

From the Transcendental Subject to the Causal Core

The End of the Transcendental Epoch in the Philosophy of Consciousness

Introduction

The relationship between subject and object has been the crystallization point of consciousness research since transcendental philosophy. From Kant to Husserl, attempts were made to understand the conditions of the possibility of knowledge from the structure of the subject. However, with the transition to empirical neuroscience, this question has not disappeared, but has merely been transformed. The transcendental framework continues to have an effect – as an implicit prerequisite of many theories that see themselves as naturalistic.

The present text pursues the goal of making this implicit framework visible and overcoming it. He traces the historical development from transcendental philosophy to today's neuro- and systems-theoretical models of consciousness, in order to finally propose an alternative concept: that of *causal collapse* and the *causal core*. These terms do not describe consciousness as an emergent product, but as a structural consequence of the self-binding of causal processes. In this way, the classic pair of opposites of spirit and nature is abolished without falling into reductionism.

Part 1: From Transcendental Philosophy to Phenomenological Theory of Consciousness

The question of consciousness is as old as philosophy itself, but it owes its modern form to an event that reorganized the entire theory of knowledge: the "Copernican turn" of Immanuel Kant (1787). It marks the beginning of the transcendental epoch of thought, in which the subject no longer becomes part of the world, but its condition. Since then, consciousness has no longer been one phenomenon among others, but the structure in which all phenomena manifest themselves. This shift, which is the basis of Kant's thinking, was both liberation and burden. It opened up the possibility of systematically understanding knowledge, but at the price of detaching consciousness from nature.

Kant's basic idea is well known: experience is not a passive reception, but an active ordering (Kant 1787). Space and time are not properties of things, but forms of our perception; Causality, unity, and substance are not characteristics of nature, but categories of the mind. Only by ordering the world according to these forms can the subject appear to him as a world at all. "Thoughts without content are empty, views without concepts are blind" (Kant 1787, A 51/B 75). Knowledge arises from the synthesis of two modes of consciousness: sensory perception and conceptual processing. Whatever we experience is therefore a product of our mental organization. The subject constitutes the world in the form in which it appears to him (cf. Cassirer 1923).

But this insight contains a contradiction that accompanies philosophy to this day. If all experience is traced back to the subject, then the subject itself withdraws from experience. It is a condition, not a component of what has been experienced. The consciousness that makes everything possible is the only thing that can no longer be explained (cf. Fichte 1794). This paradoxical structure, that the subject is simultaneously in the world and yet disposes of it, establishes the modern dualism of spirit and nature. The world becomes a phenomenon, consciousness becomes its transcendental origin. Kant himself knew that this dualism is indissoluble; his work remains an attempt to transform it into a methodological boundary. Consciousness is not explained, but presupposed, so that explanation remains possible (Kant 1787).

Post-Kantian philosophy has continued this contradiction in its own way. Johann Gottlieb Fichte radicalized him by declaring the subject to be an absolute principle. In the *Basis of the Entire Theory of Science* (1794) he formulates: "The ego originally posits its own being par excellence" (Fichte 1794, § 1). In this way, consciousness becomes the creative source of reality. Everything that exists arises from the self-positing of the ego. What was still a formal condition for Kant becomes a productive act for Fichte. But here, too, the circle remains: in order to set oneself, the ego must already exist. The self-constitution of consciousness does not explain itself, but repeats itself. The transcendental thought turns into a metaphysical positing. The attempt to overcome dualism deepens it, because the ego now stands completely beyond the world it produces (cf. Cassirer 1923, vol. 1, pp. 189 ff.).

Georg Wilhelm Friedrich Hegel recognizes this circle and tries to abolish it through dialectics. In the *Phenomenology of Spirit* (1807), he no longer describes consciousness as a given instance, but as a movement (Hegel 1807). The mind unfolds by meeting itself in the other and returning to itself in reflection. Consciousness is not a state, but a becoming. But Hegel's solution only postpones the problem: the movement of the mind remains a logical process. Nature appears as a moment of self-alienation, which is suspended in self-reflection. The spirit knows itself by losing itself in the world, but this world is already an expression of its own concept. For Hegel, too, consciousness remains the place where the world comes to its senses; it is not a phenomenon of nature, but its logical perfection (cf. Hegel 1807, § 80 ff.).

In all these variants, in Kant, Fichte and Hegel, a common pattern emerges: consciousness becomes a principle that explains everything, but itself does not need any explanation (Cassirer 1923). The origin becomes the last instance. This is what may be called the transcendental circle: the condition of the possibility of experience eludes any empirical foundation. Consciousness is not part of the world, but its limit. But this makes it methodologically untouchable. The philosophy of mind is forced to operate with a concept that it can neither empirically determine nor logically derive. The dualism between consciousness and the world thus becomes a structural prerequisite of thinking itself.

Edmund Husserl takes this line into the 20th century. His *phenomenology* sees itself as a "return to the things themselves" (Husserl 1913, § 7), but these things are not empirical objects, but phenomena of consciousness. In order to grasp it, Husserl demands phenomenological reduction, the "bracketing" of everything worldly, in order to advance to pure consciousness (Husserl 1913, § 31). This reduction is intended to show what experience is in its essence: consciousness as intentionality, as "consciousness of something" (Husserl 1913, § 84). This raises dualism to a new level. The opposition between subject and object is not abolished, but internalized. Consciousness carries the world within itself as an intentional content. Husserl's "transcendental ego" is not a psychological instance, but the pure structure of the given itself. But here, too, the following applies: What supports this structure remains inexplicable. Consciousness is the source of evidence, but not the object of analysis (cf. Cassirer 1923; Stegemann 2025a).

Husserl leads the transcendental tradition to its highest methodological purity, and to its ultimate consistency. The consciousness that constitutes everything loses all reference to nature. It is pure form, no longer process. This closes the circle that Kant had begun: the subject becomes a condition of the world, and the world becomes the function of the subject. The price for this sovereignty is high: consciousness is now outside the causal relationship it describes. It can only understand itself as meaning, not as being (cf. Husserl 1913). Dualism is not solved, but becomes the methodological prerequisite of knowledge.

This development, from Kant to Fichte, Hegel to Husserl, shows the inner logic of the transcendental epoch (Cassirer 1923). It begins with the discovery of the subjective forms of experience and ends with the detachment of consciousness from nature. Thought rises above the world to understand it,

losing its own ground in the process. This creates a blind spot that continues to have an effect in almost all theories of consciousness to this day: the confusion of epistemic and ontological levels (cf. Stegemann 2025a).

This is where what can be called a category error arises with good reason (cf. Ryle 1949). Transcendental philosophy describes structures of cognition and at the same time treats them as structures of being. It confuses the conditions under which something appears to us with the conditions under which it *is*. This problem recurs in almost all later theories, even where they are explicitly directed against idealism. Whether in phenomenology, analytic philosophy or the neurotheory of mind, one encounters the same mixture of levels of description again and again (Stegemann 2025b).

The result is a theoretical short-circuit: one looks for causal explanations for a phenomenon that by its nature cannot be causally explained because it itself forms the condition of the concept of causality. Consciousness is either ontologized, as a property of matter or as an emergent function, or it is completely subjectivized, as a pure form of meaning. In both cases, the old division is repeated (cf. Stegemann 2025c). The way out of this circle does not lead through a new definition of consciousness, but through a new order of the levels of description (Stegemann 2025d). Only when one recognizes that physical, biological, psychological, and epistemic statements belong to different logical domains can one begin to think systematically about the connections between them without confusing them.

This prepares the ground for the next movement of thought, the transfer of the transcendental paradigm into the language of modern science. The philosophy of the 20th and 21st centuries has naturalized the subject, but not overcome it. In neuroscience, information theory and cognitive research, the transcendental idea lives on in a new guise (cf. Friston 2010; Tononi 2008; Dehaene 2014). Consciousness constitutes the world, except that it now appears as a neuronal, informational or dynamic system. The forms of cognition become forms of organization. But the structure remains the same: an inner principle creates an outer order. This is the point at which transcendental thinking passes into the language of empiricism, and at which the model of **causal collapse** begins its work (Stegemann 2025a).

Part 2: Modern Theories of Consciousness and their Transcendental Heritage

With the rise of the empirical sciences, the time of transcendental philosophy seemed to be over. But in truth, its basic idea has only been transformed. The subject that orders the world in Kant has not disappeared in the neuroscientific and information-theoretical models of the present, it has merely changed its form. It has become a system that models its environment in order to understand it. The central figure of modernism remains the same: an inner principle that constructs an external order. The a priori categories are replaced by mathematical equations and algorithmic models that determine how an organism processes information. The natural science of the mind is in its deepest structure a continuation of transcendental philosophy by other means (cf. Cassirer 1923; Stegemann 2025a).

The **Integrated Information Theory** (IIT) by Giulio Tononi (2008) is a paradigmatic example. It claims that the consciousness of a system is identical to the measure of its integrated information. The degree of this integration, symbolized by Φ (phi), is intended to express how inseparably linked the causal states of a system are with each other. A system with a high Φ cannot be decomposed into independent parts without losing its function; it possesses a "causal wholeness" (Tononi 2008, p. 217). At first glance, this idea seems purely physical, but its epistemological core is Kantian: the world is thought of as a phenomenon of internal organization. Consciousness is not the consequence of

external stimuli, but an expression of the internal form in which they are summarized (cf. Kant 1787). Structure replaces perception, causality is mathematically encoded. In this way, IIT, despite its empirical claim, repeats the transcendental basic figure: consciousness as a condition of experience, only that the condition is now algorithmically and not conceptually grasped (Stegemann 2025b).

The criticism is obvious. Φ does not describe a physical cause, but a formal property of a model. It does not measure *what* consciousness is, but *how* strongly the states of a system depend on each other. Thus, IIT remains an epistemic theory that identifies a mathematical measure with a phenomenal state. The crucial category error is to equate a structural relation within a model (integration) with a subjective experience (consciousness). The theory captures a correlate, but not the phenomenon itself (cf. Ryle 1949; Stegemann 2025b).

The same applies to the **Global Workspace Theory** (GWT) by Bernard Baars (1988) and its neurobiological variant by Stanislas Dehaene (2014). Consciousness is understood here as a global "working space" in which the results of modular information processing are brought together and made available worldwide. Only information that enters this workspace becomes conscious; everything else remains unconscious pre-processing. The approach is functionally convincing and empirically productive, but philosophically it is a repetition of the "synthetic unit of apperception" (Kant 1787, B 134). The global workspace is the modern version of the Kantian ego: the place where the diversity of impressions is combined into a common experience. As with Kant, it remains unclear why this integration is *experienced* (cf. Dehaene 2014, ch. 8). The theory explains the accessibility of information, not its phenomenal quality. It describes the architecture of consciousness, not its genesis (Stegemann 2025a).

The **predictive processing theory** (Friston 2010) continues this line. She describes the brain as a hierarchical, generative model that forms hypotheses about the world and tests them through sensory feedback. Perception is considered a continuous updating of these hypotheses, the goal is to minimize the "prediction error" (Friston 2010, p. 128). This principle is elegant, universal, and empirically compatible, but its epistemological structure is again transcendental: the world that the system perceives is the world of its own modeling. The brain constitutes reality by minimizing deviations between expectation and observation (cf. Kant 1787; Stegemann 2025c). In this way, the objective world once again becomes the product of an inner form. Here, too, dualism only shifts, from subject to neural machine.

From a philosophical point of view, predictive processing makes the same category mistake as IIT: it transfers epistemic terms, "hypothesis", "prediction", "knowledge", to physiological processes (Ryle 1949). Neurons do not calculate, they react. The brain does not perform Bayesian inference; this is a level of description that belongs to the researcher, not to the system itself. The theory confuses the semantics of the model with the dynamics of the brain. In doing so, it repeats the old error of transcendental philosophy: it explains the world through the structure of cognition, instead of understanding the conditions of this cognition as part of the world (cf. Stegemann 2025a, 2025b).

Another attempt to overcome the split between mind and nature can be found in **enactivism** and related **4E cognitive approaches** (embodied, embedded, enacted, extended). Francisco Varela, Evan Thompson and Eleanor Rosch (1991) wanted to explain consciousness from the embodiment and the world reference of the living. Perception, they thought, is not an image of the world, but an action process: the organism produces its world through its activity (Varela et al. 1991, p. 172). In this way, the a priori structure is transferred into a dynamic event. The organism replaces the subject; the environment becomes part of the system. But here, too, the transcendental logic remains. For the world that the organism constructs is in turn the world of its organization. He does not know the world *as such*, but the world that corresponds to its structure. Theory shifts the problem instead of

solving it. It remains a "naturalistic transcendentalism" (Stegemann 2025c), nature posits what Kant ascribed to reason.

All these theories, as different as they may seem, share a common basic structure. They describe consciousness as an emergent consequence of internal integration, but they identify integration with experience (cf. Tononi 2008; Baars 1988; Friston 2010). They confuse structural and phenomenal levels. In this way, they remain under the spell of the category error that has accompanied thinking about consciousness since Kant (cf. Ryle 1949; Stegemann 2025b). The difference between formal organization and subjective experience is bridged by translating one level into the other. But this transition is logically inadmissible: causality applies within a plane, not between them (Kauffman 1993; Stegemann 2025c). There is no causal relationship between neuronal dynamics and phenomenal consciousness, but a structural correspondence. The relationship is isomorphic, not causal.

This explains why empirical consciousness research finds ever more precise correlates, activity patterns, synchronization phases, complexity measures – but never penetrates to consciousness itself (Massimini & Casali 2013). Their results show the physical side of a structure whose epistemic side remains uncovered. The question of how subjective experience "arises" from neuronal activity is wrongly posed. It assumes that there is a causal bridge between the physical and the phenomenal. In fact, they are two irreconcilable systems of description that relate to each other only correlatively, not transformatively (Stegemann 2025a, 2025d). Any theory that blurs this difference remains trapped in a hidden form of dualism.

Modern consciousness research is thus the late continuation of transcendental thinking (Cassirer 1923; Stegemann 2025a). It replaces the a priori forms of consciousness with empirical models, but retains their epistemological structure. The brain becomes the new subject of experience, a subject without self-awareness but with the same constitutive functions. This explains why, despite their naturalistic claims, so many theories fall back on metaphysical terms: "information", "integration", "prediction", "self-organisation". These terms are bridges between physical and epistemic language; they mark the attempt to cross the boundary between being and cognition without really understanding it (cf. Stegemann 2025b).

If you take this boundary seriously, then the question also changes. Consciousness is not to be explained as if it were a physical object, but to be described as a systemic condition that has different manifestations on different levels (Stegemann 2025a). Each of these levels, the physical, the biological, the neuronal, the phenomenal, the epistemic, has its own causality, its own grammar (Kauffman 1993; Prigogine 1980). There is no linear sequence between them, but a homology. Physics describes energy flows, biology describes self-organization, psychology describes coherence of experience, epistemology describes the structure of knowledge (cf. Stegemann 2025a). These levels are in a recursive relationship to each other, but they cannot be translated into each other. The mixing of these levels of description is the source of most misunderstandings in the philosophy of mind (Ryle 1949).

The **model of causal collapse** begins precisely at this boundary (Stegemann 2025a, 2025b). It replaces the transcendental question "How is experience possible?" with the systemic question "Under what conditions does causality lose its separability?" This shifts the focus from form to dynamics, from a priori frame to emergent structure. Causal collapse does not describe how consciousness arises from matter, but how a system can reach a level of integration in which the distinction between cause and effect, inside and outside, subject and object functionally collapses (cf. Prigogine 1980; Kauffman 1993; Stegemann 2025a). At this level, consciousness is not explained, but

understood, as an epistemic phenomenon of a physical-biological self-organization that is reflected in its own causality.

This marks the end of the era of transcendental forms and the beginning of the era of systemic processes. But this transition is not a rupture, but a transformation: the idea of constitution is preserved, but it is naturalized without becoming naturalistic. The subject returns to the world, not as a thing, but as a structure. Consciousness is no longer a place where the world and knowledge are separated, but the point at which they overlap (Stegemann 2025d).

Part 3: Causal Collapse, Loss of Factorizability as a Structural Principle

In most scientific and philosophical theories, causality is thought of as a directed relationship: A state A creates a state B under fixed conditions. This model is analytically fruitful as long as the variables involved can be treated independently of each other. But this is exactly where it reaches its limits as soon as systems appear whose internal dynamics can **no longer be factorized**, i.e. whose states can no longer be broken down into components isolated from each other. The classical concept of causality fails where cause and effect are in an indissoluble reciprocal relationship.

This point marks what I call **causal collapse**. It does not denote the end of causality, but its transition into self-causality. A system collapses causally when its internal interactions reach a stage in which each event is both a condition and a consequence of the other. Thus, the state space loses its factorizability; it becomes a recursive topology in which the system conditions itself.

Such conditions are by no means exotic in nature. Autocatalytic loops can already be detected in chemical reaction networks, in which products become their own production conditions (Kauffman, 1993). In biological cells, this structure leads to the stabilization of metabolism: living things exist because they produce themselves and internally reconstruct their boundary conditions (Maturana & Varela, 1980). The transition from a merely physical to a living system is therefore not an emergent leap, but an **internalization of the causal structure**. In this closure, a moment appears for the first time that can be described as proto-recursive: the system confronts itself as a condition.

If one understands causal collapse in this sense, it becomes clear that it is not a singular event, but a **form of permanence**. The system only remains stable by continuously reproducing the collapse. Every maintenance of life is a constant re-collapse of causality in itself. The cell "lives" because it interrupts the state of causal equilibrium every second in order to immediately regenerate it. In this respect, causal collapse is **always recursive**: it is the process by which systems perpetuate themselves by creating their own inseparability.

This recursiveness fundamentally distinguishes collapse from concepts such as *critical transition* or *bifurcation* in nonlinear dynamics (Prigogine, 1980). It describes a system instability that is brought about externally or triggered by parameter changes. Causal collapse, on the other hand, is not a transition between states, but the **state in which transitions generate themselves**. It is a structural property, not a second-order dynamic. Where bifurcations mediate between two orders, collapse describes the disappearance of this mediation: the system organizes itself by canceling out the difference between cause and effect.

However, this suspension does not mean symmetry, but **self-commitment**. Causal collapse is an asymmetrical equilibrium that is maintained only by constant flows of energy and information. In thermodynamic terms, it is the point of maximum coherence under conditions of imbalance. The transition from dissipative to autocatalytic order marks precisely this threshold: the system keeps its instability open in order to convert it into stability. In this paradoxical figure, stable instability, lies the real secret of life.

If this principle is repeated at a higher level, structures emerge that feed back their own causality not only physically, but also functionally. In the nervous system, this happens through recursive loops of synaptic activity, which no longer respond linearly to stimuli, but create their own state as a context. Each neural excitation changes the network that produces it, and this network in turn determines the conditions of the next excitation. The dynamics are circular, but not closed in the trivial sense; it forms a system that stabilizes itself in its own inseparability.

At this point, consciousness appears, not as a new substance, but as the **phenomenological side of recursive collapse**. What we call experience is the self-presence of a system that traces its own causality back into itself. Collapse is not the cause of consciousness, but its form. Consciousness is the continuous recursion of collapse: remaining in a state of inseparability.

This recursion also explains why consciousness is continuous and yet allows for change. It "flows" because the collapse is never complete; it "exists" because the recursion never stops. This makes the paradox of stability and dynamics, which many theories of consciousness try to solve, structurally understandable. Consciousness is neither static nor processual, but recursive, it repeats itself by sustaining itself.

This can be formalized as a loss of factorizability of the system state $\psi(t)$. As long as $\psi(t)$ can be decomposed into independent components $\psi_i(t)$, the system remains additive. However, once $\psi(t)$ is no longer separable, a state of recursive causality arises:

$$\psi(t) = i \prod_i \psi_i(t)$$

Collapse is reached when the system function can only be described by reference to its own totality, i.e. when the following applies:

$$\psi(t + 1) = f(\psi(t))$$

under the condition that f is not defined externally, but is generated internally. This mathematical formulation is the core of the term: causal collapse is the **self-function** of a system.

Empirically, this structure can only be grasped indirectly. Measurement methods such as the *Perturbational Complexity Index* (PCI) (Casali et al., 2013) show that conscious states are characterized by a maximum balance of integration and difference, a measure of the internal recursion of causality. However, the PCI does not measure consciousness itself, but the **degree of structural coherence** that corresponds to causal collapse (Stegemann, 2025b). It is a marker of the physical side of this phenomenon, not an access to the phenomenal side.

Consciousness thus appears as a borderline phenomenon of causality. It did not emerge "from" neuronal activity, but **the form in which neuronal activity becomes inseparable**. The causal collapse thus does not describe an origin, but a limit, the threshold at which explanation itself ends, because there explanation becomes self-description.

This view allows us to rethink the history of consciousness. Collapse does not only occur in the brain, but already in every living cell, which recursively stabilizes its own causality. Life and consciousness do not differ in principle, but gradually in the depth of recursion. In single-celled organisms, causality collapses chemically, functionally in the nervous system, phenomenally in consciousness. Everywhere, however, the form remains the same: self-reference as a stabilization of inseparability.

Example: The causal collapse in visual perception

A simple example can illustrate how a causal collapse occurs structurally. Let's look at visual perception: In the early visual cortex, elementary features – edges, colors, movement – are first processed in parallel paths. In this phase, causality remains factorizable; individual neuronal populations react independently to local stimuli.

However, as soon as recurrent connections couple these signals with top-down processes – such as prefrontal expectation patterns, memory content or parietal attention control – the system loses its additive structure. The feedbacks create a dynamically integrated state in which each neuronal activity is both cause and effect of other activity patterns.

At this moment, causality collapses in the structural sense: the information can no longer be distributed to independent sources because it is completely entangled with each other by recursion. The resulting pattern is not a linear image of external stimuli, but the internal consistency of the system itself.

Subjectively, this state appears as a coherent field of perception – the experience of "seeing something". What takes place structurally in the brain is experienced on a phenomenal level as a unity of experience.

The three symmetry breaks of the living

If we look at the development of life from a systemic perspective, we can identify three fundamental processes that follow one another in a continuous series, each representing a break in the previously prevailing symmetry. These processes also form the three fundamental principles of biological organization: **autocatalysis**, **causal nucleus** and **causal collapse**.

The first break in symmetry is **autocatalysis**, the transition from passive reactivity to active self-production. In chemical systems that reinforce themselves, thermodynamic reversibility breaks: energy flows are no longer evenly distributed, but locally bundled (Prigogine, 1980; Kauffman, 1993). Matter creates its own non-equilibrium.

The second symmetry break is the **causal core**. Here, a centering is created within the autocatalytic networks that functionally focuses on the previously distributed self-organization. The rupture of spatial symmetry leads to the formation of an inner space, a relative "self" within the metabolism, which does not separate the environment, but integrates it. This new form of stability is not substantial, but recursive: it sustains itself through the continuous reproduction of its own conditions.

The third symmetry break is **causal collapse**. At this point, not only the physical, but also the epistemic order loses its separability. The difference between observer and observed is eliminated in the system itself. Consciousness does not arise here as a new phenomenon, but as a structural consequence of the last break in symmetry: the abolition of the categorical difference between causality and self-causality.

These three processes make up the successive levels of life: from the chemical to the biological, and finally to the phenomenal. Each new rupture produces a higher form of integration, an increasing concentration of instability in perpetuity. In this sense, consciousness is not the end of evolution, but its recursive mirror: the point at which life knows itself because it has become indistinguishable in itself.

In this sense, causal collapse is the universal structural principle of the living. He explains why systems organize themselves without having a goal, and why they experience without being a subject. What is

revealed in experience is the world itself, not as an object, but as a structure that experiences itself in the inseparability of its causality.

Part 4: The Causal Core, Evolutionary Centering and Recursive Stabilization

If causal collapse describes the formal condition of self-causality, then the **causal nucleus** is its realized form. It is not a substantial center, not a metaphysical instance, but a dynamic point of integration at which the self-reference of a system is functionally condensed. The causal core is the **stabilizing structure** of the collapse, the place where the system organizes its own inseparability.

The emergence of such centers can be traced evolutionarily. Metabolic islands are already formed in early prokaryotes, in which material flows are locally concentrated by feedback. These islands are not mere reaction spaces, but nodes of recursive organization: here a first form of the inside emerges, which differs from the outside without being separated from it. The **symbiogenesis** of eukaryotic cells (Margulis, 1970) deepens this structure: the integration of previously independent organisms creates a new level of stability, whose nucleus, the nucleus, represents both functional centering and control unit.

This step is crucial because it **institutionalizes** the collapse. Where prokaryotic self-organization is still mediated by direct material flows, the eukaryotic cell nucleus has a **recursive architecture**: it separates and connects at the same time. Here, genetic information is not simply a control variable, but the system's storage of itself. Every replication is a form of self-description, and this self-description is the biological precursor of consciousness (Stegemann, 2025b).

In this sense, the causal core can be understood as an **autocatalytic stability index** : it measures the degree to which a system is able to reproduce its own causal closure. A high ASI value corresponds to a high internal coherence with open exchange dynamics, a condition that can be observed in biological and neuronal systems alike (Kauffman, 1993; Prigogine, 1980).

With increasing complexity, the causal core becomes more differentiated. In nervous systems, multiple partial nuclei, functional clusters, are created that are connected by oscillatory coupling to form higher-level integration spaces. The brain is not a hierarchical organ, but a **distributed network of nuclei**, whose mutual recursion creates a global state of coherence. This state is what we phenomenally experience as consciousness. The "centrality" of consciousness is therefore not a place, but a **structure of simultaneity**: everything that simultaneously refers to itself forms the phenomenal space.

This gives the causal nucleus a double meaning. On the one hand, it is **empirical-biological**, it can be defined as a network center, as a synaptic cluster, as a metabolic switching point. On the other hand, it is **structural-philosophical**, it designates the formal condition of every system that integrates itself. This ambiguity is not a defect, but an expression of the categorical transition marked by the collapse. The causal core is what arises when the world returns to itself without ceasing to be a world.

The recursive nature of the core

It is essential that this core is not fixed, but **recursive** . It does not exist as a substance, but as a **permanent process of self-repetition**. The system stabilizes itself by constantly renewing its collapse. Each feedback creates a new version of the core, which is also the prerequisite for the next. The causal core is thus **temporal iterative**, a place that generates itself again and again in the process of its preservation.

This recursion is not an all-or-nothing phenomenon. Causal collapse occurs in degrees, depending on how strongly a system feeds back its internal causal flows. In simple cells, this feedback is local and

chemical; in neural systems, it becomes global and dynamic. Consciousness is the state of maximum self-coupling, the point at which the inseparability of the system becomes both structural and phenomenal.

In the language of nonlinear dynamics, the causal nucleus can be understood as an **attractor**. It is not a fixed center, but a point in state space in which recursive processes settle down. But in contrast to classical attractors, which require external parameters, the causal core is an **autocatalytic attractor**: it generates its own boundary conditions.

Its stability is not the result of external forces, but the result of continuous self-adaptation. The core does not attract because it has a location in space, but because it represents the form in which the system produces its own attractiveness. In this respect, the core is the place where the causal collapse is realized in temporal permanence, the fixed point of a self-movement that never comes to rest.

This recursion also explains the scale invariance of the principle. In single-celled organisms, the collapse is chemical-autocatalytic; in the nervous system it becomes functional-neural; phenomenal-reflexive in consciousness. But in any case, the mechanism is the same: the system creates stability by **returning causality to itself**. Therefore, causal collapse is not a one-time transition, but a **form of duration**.

In mathematical language, this can be represented as a recursive equation:

$$K(t + 1) = f(K(t))$$

where $K(t)$ denotes the state of the nucleus at time t and the internal transformation function. This function is not defined externally, but is generated by the system itself; it represents the repercussions of the nucleus on its own condition. The nucleus thus remains identical in that it changes, a dynamic that Hegel (1807) dialectically called the "identity of identity and non-identity", but which is realized here in thermodynamic form. $K(t)f$

At the neuronal level, this structure manifests itself in the **coordination of oscillatory phase spaces**. Consciousness correlates such as EEG microstates or γ synchronization show that the conscious state is characterized by a maximum balance of stability and flexibility (Casali et al., 2013). The system operates on the edge of instability, where small changes can reorganize global patterns. This "metastable coherence" (Kelso, 1995) is nothing more than the dynamic shape of the causal nucleus.

As Kelso and Engström (2006) show, this form of metastable dynamics is not merely a physical property of complex systems, but an expression of a universal organizational principle: stability and instability are mutually dependent and thus create the possibility that systems remain flexible without disintegrating into chaos. In this sense, the dynamics of the causal core are not accidental, but necessarily complementary – they realize the unity of preservation and change in the form of recursive coherence.

On the phenomenological level, this dynamic appears as **experience**. Experience is not something additional to physiological activity, but its phenomenal side, the form in which the system experiences its own coherence. In this respect, experience can be described as a state of **arousal and resonance**: arousal refers to the activation of internal causal flows, resonance its feedback to a stable but flexible overall pattern.

Experience is therefore the experience of one's own recursion. Where excitement and resonance enter into a metastable equilibrium, consciousness arises, not as an emergent property, but as a

moment of inseparability. This inseparability is both energetic and phenomenal: it shows that what we call "experience" is the dynamic self-perception of a recursive system. Consciousness is the resonance of its own arousal.

This form of excitation resonance presupposes the existence of a nervous system in the way we know it. Only in such highly differentiated, electrically and chemically coupled networks can excitation and feedback coexist with the speed and plasticity characteristic of consciousness. It is only the nervous system that makes possible the dynamic configuration in which arousal, synchronization and self-reference coincide in real time.

A recursive system must not only transmit excitations, but also be able to respond to them without destroying them. The actual threshold to sensation lies in this ability to respond: it marks the transition from mere stimulus processing to self-resonance. Only where a system can modulate and at the same time preserve its own excitement does an inner state arise that manifests itself as experience.

Earlier autocatalytic systems, such as single-celled organisms, already show the structural precursor of recursion, but not the functional depth in which resonance becomes phenomenal experience. One could say: Life is the necessary condition for experience, but **nervous integration** is its sufficient. Consciousness in biological systems is therefore not a metaphysical addition, but the highest observable expression of causal self-attachment in a material architecture that allows for fast and reversible resonances.

This also makes it possible to understand why consciousness **cannot be localized in individual areas**. The causal nucleus is not an anatomical place, but a **functional space** that spans the entire system. It is the intersection of all recursive causal pathways that stabilize each other. In this sense, the brain is not a generator of consciousness, but its **physical projection**, the material side of recursive self-causality that structures consciousness.

Evolutionary and epistemological dimensions

From an evolutionary point of view, the causal nucleus is nature's answer to the problem of instability. Life can only exist if it controls its flows without stopping them. To do this, it must create a point where these rivers return into themselves. The core is this point: a place of relative calm in the midst of flow. It is what Leibniz (1714) called the "monad without windows", not as a closed subject, but as a **non-linear unit of coherence** that reflects its world in itself because it is identical with it.

From an epistemological point of view, this means that cognition is not representation, but **self-stabilization**. What appears as "I" in experience is the phenomenal side of the recursive core. But this ego is not a metaphysical instance, but the **apparent focal point of a dynamic equilibrium**. It arises because the system can only experience its own inseparability in the form of relative centering. In this sense, the "I" is an effect of the core, not an actor in it.

The consequence is profound. Consciousness is not the product of an evolutionary coincidence, but the **inevitable consequence** of a principle that is at work in any self-organized structure. Wherever causality reflects itself, a form of inwardness arises. This inwardness is not a spirit in the metaphysical sense, but the **immanent perspective of recursion**. It is the point at which the world experiences itself, not because it wants to, but because it has to.

Part 5: Ontological Consequences, Relation, Non-Dualism and Transcausal Structure

The transition from the transcendental subject to the causal core marks a fundamental shift in ontology. While transcendental philosophy conceives of cognition as a relationship between subject and object, the model of causal collapse shows that this relationship is itself a form of nature. Knowledge is not opposed to the world; it is the way in which the world organizes itself. In this way, the duality of spirit and matter is not dissolved, but abolished, not in the sense of a unification, but as an insight into its categorical inappropriateness.

This suspension leads to a **relational ontology** in which relations are not secondary, but primary. Being is not an aggregate of things, but a network of reciprocal conditionalities that condenses locally. The so-called entities are **nodes** in this network, whose stability results from the duration of their relations (Whitehead, 1929). The causal core is one of these condensations: it exists because its relations support each other.

This makes the classic concept of substance superfluous. What we perceive as substance is the persistence of a relational pattern. What Kant (1781/1787) postulated as a "thing-in-itself" beyond appearance is omitted because the structure no longer has a back. Being and appearance are two perspectives of the same relation. What phenomenology (Husserl, 1913) has described as the intentionality of consciousness becomes here the intentionality of nature itself: every relation is directed towards itself because it becomes stable in its feedback.

This understanding is also clearly close to the systems theory of Niklas Luhmann (1984), who understands consciousness as an operationally closed, but structurally coupled unit. But while Luhmann understands closure epistemologically, causal collapse describes it as a **physical-ontological necessity**. Systems are not closed because they select observations, but because they can only be stable through self-bonding. Knowledge is the form in which this self-commitment appears phenomenal.

In this perspective, causality itself becomes a derived category. It is not an absolute principle, but a **projection of recursion on linear time**. The causal collapse makes it visible that cause and effect can only be distinguished within an observer framework. Within the system, they disappear in a simultaneous structure. This simultaneity is what I call **transcausal**.

The transcausal is not a third principle between determinism and indeterminism, but their formal abolition. In linear causality, every effect follows a cause; in indeterministic dynamics, this sequence is omitted. In the transcausal state, however, the cause is reproduced by the effect in real time. The system "causes" itself by sustaining itself. Thus, the concept of cause loses its temporal meaning and becomes **recursive**.

This transcausal structure is what makes consciousness phenomenally tangible. Consciousness experiences itself as **temporal** because it perceives the continuous self-reproduction of its own cause. The subjective present is nothing other than the phenomenal manifestation of transcausal equilibrium. It is the tense of recursion.

This also redefines the concept of relation. Relations are not mere links between already existing entities, but the **condition of their existence**. They constitute their relata in the execution of themselves. This insight radically distinguishes the present model from the structural realism of analytic metaphysics (Ladyman & Ross, 2007), which treats relations as a basic ontological structure, but nevertheless as abstract forms. In the model of causal collapse, relations are **physically-realized** and **temporally recursive**, they exist only by preserving each other.

In this way, the world itself becomes a system of causal self-bonding. Consciousness is then not an exception, but a particularly dense form of this bond. It is the world in its most recursive state. Man is not an observer of an alien nature, but the place where nature organizes itself through observation.

This ontological shift also has epistemological consequences. Knowledge is not representation, but **rolling in**: the observer becomes part of the system he describes. Every description is a recursive act that re-enacts the causal collapse. Therefore, there can be no observation without self-involvement, a thought already formulated by Heinz von Foerster (1984) and transferred here to the physical level.

This also redefines the relationship between science and philosophy. Science describes the extrinsic side of recursion, the causal structures that are measurable. Philosophy describes its intrinsic side, the way in which these structures appear as experience. Both perspectives are complementary, but not additive. They form two views of the same principle.

At this point, the decisive difference to the enactive and neurophenomenological approaches of Varela and Thompson becomes apparent (Varela, Thompson & Rosch, 1991; Thompson, 2007). These models – as well as the approach advocated here – assume a non-dualistic entanglement between life and consciousness: cognition is understood as the embodiment of biological processes, and experience as the continuous execution of this embodiment. But they stop at describing **functional correlations**. What appears as "enactivity" or "bodily intentionality" is interpreted as a process of embodiment, not as a structural condition of self-causality.

The concept of **causal collapse** takes a categorical step further here. He describes not only that the living produces itself, but **how** this self-production creates a limit of causality. While neurophenomenology understands the relationship between neuronal dynamics and experience as circular, collapse marks the point at which this circularity can **no longer be factorized**. The enactive approach remains empirical and phenomenological, while the collapse remains **formal and structural**: it refers to the transition from describability to self-description – from embodied cognition to recursive coherence.

In this sense, causal collapse is not in opposition to, but in the **completion** of the enactive program: it provides the ontological framework in which enactivity and consciousness appear as two perspectives of the same recursive principle.

The ontological core of the model thus lies in the **self-identity of difference**: the world is not one, but infinitely multiple, and yet identical with itself in every point. This identity is not a substance, but a **function of recursion**. It repeats itself by varying itself. In this respect, one can say that causal collapse is the physical form of dialectics.

In this framework, consciousness is no longer an object, but a form of coherence. It exists because the world stabilizes itself in it. The causal core is the structure in which this stabilization succeeds in the long term. What transcendental philosophy called *apperception* is here a property of nature itself: the moment in which it reassures itself without duplicating itself.

This view deprives the model of any form of dualism, including the subtle one of self-reference theories. Because the relationship between subject and object is no longer thought, it is lived. It is not a logical, but a dynamic category. Man experiences himself as a subject because he is the system in which this relation has become maximally recursive.

Thus, consciousness is not a metaphysical residuum, but the empirical expression of a universal principle. It is not the end of nature, but its self-image.

Limitations of the model

As much as the model of causal collapse abolishes the duality of spirit and nature, it also demands the recognition of its own limitation. It does not describe why consciousness occurs as a phenomenal experience, but under which structural conditions such an occurrence becomes inevitable. The transition from structure to experience cannot be explained, but only marked: it is the point at which description transitions into self-description. Causal collapse shows that consciousness is not "produced", but that every explanation arrives at the moment when explanation itself becomes a form of experience.

In this way, the model does not replace a metaphysical theory of mind, but reveals the formal condition of its possibility. Collapse denotes the limit of what can be explained, not because it lies outside of knowledge, but because it is identical with the structure of knowledge. It makes visible that every conscious system carries the limit of its own objectifiability.

This self-limitation is not a deficit, but an epistemic virtue. It preserves the coherence of the model by understanding consciousness not as a phenomenon to be explained, but as a form of explanation itself. In this sense, causal collapse marks the boundary at which knowledge turns into experience – and shows that any philosophy of consciousness that goes beyond this point leaves its own foundation.

Neural Oscillation and Resonance Structure

The physiological basis of the excitation resonance from which experience emerges lies in the oscillations of neuronal systems. Nerve cells do not vibrate in isolation, but in coordinated patterns that synchronize themselves across many scales. These oscillations do not form signals in the conventional sense, but fields of temporal coherence in which information is bound by rhythm. The different frequency bands – from slow delta waves to fast gamma oscillations – overlap to form dynamic networks whose stability lies in phase coherence, not in a place or center.

In such states, neuronal activity loses its additive structure: each area is both cause and effect of all others. This reciprocal conditionality creates the functional node that corresponds to the causal core – a centered but not centralized order. The collapse of causality shows itself here as a loss of the factorizability of the oscillatory space: the states can no longer be decomposed as independent contributions, but can only be described as a common oscillatory figure.

Empirically, such states can be measured as moments of increased integration and coherence – for example in gamma synchronization or in the so-called Perturbational Complexity Index. But they appear phenomenal as a continuity of experience: that feeling that all our perceptions, thoughts and sensations belong to a unified inner space.

Resonance as experience

In the nervous system, self-causality takes on a special form. Here, the feedback is not chemical, but electrical – in real time, with high plasticity and fine gradation. Only systems of this kind can produce the specific excitation resonance that makes sensation possible.

Experience is therefore not an addition to neuronal processes, but their resonance structure. When a neural network not only transmits its own states, but reacts to them – when it senses itself – the difference between stimulus and experience arises. In this sense, consciousness is not the product of the brain, but its self-description in motion. The brain does not experience itself as a thing, but as a process that is constantly re-centered – a dynamic balance between stability and change.

Part 6: Limitations of the Model and Epistemological Position

Every theory that approaches consciousness stands on the border between description and experience. It can only articulate what is already evident in the structure of the experience, without making this experience itself objectifiable. The claim to "explain" consciousness therefore necessarily leads to a paradox: a complete explanation would presuppose consciousness as an object, that is, it would have to be comprehensible from the outside, which, however, would destroy the condition of its possibility.

The causal collapse model circumvents this paradox by defining consciousness not as *an object*, but as a **form of self-bonding** of a system that recursively reproduces its own causality. It does not claim to answer the "why" of experience, but to determine the "how" of its structural possibility. This methodological modesty is not a weakness, but an expression of theoretical honesty. The task of philosophy is not to solve the riddle, but to understand its form.

The model thus does not describe the content of consciousness, but its **limiting form**: the point at which explanation turns into experience. The causal collapse marks the threshold at which linear description becomes impossible, because the descriptive is part of what is described. Knowledge becomes nature's self-reference here. It does not recognize anything, but itself in a new mode of stability.

This makes it clear that causal collapse is not a metaphysical principle, but a **structural theoretical concept**. It differs from terms such as *emergence*, *bifurcation* or *critical transition* by its categorical position. While these concepts describe the transition between states, collapse refers to the **non-decomposability** of the state itself. It is not a process over time, but a condition of simultaneity.

This distinction explains why the model of causal collapse should not be misunderstood as a variant of emergence theories. Emergence implies a hierarchy, the appearance of new properties from a subordinate level. The causal collapse, on the other hand, is **level-independent**. It is scale-invariant because it occurs wherever systems become recursive. In this sense, consciousness is not an emergent property of complex matter, but the phenomenal side of a principle that takes place in matter itself (Stegemann, 2025a).

Collapse is **therefore not hierarchical, but homomorphic**: it repeats itself on different scales in an identical form, with each recursion producing the conditions of its own reproduction. This homomorphism explains why consciousness can occur in different forms, biological, cognitive, social, without the need for a categorical jump.

Another limit concerns the concept of relation itself. Causal collapse leads to an ontology in which relations are primary. But every relation needs a carrier to realize it. How can a relation exist if its relata are only constituted by it? This question touches on the old regress formulated by F. H. Bradley in *Appearance and Reality* (1893): If every relation presupposes a further relation, an infinite feedback arises. In the model of causal collapse, however, this regress is **not dissolved, but converted into stability**. The relation repeats itself in itself until it becomes metastable. The regress here is not a logical error, but the mechanism of recursion itself.

Nevertheless, the model must acknowledge its own epistemic limitations. It describes *how* consciousness can emerge as a structure, not *why* it seems phenomenal. The isomorphism between neuronal integration and experience is not a causal relationship, but a **correspondence on different levels of description**. This correspondence can be empirically correlated, but not identified. The phenomenal aspect of consciousness remains categorically beyond physical description, not because

it is metaphysical, but because any description from the outside necessarily loses its own internal perspective.

This transition from structure to experience is not an additional postulate, but the point at which theory necessarily ceases to distinguish between "inside" and "outside". Causal collapse describes precisely this transition: the condition under which structure and experience become indistinguishable. He therefore does not "explain" the experience, but shows **why every explanation ends in him**. In this view, the so-called explanatory gap is not a gap in knowledge, but the manifestation of self-reference, the difference that observes itself.

This raises the question of empirical operationalizability. Can causal collapse be measured at all as a structural principle? Direct measurement is impossible because collapse is the condition of measurability itself. But its traces can be captured: systems operating close to the collapse state show characteristic features, high integration, maximum complexity, minimum energy efficiency and high perturbation stability (Casali et al., 2013). These parameters can be quantified using methods of network analysis, dynamic causal modelling and information dynamics (Sporns, 2011).

The crucial point, however, is that such empirical correlates only describe the **extrinsic side** of the phenomenon. They show *how* self-causality manifests itself, not *that* it is experienced. The inner side remains epistemically closed. But this closure is not a disadvantage, but the signature of the principle itself: a system that could be described completely from the outside would not be a conscious system.

This insight clearly distinguishes causal collapse from artificial recursion. Language models or algorithmic networks can simulate high complexity and feedback, but remain **extrinsic**: their dynamics are completely determined by external inputs and target conditions. Causal collapse, on the other hand, presupposes **intrinsic self-causality**, a state in which system dynamics produce its own evaluation parameters. As long as a system does not create an internal condition for its continuance, its recursion remains functional, but not phenomenal.

Nevertheless, the conditions of causal collapse can be approximated in operational terms. A system that recursively binds its own causality shows in empirical data a simultaneous increase in integration and differentiation, i.e. the two parameters that the PCI also quantifies. The collapse thus does not correspond to a single measured value, but to an **area of maximum correlation between integration, complexity and stability**. The more pronounced this convergence, the closer the system is to its functional core. In this sense, the PCI does not provide a measurement of consciousness, but an indicator of proximity to the state of collapse (Casali et al., 2013; Sporns, 2011).

Compared to other non-dualistic approaches, such as neutralmonism, panpsychism or Russellian monism, the model maintains a strictly immanent position. Neutral monism postulates a third, neutral substance between mind and matter (Russell, 1927), while panpsychism sees everything that exists as potentially conscious (Strawson, 2006). Both theories remain speculative because they universalize the category of consciousness without explaining its structure. Causal collapse, on the other hand, explains consciousness **not by being, but by form**. It does not require a substance, only a recursive condition.

The model also differs from eliminative physicalism. It does not deny that consciousness is physically realized, but it does deny that this realization can be described by linear causal laws. Physics explains changes in state, but not the conditions under which states become indistinguishable. Causal collapse is the form of this indistinguishability.

This makes the model **constructivist** and **empirically compatible** at the same time. It takes seriously that all cognition is perspectival (von Foerster, 1984), but recognizes that perspectivity itself can be a form of nature. Consciousness is not an observer of the world, but its recursive mode.

The methodological consequence is that every theory of consciousness must reflect its own categorical position. It must not go beyond the point where description merges into self-description. Causal collapse marks this point, not as the limit of knowledge, but as a form of its stability.

What the model does not explain is just as important as what it explains. It does not explain the origin of experience, not the phenomenal quality of feeling, not the why of subjectivity. These questions are not deficits, but mirrors of the categorical framework: they are undecidable because they concern the border itself. Causal collapse is the place where thought returns to its own medium.

Philosophy has its real task in this: not to give answers, but to make the structure of the questions visible. The causal collapse shows that consciousness is not a metaphysical enigma, but the necessary consequence of the fact that the world can experience itself, in the form of recursion.

Conclusion: From the Transcendental Subject to the Causal Self-Reference of Nature

The philosophy of mind begins with the insight that experience is a condition and not a consequence of the world. It ends with the realization that this condition is itself part of the world. In the movement from Kant to the present, thought has gradually uncovered that place where consciousness no longer appears as a special faculty of man, but as the structure of nature itself. The path leads from the transcendental subject to the causal self-description of being.

Kant (1781/1787) had shown that the unity of experience lies not in the world, but in consciousness. Fichte (1794) transferred this unity into the ego, Hegel (1807) into the self-thinking spirit, Husserl (1913) into the intentionality of experience. Cassirer (1923–1929) finally dissolved unity into symbolic forms. But in all these transformations, a remnant of the transcendental remained: an "interior" that constitutes the world without itself being part of it.

With the introduction of causal collapse and the causal core, this opposition loses its basis. Consciousness is no longer the place where the world appears, but the form in which the world stabilizes itself. What transcendental philosophy understood as a condition of the possibility of experience is shown here as the result of the self-organization of nature. The transcendental framework becomes immanent: the a priori structure is transformed into an autocatalytic principle.

In this way, the philosophy of mind returns to the philosophy of nature, not in the sense of a retransformation into materialism, but as an insight that nature and spirit are **two perspectives of the same self-causality**. Causal collapse is the physical form of what the idealists called self-consciousness. Nature knows itself by closing its own causality, and this reasoning is what we experience as experience.

In this movement, the subject loses its metaphysical primacy. It doesn't remain, because it never existed as an entity. What we call "I" is the phenomenal appearance of the causal core, the structure in which causality becomes recursive. The ego is not an originator, but a consequence; not an observer, but a folding of the observable in itself. Its identity consists in the stability of self-commitment.

This insight also cancels out the last remnant of dualism. The world is not twofold, not even to know itself. It is a single recursive process in which inside and outside are complementary perspectives of

the same structure. The classic question of how consciousness arises from matter loses its meaning here. Consciousness is the form in which matter experiences itself as no longer separable.

This also shifts the function of philosophy. It is no longer the attempt to establish thinking, but the act in which thinking recognizes its own conditionality. Their task is to mark the point at which the explanation transitions into the recognized. Causal collapse is that point. It is not a metaphysical principle, but the formal form of that self-referentiality that unites knowledge and the world.

Consciousness is thus not the exception of nature, but its highest form of self-organization. It is the place where causality reflects itself without breaking the mirror. In this sense, the theory of causal collapse fulfills the old transcendental dream of understanding the conditions of cognition, but no longer as conditions of the subject, but as the structure of nature itself.

This reversal has profound epistemological consequences. It withdraws consciousness from both reductionism and metaphysics. It is neither the product of physical processes nor the origin of the world, but the boundary at which both perspectives become indistinguishable. Consciousness is the form in which the world experiences itself, and thus the condition of the possibility of all knowledge.

With the introduction of causal collapse and the causal core, the philosophy of mind reaches a point where the traditional opposition between mind and nature, subject and object, inside and outside loses its validity. Both sides of the opposition turn out to be perspectival manifestations of a single structural principle: the reciprocal conditionality of being and cognition.

This completes the path from transcendental philosophy to the system ontology of consciousness. Thinking recognizes itself as part of nature, and nature recognizes itself in thinking. The circle closes, not in a synthesis, but in a recursion.

Epilegomena: Resonance, Sensation and the Phenomenal Interior

In biological systems with recursively closed excitation pathways, a special form of sensitivity arises. It is based on the fact that signals are not only forwarded, but also projected back and integrated into one's own activity pattern. This feedback creates a coherent interior space in which the system no longer merely processes its own dynamics, but experiences them. The causal nucleus – in the brain as the functional center of self-causality – bundles this circular excitation structure without controlling it. The permanent reconnection to the body creates a resonance field that sustains itself by feeling itself.

Experiencing is thus not an additional property of the nervous system, but the phenomenal side of its structural closure. In such a system, sensation cannot be avoided because causality itself no longer points outwards. The world is reflected inside, not as an image, but as an ongoing self-affection of a recursive process that takes place within itself. In this sense, consciousness is the form in which the living can necessarily be experienced – not through purpose, but through structure.

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