THE IMAGE AND THE ARCHITECTURE

Four Evolutionary Prerequisites for the Soul That Can Know Itself

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Abstract

Four evolutionary innovations, accumulated over 600 million years, together constitute the structural prerequisites for the kind of consciousness the Judeo-Christian tradition identifies as 'made in the image of God.' Bilateral symmetry (~600–700 Mya) establishes the two-pillar governance architecture. Cephalization (~550–600 Mya) concentrates governance into a central head region, producing the middle pillar. The perpendicular decussation (~500 Mya) hides each hemisphere from the side it governs, producing the Abyss — the structural condition for genuine autonomy. And prefrontal cortical expansion (~2–6 Mya) develops the governing centre to the point where it can voluntarily extend its jurisdiction over its own hidden infrastructure — the capacity for the cathartic work. Each innovation builds on the last. None alone is sufficient. Together they produce a being that can know its own hidden governance and choose to participate in it. The image of God is not a single feature but a complete architecture — four evolutionary layers producing the soul that can see that it cannot see, and choose to look anyway.

I. The Question

What does it mean, biologically, to be made in the image of God? The question is not whether biology can prove the theological claim. It is whether the biological architecture of the human being exhibits specific structural features that correspond to what the theological tradition means by 'image' — and whether those features can be identified, traced to their evolutionary origins, and shown to form a cumulative, layered architecture in which each innovation is necessary and none alone is sufficient.

The Catharturgy Corpus proposes that the 'image of God' is not a single feature (reason, language, morality, consciousness) but a complete structural architecture that enables a specific capacity: the capacity to know one's own hidden governance and choose to participate in it. This capacity — the capacity for the cathartic work — requires four evolutionary prerequisites, each of which appeared at a specific point in the history of life and each of which contributes a dimension the previous innovations lacked.

II. The First Innovation: Bilateral Symmetry (~600–700 Mya)

Bilaterian metazoans arose approximately 600–700 million years ago during the Ediacaran period and radiated rapidly into most bilaterian crown clades by the end of the Cambrian (Erwin et al., 2011). Three features define bilaterians: bilateral symmetry (the body divisible into two mirror-image halves along a central axis), two distinct body axes (anterior-posterior and dorsal-ventral), and mesoderm (a third germ layer enabling complex organ development).

Before bilateral symmetry, animal life was radially symmetric: jellyfish, sea anemones, corals. A radially symmetric organism has no preferred direction of movement, no front or back, no left or right. Its nerve net is distributed uniformly. There is no possibility of differentiated lateral governance — no severity on one side and mercy on the other, no proactive analytical control on the left and reactive contextual control on the right.

Bilateral symmetry establishes the two pillars. A left side and a right side, each capable of independent specialisation. The bilateral body plan allows for paired organs, paired limbs, paired sensory structures, and — critically — paired cerebral hemispheres, each of which can develop distinct functional specialisations while remaining connected through commissural fibres. Without bilateral symmetry, the Tree's lateral architecture is structurally impossible. The two pillars of the Tree of Life — the pillar of Severity and the pillar of Mercy — require bilateral symmetry as their biological substrate.

Bilateral symmetry is the evolutionary innovation that makes dual-pillar governance structurally possible. It is shared with every bilaterian animal from flatworms to humans — approximately 99% of all animal species. It is necessary but not sufficient for the image. Every bilaterian has two sides. Not every bilaterian has a governing centre that integrates them.

III. The Second Innovation: Cephalization (~550–600 Mya)

Cephalization is the evolutionary trend toward the concentration of sensory organs, nervous tissue, and the mouth at the anterior end of the body, forming a distinct head region. The development of cephalization in Platyhelminthes (flatworms) is considered a major evolutionary milestone because they were among the first animals to exhibit bilateral symmetry and a distinct head region with a concentration of nerve cells, forming a primitive brain (cerebral ganglia). Cephalization is thought to be an evolutionary adaptation resulting from the tendency of bilaterally symmetrical animals to move forward, so that information about newly encountered environments impinges first on the anterior end (Hill, Wyse, and Anderson, 2016).

Before cephalization, bilateral animals had nerve cords and distributed ganglia but no concentrated governing centre. The body had two sides but no head — no position from which both sides could be simultaneously coordinated, evaluated, and integrated.

Cephalization produces the middle pillar. A head — a concentrated governing centre at the

anterior end, where sensory information converges and executive decisions are made. The head is the position from which both sides can be coordinated: the structural prerequisite for Tiphareth, the solar centre, the anterior cingulate cortex that sits between the two hemispheric pillars and integrates their governance into a unified response. Without cephalization, there are two pillars but no middle column. The bilateral body has differentiated sides but no centre that harmonises them.

Cephalization is the evolutionary innovation that makes integrated bilateral governance possible. It is shared with all cephalised bilaterians — flatworms, annelids, arthropods, molluscs, and all vertebrates. It is necessary but not sufficient for the image. Every cephalised animal has a governing centre. Not every governing centre possesses the perpendicular hiddenness that the Abyss requires.

IV. The Third Innovation: The Perpendicular Decussation (~500 Mya)

The contralateral organisation of the vertebrate forebrain — each hemisphere controlling the opposite side of the body — is present in every vertebrate from fish to humans but in no invertebrate phylum (Kinsbourne, 2013). Hippocrates first observed its clinical consequences around 400 BCE. Aretaeus of Cappadocia (2nd century CE) described the mechanism: the nerves 'pass over to the other side from that of their origin, decussating each other in the form of the letter X.' Ramón y Cajal published the first functional theory in 1898. Despite 2,400 years of observation and over a century of theorising, no explanation is generally accepted (de Lussanet and Osse, 2012).

The axial twist theory (de Lussanet and Osse, 2012) proposes that a 90-degree left-turn around the body axis evolved in a common ancestor of all vertebrates. The forebrain compensated in one direction while caudal structures migrated in the other, producing a perpendicular inversion between the forebrain and the body. The somatic twist theory (Kinsbourne, 2013) proposes a 180-degree rotation of the body behind the anterior pole during the invertebrate-vertebrate transition, as the neuraxis relocated from ventral to dorsal. Both theories identify a perpendicular or rotational transformation as the origin of the crossing.

A 2025 reframing (El-Boustani et al.) argues that light rays from each visual hemifield physically cross the midsagittal plane before reaching the retina, and the optic chiasm preserves rather than creates this crossing: each hemisphere is positioned directly 'behind' the contralateral external space (El-Boustani et al., 2025). The motor decussations follow the same spatial logic.

Before decussation, bilateral cephalised animals had direct, ipsilateral governance: the left brain governed the left body, the right brain governed the right body. Governance was transparent — each side could 'see' what it governed directly.

Decussation produces the Abyss. The perpendicular crossing hides each hemisphere from the side it governs. The left brain now governs the right body through a crossing that the right body cannot directly perceive. The governance is real but hidden. The source is present but perpendicular to

the recipient.

This hiddenness is the structural condition for genuine autonomy. The soul whose governance is direct and visible has no freedom: the governance is compulsory, transparent, inescapable. The soul whose governance is hidden — operating through perpendicular channels below the threshold of conscious awareness — can choose to extend its awareness to encompass the hidden governance (the cathartic work) or to remain unaware of it (the default condition). The Abyss is not an obstacle to the divine image. It is the structural condition under which the divine image can operate with genuine freedom. The perpendicular hiddenness is what makes the cathartic work voluntary rather than compulsory, chosen rather than imposed, and therefore genuinely moral rather than merely automatic.

Decussation is the evolutionary innovation that makes the Abyss structurally possible — the perpendicular hiddenness that separates the governing source from the governed recipient while maintaining the governance itself. It is shared with all vertebrates. It is necessary but not sufficient for the image. Every vertebrate has the perpendicular crossing. Not every vertebrate can choose to extend its conscious awareness across the threshold.

V. The Fourth Innovation: Prefrontal Cortical Expansion (~2–6 Mya)

The Cambridge Declaration on Consciousness (2012) established that 'convergent evidence indicates that non-human animals have the neuroanatomical, neurochemical, and neurophysiological substrates of conscious states along with the capacity to exhibit intentional behaviors' (Low et al., 2012). The 2024 New York Declaration on Animal Consciousness extended this further, finding strong evidence for consciousness in all vertebrates and a realistic possibility in many invertebrates (Andrews et al., 2024). Consciousness itself is not uniquely human.

What distinguishes the human brain is the proportional expansion of the prefrontal cortex — specifically the dorsolateral prefrontal cortex (the executive Sephiroth, Geburah and Chesed) and the anterior cingulate cortex (the gatekeeper, Tiphareth). The human DLPFC is the only cortical area with direct descending projections to all three brainstem monoamine nuclei (Arnsten and Goldman-Rakic, 1984; Arnsten, 2022). The left DLPFC has a unique tonic regulatory relationship with the subgenual ACC (BA25) that modulates dopamine release (Ko et al., 2008). The right DLPFC provides reactive deactivating governance of the threat-processing network (Balderston et al., 2024). The human thumb co-evolved with the neocortex, and the proportional thumb length correlates with neocortex size across 95 primates (Bardo et al., 2025).

The human prefrontal expansion provides the capacity for the cathartic work: the ability to extend the ACC's evaluative jurisdiction to encompass the hidden paths' ascending subcortical traffic. Other vertebrates have the hidden paths (the MFB, the ascending monoamine systems). Other vertebrates have the contralateral crossing (the Abyss). Other vertebrates have bilateral symmetry (the two pillars) and cephalization (the governing centre). But only the human brain has a prefrontal cortex developed to the point where the ACC can choose to extend its jurisdiction — where the soul can deliberately, voluntarily, through sustained contemplative practice, bring the

hidden governance within conscious awareness and participate in its own regulation.

The observation principle — the discovery that conscious evaluative awareness directed at projected mental content changes that content — requires a prefrontal cortex capable of sustained, voluntary, directed self-observation. The reconsolidation mechanism that allows overconsolidated traumatic memories to be modified requires the vmPFC's direct amygdala-inhibitory projections. The tonic thermostat that maintains the brainstem at optimal operating parameters requires the DLPFC's sustained descending excitatory drive. The bilateral regulatory governance that distinguishes terror from depression from rage from lust requires both the left DLPFC's proactive analytical control and the right DLPFC's reactive contextual control. All of this is specifically human in degree, if not in kind.

Prefrontal cortical expansion is the evolutionary innovation that makes the cathartic work possible — the capacity to extend the gatekeeper's conscious jurisdiction over the hidden infrastructure of the soul. It is the specifically human development within the vertebrate template. It is the fourth and final prerequisite for the image of God: not consciousness itself (which is widespread) but the capacity to direct consciousness at one's own hidden governance and choose to participate in it.

VI. The Complete Architecture: The Image as Four Layers

The image of God is not a single feature. It is a complete architecture — four evolutionary innovations accumulated over 600 million years, each building on the last, each contributing a dimension the previous innovations lacked:

Bilateral symmetry establishes the two pillars: the structural framework for differentiated lateral governance. Severity and mercy. Proactive and reactive. Tonic and phasic. Left and right.

Cephalization concentrates governance into a central head region: the middle pillar, the governing centre that integrates the two sides into coordinated action. Tiphareth between the pillars.

The perpendicular decussation hides each hemisphere from the side it governs: the Abyss, the structural condition for genuine autonomy, the hiddenness that makes the cathartic work voluntary rather than compulsory.

Prefrontal cortical expansion develops the governing centre to the point where it can voluntarily extend its jurisdiction over its own hidden infrastructure: the capacity for the cathartic work, the specifically human development that enables the soul to participate in its own purification.

Remove any one layer and the image collapses. Without bilateral symmetry: no two-pillar governance. Without cephalization: no integrated governing centre. Without decussation: no Abyss, no hiddenness, no autonomy, no freedom. Without prefrontal expansion: no capacity for voluntary self-awareness of the hidden governance. The image requires all four.

The image of God is a being that can see that it cannot see — and choose to look anyway. Bilateral symmetry provides the two sides. Cephalization provides the centre that looks. Decussation provides the hiddenness that makes the looking non-trivial. And prefrontal expansion provides the capacity to choose to look, to sustain the looking, and to be transformed by what the looking reveals. The cathartic work is the looking. The image of God is the architecture that makes the looking possible. Six hundred million years of evolutionary innovation, stacked layer upon layer, producing at the end a being that can know its own hidden governance and choose to participate in it. The rivers were hidden since the first vertebrate swam. The capacity to clear them is specifically, uniquely, human.

VII. The Four Thresholds: What Exists on Either Side

Each evolutionary innovation is a threshold. Understanding what the image of God is requires understanding what exists on either side of each threshold — what was gained at each crossing, and what remains for those who did not cross.

VII.1 — Before Bilateral Symmetry: The Radial World

The animals that lack bilateral symmetry are still alive today: jellyfish, sea anemones, corals, comb jellies. They possess nerve nets — diffuse networks of neurons spread throughout the body with no concentration, no directionality, no hierarchy. A jellyfish detects a stimulus and the signal spreads outward in all directions. There is no 'this side' and 'that side.' There is no front. The organism pulses, drifts, contracts in response to stimuli, but it does not go anywhere deliberately.

What radial animals have: reactivity. They respond to stimuli. They contract when touched. They capture prey that drifts into their tentacles. What they lack: directionality. They cannot pursue. They cannot flee in a chosen direction. They cannot differentiate their response based on which side the stimulus arrives from. Without bilateral symmetry, there is no binary choice architecture — no left-or-right, no this-or-that, no severity-or-mercy. There is only uniform radial response.

What bilateral symmetry introduced: polarity. A front and a back, a left and a right. For the first time, an organism could move toward something or away from something. The capacity to turn — to choose a direction — is the most basic form of agency. The radial animal drifts. The bilateral animal goes. Bilateral symmetry introduces the possibility of choice at the most fundamental biological level. The two-pillar architecture is the architecture of decision.

VII.2 — Before Cephalization: The Distributed World

Some bilateral animals lack significant cephalization — certain echinoderms (starfish, sea urchins) are bilaterians that reverted to radial symmetry secondarily, and some simple worms have nerve cords with distributed ganglia but no concentrated brain. Each segment of the body responds somewhat independently.

What non-cephalised bilaterians have: bilateral symmetry, nerve cords, the ability to move directionally, basic stimulus-response chains distributed along the body. What they lack: integration. There is no single centre where all sensory information converges, where competing inputs are weighed against each other, where a unified decision is made. The organism can move directionally but cannot deliberate — it cannot hold two conflicting inputs simultaneously and evaluate which should govern the response.

What cephalization introduced: a single point of integration. A head where sensory organs concentrated, where neural tissue accumulated, where the organism's first brain could receive inputs from both sides simultaneously and produce a coordinated, integrated response. For the first time, an organism could weigh competing priorities: food on the left, predator on the right, and a response that integrates both. This requires a centre. Without a centre, each side responds to its own inputs independently. Cephalization introduces the capacity for judgement — the evaluation of competing claims, the weighing of alternatives, the production of an integrated response that reflects the whole situation rather than just one side of it. The middle pillar is the pillar of judgement.

VII.3 — Before Decussation: The Transparent World

All invertebrate bilaterians — insects, worms, crustaceans, octopuses, spiders — have bilateral symmetry and cephalization but no decussation. Their left brain governs their left body. Their right brain governs their right body. The governance is direct, ipsilateral, transparent. Insects have complex brains and sophisticated behaviour. Octopuses are brilliant problem-solvers with enormous brains. The Cambridge Declaration acknowledges they may possess consciousness. These are not simple creatures. They can learn, remember, plan, and adapt.

What non-decussated bilaterians have: bilateral symmetry, cephalization, complex brains, possibly consciousness, sophisticated behaviour, learning, memory, and in some cases something approaching intelligence. What they lack: self-opacity. Their governance is direct. The left brain sees what the left side sees and governs what the left side does. There is no crossing, no hiddenness, no perpendicular separation between the source of governance and the recipient. The organism's nervous system is, in a structural sense, transparent to itself.

What decussation introduced: structural self-opacity. The condition in which the governing system cannot directly see what it governs, because the governance crosses a perpendicular threshold. The left hemisphere governs the right body through a crossing that neither side can directly perceive. This fundamentally changes the organism's relationship to its own governance. The non-decussated animal is governed directly and transparently. It has no freedom in relation to its own governance because it has no distance from it. The decussated animal is governed through a perpendicular crossing that introduces distance between the governance and the governed. This distance is the space in which freedom becomes possible — the space in which the soul can choose to extend its awareness across the hidden threshold or not. The Abyss is not an obstacle. It is the gift that makes moral agency possible.

VII.4 — Before Prefrontal Expansion: The Conscious but Unreflective World

All vertebrates — fish, amphibians, reptiles, birds, mammals — have bilateral symmetry, cephalization, and decussation. They all have the hidden paths, the MFB, the ascending monoamine systems, the contralateral crossing. Many are conscious. Some (corvids, great apes, cetaceans) are quite intelligent. They can learn, grieve, love, play, and plan.

What non-human vertebrates have: all three previous innovations, consciousness, the hidden paths, the autonomic regulatory infrastructure, and in many cases significant intelligence, social complexity, and emotional depth. What they lack: reflexive self-governance. The capacity to direct conscious awareness at their own hidden infrastructure and choose to participate in its regulation. A dog can be afraid — the Hiddekel flooding — but cannot observe its own fear as a projected state and apply source attribution. A chimpanzee can rage — both channels flooding — but cannot hold the rage in evaluative awareness and choose not to act on it through sustained contemplative effort. An elephant can grieve — the Euphrates disrupted — but cannot systematically rebuild the descending governance through practice.

What prefrontal expansion introduced: the capacity to govern the governance. To observe the hidden paths' ascending traffic, to evaluate the neuroceptive signal's accuracy, to hold the ascending flood in evaluative awareness without being overwhelmed, and to neuroplastically strengthen the descending regulatory connections through sustained, voluntary, repeated practice. The human prefrontal cortex does not just govern the body. It can govern the process of governance itself — and this recursive capacity (governing the governance, observing the observation, being aware of awareness) is what makes the cathartic work possible.

VII.5 — What Truly Sets Us Apart

Not our consciousness — fish are conscious. Not our intelligence — octopuses are intelligent. Not our social complexity — ants build civilisations. Not our tool use — chimpanzees use tools. Not our emotions — elephants grieve, dogs love, crows hold grudges. What sets us apart is the capacity to observe our own hidden governance and choose to participate in its restoration.

Every bilaterian has two sides. Every cephalised animal has a governing centre. Every vertebrate has hidden governance through the perpendicular crossing. Only the human being has the prefrontal architecture to extend conscious awareness across the hidden threshold and participate voluntarily in the restoration of what the fall desecrated. The image of God is not a feature. It is an architecture. And the architecture's purpose is not governance alone — every animal is governed. Its purpose is self-governance — the capacity of the governed to participate consciously, voluntarily, and deliberately in their own governance. That is the image. That is what was made. That is what fell. And that is what the cathartic work restores.

VIII. The Perpendicular Ontology Confirmed

The KEP framework's perpendicular ontology — the principle that the created order stands perpendicular to the divine ground, accessible at the origin-point of every coordinate system but hidden from the dimensional register by the perpendicular angle of their intersection — finds its biological instantiation in this four-stage sequence. Bilateral symmetry establishes the two axes (left-right, anterior-posterior). Cephalization concentrates governance at the anterior pole. The axial twist rotates the anterior pole perpendicular to the posterior body, producing the contralateral crossing. And prefrontal expansion develops the governing centre to the point where it can reflect on its own perpendicular hiddenness and choose to extend its awareness across the threshold.

The perpendicular geometry is not an abstract philosophical principle imposed on biology from outside. It is the structural logic of the biological architecture itself. The axial twist theory proposes a literal perpendicular rotation as the origin of vertebrate contralateral organisation. The craniocervical junction — where the horizontal brain meets the vertical spine — is the anatomical location of this perpendicular threshold. The Abyss is not a metaphor. It is the developmental location where the ancestral perpendicular rotation is preserved in every vertebrate embryo, separating the forebrain's governance from the body's reception through a crossing that is as old as vertebrate life itself.

The image of God is the architecture that can navigate the perpendicularity — that possesses the bilateral structure, the concentrated governing centre, the perpendicular hiddenness, and the prefrontal capacity to extend conscious awareness across the hidden threshold. The Catharturgy Corpus proposes that this is what 'image' means: not a resemblance in appearance but a structural correspondence in architecture. The soul is made in God's image because its architecture — built over 600 million years of evolutionary innovation — mirrors the structural relationship between the unlimited divine ground and its kenotic self-expression: a perpendicular relationship in which the source is hidden from what it governs, and what it governs can choose to extend its awareness back toward the source.

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