Jung 4.0 - The Code Architecture of the Archetype: Reframing Analytical Psychology through Code Biology

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Abstract

The archetype has always been a central construct in Analytical Psychology, yet its theoretical status remains contested. Since Jung, three major schools have emerged: the Classical, faithful to Jung's formulations; the Developmental, integrating object-relations and attachment theory; and the Archetypal, shaped by James Hillman's emphasis on imagination and mythopoesis. Across these trajectories, the concept of the archetype proved clinically and culturally generative, but it often lacked a coherent naturalistic foundation.

This paper proposes a "fourth school" of Analytical Psychology — also referred to as Code Psychology or Jung 4.0 — which reframes the archetype through the logic of biological and neural codification. In this model, archetypes are defined as phylogenetically stabilized codical structures, higher-order regulatory dispositions that require affective, relational, and cultural mediators to become symbolic artifacts such as myths, images, dreams, and narrative patterns. By situating archetypes within the triadic structure of code–mediation–artifact, this framework avoids both symbolic reductionism and metaphysical essentialism, offering a scientifically testable and conceptually precise foundation for Jung's original intuition.

Building on Anthony Stevens's ethological account, John Haule's evolutionary synthesis, Erik Goodwyn's notion of innate "story codes," and Gary Clark's anthropological framework, this approach integrates biological, neural, developmental, and cultural perspectives. By aligning Jung's intuition with Marcello Barbieri's theory of organic codes, "Jung 4.0" positions Analytical Psychology within contemporary science, opening new avenues for empirical research, clinical practice, and interdisciplinary dialogue.

Keywords: Analytical Psychology; archetypes; archetypal codes; Jung 4.0; Code Biology; neural metacodes; code–mediation–artifact framework; story codes; interdisciplinarity; Marcello Barbieri.

1. Introduction

Throughout the history of Western thought, moments of epistemological rupture have required not just revision but a genuine conceptual refounding. One clear example is found in the work of Thomas Aquinas in the 13th century. Confronted with the rediscovery of Aristotelian philosophy — mediated through Arab scholars such as Averroes and Avicenna — Aquinas undertook the ambitious task of integrating Aristotelian natural philosophy into a tradition largely shaped by Neoplatonic and Augustinian ideas. The result, Thomistic scholasticism, equipped medieval thought with a rational and systematic language capable of engaging with the science and philosophy of its time (Gilson, 1955; Pieper, 1986). Aquinas did not abandon his tradition; he built a new intellectual framework that kept it relevant without losing its core.

Analytical Psychology currently faces a similar crossroads. Jung's early-20th-century project developed as a creative response to the crises in modern psychology — including its positivism, fragmentation, and mechanistic view of the psyche. His concepts, such as the "collective unconscious," "archetypes," "individuation," the "transcendent function," and the "Self," provided a symbolic vocabulary rooted in *Naturphilosophie* and mythopoesis. However, despite its clinical strength and anthropological depth, Jung's framework remained epistemologically fragile: it lacked a naturalistic foundation capable of explaining why archetypal structures exist and how they relate to biological, neural, and semiotic processes (Major, 2021; Clark, 2025a). In other words, Jung developed a symbolic ontology, but the scientific fields of his era were not yet able to provide it with a biological grounding.

It is in this context that Marcello Barbieri's work becomes crucial. His theory of Code Biology, developed over the last forty years, presents a new *philosophy of nature* that is similar — in its scope if not in its details — to the role Aristotle played for Aquinas. Barbieri contends that life is not governed solely by physicochemical laws but is organized through *biological codes:* systematic connections between signs and meanings that cannot be deduced from physical causation alone. DNA is the most familiar and classic example — not just a metaphor, but an actual code governed by historically stabilized conventions (Barbieri, 1985; 2003; 2015; 2024; 2025a). Code Biology thus recognizes a formal, codified aspect of life, structured through what Barbieri calls *natural conventions* and expressed through the triadic logic of code–mediation–artifact.

This perspective opens a new epistemological space for Analytical Psychology. In the light of Code Biology, Jungian archetypes can be understood as *phylogenetically stabilized neural codes* (Major 2021, 2025b): biologically grounded organizational dispositions that, through affective, relational, and cultural mediators, give rise to symbolic artifacts such as myths, dreams, narratives, and ritual forms. Just as the genetic code organizes the production of proteins and tissues, *archetypal codes* organize the recurrent patterns of image, meaning, and behavior that shape human experience and symbolic life (Major, 2025c; 2025d). Archetypes, in this view, are not metaphysical entities nor inherited images; they are codical structures whose symbolic manifestations depend on mediators that translate codical potentials into experiential forms.

The goal of this proposal is not to subordinate Jung to Barbieri, nor to reduce symbolic life to biology, but to recognize that Code Biology provides the naturalistic foundation that Analytical Psychology has historically lacked. The integration of Barbieri's model

allows Jung's symbolic ontology to be reframed within a rigorous scientific framework — one that includes theoretical biology, natural semiotics, affective neuroscience, and the emerging sciences of neural coding — while fully maintaining the clinical, anthropological, and symbolic specificity of Jung's project.

Just as Aquinas endowed theology with a conceptual system capable of engaging his era's intellectual currents, the integration of Code Biology can offer Analytical Psychology its long-missing epistemological backbone: a way to stay current without falling into reductionism, to ground symbolic richness in biological reality, and to understand the human psyche not as an exception to nature but as its most complex and symbolic manifestation.

2. "Jung 4.0"

Since its inception, Analytical Psychology has been marked by both lively clinical practice and ongoing theoretical debate, especially regarding the idea of the archetype. Jung saw archetypes as inherited mental patterns and behaviors, like a *psychic organ* present in everyone, shaped by evolutionary history and similar to instincts and the biological foundations of perception and action (Jung, CW 8/2, §589). He consistently opposed the behaviorist idea of the *tabula rasa*, insisting that we are born with a differentiated brain, determined by heredity and thus already unique (Jung, CW 9/1, §136). The brain, he explained, actively pushes us toward certain experiences and leads us to particular conclusions (Jung, CW 6, §578), needing only the appropriate activating stimulus for these patterns to manifest (Jung, CW 7/1, §109). In this way, as he described, archetypes are closely connected to instincts; they can be understood as the *self-portrait* or *perception* of the behavioral program called instinct (Jung, CW 8/2, §277; CW 9/1, §91).

The exact nature of archetypes — whether mainly biological, symbolic, or metaphysical — remains debated. Jean Knox's work is already regarded as a classic (2003), and more recently, Christian Roesler's report for the IAAP–Zurich (2020) has been seen as a representative "state of the art" in Analytical Psychology. For this reason, Gary Clark's strong argument against this supposed "state of the art" — which we might call the "state of things at a standstill" — proves especially compelling. His book, *Carl Jung and the Evolutionary Sciences: A New Vision for Analytical Psychology* (Routledge, 2025), is one of the most significant recent efforts to identify the core issue and remind us of the essentials.

The Roesler Report (2020), the plenary panel at the 2025 IAAP Congress in Zurich — which explicitly asked, "Can the IAAP maintain a sense of unity and collegiality in a severely divided world?" (IAAP, 2025) — and the recent exchange between Clark (2025c; 2025d) and Roesler (2025) in this *International Journal of Jungian Studies* all point in the same direction: there is currently no real unity within Analytical Psychology. The reason is simple: the field lacks a shared conceptual foundation for Jung's core idea: the archetype. I have already explored this issue extensively in my review of Clark's book (Major, 2025a), which prompted a thoughtful reply from the author (Clark, 2025b); something I truly appreciated.

Let us consider this ongoing debate, with its tensions, counterarguments, and shifting positions, not as a *mákhē* (μάχη), a clash of positions, but as an *agón* (ἀγών): a structured contest of ideas whose movements unfold like those of a Greek drama. The discussion moves through distinct phases or "rounds," tending toward either a *lýsis* (λύσις), in Jung's sense, the symbolic completion of a process, or an *epimýthion* (ἐπιμύθιον), the moral afterword with which the ancients concluded their fables.

Round 1 – The Contemporary Debate

In recent years, the discussion concerning the scientific status of the archetype has entered a new phase, shaped by the contributions of Christian Roesler (2024), Erik Goodwyn (2024), Gary Clark (2025), as well as proposals to integrate archetype theory with Code Biology (Major, 2021).

But this controversy has gained new momentum in the pages of this very journal through the recent exchange between Clark, Roesler, and Clark again. Taken together, these contributions in the *International Journal of Jungian Studies* crystallize distinct paradigmatic positions regarding the future of Analytical Psychology. This tension, however, is not entirely new. A similar fault line between biological and cultural interpretations was already evident in the earlier exchanges, namely between Goodwyn (2010) and Roesler (2012) in the *Journal of Analytical Psychology*, which effectively anticipated the more explicit controversies now unfolding in this journal.

Roesler defends a post-biological, hermeneutic reading of archetypes, arguing that they are not inherited structures but rather *relational and narrative patterns* emerging from culture. Clark, by contrast, insists on the enduring relevance of evolutionary anthropology to Jungian thought, seeing in archetypes the vestiges of a co-evolutionary process linking brain, ritual, and symbolization. Goodwyn proposes an integrative neurobiological approach, understanding the archetype as a *narrative code* — a biological artifact that translates universal emotional experiences into symbolically mediated narratives.

Round 2 – Between the Biological and the Symbolic

The true value of that debate lies in recognizing that the essential question is not whether archetypes are biological or cultural, but rather *how* the biological becomes inscribed in symbolic form, and *how* those forms, in turn, reshape the neural and emotional architecture of the individual. On this point, Clark closely aligns with Goodwyn: both assert that symbolic consciousness arose from ancient affective mechanisms. However, they differ in their views on how universal or autonomous such patterns may be. Clark, drawing on evolutionary anthropology, demonstrates that archetypal regularities emerge from social and ritual configurations that have remained stable throughout human history. Roesler, in contrast, sees in this appeal to universality a modern illusion, arguing that the comparative record of culture denies any psychological map "applicable to all times and peoples."

To understand the depth of this question, one must explore the origins of modern affective science. Charles Darwin, in *The Expression of the Emotions in Man and Animals* (1872), was the first to treat emotion as an evolved function, linked to the biological life of the species. A hundred years later, Paul Ekman (Ekman & Friesen, 1971; Ekman, 2004), through his studies in Papua New Guinea that he started in the late sixties, confirmed

Darwin's insight via cross-cultural research, showing that basic emotions — *anger, fear, disgust, sadness, happiness,* and *surprise* — have universal facial expressions. What Ekman found on the surface of the face, Jaak Panksepp (1998) later discovered within the brain. His identification of the primary emotional systems — *seeking, care, fear, rage, play, lust,* and *panic/grief* — mapped the fundamental grammar of emotion: the ancient neuroaffective codes that shape motivation and behavior long before language or reflection.

Antonio Damasio then provided the missing bridge between affect and consciousness. Through his work on *somatic markers* and the feeling of what happens (1994; 2010), he showed how bodily signals are integrated into subjective experience, transforming emotion into feeling and feeling into thought. In other words, Damasio described the *mediation* that turns neural code into narrative meaning — the very process through which the archetypal becomes symbolic.

It is precisely along this lineage that Goodwyn and Clark situate their own contributions. Goodwyn translates Panksepp's discoveries into Jungian terms, describing archetypes as *symbolic encodings of affective invariants* — emotional dispositions that, when filtered through cortical mediation, crystallize into recurring motifs of meaning. Clark extends this view outward, into the social and ritual life of the species, showing how early human ceremonies, myths, and kinship structures served as *collective mediators* that transformed these affective codes into shared symbolic orders.

From Darwin's evolutionary insights to today's neurophenomenology, one clear thread emerges: symbolic form is not opposite to biology but its most complex expression: life recognizing its own pattern and shaping it.

Round 3 – An Epistemological Turning Point

The convergence of these perspectives sets the stage for a profound *paradigmatic inflection* within Analytical Psychology. What is at stake is not merely the reconciliation of biology and culture, but the emergence of a new epistemic horizon in which the psyche itself is understood as a process of coded mediation between them.

In this light, the confrontation between Clark and Roesler becomes emblematic. Roesler demands that Analytical Psychology conform to the empirical standards of the contemporary social sciences, framing the psyche as a construct emerging from narrative and cultural transmission. Clark, by contrast, calls for an expansion of those very standards — one that acknowledges the evolutionary continuity of emotion, meaning, and symbol. What he proposes — and Roesler rejects — is an *anthropology of mind:* an approach in which the collective unconscious is conceived as an evolutionary archive of relational forms encoded simultaneously in the brain, the body, and the symbolic practices of culture.

Clark's (2025a) reading thus reintroduces the spirit of *Naturphilosophie* that originally shaped Jung's thinking, now refracted through the conceptual lenses of evolutionary anthropology, developmental biology, and affective neuroscience. The psyche, in this perspective, is no longer a metaphysical entity nor a purely interpretive construct, but — as we can say — a *field of coded correspondences* (Major, 2025b), a living interface through which nature and meaning continuously negotiate their boundaries.

This inflection, once made explicit, allows Analytical Psychology to reposition itself within the broader dialogue of the sciences of life and mind. The symbolic is no longer the opposite of the biological; it is its higher-order articulation. To think archetypally is, therefore, to think biologically — but in the broadest sense of the word: to perceive life as a pattern that translates itself into image, story, and relation.

Round 4 – From Opposition to Mediation

Viewed through the lens of Code Biology, the entire quarrel between Clark and Roesler — and, by extension, between nature and culture — assumes a new contour. Once the archetype is no longer treated as an entity or mere narrative motif, but as a mediating artifact, the polarity between biology and symbol dissolves. What remains is a dynamic process of translation: the continual negotiation through which life expresses itself in meaning. As John Searle (1984) repeatedly observed in his Reith Lectures, we still attempt to address contemporary problems with conceptual tools inherited from the philosophy of the sixteenth and seventeenth centuries.

In Barbieri's formulation, every living system operates through *codes* — stable correspondence rules that link otherwise independent domains. Life, in this view, is not driven solely by chemistry or information, but by *codical relations* that mediate between matter, structure, and function. When transposed to the psychological domain, this principle reveals the archetype as a *psychic* or *neuronal code:* a conserved rule of correspondence linking affective dispositions to symbolic representations.

From this standpoint, inheritance is no longer the transmission of content but of *grammars of relation* — patterns of mapping that determine how energy, emotion, and image become mutually legible. Archetypes thus appear as *machines of correspondence*, to use Barbieri's term, mediating between biological, neural, and symbolic orders. Each archetypal configuration represents not a static idea, but a translation event — a moment in which the biological code is refracted through emotional, relational, and cultural mediations into a symbolic form.

In this way, the dialogue between biology and culture is transformed from one of causality into one of *mediation* — from a question of origin to a question of articulation. What Jung intuited as the rhythm between instinct and image, between drive and representation, can now be reformulated in codical terms: *code* → *mediation* → *artifact* (Major, 2025b).

This is the logic that "Jung 4.0" brings to the foreground. By recognizing archetypes as mediating codes rather than inherited contents, Analytical Psychology enters a new scientific phase — one capable of integrating the symbolic imagination with the deep structures of life itself.

2.1 Aftermath – Toward a Fourth School

The convergence of Stevens's ethological reformulation, Haule's evolutionary synthesis, Goodwyn's neurobiological model, and Clark's anthropological expansion indicates that Analytical Psychology is already gravitating toward a fourth school — a trend based not on inherited images or cultural constructs but on mediation and codes.

Within this emerging perspective, the archetype is best understood as a coding process: a set of conserved correspondence rules that translate biological impulses into symbolic configurations. It functions as a sense-making operator located at the interface between systems, guiding the transformation of affect, perception, and relation into images and meaning.

This integrative vision finds formal expression in what I have elsewhere termed the Code–Mediator–Artifact (CMA) framework (Major, 2025b). Here, conserved codical rules generate novelty through changing mediations across biological, neural, and symbolic domains. The archetype functions as a relational syntax — a regulator of translation between levels of organization — through which life expresses itself in meaningful form. The same code, refracted through different mediations, yields different artifacts: morphologies, emotions, images, myths (Major, 2025d).

Seen in this light, the recent debate between Clark (2025c; 2025d) and Roesler (2025) marks not an impasse but a threshold of renewal. Their exchange concerns the nature and scientific status of archetypes, yet when viewed through the lens of Code Biology, it reveals a more profound shift: from a psychology of forms to a psychology of mediations; from the archetype conceived as content to the archetype understood as code. In this integrative reading, Analytical Psychology is re-centered within the life sciences — not opposed to biology but continuous with it. In Jung's own spirit, "Jung 4.0" treats the psyche as the field in which life reflects upon itself, where biological dispositions become conscious as images and meaning emerges as the articulation of living form.

Jung once remarked that a "long way" still separated brain physiology from the psychology of the unconscious (Jung, CW 3, §589). Today, this gap is untenable. New conceptual tools allow us to comprehend — in the literal Latin sense of *com-prehendere com-prehendere*, "grasp together" — biology and psyche within a unified framework.

What is needed today is a new grammar of understanding: one that can encompass both neural processes and symbolic expression, including both the matter of the brain and the form of meaning. This type of grammar is already emerging in the dialogue among Analytical Psychology, Code Biology, and Affective Neuroscience. It encourages us to imagine a discipline where psyche and soma are not opposing substances but complementary parts of the same vital code.

This is the core claim of this paper: the renewal of Analytical Psychology through the science of mediation, in which the archetype becomes not a static concept but a dynamic interface — the point where life, mind, and meaning converge.

2.2 From the Three Schools to a Biological Renewal

To situate this renewal within the broader history of Analytical Psychology, it is worth recalling how Jung's legacy has unfolded across the past century — from its three foundational schools to the biological and codical synthesis now taking shape.

Over the past hundred years, three primary schools of Analytical Psychology crystallized (Samuels, 1985): the *Classical School* remained fundamentally faithful to Jung's

formulations, emphasizing complexes, individuation, and archetypal imagery. The *Developmental School* combined Jungian concepts with psychoanalytic theories of object relations and attachment. The *Archetypal School* of James Hillman, by contrast, shifted attention to imagination and mythopoiesis, decentering the *Self* and emphasizing psyche-as-image over biology.

These trajectories preserved Jung's influence but often at the cost of a *scientifically grounded concept of the archetype* (Major, 2021). Against this backdrop, a biological perspective has been intermittently but consistently pursued. Anthony Stevens, in *Archetype Revisited* (2004), offered one of the first systematic ethological approaches, treating archetypes as inherited behavioral patterns analogous to fixed action patterns. John Ryan Haule advanced this trajectory by developing an evolutionary-biological account of archetypes grounded in comparative neuroethology and cross-species behavioral continuities (Haule, 2010). This biological trajectory was further advanced by Goodwyn's neurobiological account of symbolic imagery, which argues that recurrent mythological and dream motifs reflect conserved affective and perceptual architectures shaped by evolution (Goodwyn, 2012). From this perspective, archetypal patterns arise not merely from cultural elaboration but from species-specific neural systems that structure emotion, perception, and narrative imagination. Erik Goodwyn extended this line of thought, proposing innate "story codes" and operational criteria of indexicality and resonance for clinical work (Goodwyn, 2022; 2024). Gary Clark contributed a developmental dimension, situating archetypes at the interface of evolutionary anthropology and early relational dynamics (Clark, 2025a).

Several studies provide examples that reinforce this biological–codical reframing, including the *archetypal memory advantage*, which shows that word pairs with archetypal associations are recalled more effectively than neutral ones (Sotirova-Kohli et al., 2013). Additional work argues that archetypes reflect stable patterns of biological organization and that oneiric motifs emerge from conserved codical structures (Vedor, 2023; 2025). Research in theoretical immunology likewise indicates that adaptive biological systems rely on stable, recurrent organizational patterns analogous to archetypal codes, exemplified by the immune granuloma (Giorgio, 2024). The so-called ARCH triad further demonstrates that violent behavior follows archetypal scripts such as the Hero, Martyr, and Outlaw (Rahman & Meloy, 2025). Finally, extra-oral dentition in *Hydrolagus colliei* — which I have analyzed as an instance of codical redeployment — illustrates how conserved correspondence rules can generate novel anatomical "artifacts" (Major, 2025c). Taken together, these contributions confirm that codical structures, including archetypes, can indeed be investigated with scientific rigor across biological, cognitive, behavioral, and symbolic domains.

2.3 The Fourth School: Analytical Psychology in the Age of Codes

A fourth school of Analytical Psychology is now emerging from the convergence of the biological, anthropological, and neuroaffective perspectives outlined above. This new orientation does not treat archetypes as inner images, inherited representations, or purely cultural constructions. Instead, it understands them as archetypal codes: phylogenetically stabilized neural dispositions that exert a higher-order regulatory role within the psyche

and require mediators — affective, relational, and cultural — to become symbolic artifacts.

This perspective was formally introduced at the *Tenth International Conference on Code Biology* in La Spezia, Italy (14 June 2024), where the proposal to integrate Jung's intuition with Barbieri's theory of organic codes was first articulated as a coherent scientific program in the talk: "The Cortex as a 'Model Builder' or 'Archetype Maker'" (Major, 2024). In this view, archetypes are not metaphysical entities but cross-level correspondence rules linking biological dispositions to symbolic expressions through the mediating layers of affect, relationship, and culture.

This "School of Codes," initially anticipated in Major (2021) and later developed into the Code–Mediator–Artifact (CMA) framework (Major, 2025b; 2025d), reframes the archetype as a process rather than a content: not something inherited fully formed, but a translation operator that organizes experience across biological, neural, and symbolic domains. What distinguishes this fourth school is its mediational ontology: a naturalistic yet non-reductionistic account of how life becomes image and how neural pattern becomes meaning.

Within this perspective, "Jung 4.0" names the scientific maturation of Analytical Psychology: a shift from theories of inherited forms to a theory of codical processes, from archetype-as-image to archetype-as-code, and from the psychology of forms to a psychology of mediations.

3. The Biological and Codical Foundations of the Archetype

From its inception, Analytical Psychology situated the archetype at the intersection of biology and symbol. Jung conceived archetypes as organs of the psyche: innate dispositions stabilized through evolution that structure perception, emotion, and behavior (Jung, CW 9/1, §§91–92, 155; CW 11, §222). He consistently paired archetypes with instincts, describing them as complementary expressions of a single adaptive system: instinct regulates the behavioral impulse, while the archetype organizes its symbolic meaning (Jung, CW 8, §414; CW 9/1, §92).

Jung also drew an analogy with genetics: he suggested that archetypes operate like inherited but invisible structures whose effects become observable only in their phenotypic expressions—myths, dreams, rituals, and symbolic patterns. Although he did not use the language of "neuronal codes," his comparison anticipates precisely this logic. The archetype functions as a latent organizational principle, while its imaginal manifestations correspond to its perceptible outputs. In this sense, Jung's intuition already foreshadows the later integration of archetype theory with the logic of biological coding:

> The archetype *an sich* is an *irrepresentable* factor, a *"disposition"* which starts functioning at a given moment in the development of the human mind and arranges the material of consciousness into definite patterns. These patterns are the archetypes in their proper sense. They are *inherited with the brain structure* — indeed, they are its *psychic aspect*. Just as the human body shows a common anatomy over and above all racial differences, so too there is a common psychic substratum transcending all differences in culture and consciousness. I have called this the *collective unconscious.* Correspondingly, the archetypes manifest themselves in the individual

> only in part or in distorted form; in their totality they belong to the collective unconscious (Jung, CW 11, §222)

A key clarification in Jung's thought was the distinction between the archetype-as-such (archetype *an sich*) and the archetypal image (Jung, CW 8/2, §417; CW 9/1, §155). The former designates an unconscious, pre-formal organizing factor — irreducible, intangible, and ultimately unknowable — while the latter refers to its symbolic manifestation within consciousness. Confusing these two dimensions leads either to symbolic reductionism (treating archetypes as mere cultural motifs) or to metaphysical essentialism (reifying them as timeless, pre-existing ideas). The theoretical task, therefore, is to preserve their dual nature: biological in structure yet symbolic in expression. This dialectic is the focus of my recent analysis of the archetype as a codical system within the Code–Mediator–Artifact framework (Major, 2025d).

3.1. From Code Biology to Code Psychology

The debates outlined in the previous chapter show that the archetype cannot be reduced to either a cultural construct or a rigid genetic template. What is required is a framework capable of integrating biological grounding with symbolic elaboration. It is precisely here that Marcello Barbieri's Code Biology provides a decisive contribution. By proposing that life is organized by codes — natural conventions irreducible to physics and chemistry — Barbieri offers an epistemological foundation that can be extended into psychology. In what follows, I outline the main features of his framework and its implications for the emergence of Code Psychology: a scientific approach that re-situates Jung's archetypes within the broader architecture of contemporary life and mind sciences.

3.1.1 Barbieri's framework of codes

Marcello Barbieri's work on Code Biology represents one of the most significant developments in contemporary theoretical biology. His central claim is that life cannot be explained solely by physics and chemistry but also requires the existence of codes: sets of rules that establish arbitrary correspondences between otherwise independent worlds (Barbieri, 2024; 2025). The genetic code, for example, connects nucleotide triplets to amino acids via transfer RNAs; physical laws do not determine this mapping, but rather historically stabilized conventions. In this sense, biology is permeated by what Barbieri calls *natural conventions.*

Barbieri distinguishes three great forms of semiosis: (1) coding, based on fixed mapping rules; (2) interpretation, which emerges later in evolution as abductive choice in complex neural networks; and (3) languaging, unique to humans, requiring extended postnatal development and social mediation (Barbieri, 2024). Importantly, Barbieri argues that for the first three billion years of life, coding was the only form of semiosis on Earth, responsible for the major evolutionary novelties. Interpretation and language appear only later, as animals and humans evolve. This perspective provides an anchor for understanding archetypes as forms of coding that do not presuppose conscious interpretation.

Barbieri's "The Concepts of Code Biology" (2025) formulates twelve central concepts that illuminate this alignment. Among these are the notions of the ribotype as a third cellular dimension (genotype–phenotype–ribotype), codepoiesis as the exploration and conservation of coding space, the multiplicity of codes as the driver of biological complexity, and the neural code as the basis for mind and subjectivity. Particularly relevant is his distinction between coding, interpretation, and languaging: coding suffices for basic semiosis; interpretation emerges only in animals with complex nervous systems; and languaging is a uniquely human achievement that depends on prolonged developmental dependency.

In neuroscience, the concept of neural code refers to a stable set of correspondences between patterns of neural activity and the perceptual, affective, or behavioral states they regulate. As Barbieri emphasizes, these codes function as natural conventions: internally stabilized rules of mapping that are not derivable from physical or chemical laws but are realized by neural circuits acting as correspondence machines (Barbieri, 2024; 2025). Unlike organic codes, which operate on spatial objects (molecules, cellular structures), neural codes operate on temporal objects: time-dependent electrical patterns and oscillatory dynamics that allow the nervous system to represent categories, spatial relations, emotions, and action plans.

The empirical foundation of neural coding was established by the work recognized by The Nobel Assembly at the Karolinska Institute (2014) with the Nobel Prize in Physiology or Medicine. John O'Keefe (1978) demonstrated that specific hippocampal neurons fire only when an animal occupies a particular location, forming "place cells" that encode position. May-Britt Moser and Edvard Moser discovered "grid cells," neurons that fire in a hexagonal pattern, providing an intrinsic metric for navigation. Together, these systems show that the brain does not merely react to stimuli; it contains internal conventions that map neural states onto functional meanings — codes that enable organisms to construct spatial representations, guide behavior, and integrate memory.

Further domains reinforce this codical architecture. Research in affective neuroscience has shown that primary emotional systems are organized by stable, evolutionarily conserved patterns of neural activation (Panksepp, 1998). These systems reveal that neural activity is structured by rule-like mappings that link temporal patterns to functional outcomes. In this sense, the neural code constitutes the formal bridge between organic codes and higher-order psychological phenomena. It is this codical layer — phylogenetically conserved yet plastically reorganizable — that provides the biological foundation for the emergence of archetypal codes.

3.1.2. Chirality and the Natural Convention of Codes

One of the most striking illustrations of the code-based nature of life is molecular chirality.

Many biological molecules — including sugars and amino acids — exist in two mirror-image forms: *dextrorotatory* (D) and *levorotatory* (L). Chemically, these enantiomers are indistinguishable: they share the same formula, atomic composition, and energetic profile. Yet biologically, they have radically different functions.

The human body, for example, metabolizes D-glucose but not its mirror image, L-glucose. The latter is biologically inert — or even toxic in certain contexts. In other words, "food" and "poison" are not determined by chemistry but by biological convention.

As Marcello Barbieri (2015) has shown, this asymmetry cannot be reduced to physical or chemical necessity. It arises from what he calls a *natural convention* — a stable correspondence between sign and function established through biological codes. The molecular world allowed both configurations, but life evolutionarily "chose" one based on its adaptability/survivability. All subsequent organisms inherited this convention, making it a universal rule of the biosphere.

This phenomenon demonstrates a key principle: chemistry does not determine biology; it merely enables it. Between what is chemically possible and what becomes biologically real, there is a codified relationship — a correspondence that is not deducible from physical laws alone.

Furthermore, chirality is just one example among many biological codes that control living systems. The *genetic code* is the best-known, but others are equally fundamental: the *histone code* regulates chromatin structure and gene expression; the *splicing code* determines how RNA is edited and translated into proteins; the *neurotransmitter code* coordinates signaling between neurons; and the *immune code* orchestrates recognition of self vs. non-self. As Robert Prinz (2025) has summarized, more than 200 such codes are now documented across molecular, neural, and systemic levels. In fact, nothing in evolution makes sense except in the light of Code Biology (Prinz, 2023).

Each of these codes defines a distinct layer of mediation — a rule-based correspondence that links physical substrates to emergent biological functions. They collectively reveal that life operates not by deterministic law, but by systems of correspondence, translation, and meaning.

In this sense, chirality provides a paradigmatic example of coded mediation: the process by which matter becomes life through convention-based correspondences rather than mechanical causation. The same logic underlies the evolution of neural and cultural codes, in which meaning or function emerges from stable mapping rules rather than from physical necessity. Life, mind, and culture are thus continuous in their codical foundations.

3.1.3 Barbieri and Kull: coding or interpretation?

Almost mirroring the argument between Roesler and Clark, something similar happened between Kalevi Kull and Marcello Barbieri.

Kalevi Kull (2020) has argued that codes are "necessary but not sufficient" for meaning-making. For Kull, semiosis requires not only coding but also choice — a primitive agency that comes into play when multiple codes are possible in each context. He stresses that a single code cannot produce meaning in isolation; meaning emerges from the articulation of various codes and the interpretive act that selects among them. In his reading of Charles

Sanders Peirce, interpretation is the essence of semiosis, whereas Barbieri insists that codes themselves constitute semiosis.

The debate between Barbieri (2025a) and Kull resonates deeply with the problem of the archetype. If one adopts Barbieri's position, archetypes can be conceived as neural codes stabilized by phylogeny: unconscious structures that shape perception and behavior irrespective of conscious interpretation. If one follows Kull, archetypes yield meaning only when articulated with other codes (affective, relational, cultural) and when choice or interpretation is involved. Both perspectives capture essential aspects of Jung's theory: the archetype-as-such as a structuring code, and the archetypal image as the symbolic artifact that emerges when multiple codes converge and are mediated through experience.

3.2 The Code Psychology

These insights map seamlessly onto the Jungian distinction between archetype and image. Archetypes, in this light, can be seen as regulatory metacodes: unconscious neural dispositions stabilized across evolutionary time. Their manifestation in symbolic form requires mediators — what Barbieri calls adaptors or codemakers — such as hormones, cortical networks, relational interactions, and cultural practices. The codified products of this process are the artifacts: dreams, myths, rituals, works of imagination. Thus, the triadic structure of code–mediation–artifact corresponds directly to the Jungian structure of archetype-as-such → mediating processes → archetypal image (Major, 2021; 2025b).

This framework, which we may call *Code Psychology* or *Jung 4.0*, extends Barbieri's biological insights into the psychological domain. Just as transfer RNAs and ribosomes mediate the genetic code to produce proteins, so archetypal codes are mediated by affective and relational processes to produce codified artefacts in the psyche. Dreams, as we will see in the next chapter, provide a privileged arena where this process becomes visible: they function as a language of archetypal coding, recombining fragments of daily experience with phylogenetically stabilized patterns to generate novel configurations that reach consciousness.

While Barbieri consistently avoids terms such as "symbolic" or "interpretation" in biological contexts — arguing that codes operate without agency or intentional meaning — Jung 4.0 applies the triadic logic of code–mediation–artifact to the psyche, where codical artifacts necessarily appear in symbolic form as images, narratives, and patterned meanings. In this way, the debate between Barbieri and Kull reaches a synthesis in Analytical Psychology. Barbieri is correct in emphasizing that biological codes function as objective correspondences without interpretive capacity. Yet, it is equally essential to recognize that meaning emerges only when multiple codes interact, generating a level of semiotic "freedom" that arises much later in evolutionary history (Major, 2025d). From this perspective, archetypes represent precisely such a threshold phenomenon: phylogenetically stabilized codes which, through the coordinated action of affective, relational, and cultural mediators, give rise to symbolic artifacts and ultimately to the reflective meaning-making of human culture. This synthesis positions the archetype as the paradigmatic case of a biological code that links coding and interpretation, biology and culture, unconscious structure and conscious image — the central insight of "Jung 4.0."

4. Archetypes vs Codified Artifacts

The convergence between Jung's distinction between the archetype-as-such and the archetypal image, and Barbieri's triadic model of code–mediation–artifact, allows us to reformulate the archetype as a codified biological reality. Archetypes are not inherited ideas, metaphysical forms detached from biology, or behavioral templates per se. They correspond to phylogenetically stabilized neural dispositions — structural patterns embedded in the architecture of the human brain and nervous system. These patterns express themselves in the psyche only through mediators — affective, relational, neural, and cultural adaptors — which translate them into symbolic artifacts such as myths, dreams, rituals, narratives, artistic motifs, and recurrent behavioral scripts (Goodwyn, 2024; Major, 2025b).

This conceptualization resolves a long-standing ambiguity in Analytical Psychology: the tendency to conflate the underlying disposition with its symbolic manifestation. Jung himself oscillated on this point, at times treating archetypes as organizational structures and at other times as symbolic or metaphysical entities. Jean Knox (2003, p. 24) identifies four distinct ways in which Jung defines the archetype throughout his work:

- biological entities in the form of information which is hardwired in the genes, providing a set of instructions to the mind as well as to the body
- organizing mental frameworks of an abstract nature, a set of rules or instructions but with no symbolic or representational content, so that they are never directly experienced
- core meanings which do contain representational content and which therefore provide a central symbolic significance to our experience
- metaphysical entities which are eternal and are therefore independent of the body.

By explicitly distinguishing the archetype-as-code from the archetypal image-as-artifact, the present model avoids both symbolic reductionism — reducing archetypes to cultural motifs — and metaphysical essentialism — treating them as timeless Platonic forms. In this framework, archetypes are codes; images are artifacts. What connects them are mediations — the adaptors that allow codes to operate within particular psychological and cultural contexts (Major, 2025b).

4.1 Dreams as a Privileged Laboratory

Dreams constitute the privileged language of archetypal coding — the space where the psyche experiments with the possibilities of its own code. They weave fragments of waking experience with deep structural patterns to generate novel symbolic artifacts, performing a genuine act of psychic codepoiesis. From a codical perspective, dreams are one of the clearest examples of how biological, neural, and symbolic codes converge into a single dynamic field. Neural activation patterns (mediators) translate biochemical and affective codes into imaginal configurations (artifacts), which the psyche reorganizes in symbolic form. In this recursive loop, the different layers of the codical architecture — biological, affective, neural, and symbolic — continually reorganize one another.

As Roberto Gambini put it, dreams do not translate into conceptual meaning; they transliterate into consciousness. Their images do not function as abstractions to be decoded ("A means B"), because the dream operates within a different semiotic register.

As Gambini writes, the dream must pass "through other veins, be retransfused in the analyst, pass through his psychic and emotional circuit, and return oxygenated, transformed" (Gambini, 2008, p. 155). This metaphor of *psychic dialysis* reveals a fundamental principle: the dream-image is a presence, not a signifier to which a conceptual equivalent can be assigned. A lion curled beneath the bed is not an allegory of aggression or a father-complex — it is a lion, a living imaginal event whose opacity and alterity are integral to its codical potency. To conceptually sterilize this presence is to mutilate its function.

James A. Hall (1983) had already anticipated this imaginal rigor when he argued that dreams must be engaged as dramatic, self-regulatory processes rather than deciphered as encoded messages. For Hall, the dream-image is a *living form* that reorganizes psychic equilibrium through dramatic enactment rather than conceptual representation. The analyst does not decode a symbol; he participates in its drama. This view converges directly with Gambini's notion of transliteration and with contemporary neuroscientific accounts of dream-based affective regulation.

Within the code–mediator–artifact framework, these perspectives become fully intelligible. The dream-image is not the archetype itself but a symbolic artifact emanating from an archetypal code and shaped by affective intensity and relational context. Dreams are thus neither arbitrary nor conceptual: they are codically generated instantiations — moments in which unconscious codes are permitted to manifest in imaginal form before being reorganized by consciousness.

In this light, the analyst is not an interpreter imposing meaning from outside but an adaptor within the codical process. Just as molecular adaptors mediate between the genetic code and the protein, the analyst mediates between archetypal codes and conscious articulation. Interpretation arises not as a conceptual reduction but as an emergent artifact of the analytic dialogue — a living transliteration between unconscious code and reflective mind. The task of analysis is therefore not to decode the dream but to accompany its entry into consciousness, preserving its imaginal strangeness while fostering its intelligibility. The dream is not a message to be deciphered but an event to be metabolized, a symbolic artifact whose meaning emerges through the dynamic interplay of code, mediation, and relational presence.

This codical view of dreaming also resonates with Joseph Campbell's (1970) classical insight that dreams function as *the personal myths of the dreamer*, while myths are *the public dreams of humanity*. In both cases, symbolic images are not allegories to be decoded but dynamic operations that reorganize experience. Campbell repeatedly emphasized that a symbol *does not point to something else; it works*, a principle fully compatible with Gambini's and Hall's insistence that dream images must be engaged, not translated. This perspective also aligns with Patrick McNamara's (2019) neurobiological account, which holds that dreams reorganize the self by amplifying affective codes and recombining them into narrative simulations that express ancestral motivational patterns. From this combined perspective, the dream emerges as a recursive codical system: a biological and symbolic process in which ancestral motivational codes are re-mediated into imaginal artifacts that restructure the conscious organization of the self. Far from being a message to interpret, the dream is an act, a codical performance through which the psyche experiments with new configurations of meaning.

4.2 Archetypal Codes in Waking Symbolization

If dreams constitute the privileged place where archetypal codes experiment with new symbolic configurations, waking life represents the complementary terrain in which these configurations are stabilized, transformed, or resisted. The psyche does not cease its codical activity upon awakening; instead, it shifts from the imaginal mode of transliteration to the mediated mode of symbolic articulation.

Daily symbolic activity — spontaneous imagery, slips, artistic expression, relational patterns, symptomatic behaviors — can thus be read as waking artifacts arising from the same underlying archetypal codes that manifest most freely during sleep. What differs is the mediating environment: instead of REM-dominated neurodynamics, waking consciousness imposes linguistic, cultural, and relational constraints that shape the unfolding of codical expressions.

In this sense, waking symbolic phenomena represent the second half of the codical cycle: dreaming generates imaginal artifacts through bottom-up processes in which affective, neural, and biological codes unfold with minimal top-down constraint; waking consciousness then reorganizes those artifacts through top-down linguistic, cultural, interpersonal, and volitional mediators.

From the standpoint of the code–mediator–artifact framework, waking symbolic life serves as a *regulatory interface* between archetypal codes and social reality. Much as developmental codes unfold differently in response to environmental signals, archetypal codes produce distinct artifacts in response to the relational matrix of waking life. Symbolization is thus not merely representational but regulatory — a continuous, active negotiation between deep codical structures and lived experience.

This prepares the ground for a more systematic examination of the empirical evidence that archetypes operate as codical systems across biological, neural, psychological, and cultural domains.

5. Archetypes as Codical Systems: A Theoretical Integration

The previous sections clarified the biological foundations of codical systems and demonstrated how codes require mediators to generate artifacts. We can now extend this logic to the psyche itself. Jung's most crucial intuition — that archetypes are structural dispositions rather than inherited images — becomes fully intelligible once placed within a codical framework. If biological life evolves by creating new layers of correspondence through natural conventions, the psyche may (and does) follow the same logic: archetypes emerge as higher-order codical structures that regulate the formation of symbolic artifacts.

In this section, I integrate biological theory, affective neuroscience, relational dynamics, and Jungian phenomenology into a unified account of archetypes as codical systems. This integration unfolds through four steps: the nature of archetypal codes (5.1), the mediators that translate them (5.2), the symbolic artifacts that arise from this mediation (5.3), and the resulting architecture of the code–mediator–artifact model (5.4).

5.1 From Biological Codes to Archetypal Codes

If biological evolution is driven not only by physical constraints but by *natural conventions* — stable correspondences between signals and meanings (Barbieri, 2015; 2024) — then archetypes can be understood as one more instantiation of this codical logic. Biological codes such as the genetic code, the cytoskeletal code, the splicing code, or the sugar code demonstrate that life repeatedly creates layers of organized correspondence that are not derivable from chemistry alone. They emerge as codes that coordinate complex systems from within.

In this light, archetypes can be conceived as codical structures that regulate the formation of symbolic artifacts in the psyche. Rather than being inherited images, they operate as pattern-generating rules — conventions of neural architecture and affective systems that together guide the emergence of imaginal forms. This perspective preserves Jung's distinction between *archetype-as-such* and *archetypal image*, while grounding it in contemporary biological theory. Archetypes become part of the deep codical architecture of the organism: not entities but rule-like constraints that shape meaning.

This evolutionary perspective also explains why archetypal patterns recur across cultures and epochs. Just as organic codes canalize the emergence of specific developmental trajectories, archetypal codes canalize the formation of symbolic configurations through recurrent affective and neural pathways. Archetypes are therefore not mystical universals but natural conventions stabilized by the long-term redeployment of biological codes into neural and symbolic domains.

5.2 Mediators: Neural, Affective, and Relational "Circuits"

Between the archetypal code and the symbolic artifact lies a complex field of mediators (Major, 2025b; 2025d). In biological systems, mediators are structures such as transfer RNAs, protein adaptors, or membrane receptors that translate one code into another (Barbieri, 2024). An analogous mediational function operates throughout the organism's neural–affective–relational architecture.

At the neural level, mediators consist of canonical networks that integrate perception, memory, and affect. Within this architecture, it is essential to distinguish *neural codes*, *neural metacodes*, and *archetypes*. Neural codes are conserved correspondence rules shared across the animal kingdom that encode basic affective and behavioral dispositions through stable activation patterns. Neural metacodes emerge only at the level of the (human) relational–symbolic organism: higher-order regulatory structures that reorganize and modulate these basic codes by integrating affect, cognition, and relational context. Archetypes correspond to these metacodes — not to basic neural codes — and represent the upper-level structures through which codical dispositions are translated into symbolic configurations via multiple layers of mediation. Terrence Deacon's (1997) analysis of symbolic reference shows that symbols do not contain intrinsic semantic content; instead, their meaning emerges from constraint-relations within a system of higher-order correspondences. Symbolic thought arises when indexical associations are reorganized into "relations between relations," a recursive process that depends on neural architectures capable of inhibiting lower-level associations and detecting systemic

patterns. Neural circuits thus function as mediators that translate codical potentials into symbolic configurations.

At the affective level, mediators include the primary motivational systems described by affective neuroscience — systems that stabilize action tendencies such as fear, care, rage, or desire. These evolved circuits organize the animal's repertoire of approach/avoidance, bonding, exploration, and defense, providing the affective scaffolding upon which symbolic elaboration later emerges. Goodwyn (2024) has shown that these systems operate as innate story codes: affective patterns that shape the narrative logic of dreams, myths, and psychopathology, acting as motivational templates that guide how experience is encoded and transformed symbolically.

At the relational level, mediators include the transferential field, understood as a dynamic space of co-regulation and mutual adaptation. This view was anticipated in the seminal volume *Signifying Bodies: Biosemiosis, Interaction and Health* (Cowley, Steffensen, Major & Dinis, 2010), which argued that meaning and subjectivity emerge not within isolated individuals but within relational dynamics distributed across bodies, contexts, and interactive loops. As Dinis notes, the relational field functions as an embodied matrix of co-construction, where symbolic significance arises through mutual regulation and affective resonance. Major emphasizes that subjectivity is inherently relational and self-organizing, making the analytic relationship a privileged site for symbolic mediation. Cowley shows that linguistic and symbolic activity depends on distributed coordination rather than internal representations, while Steffensen describes interactivity as a soft-assembled, affectively modulated process that stabilizes and transforms patterns of sense-making. Within this framework, the analytic relationship operates as a relational adaptor: it reorganizes, amplifies, or inhibits codical dispositions through enactments, projections, and symbolic reformulations. Without such relational mediation, archetypal codes would remain latent, unable to take form in conscious life.

This relational understanding resonates with the enactive tradition inaugurated by Varela, Thompson, and Rosch (1991), who argued that mind does not stop at the biological boundary of the skin but is enacted through the organism's structural coupling with its environment. Cognition, in this view, is not a property of an isolated brain but a distributed process that emerges from ongoing co-regulation between bodies, contexts, and interactive loops. This perspective aligns closely with the role of relational mediation in the analytic field: symbolic meaning arises not "inside" the individual but within the dynamic interplay that binds analyst and patient in a shared, co-constructed field of sense-making.

Thus, mediation is not optional but constitutive: archetypes do not express themselves directly, but only through the mediators that bind neural, affective, and relational systems together.

5.3 Archetypal Artifacts as Symbolic Instantiations

From this perspective, archetypal images, motifs, and narratives are not archetypes themselves but *artifacts:* symbolic instantiations generated through the interplay of code

and mediation. The code provides the structural potential; the mediator provides the relational and neural translation; the artifact is the symbolic outcome.

This distinction corrects a long-standing confusion in Jungian discourse. Post-Jungian constructivists often reduce archetypes to cultural patterns, while essentialists risk reifying them as preformed images. The codical approach avoids both extremes. Archetypes are neither cultural constructs nor metaphysical entities; they are natural codical structures that regulate the formation of symbolic artifacts through neural and affective mediators.

This distinction also resolves the tension highlighted in analytic debates: (a) the archetype is codical and universal; (b) the artifact is symbolic and particular; and (c) their resonance is always mediated. Such conceptual clarity is essential for clinical work because it allows analysts to recognize when an image is functioning as an archetypal artifact without confusing the artifact with the archetype itself.

5.4 The Code–Mediator–Artifact Framework as a Unifying Architecture

The CMA framework unifies biological codes, neural mediation, and symbolic artifacts in a single explanatory model:

- *Code:* deep organizational rules that canalize form and meaning (biological, neural, archetypal).
- *Mediator:* the adaptors — neural, affective, relational — that translate codical potentials.
- *Artifact:* the symbolic instantiations that emerge from this mediation (dreams, myths, symptoms, enactments).

This model naturalizes Jungian psychology without reducing it. It preserves the numinosity of symbolic experience while grounding it in codical logic and neurobiological mediation. It shows that archetypes are neither metaphors nor metaphysics, but dynamic regulatory structures whose expression depends on layered mediation.

With this architecture in place, we can now turn to the clinical implications: how archetypal codes manifest in dreams, relationships, and psychopathology — and how analysts can work with them without falling into either interpretive arbitrariness or biological reductionism.

6. Clinical, Scientific, and Cultural Implications

The codical reframing proposed here situates Analytical Psychology within a naturalistic architecture capable of integrating biological dispositions, neural mediation, and symbolic expression. By redefining archetypes as archetypal codes — phylogenetically stabilized neural dispositions whose effects become visible only through mediators — Jung 4.0 offers a framework that is both empirically grounded and symbolically robust.

To unfold the implications of this approach, it is necessary to clarify the internal architecture of the Code–Mediator–Artifact model.

Within the CMA architecture, archetypal codes provide deep organizational rules; mediators translate these rules into lived, situated experience; and artifacts become the symbolic instantiations accessible to consciousness and culture. This triadic logic allows Analytical Psychology to be reformulated with operational precision, opening new pathways across clinical, scientific, and cultural domains. I begin with the clinical field, where the need for conceptual clarity has long been most acutely felt.

6.1 Clinical implications

From its inception, Analytical Psychology has distinguished itself from other psychotherapies by its emphasis on the symbolic. Yet one of the persistent critiques has been its lack of operational clarity: how can an analyst discern when an image, dream, or behavior is genuinely archetypal rather than merely personal or cultural?

The codical framework of Jung 4.0 provides a decisive clarification by mapping clinical phenomena onto the CMA triad. Within this model, archetypal codes operate in a higher-order regulatory capacity — hence their designation here as "regulatory metacodes":

- *Code*: archetypal dispositions as regulatory metacodes;
- *Mediators*: affective, relational, and neural processes (including transference–countertransference, attachment patterns, and cultural framings);
- *Artifacts*: dreams, images, narratives, symptoms, and enactments in the analytic field.

Erik Goodwyn has proposed two criteria — *indexicality* and *resonance* — that help identify archetypal material within this architecture (Goodwyn, 2013; 2022). Indexicality refers to the way an image "points beyond itself," evoking disproportionate affect, numinous intensity, or uncanny familiarity that cannot be explained solely by the patient's biography. Resonance refers to the recurrence of motifs across time and cultures: when an image echoes mythological, literary, or collective themes, its archetypal dimension becomes evident.

As Goodwyn (2018) argues, dreams and other spontaneous images emerge from deep narrative structures shaped by embodied experience, making them privileged sites where archetypal codes become symbolically elaborated.

Example 1: A dream motif. As Goodwyn's criteria suggest, a patient dreams of a vast flood sweeping away familiar landmarks. The analyst notes the overwhelming affect (indexicality) and recognizes parallels with collective flood myths such as those of Gilgamesh or Noah (resonance). In codical terms, the flood archetype functions as a regulatory metacode of dissolution and renewal. The dream's symbolic artifact emerges through the patient's current life transition (loss of a job or entering a new phase). Thus, the archetypal code is activated, mediated by biographical affect, and expressed in dream imagery.

Example 2: A clinical constellation. Following Goodwyn's operational criteria, a patient repeatedly describes feeling "invisible" in relationships, coupled with recurring imagery of transparent figures. The intensity of affect (indexicality) and the cross-cultural resonance of invisibility as a motif (from Greek myths of Hades' helmet to modern fantasies of invisibility) point to the activation of an archetypal code of presence/absence. Here, the therapeutic relationship itself becomes a mediator: the analyst's attunement offers a new relational adaptor through which the archetypal code of recognition is translated into conscious experience.

Example 3: Violence and archetypal scripts. Rahman and Meloy (2025) demonstrate that violent offenders frequently narrate their acts in terms of archetypal roles: the Hero who must cleanse corruption, the Martyr who sacrifices for a cause, and the Outlaw who transcends unjust laws. These are not mere metaphors but codical structures that organize affect and behavior. Forensic clinicians, by recognizing these patterns, can assess risk and predict escalation. Within Jung 4.0, such narratives are seen as symbolic artifacts of archetypal codes, mediated by distorted relational and cultural adaptors.

In this framework, the analyst is no longer primarily an "interpreter" who imposes meaning from outside. Instead, the analyst functions as a mediator or adaptor within the codical process. Just as transfer RNAs mediate between the genetic code and protein, the analyst mediates between unconscious archetypal codes and conscious articulation. Interpretation arises not as a unilateral act but as an emergent artifact of the analytic dialogue.

By grounding clinical practice in the triad code–mediation–artifact, the School of Codes clarifies Jung's intuition that archetypes are both biological and symbolic. It allows clinicians to work with symbols not as speculative metaphors but as empirical manifestations of codical structures, activated and shaped by mediators in the analytic field, thereby restoring Analytical Psychology's symbolic practice on a rigorously naturalistic basis.

6.2 Scientific implications

The codical reframing of archetypes proposed in Jung 4.0 has profound scientific consequences. By treating archetypes as archetype codes, it becomes possible to articulate hypotheses testable across biology, neuroscience, cognitive science, and AI. What was historically dismissed as symbolic speculation becomes a natural phenomenon embedded in multilevel codical architecture.

Neuroscience: evidence for neural codes as archetypal scaffolds

One of the earliest empirical anchors for this proposal comes from neuroscience. Nicolelis and Ribeiro (2006) demonstrated that stable neural coding patterns underlie sensory and motor processes — showing that neural states function as time-based codes, parallel in structure to molecular codes. This was dramatically reinforced by the 2014 Nobel Prize (O'Keefe, Moser, & Moser), which established that hippocampal place cells and grid cells encode spatial orientation.

Barbieri first introduced the broader conceptual framework for biological codes in *The Semantic Theory of Evolution* (1985), where he proposed that biological systems depend on correspondence rules that cannot be simply reduced to physico-chemical necessity. He later expanded this into a comprehensive taxonomy of codes — including the distinction between organic codes and neural codes — particularly in *The Organic Codes* (2003) and again in *Codes and Evolution: The Origin of Absolute Novelties* (2024). Within this framework, neural codes are defined as correspondence rules among neuronal states (time-objects), paralleling the correspondence rules that link molecules to functions in organic codes (space-objects). Since all animals share primary feelings and instincts, these conserved affective structures suggest the existence of deep phylogenetic neural codes.

Within the Jung 4.0 framework, this provides a direct bridge: archetypes are best understood as neural metacodes — higher-order correspondence rules that organize and modulate conserved affective dispositions, whose symbolic elaborations emerge only through affective, relational, and cultural mediators. A testable prediction follows from this view: neuroimaging studies should reveal convergent activation patterns in response to archetypal motifs (e.g., hero, shadow, mother–child dyad), displaying cross-cultural regularities despite variations in narrative content.

Cognitive science: archetypes as cognitive attractors

Cognitive science already provides empirical support for the view that archetypes function as deep organizational dispositions rather than inherited images. Using standard paired-associate recall tasks from cognitive psychology, Sotirova-Kohli et al. (2013) demonstrated a robust *archetypal memory advantage*: symbol–meaning pairs corresponding to archetypal associations (e.g., "mother–child," "hero–enemy," "predator–prey") were recalled significantly better than neutral or mismatched pairs, even when participants had no conscious familiarity with the symbolic meanings involved. The study replicated and extended earlier findings by Rosen and colleagues, showing that archetypally congruent information has privileged access to attention and memory systems across cultures and languages.

These results suggest that archetypal codes act as *cognitive attractors:* deeply rooted structural dispositions that channel perception, affect, and memory toward evolutionarily meaningful configurations. Rather than reflecting culturally acquired symbolism, these attractor effects emerge from the interaction between neural architecture, affective systems, and embodied experience — precisely the kind of codical stabilization predicted by the Code–Mediator–Artifact framework. Jung's intuition that archetypes structure mental life by organizing experience "from below" thus finds empirical grounding: archetypal patterns influence cognition not through metaphysical imposition or cultural transmission, but through measurable effects on memory, association, and meaning-construction.

Biology: codical redeployment as the template for archetypal transformation

Recent discoveries in evolutionary biology further corroborate this model. Cohen et al. (2025) described extra-oral dentition in *Hydrolagus colliei*, an anomaly whose developmental origin my own analysis (Major, 2025c) linked to codical redeployment:

- *the odontogenic code* → normally governs oral dentition
- *mediated differently* → produces a novel anatomical artifact ("teeth between the eyes").

This biological logic maps directly onto Analytical Psychology: archetypal codes are stable, but their symbolic expressions vary depending on mediators (affective, relational, cultural).

Just as developmental mediators redirect biological codes to produce anatomical novelties, psychodynamic mediators redirect archetypal codes to produce symbolic artifacts.

Experimental predictions and research programme

Jung 4.0, therefore, generates a series of concrete, testable hypotheses:

1. Neuroimaging of archetypal motifs:
   fMRI/EEG convergence across cultures for universal themes (birth, death, hero, shadow).
2. Cross-cultural dream networks:
   Semantic network analysis of large dream corpora (Bulkeley, 2014; Domhoff & Schneider, 2008) should reveal recurring clusters such as death–rebirth, anima/animus, and hero/journey motifs across cultures.
3. Affective–archetypal coupling:
   Building on Ekman's demonstrations of universal affective expressions (Ekman & Friesen, 1971; Ekman, 2004), Damasio's account of primary emotions (1999, 2010), and Panksepp's identification of neuroevolutionary affective systems (1998; Panksepp & Biven, 2012).
4. AI simulations:
   Generative models trained on global mythic corpora should spontaneously converge on recurrent Jungian motifs (Major, 2025b), reflecting latent codical invariants.
5. Forensic validation of archetypal scripts:
   Rahman & Meloy's ARCH model (2025) predicts behavioral escalation based on archetypal narrative scripts (Hero, Martyr, Outlaw).

Together, these predictions constitute a genuine research programme, repositioning Analytical Psychology as an empirically grounded dialogue partner within contemporary science.

6.3 Positioning within current debates

This scientific reframing clarifies the longstanding debate over the biological versus cultural status of archetypes. Roesler's culturalist position rightly emphasizes the roles of development and symbolization, while Goodwyn has already argued that the opposition between biology and culture is a false dichotomy. For Goodwyn, biological dispositions underlie symbolic universals, whereas Clark emphasizes how culture mediates innate motifs rather than replacing them.

The Barbieri–Kull debate provides parallel structure. Barbieri: codes *are* semiosis; Kull: semiosis requires an interpretive *choice.*

The *School of Codes* integrates both: codes generate invariants; mediators generate variation; artifacts express the synthesis. This triadic view dissolves the nature/nurture dichotomy: archetypes are biological in origin, psychological in mediation, and symbolic in expression.

Far from being a speculative metaphor, the archetype becomes an empirically tractable phenomenon: a natural-level codical structure with predictable neural, cognitive, and symbolic manifestations. Analytical Psychology thus finds itself not marginal but renewed — anchored in the Biology of Codes, extended through neural mediation, and expressed in the symbolic life of the human mind.

Analytical Psychology has long recognized that symbols, myths, and rituals express collective structures of meaning. By situating archetypes within the triad code–mediation–artifact, Jung 4.0 offers a naturalistic foundation for culture — not as a human invention *ex nihilo* nor as a metaphysical domain of eternal forms, but as the symbolic flowering of biological codes articulated through history, relation, and imagination.

Archetypes in myth and religion

Classical mythologies and religious traditions can be reinterpreted as *cultural artifacts of archetypal coding*. The hero's journey, for example, expresses a phylogenetically stabilized metacode of transformation, mediated by rites of passage and elaborated into narrative artifacts from Gilgamesh and Odysseus to the Buddha and Luke Skywalker.

Likewise, maternal imagery across sacred traditions reflects the archetypal code of nurturance, mediated biologically through dependency and culturally through motifs such as Isis and Horus or the Madonna and Child.

Here, ritual serves as mediator: sacrifice, initiation, festival, and pilgrimage are codified processes through which communities activate and stabilize deep motivational and symbolic structures.

Archetypes in literature and the arts

The arts constitute another privileged domain where archetypal codes manifest as symbolic artifacts. Literature encodes archetypal dramas — Macbeth elaborates the code of ambition, Othello's envy, Hamlet's fate, and indecision.

Visual art, from Upper Paleolithic caves to Renaissance altarpieces, expresses codical patterns of hunting, fertility, light, shadow, and transformation. Even modernism and postmodernism, often seen as rejecting universals, re-code archaic motifs: Joyce's *Ulysses* transposes the Homeric hero archetype into quotidian Dublin, revealing how archetypes survive through mediation.

Artistic innovation itself becomes a form of *codepoiesis:* the exploration of new symbolic possibilities within the archetypal space.

Archetypes in contemporary culture

Contemporary media amplify these dynamics.

Cinema continually reactivates archetypal structures — superhero films reprise the hero archetype; dystopias explore the shadow; romantic dramas enact union/separation motifs. Their persistence is not due to cliché but to their alignment with deep neural predispositions.

Digital culture multiplies these processes. Memes, viral narratives, and online personae (the Trickster as the "troll," the Shadow as the "anti-hero") reveal continuous re-mediation of archetypal codes.

Even artificial intelligence contributes: generative models trained on extensive cultural data sets naturally reproduce themes of death–rebirth, shadow, transformation, and the hero's journey. These emerging patterns imply that archetypal coding mirrors the fundamental structures of narrative understanding itself.

A biological anchor for cultural universals

Barbieri's theory of neural codes sharpens this cultural interpretation. Each species possesses its own repertoire of neuronal conventions that structure perception and behavior. In humans, these archetype codes form the scaffolding for symbolic elaboration.

Just as bird-song codes delimit the repertoire of avian communication, human neural codes delimit the repertoire of symbolic forms. Thus, cultural universals (e.g., hero, mother, trickster, death–rebirth) are not metaphysical essences but human-specific archetype codes, stabilized through phylogeny and diversified through affective, relational, and historical mediators.

Universality comes from the *codical substrate;* diversity comes from its *mediators*.

The cultural meaning of the Self

Within this framework, even the Jungian *Self* becomes intelligible in codical terms.

The Self is not a reified entity or metaphysical hypostasis but the emergent artifact of recursive interaction between conscious and unconscious codes.

It names the integration of biological predispositions, neural patterns, affective dynamics, and cultural mediations.

Far from transcending nature, the Self is nature reflecting upon itself through symbolic articulation — the most complex cultural flowering of the codical architecture of the human species.

Toward a cultural research programme

The *School of Codes* thus proposes a new cultural programme. It invites scholars of religion, literature, anthropology, media studies, and cognitive science to approach cultural forms not as metaphors but as *codical artifacts.*

It offers a vocabulary capable of bridging the humanities and the sciences, showing that myths, rituals, stories, and digital narratives are symbolic translations of biological codes mediated by affect, cognition, and culture.

In an era of intellectual fragmentation, this yields a unifying vision: culture as the ongoing translation of archetypal codes into symbolic form.

6.4 Synthesis

Taken together, the clinical, scientific, and cultural perspectives converge on a central insight: Jung 4.0, or the School of Codes, does not merely reinterpret the archetype; it renders the concept operational, empirically grounded, and culturally generative. Clinically, the codical framework clarifies how archetypal material can be recognized through criteria such as indexicality and resonance, and how it becomes transformable through relational mediation. Scientifically, it outlines a research programme linking psychology, neuroscience, biology, evolutionary theory, and artificial intelligence, offering testable hypotheses about how archetypal codes shape affect, cognition, and symbolic production. Culturally, it situates myth, ritual, literature, and digital media within a naturalistic architecture that honors their symbolic richness while grounding them in phylogenetically conserved neural–affective architectures.

In this sense, this proposal is not just a theoretical refinement but a federative model. It combines clinical practice, scientific research, and cultural analysis within the framework of code–mediation–artifact, demonstrating that the symbolic, neural, and biological are not competing explanations but complementary aspects of the same process. This integrative approach positions Analytical Psychology not as a legacy discipline at risk of drifting into metaphor but as a field capable of engaging with the life sciences while maintaining its symbolic depth. It transforms the archetype from an elusive concept into a testable, mediational, and culturally expressive system, thus paving the way for an epistemological shift in how Analytical Psychology is understood.

What emerges is a new chapter — one in which Jung's intuition finds its natural place within the sciences of life, mind, and meaning.

7. Conclusion

The emergence of the Code School — also referred to as Code Psychology or Jung 4.0 — marks a decisive turning point in the intellectual history of Analytical Psychology. From the beginning, Jung's psychology combined clinical vitality with symbolic depth, yet it carried an enduring epistemological vulnerability: its central concept, the archetype,

remained suspended between biology, symbol, and metaphysics. This indeterminacy, though not always fairly interpreted, exposed the field to recurring criticisms of ambiguity, essentialism, and speculative excess.

The Fourth School seeks to resolve this tension by situating the archetype within the triadic logic of code–mediation–artifact, providing it with a clear operational definition, and embedding it within a naturalistic architecture spanning biological, neural, relational, and symbolic domains.

In this framework, archetypes are no longer metaphysical postulates nor merely cultural patterns. They are codical, phylogenetically stabilized structures of neural organization that become symbolically productive only through layers of affective, relational, and cultural mediation. Through this triadic process, archetypal dispositions give rise to the symbolic artifacts that populate human experience — images, dreams, rituals, myths, artistic forms, and recurrent behavioral configurations. The code–mediation–artifact model is therefore both naturalistic and testable: it preserves the numinosity and symbolic richness of Jung's intuition while grounding it in the codical architecture that organizes all levels of living systems.

The implications are extensive and multidimensional:

- *Clinically*, Jung 4.0 offers renewed clarity for distinguishing archetypal from personal material, grounding dreamwork and symbolic work not in metaphor but in codical logic.
- *Scientifically*, it defines a research programme that integrates neuroscience, affective science, dream research, evolutionary anthropology, behavioral studies, computational modeling, and artificial intelligence.
- *Culturally*, it reframes myths, rituals, and symbolic productions as codical artifacts, restoring the archetype as a central principle for understanding the human condition.

Seen from this angle, the Code School may become not a new orthodoxy but a shared space — open, collaborative, and non-hierarchical — for all those who recognize themselves in a scientific Jung, and who acknowledge the enduring validity of his most astonishing insight: that meaning itself has a structure. Just as the genetic code and other biological codes provide the invisible syntax of organic life, archetypes constitute the deep syntax of symbolic life — the grammar through which the human species thinks, dreams, relates, and becomes itself.

If Jung was the discoverer of the archetype, then Barbieri may be seen as its Aristotle: the thinker who supplied the natural philosophy and epistemological scaffolding capable of rendering Jung's vision intelligible within the contemporary sciences of life and mind. In this perspective, Jung 4.0 restores the archetype to the center — not as a relic of outdated metaphysics, but as a foundational structure for a renewed scientific psychology. The "human soul," far from being an anomaly in nature, reveals itself as its most intricate codified creation.

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