself by the unified will of a conscious self because there is no self with dominion over the behavior of the abstract symbols that the computer matter is *forced* to represent by human construction.

The computer cannot host a *unified* consciousness because it is not a live coherent symbol, no matter how complex it is. Only living organisms, as far as we know at present, possess the special material organization necessary to represent within physical reality a live coherent symbol controllable by a unified self. A living organism behaves like a giant “macromolecule” that is constantly *re-created* and *changed* by matter flowing into and out of it. This

unbelievable level of dynamism is *the signature* within physical reality of a structure capable of hosting a unified consciousness.

This is the fundamental difference between a living organism and a classical or quantum computer. Only a live coherent symbol can represent the meaning that a self wants to *freely* communicate to other selves. And in the physical world, only a living organism has the level of dynamism and the extraordinary interdependence with the environment to properly represent a true live coherent symbol controllable by the free will of a self.

Since consciousness and free will are irreducible aspects of a self, no bounded, mechanical, physical structure obeying the laws of classical physics can ever be seamlessly “embodied” by a conscious self. To be embodied would require the capacity to communicate with free will between I-space and a quantum-classical body, thus controlling the physical structure from within.

Computers have only *mechanical* intelligence. We have *real* intelligence based on comprehension, a more general intelligence that contains mechanical intelligence as a special case. Our physical body, qua body, doesn’t possess real intelligence either, because that kind of intelligence comes only from our consciousness. What our body has over the computer, however, is *the capacity to interface with I-space and thus with a conscious self*. To be able to do so, the body’s physical structure must maintain a core of quantum coherence, an impossible achievement for a classical system like a digital computer.

The moment information is defined independently of its meaning, we have embarked on a path that leads us to describe only an abstract informational reality devoid of any interiority. In this *virtual reality*, consciousness could exist neither in machines nor in living organisms.

The artificial material structures created by humans to represent abstract information cannot represent the live information that expresses itself with live coherent symbols *inseparable* from their meaning and controllable by selves with free will.

THE EXPLANATORY POWER OF THE CIP FRAMEWORK

The CIP framework offers a conceptual structure capable of providing sensible explanations for many of the “rogue” phenomena identified in the introduction to this volume. Following is an outline of how CIP could potentially explain some of these phenomena.

In the ensuing discussion, the embodied consciousness is the consciousness that identifies with the body, roughly corresponding to the ego in psychology. The ego is only a small portion of the consciousness of a larger self—what

many traditions call the psyche or soul—existing independently from the body though communicating with it while embodied. The larger self is the self A** on the right side of Figure 8.1, and A** is in contact with the vast extra-physical information (I-space). The ego is shown as a small circle inside A** with broken boundaries to indicate that it can communicate directly with A**. In our ordinary life, the ego is unaware of its connection with A** and considers the body (A*) the source of all its experiences.

The information coming from the physical environment—both outside and inside the body—is transformed by the senses and by the nervous system of the body into the symbols that produce the ordinary experience of the physical world within the ego’s consciousness. Through the larger self A**, the ego can access additional live information, like intuitions, insights, comprehensions, and deep emotions, that the ego generally attributes to the body though they truly originate from A**.

When our body dies, we lose the ability to observe the physical world from the point of view of the body, but we keep the connection with A**, allowing us to observe the world from the perspective of our vaster self that exists in C-space and I-space and is not embodied. This deeper point of view, drowned out during our life by the *louder* body-perspective, becomes perceivable again within this model, revealing our true nature. Thus, postmortem survival is a natural consequence of the CIP framework.

Once we accept the primacy of consciousness and the existence of a hierarchy of selves that doesn’t end with human egos, we can potentially account for many other reported extraordinary experiences, like vivid and lucid dreams, genius, mystical experiences, and near-death experiences. For example, when physical stimulation ceases during a near-death incident, the ego-consciousness may become aware of its extraphysical nature, as if a veil were lifted, experiencing the reality of A** currently unknown to science. Mystical experiences can be similarly explained: when a person deeply desires to know his own nature, not to “get” something from that knowledge but for knowing’s sake, the communication between the ego and the larger self A** is activated more than usual, allowing the ego to momentarily partake of the perspective of A** in a process similar to a near-death experience.

Within the CIP framework, A** embodies voluntarily with the purpose of developing a deeper comprehension of its true intention and purpose. This is done by interacting with other selves who wear similar “costumes” made of matter and by witnessing the consequences of its actions that are ultimately informed by its most hidden intentions. Physical reality is much more constraining than C-space and I-space, forcing conflicting situations to arise that more readily reveal to the self its true intentions. In this sense, matter is like a

mirror allowing the self to know itself more fully. I like to think that matter is the *ink* with which the self writes the comprehension of itself and the world.

Explaining Anomalous Events

The essence of each of us is this extraordinary self who belongs to a physics we do not yet know, a physics from which the physics we do know emerges. Selves vaster than we are can create top-down influences on physical reality, proceeding from our intuitional and emotional levels to affecting our rational mental level and finally producing physical consequences. For example, many inventions start in this manner—some with the inventor waking up from a dream with an idea and the desire to see it through—and end up changing the physical world in ways totally unpredictable to science.

The inventor who has been so inspired can indeed freely decide to seriously pursue the idea and can accurately predict that a completely new organization of matter embodying his invention will exist a few years in the future. This is an impossible *prediction* for science to make because it comes from the *top down* and from the *inside out*. Science works instead from the bottom up only and attributes no causal power to our interiority. Science attributes creativity only to the principle of random variation and selection, which makes these types of predictions impossible.

If we accept the CIP model, we can also begin to explain reincarnation, out-of-body experiences, lucid dreaming, extrasensory perception phenomena such as telepathy and clairvoyance, and psychokinesis. Let's briefly outline the explanations.

Reincarnation

When the body dies, the ego is no longer flooded with physical information and might become aware of being part of a vaster self, in line with the spiritual maturity achieved in the life just ended. To better explain the general idea, I will use an analogy with an astronaut learning to fly a lunar lander in a sophisticated simulator. To succeed, the astronaut needs to (1) take seriously the simulation, (2) identify only with the simulated reality, and (3) momentarily forget what's outside the simulator to focus entirely on the learning task. After each session, the astronaut gets out of the simulator and conducts a "postmortem" with experts to learn what went right and wrong. And after many sessions, the astronaut will eventually master the complex task.

A human life might be like a session in the simulator, followed by (1) a postmortem with "experts," (2) some additional homework assignments, and

(3) another session in the simulator. Through the repetition of this process, the vaster self (A**) might gradually comprehend its deeper nature, becoming aware of the subtle threads that connect its various lives, recognizing the deeper reasons for its actions, and ultimately coming to know its real intentions and purposes.

Lucid Dreaming and Out-of-Body Experiences

The ego's identification with the body can be compared to being hypnotized by physical reality to the point of believing that physical reality is all that exists. As the self-knowing advances over many lives, the identification with the body might diminish, allowing new freedoms to the maturing egos. And with increasing maturity, the ego could become more open (less fearful) to begin the exploration of other realities.

Lucid dreaming emerges as the natural ability to "wake up" inside a dream and experience the dream from the viewpoint of the ego, not the situation occurring in an ordinary dream. In a lucid dream, the ego-consciousness may initially only *witness* the dream, realizing that it is "inside" a dream, *while dreaming*. As the ego advances, it may also learn to *control and direct* the lucid dream, in addition to witnessing it, beginning to explore the "dream-world," a different reality than physical reality.

An out-of-body experience is like a controlled lucid dream, except that the *induction* is different. In a lucid dream, the dream starts first, and the ego then "awakens" inside the dream. In an out-of-body experience, the ego "leaves the body" without ever losing its consciousness, often while the body is in deep relaxation. Therefore, the ego experiences "leaving the body" and then explores physical reality and other realities with a "sensory system" that is clearly not the one possessed by the body, since the body remains behind while the ego roams other worlds.

Telepathy

The ability to know the thoughts or feelings of another person without a physical communication is not recognized by science, but it is possible within the CIP framework. When the egos are completely identified with their bodies, they believe they can communicate only physically. When physical communication is impossible, telepathy would allow self A** or the ego of self A** to communicate with the ego of self B**, bypassing the normal body-to-body communication (Figure 8.1). In this case, A** could communicate directly with B** using I-space symbols, and that information would immediately appear as an intuitive thought and/or an empathic feeling within the ego of

B**. Notice that the ego of B** would be a *passive* receiver of information sent by either A** or the ego of A**.

The initiative for the communication may come directly from A**, who needs to communicate with the ego of B** without necessarily involving its ego. Another possibility is when the ego of A** has a strong desire to communicate with the ego of B** but their bodies (A* and B*) are not physically able to communicate. In this case, a strong desire of the ego may *activate* the direct communication from the ego to its vaster self A**, inviting A** to intervene.

Clairvoyance and Precognition

I think of clairvoyance in general as the ability to gain information about the world by extrasensory means, including retrocognition, remote viewing, and precognition, depending on the temporal origin of the information. Here I will highlight *precognition* because it is conceptually the most challenging.

If the universe obeyed deterministic classical physics, precognition would not violate any physical law, though it would require solving impossibly complex equations with unknowable initial conditions. But precognition deals with predictions that are generally outside the reach of science, even in principle. For example, a precognition like “There will be a car accident at a specific place and time, and person X will die” cannot be made by bottom-up physics. Within the CIP framework, however, such a precognition is possible as long as it does not violate free will. This is so because the egos are directly connected with their vaster selves, who in turn can communicate with each other using I-space symbols, as discussed earlier in connection with telepathy. Clearly, only certain classes of phenomena are predictable and thus precognitively knowable by egos—for example, those that have been *prearranged at the mental level* by agreement of all the selves involved.

Following is an example of a possible precognition scenario. Imagine that a high-level self (P**) communicates an unpredictable idea to the brain of an inventor (P*) in an intuitive flash. P* later decides to pursue the idea and begins its development in secret. When P* has firmed up his schedule and is about six months away from public disclosure, P** may communicate to a third person (Q*) a detailed description of the invention and the date on which it will be disclosed. This precognition, engineered by P** without violating the free will of either P* or Q*, will likely be correct.

Within the CIP framework, free-will choices are completely creative and cannot be known in advance even by the vaster selves. This is a complex subject because the nature of time within CIP is not the same as that described by various physical theories. What time really is remains an unsolved puzzle in physics.

Psychokinesis

This class of phenomena is hard to explain, given free will, the constraints of physical laws, and the intersubjective nature of psychokinetic events. Changing or suspending the laws of physics is impossible within current physics. Not so within the CIP framework because physical laws are *agreements* among the hierarchy of selves who cooperatively, voluntarily, and collectively create and evolve physical reality. However, for a psychokinetic event to occur, all the selves affected by it must give their permission—perhaps even cooperate—to make it possible. If that is the case, provided no free will is violated, the laws of physics may be temporarily and locally “bent” and their effects circumscribed. At least in principle, psychokinesis should be possible, although how it could be done in practice is not yet clear.

A full explanation of any of the rogue phenomena discussed in this section would require many more details to be filled in. Nonetheless, I believe enough has been said to show that the CIP framework can, in principle, accommodate with conceptual ease most (if not all) of them.

CONCLUDING REMARKS

The more we identify with our body and with our mechanical mind—and thus pay attention only to the symbols produced by the body—the more we lose contact with our deeper inner reality. Our ancestors who wrote the Vedas nearly four thousand years ago said something similar based on inner experiences and reflections like the ones discussed in this chapter. And the same deep message has been repeated in the various civilizations that have arisen ever since.

The materialist and reductionist vision of the world that dominates the *Weltanschauung* of our time considers the message of the Vedas the naive result of the pious desire of man for immortality, the ignorant and illusory attempt to be more than our body. By accepting only physical reality, much of our society has closed itself off to the possibility of experiencing the deeper truth that connects us all, for the simple reason that if a person believes certain experiences are impossible, the necessary investment to explore them will never be made.

Within the CIP framework, the fundamental purpose of One is self-realization in the endless pursuit of self-knowing. The fact that we are conscious is circumstantial evidence that consciousness may be purely quantum and that the body may be a mixture of classical and quantum organizations in which a unified quantum core can interface with the domain of consciousness on the one end and with the domain of classical physics on the other.

“Mind” (meaning) and “matter” (symbols) are two coevolving indivisible aspects of the dynamic and holistic “substance” of One. And One comes to know its true nature reflected in the ever more complex forms of the live coherent symbols created to capture the infinitely deep inner structure of its

own self-knowing. Since any symbol is finite, it will be impossible to fully capture symbolically the potentially infinite knowing of One. No matter how much One knows itself, it will never reach the end of its potential infiniteness.

I have come to believe the hypothesis that life is the symbolic-semantic expression of this eternal search for truth of One. And the life that we know can be only one of a nearly infinite number of diverse life-forms in existence.

Just as the invention of the steam engine amplified our human muscular power, so computers, robots, and artificial intelligence will amplify our mechanical intellectual power, freeing us from monotonous, repetitive, and dangerous jobs and extending our reach where it matters. This great potential, however, must be placed at the service of humanity's spiritual, mental, emotional, and physical progress.

Before us, the mystery of life and consciousness is opening with the amazing possibility of learning how to explore the universe of light that each one of us senses within. The human journey in the information era has just begun. If this venture is illuminated by love, discipline, passion, curiosity, and courage, we will learn to use the only tool capable of exploring the universe of live symbols and the true meaning of the multiverse. This incredible instrument is our birthright. Its name is consciousness, and it is what comes first.

NOTES

1. Cicero (1972, p. 132).
2. For further details, see D'Ariano and Faggin (2020).

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