

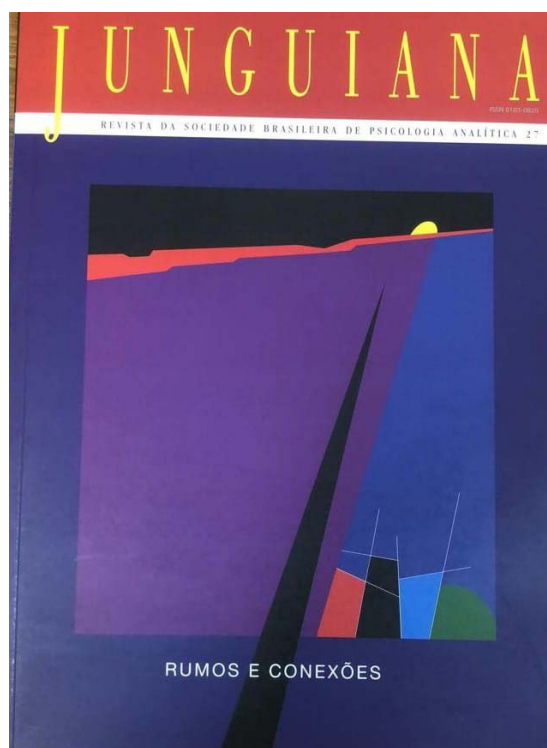
The question of meaning in a world of chance¹

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Abstract

The article focuses on the confluence of the fundamental principles that guide quantum physics and analytical psychology. Of note is the question of dealing with the practical issues arising from both approaches and the difficulty of integrating their implications in terms of our worldview. The experience of synchronicity is understood as being the human experience of quantum interconnection, and the article expounds on the question of meaning involved in this experience, the perception of being an integral part of a broader order, and the paradoxical experience of uniqueness and the cosmic. ■

Keywords
Quantum physics, psychoid archetype, synchronicity, meaning.



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The question of meaning in a world of chance

The psychoid nature of the archetype contains very much more than can be included in a psychological explanation. It points to the sphere of the *unus mundus*, the unitary world, towards which the psychologist and the atomic physicist are converging along separate paths, producing independently of one another certain analogous auxiliary concepts (JUNG, 1981a, par. 852).

Jung's statement of 64 years' standing indeed suggests the revolutionary potential of discoveries, from both quantum physics and analytical psychology, which bring the two perspectives closer together. Nevertheless, this potential has not yet been sufficiently integrated by collective consciousness. The tendency, in my opinion, has been to put fundamental aspects from both approaches to one side. We have been dealing with the practical applications while avoiding the resulting implications.

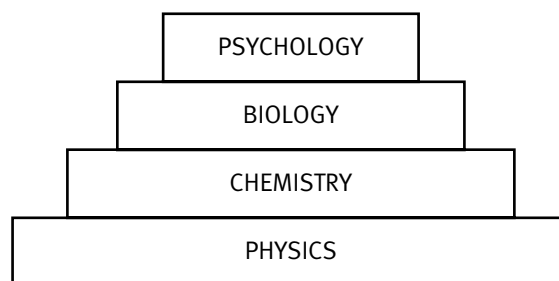
The applications arising from quantum physics, such as the development of the microchip, the laser and magnetic resonance, as well as its part in the discovery of DNA, are astonishing. In turn, analytical psychology has richly demonstrated its application in clinical practice, through the development of concepts such as archetypes, complexes, and individuation.

Yet, we have tended to ignore the innovative in these approaches, denied what is truly revolutionary and what, inevitably, would cause us to reassess our scientific paradigm, our view of the world, as well as our place in the world. We have grown accustomed to seeing the world through the parameters of Newtonian physics and the Cartesian division between mind and matter, taking these parameters as ultimate truths. Here are some of the basic principles of which we have become overly accustomed:

- Materialist determinism: the universe is composed of matter and governed by the laws of cause and effect. Everything is determinable: if we recognize the forces that act and their initial conditions, we can know their effects. Our knowledge is only limited, in the eventuality, by a lack of appropriate instruments to measure it.
- Objectivity: the separation of mind and matter has brought objectivity as a consequence, which is, incidentally, one of the pillars of our scientific research.
- Locality: objects that are separated by space or time are independent of one another. That is, objects that are a specific distance apart require an appropriate amount of time for the energy to flow from one point to another, guaranteeing communication; otherwise, the objects are independent of one another.
- Reductionism: complex systems must be reduced to their elementary parts. This is the way we have been required to learn about and research the phenomena.

According to the reductionist and materialist perspective of science, then, our worldview can be represented by the following pyramid (ROSENBLUM; KUTTNER, 2006, p. 36) (Figure 1).

Figure 1. Hierarchy of Scientific Explanation



Source: ROSENBLUM; KUTTNER, 2006, p. 36

In this model, we must seek explanations for psychic phenomena in biology, in brain functioning. Biological phenomena, in turn, are thought of in terms of their chemical essence. We study neurotransmitters and ultimately reduce chemistry to physics. That is, a human being is ultimately seen as a machine, the current metaphor being the computer.

This scientific perspective, which has led us to a machine vision of the world, as if it were clockwork, dates from the 17th Century. Lord Kelvin, the late 19th Century mathematician and physicist, was so enamored with the results of scientific research that he believed that the mysteries of nature had mostly been unraveled, leaving only minor details to be clarified. Although such views have now been discredited, new scientific parameters have led to a huge development of knowledge and technology.

But the question of meaning does not align with causal reductionism. Meaning is associated with the search for totalities, which demand a wider view. The question of free will also does not make sense, since we are determined, whether genetically or through environmental conditions.

Before the scientific age, humanity lived through a period in which the worldview was religious, the question of meaning being associated with God and his designs. Today, we find ourselves alone in a world devoid of meaning. Reason and scientific knowledge have taken the place of God, and matter the place of the spirit (AUFRANC, 2004).

And yet, the beginning of the 20th Century profoundly questioned these parameters, through quantum physics on one side, and analytical psychology on the other.

Niels Bohr, one of the great quantum physicists who, together with Werner Heisenberg and Max Born, was responsible for the set of principles of quantum physics known as the Copenhagen Interpretation, said: "anyone who is not shocked by quantum theory has not understood it" (BOHR apud MORGAN, 2000, p. 110).

Let us briefly outline some of the basic principles of quantum physics:

- Heisenberg's Uncertainty Principle: we cannot precisely measure the speed (momentum or quantity of movement) and the position of a quantum object at the same time. For example, we can discover where an electron is, but the more precisely we measure its position, the more uncertain we are of its speed. And vice versa, the more precise the measurement of an electron's speed, the more uncertain we are of its position. Interestingly, this situation is an ontological impossibility rather than the lack of an adequate measurement instrument.
- Bohr's Complementarity Principle: quantum objects, whether photons, electrons, or atoms, are both wave and particle. Wave and particle are two complementary expressions, although mutually exclusive of a quantum object as seen by an observer. That is, instead of determinism, we have uncertainty, complementarity.

Another principle:

- There is no objective reality independent of the interference of consciousness. A quantum object is in an undefined state, it exists only as probabilities, until an observation is made. Before its measurement, that is its observation, an object is in a superposition of all its possible states, a condition which Erwin Schrödinger, the renowned quantum physicist, described as the wave equation. When an object is measured, it is observed in only one possible state, never in a combination of them. This he referred to as the wavefunction collapse. On being observed, an object ceases to be a superposition that embraces all its possible states, one more probable than the next, and is instead defined by one unique state. Before being observed, an atom is a wavefunction, that is, only probability. A very important distinction needs to be made here: when we talk about quantum probability, we are dealing with the probability of *finding* an object in a particular region, and not the probability that it *is* in that region. This means that

the object is not there before it is observed. Atoms and molecules are not real, therefore, only potentialities.

John von Neumann, in *Mathematical Foundations of Quantum Mechanics*, 1932, demonstrated that quantum theory makes the encounter between physics and consciousness inevitable. According to the author, we could take a measurement device - a Geiger counter, for example - and imagine the device in a box, isolated from the rest of the world but in contact with a quantum system, such as an atom. The counter has been programmed to sound an alarm when the atom appears at the top of the box and not sound if it appears at the bottom of the box. Von Neumann suggested that since the counter is a physical system governed by quantum mechanics, it should enter into a state of wave superposition with the atom and simultaneously activate and not activate. If a second measurement device, an electronic apparatus, for example, contacted the Geiger counter to verify what is happening to it and register when the counter activates, it would also enter a state of superposition and register both situations as existing simultaneously. This so-called "von Neumann chain" could continue indefinitely. Von Neumann therefore demonstrated that no physical system, obeying the laws of quantum physics, could collapse the wavefunction of a superposition state into a particular state. However, when we verify the Geiger counter reading, it always registers a specific state, never a superposition of states. Von Neumann concluded that only a conscious observer doing something beyond the embrace of physics can collapse a wave function (ROSENBLUM; KUTTNER, 2006).

Two years later, Erwin Schrödinger, who was particularly intrigued by the consequences of quantum physics, created what became known as the cat metaphor, referring to a thought experiment in which an imaginary cat is placed inside a sealed box. Inside the box is a radioactive emitter which has a 50% chance of radioactive decay every hour; if this occurs, an internal

mechanism will release poison that, in turn, will kill the cat. There is, therefore, after an hour, a 50% probability of the cat being alive and a 50% probability of the cat being dead. In quantum theory, all probabilities are real up until the point at which an observation is made. Thus, after an hour, with no-one observing, the cat must be both alive and dead. It is not a question of whether the cat is sick or a zombie, but a situation in which it is equally alive and dead. It is only when someone opens the box to see if the cat is alive or dead that a wavefunction collapse will occur, and the cat will be alive or dead.

Taken to its extremes, quantum theory seems absurd, since it denies the existence of a physically real world, replacing it with one in which observation creates reality.

Schrödinger's wave equation applies to the atomic scale, and yet quantum theory is at the basis of all natural science, from chemistry to cosmology, governing the behavior of everything.

All large objects, be they chairs or galaxies, are made from a collection of atoms. If an unobserved atom has no physical reality, then the real world is likewise created by observation.

We leave objectivity to the non-existence of objective reality, independent of the interference of consciousness.

Let's explore another principle.

- Nonlocality: John Bell's theorem of 1964, which was later demonstrated by the experiment of Alan Aspect in 1982, in France, and by the experiments of Nicholas Gisin in 2004, in Switzerland, postulated that objects at a quantum level do not exist independently of one another; they exist in a veritable web of interconnections.

Einstein, who was not only worried about the practical applications of scientific theories but also about their implications, called this the *spooky action at a distance*. Together with Podolsky and Rosen he created a thought experiment, known as EPR, in which they demonstrated that nonlocality could not be right.

In the thought experiment, two electrons would be emitted from the same atom and deflected in opposite directions, many miles distant from each other, one of them then being observed. According to quantum theory, the spins of electrons fired from the same source should be complementary, that is, opposing. The direction of spin is random and will only be defined through observation. Thus, when observing one of the electrons in the thought experiment, one spin would be defined and automatically the other would be defined by the opposite spin. The observation of one would instantly cause the wavefunction collapse of the other. The thought experiment demonstrates that nonlocality is unworkable, since it would necessitate violating two laws of the special theory of relativity: that nothing can travel faster than the speed of light and that spatially distant objects are independent of each other.

Nonetheless, the experiments of Aspect and Gisin confirmed Bell's theorem. The issue, however, is not about communication, therefore the first law of the special theory of relativity, which says that nothing can be faster than the speed of light, holds; but the second law does not, for objects are interdependent even at a distance (RADIN, 2006). Instead of locality, we have nonlocality.

Finally:

- Pauli's totality property: a quantum event suggests a new property of totality, one that

cannot be broken down into partial phenomena without thereby transforming the phenomenon as a whole in an essential way. Instead of reductionism we have totality.

The scientific principles would, therefore, be modified through the application of quantum physics (Figure 2).

The reductionist pyramid that we saw earlier could be replaced by a circle (Figure 3).

The implications of quantum physics seem daunting! But quantum physics describes the atomic and sub-atomic world, that is, the microphysical world; whereas the world in which our conscious mind resides is the macro physical world, wonderfully elucidated by Newtonian physics. Because it is impossible to carry out quantum experiments with large objects, there is no reason for us to worry about the reality of large things, since they obey the laws of classical physics. For all practical purposes, moons, chairs, and cats are real. This acceptance permits us to mentally economize, to concern ourselves only with the practical application of quantum physics and ignore the implications which result from it.

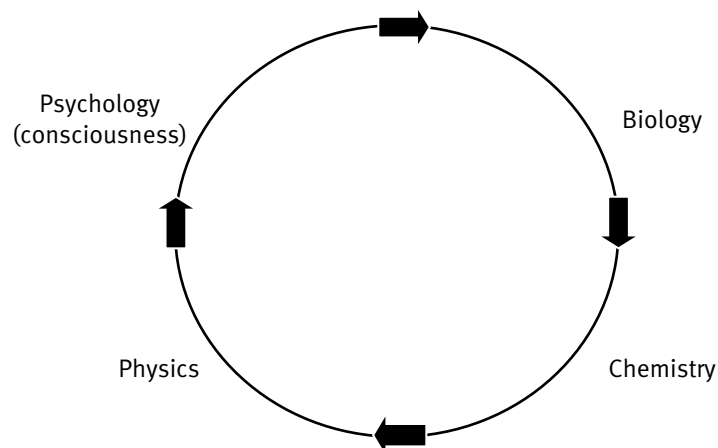
Yet, the question of meaning in quantum physics appears to be more serious. For, the basic process of nature generates probabilities or tendencies. Any hope of meaning is invalidated by the entry of pure chance. That which would bring revolutionary potential can be put aside, which is in fact what often happens.

Figura 2. Modified scientific principles.

Determinism	X	Uncertainty, complementarity
Objectivity	X	Non-existence of objective reality independent of the interference of consciousness
Locality	X	Nonlocality, interconnection
Reductionism	X	Totality

Source: AUFRANC, 2009 p.44

Figura 3. New scientific perspective



Source: AUFRANC, 2009 p.44

Einstein, who could not accept the question of pure chance and worried about the implications for the scientific theories, wrote in a letter to Born (1971) that God does not play dice.

Jung (1981b, par.1187), referring to Einstein, wrote: "He fails to see that if God did not play dice he had no choice but to create a [from the human point of view] meaningless machine [...] *Meaning arises not from causality but from freedom, i.e., from acausality*".

We could say that Einstein, on the other hand, was right. It is not about chance, but the meaning inherent in chance. Quantum physics lacks the notion of the archetypal, of meaning.

While the discoveries of quantum physics were being made, Jung, through clinical observation, was discovering and conceptualizing the existence of the collective unconscious. Consciousness can be understood as a product of this unconscious, the existence of which precedes us and is common to all humanity. The collective unconscious, contrary to the personal, does not owe its existence to individual experience. It is not a personal acquisition. Consciousness develops from the unconscious, which is collective and common to the human species.

The concept of archetype is inherent to the collective unconscious. We can understand

archetypes as being neuropsychic cores that have the capacity to initiate, control and measure the common characteristic behaviors and the typical experiences of all human beings. Jung (1981c) developed the notion of archetype from 1912, when he spoke of primordial images. In 1919, he conceived the archetype as being the self-perception of instinct (JUNG, 1981d), and the concept continued to be elaborated on, until reaching its final form in 1946. The archetype came to be understood as a bipolar, psychic and physical factor, which expresses itself through symbols (JUNG, 1981e). Such symbols need to be understood as the expression of something completely new for consciousness and, therefore, having great transformative potential.

We do not encounter the archetypes, but rather their symbolic manifestations. The archetypes, through symbols, are expressed in psychic polarity as well as in biological polarity. A symbol may manifest itself in the psychic polarity of an individual through dream images, fantasies, projections, transferences, or psychic symptoms. In the collective, symbolic expression is given in the myths, legends, religions or art. Biological polarity, in turn, sees bodily experiences or physical symptoms as symbolic

vehicles. The archetype, therefore, harbors the potential for psychic and physical development. The archetype implies psychic and physical potentialities, which may be actualized provided there are matching conditions; and for this reason, we can say that, from an archetypal perspective, cerebral chemical imbalance and psychic pathology cannot be seen as the cause or the effect of each other, but rather as different manifestations of a whole that encompasses psyche and matter. It is for this reason that we have observed that many pathological states respond better when treated concomitantly with medication and psychotherapy.

Jung called the non-representable essence of the archetype psychoid, since it goes beyond the sphere of the psyche and forms a bridge to matter in general.

Up to this point, then, we have established a new and creative reference. We can work with symbols in their different strands, we can approach dreams, projections, fantasies, transference, and make symbolic amplifications; we can look at the symbols not only from their reductive aspects, that is, with reference to the personal history of a patient, but we can also work with prospective aspects, that is, questioning where these symbols point to, considering that we have established an archetypal reference.

However, when it comes to the question of the psychoid nature of the archetype, many of us, Jungians, tend not to consider the concept, since it is not easily assimilated by our conscious mind.

Jung uses the term *unus mundus*, from the alchemist Gerardus Dorneus, to describe the existence of a unitary potential reality underlying the duality of psyche and matter. In this unitary, potential reality is found in the archetypal preconditions that will determine the empirical phenomenon, whether physical or psychic. Archetypes, therefore, are the mediating factors of this unitary potentiality. When operating in the psychic sphere, they are organizers of images; in the sphere of matter, they

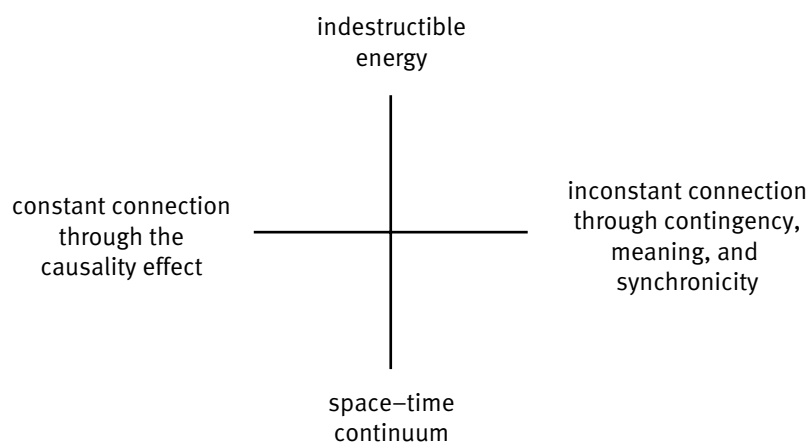
give rise to the ordering principles of patterns of matter and energy. The psychoid nature of the archetype expresses the origin of the psyche and matter and equally expresses the origin of the basic structure of the universe (AUFRANC, 2006).

We could say that when archetypes operate simultaneously in both spheres, of the psyche and matter, it gives rise to the phenomenon of synchronicity. Here we have to tread lightly. Jung avoided the subject for a long time. He first referred to synchronicity in 1929, in the introduction to *The Secret of the Golden Flower*, and in 1930, in his *In Memoriam to Richard Wilhelm*.

In 1930, Wolfgang Pauli, a Nobel Laureate of Physics, sought out Jung for analysis. Jung was impressed by the archetypal material that the young scientist brought to therapy from his dreams and decided to refer him to a colleague, Erna Rosembaum, a fledgling analyst at the time with little knowledge of archetypal material. His intention was to gain access to this material without running the risk of influencing it (JUNG, 1981f). In fact, Jung (1981g) later came to study 400 of Pauli's dreams for his work *Psychology and Alchemy*. But perhaps more important than this was the fact that two years later, Jung and Pauli had begun a fruitful correspondence, one that would last 26 years and culminate in the joint publication, in 1952, of *The Interpretation of Nature and the Psyche*, which contained Pauli's article, "The Influence of Archetypal Ideas on the Scientific Theories of Kepler", and Jung's "Synchronicity: An Acausal Connecting Principle". It was Pauli who encouraged Jung to work with the issue of synchronicity and, therefore, take on the task of venturing into a revolutionary field that had previously been difficult to assimilate. This is the scheme developed by Jung with Pauli's assistance (JUNG, 1981h, par. 963) (Figure 4).

It is interesting to note here that the principle of synchronicity is positioned as a complement to that of causality, and not seen as excluding principles.

Figura 4. Quaternio of Jung and Pauli



Source: JUNG, 1981h par. 963

In its most restricted sense, synchronicity could be described as the coincidence of a subjective psychic state with an objective external event, bringing a significant experience to consciousness. Many of us will know of the classic example of one of Jung's patients who was extremely rational and practically inaccessible to analytical treatment. During one consultation with Jung, the patient talked about a dream in which someone gave her a scarab-shaped gold jewel. At that moment Jung, who was seated with his back to the window, heard something tapping on the glass. It was a bright gold scarab beetle, which was uncharacteristically knocking on the windowpane to enter the darkened room. Jung opened the window, caught the insect in midflight and gave it to his patient, saying: "here is your scarab" (JUNG, 1981i, par. 982). Evidently, this experience was extremely significant, and the analysis was able to flow and deepen from that moment.

Pauli preferred the term significant correspondence to synchronicity, since he felt that emphasis should be given to the question of meaning, seeing that the phenomenon may occur at the same time and place, as in the classic example of the scarab. And yet it may equally occur in different places as in telepathy, or at different times as in precognition and clairvoyance.

Synchronicities oblige us to consider phenomena rejected by current science, as is the case of extrasensory perceptions. We are accustomed to ignoring such phenomena and considering them meaningless beliefs, since they do not match with our scientific paradigms. There is serious research being conducted in this area, however, and physicists have shown themselves to be much braver than we are by getting involved in the field (JAHN; DUNNE, 2011; MALIN, 2012; RADIN, 1997; TARG; PUTHOFF, 2005; TART et al., 2002).

The fact that archetypes function in both psychic and physical spheres, giving rise to acausal connections, is difficult to assimilate within our traditional parameters, based on location and causality. It is interesting to note that acausal non-local connections arise independently in research on quantum phenomenon. Physics had to incorporate the subjective element of the observer in its research, hitherto supposedly objective, while psychology, by studying the subjective nature of the psyche, arrived at the objective reality of archetypes (CARD, 1991).

Synchronicity, in its wider sense, speaks to us of the equivalence of the psychic and physical processes in an acausal general order. The archetypes are the mediators of this general acausal order. The psychoid nature of archetypes, therefore, extends beyond a neurophysiological basis

to incorporate general dynamic patterns of matter and energy.

The fascination of an experience of synchronicity is that it is a unique and individual event and, at the same time, the manifestation of a universal order (PEAT, 1988). Synchronicity gives rise to numinous experience (OTTO, 1992), the experience of the sacred.

An experience of synchronicity offers us an experience of wider meaning: the perception that we are an integral part of a greater order, a paradoxical experience of the unique and the cosmic. From our materialistic deterministic point of view, the individual is found alone in a meaningless world. It is the archetype that brings the evidence of a general cosmic order that includes the psyche and matter and permits us this numinous experience.

Jung used to recount an experience that Richard Wilhelm, a Sinologist who brought the *I Ching* to the West, had had in China. In one Chinese village Wilhelm was visiting, it had not rained for a long time. No longer bearing the drought, the residents decided to bring in a rainmaker from another province. When the rainmaker arrived, he requested to be left alone, and spent three days in a locked cabin, receiving only water and food. On the fourth day it rained – in truth, it snowed heavily, something which was not normal for that time of the year. Acutely curious, Wilhelm went to speak with the rainmaker and asked him what he had done to make it snow. The old man replied that he was incapable of producing snow, and was therefore not responsible for what had happened. Not discouraged, Wilhelm asked him what he had been doing over the last three days. The old man explained that he had come from another place, one in which everything was in order. On arrival at the drought-stricken village, he had realized that things were disorganized, out of the natural order of the universe; and he also found himself out of the natural order of things, out of Tao. He said he had had to wait three days to get back to Tao, and then the weather changed naturally (SABINI, 2002). It is very difficult for us who rely on the principles of causality and locali-

ty to understand a story like this, unless we consider it to have a magical cause.

There is a new perspective that we are not yet used to: we are part of a dynamic interconnected network. In the potential archetypal reality, or in the quantum potentiality, this interconnection seems to be clearer. The dimensions of time and space that separate us, being part of the conscious reality, do not exist in this potential world. The quantum process is surprisingly like the process of synchronicity. Both are acausal, that is, they violate the principal of the local cause, and both manifest holistic structures in a realm that goes beyond the difference between the physical and the psychic (STAPP, 2004).

We could say that the experience of synchronicity is the human experience of quantum interconnection.

We are facing a field of human knowledge which is still very new to us, a field to be explored. As a great physicist of our current time, Henry Stapp (2004, p.183), once said: “[...] if the quantum and the synchronistic processes are indeed essentially the same process, then an empirical window may have been opened on the process that had been thought by quantum theorists to lie beyond the ken of empirical knowledge”.

Becoming conscious of archetypal symbolic material brings us the possibility of choosing. It reinstates the question of free will and, therefore, alters what is constellated as probability.

We cannot think of a predetermined destiny; we forge our destiny, as well as the destiny of humanity, from an awareness of the archetypal probabilities (AUFRANC, 2006, p. 10).

The archetypes represent probabilities. Within the collective unconscious there are “n” archetypes, “n” possibilities. The development of consciousness constellates various probabilities, and, in a system of feedback, some are being updated in conscious reality, while others are reforming in the unconscious. Thus, destiny is being forged, for a change in the conscious alters the path of probabilities constellated in the unconscious.

The social, political, economic, and religious conditions affect the unconscious (JUNG, 1981). Major historical transformations cannot only be attributed to external causes. A new reality is being prepared as potential in the unconscious, for a change in consciousness alters the course of the probabilities constellated in the unconscious.

Quoting the Brazilian physicist Rocha Filho (2003, p. 70):

As the most accepted hypothesis about the formation of the universe involves a very dense initial state in which interactions occur violently at an immeasurable rate, it is probable that no particle can be considered absolutely independent of any other, and the consequences arising from this give form to a totally interconnected cosmos.

In other words, an apparently isolated choice signifies true global change.

We have, therefore, left the worldview in which the individual is alone in a meaningless world, where the question of free will is irrelevant since we are determined, for a meaningful worldview in which we live as an integral part of the whole, in which the very fundamental process of nature poses the question of ethical responsibility, to each other and to the whole.

Paradigms function as lenses through which we see and insert ourselves in the world. Analytical psychology and quantum physics, formerly traveling along separate paths, have merged to form a new paradigm. Being conscious of these new parameters, the perception that we are interconnected and that our actions have repercussions for all, encourages a huge change in the way we are in the world. I understand that we are passing through profound transformation and that the survival of our own species depends on the transformation of our consciousness. ■

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Resumo

A questão do sentido no mundo do acaso

A palestra enfoca a confluência dos princípios fundamentais que norteiam a física quântica e a psicologia analítica. Destaca a questão de estarmos habituados a lidar com as aplicações práticas decorrentes de ambas as abordagens e a dificuldade de integrarmos suas implicações no que concerne a nossa visão de

mundo. Compreende a experiência da sincronicidade como sendo a experiência humana da interconexão quântica e elabora a questão do sentido envolvida nessa vivência, a percepção de fazermos parte integrante de uma ordem mais ampla, a vivência paradoxal da unicidade e do cósmico. ■

Palavras-chave: física quântica, arquétipo psicoide, sincronicidade, sentido.

Resumen

La cuestión del sentido en el mundo del azar

El artículo se centra en la confluencia de los principios fundamentales que orientan la física cuántica y la psicología analítica. Destaca la cuestión de que estamos habituados a tratar con las aplicaciones prácticas derivadas de ambos abordajes y la dificultad que tenemos de integrar sus implicancias en lo que concierne a nuestra

visión del mundo. Comprende la experiencia de la sincronicidad como la experiencia humana de interconexión cuántica y elabora la cuestión del sentido intrínseca en esa vivencia, la percepción de formar parte integrante de un orden más amplio, la vivencia paradójica de la unicidad y de lo cósmico. ■

Palabras clave: Física cuántica, arquetipo psicóide, sincronicidad, sentido.

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