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A Neurocosmological Neurotheology Organized around Reissner's Fiber

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Abstract

Neurotheology is the study of the neurobiological correlates of religious experiences. A key problem for this nascent field is that interpretations of religious experiences range from a regression to the oceanic oneness of the womb to supersensory apprehensions of transcendent realities. Identifying appropriate subjects is therefore problematic. Correlating the complex array of neurobiological data obtained from neuroimaging, genetic analysis and lab tests with such elusive "religious experiences" offers little hope of scientific rigor. This paper proposes a new approach. Mystical traditions have consistently described a "subtle anatomy" organized around a circuit running through the center of the spine that connects the human and the divine. If descriptions of this circuit are based on actual interoceptions, then it corresponds to a little-known, epigenetically suppressed structure that ensheathes the central axis of the central nervous system; Reissner's fiber (RF). Rather than identifying subjects based on self-reporting and correlating their experiences with an array of neurobiological data, this new approach would regenerate the fiber, measure its activity and explore possible correlations with religious experiences.

Keywords: Neurotheology, Quantum biology, Subtle anatomy, Quantum mysticism

Abbreviations: RF: Reissner's Fiber; SCO: Subcommissural Organ; CSF: Cerebrospinal Fluid; MRI: Magnetic Resonance Imaging; PET: Positron Emission Tomography; CNSS: Circumneurocelic Sensory System; LSD: Lysergic Acid Diethylamide; AUB: Absolute Unitary Being

Introduction

Devil According to Baudelaire

Although RF has been conserved along all the branches of the 550-million-year-old chordate phylogenetic tree from amphioxus to *Homo sapiens* and occupies the most strategic location in the central nervous system, it has been neglected by neuroscientists. Two historians of neuroscience recently dubbed RF the "Devil according to Baudelaire" whose "loveliest trick" is convincing us that he doesn't exist [1].

For nearly fifty years after its discovery by Ernst Reissner

[2] in 1860, in spite of the fact that he distinguished "this cord from axons or irregular masses previously observed floating in the central canal," neuroscientists continued to mistakenly refer to it as an axon, cellular debris or an artifact of preservation. Porter Sargent, who observed the fiber 1899 while dissecting fish, was astonished that "so peculiar and conspicuous a structure as RF, which is of so great importance in the nervous anatomy as to persist throughout the vertebrate series, should have remained for forty years after its discovery so little known [3]". His neuroanatomical studies and behavioral experiments convinced him that the fiber is a novel, specialized pathway for the high-speed transmission of signals that

mediate an “optic reflex apparatus” for the “short circuit transmission of motor reflexes”.

Sargent concluded his 1905 paper by saying, “The conclusions and the discussion of the results and bearings of this research are reserved for the second part of this paper dealing with the higher vertebrates. This is already well advanced, and it is hoped will appear in about a year.” However, Sargent never published the second part of his paper. He abruptly abandoned his academic career and spent the next decade traveling the globe, “re-educating myself and others, studying and interpreting peoples, their arts and religions.”

For several years, Sargent’s hypothesis that RF is a novel pathway for the high-speed transmission of signals was generally accepted. In 1908, giving “greatest deference” to Sargent’s opinions regarding the fiber’s function, pioneering neurosurgeon Sir Victor Horsley undertook an investigation of RF in apes [4]. Owing to the fragility of the fiber and its elastic recoil, Horsley was able to examine it adequately in sagittal sections of the spinal cord in only one specimen of *Macacus cynomolgus*. He showed that the fiber lacked the structure of nerves and did not display Wallerian degeneration. He urged re-investigation of the fiber before dismissing it as vestigial.

While Sargent distinguished the “axons” that form RF from “ordinary axis cylinders,” described the fiber as a “highly specialized conduction path,” and contrasted the “very thin medullary sheath” surrounding the fiber with the sheath surrounding “ordinary nerves,” he nevertheless labeled the fiber as a coalescence of axons from various nuclei that project into the ventricles. Rudolph Albert von Kölliker, who, in 1898, coined the term axon, was more cautious. He was unable to decide if RF was an axon, an artifact of preservation, or a “crystallization of biological secretions [5]”. Electron microscopic studies show that the fiber is formed by the aggregation of glycoproteins secreted primarily by the subcommissural organ (SCO) [6].

The realization that the fiber is not an axon led to the rejection of Sargent’s hypothesis that the fiber is a novel, specialized pathway for the high-speed transmission of signals.

In 1910 Dendy and Nicholls proposed that the fiber is an elastic cord. Varying tensions of the fiber resulting from movements of the body are relayed to sensory cells in the SCO which in turn regulate those movements [7]. As the conceptualization of RF transformed from a

novel high-speed transmitter of signals associated with the visual system to an elastic cord, it became invisible to neuroscientists. Since new facts have come to light, the fiber has been hypothesized to play a role in the pathogenesis of hydrocephalus [8], “detoxification” of the cerebrospinal fluid (CSF) [9] and morphogenesis [10] [11]. Overshadowed by neuronal physiology, however, the fiber continues to be neglected.

Further contributing to the fiber’s obscurity is the fact that the scientific literature that does refer to the fiber usually states that it does not exist in humans. However, the fiber has been observed in a 15-week human fetus [12] and a successful immunoreaction against a proteinaceous compound secreted by the fetal human SCO has been performed [13]. Also, has been observed in a 14-year-old-teenager [14]. The SCO typically regresses during infancy, but a fully developed organ has been observed in a 60-year-old man [15]. The central canal typically occludes during childhood, but sometime persists into adulthood. Surprisingly, the occlusion is not the result of age-dependent degeneration, but of inflammation of the canal’s ependymal lining [16].

RF undergoes rapid post-mortem degeneration and soon becomes indistinguishable from the ground substance and cilia along the ventricular lining to which it adheres. Other rare anomalies, therefore, might have gone undetected. The words of the French investigator of RF, Etienne-Jules Legait [17] remain true today: “when its existence is denied, this fact should be carefully analyzed and discussed: one could not take it into account if fixation is uncertain”. Current neuroimaging using magnetic resonance imaging (MRI) or positron emission tomography (PET) lack sufficient resolution to detect the fiber.

Circumneurocelic Sensory System

RF is surrounded by a circumneurocelic sensory system (CNSS) along the walls of the third and fourth ventricles, central canal and terminal ventricle. While investigations of the sensory role of CSF-contacting neurons and circumventricular organs are still in their early stages [18],[19], similarities between the rods and cones of the retina and the hair cells of the inner ear, and the cilia lining the neurocele, prompted speculations that it might be an interoceptive sensory system more than 100 years ago. In 1913, Dimitri Tretjakov dubbed this system the “central sense organ [20]”. William Kolmer later elaborated on Tretjakov’s proposal, comparing RF to the gel- like tectorial membrane of the inner ear which

Table 1: History of RF.

Author	Contribution
E. Reissner, 1860	Discovered a refractive cord in the central canal of a lamprey different from axons or irregular masses previously observed.
K. Kutschin, 1863	Confirmed Reissner's discovery, naming it "Reissner's fiber."
L. Steida, 1868, F. Viault 1876, J.VRon, 1877, A.Sanders, 1878, 1894, and H. Gadow, 1891	Claimed that Reissner's fiber is an artifact
P. Sargent, 1899	Astonished that such a strategically located, evolutionarily preserved structured had been neglected, he undertakes an investigation and concludes that the fiber is a novel high-speed pathway for the transmission of optic reflexes. While contrasting the fiber from ordinary "axis cylinders," he refers to it as an axon.
R. Kölliker, 1902	After having coined the term "axon" four years earlier, he is unable to determine whether the fiber is an axon, an artifact of preservation, or a "crystallization of biological secretions"
A.Kalberlah, 1900, G. Streeter, 1903, L. Edinger 1908.	Reasserted the claim that the fiber is an artifact.
P. Sargent, 1905, C. Sherrington, 1906, V. Horsely, 1908	Sargent abruptly abandoned his research shortly before publishing his nearly completed paper on the significance of the fiber for higher vertebrates. Sherrington and Horsley accept Sargent's hypothesis and urge further research.
G. Nicholls, 1907	Nicholls begins an investigation of the fiber that leads him to conclude that Sargent was mistaken. He concludes that the fiber is an "elastic cord" that transmits varying tensions to regulate posture and movement.
E. Agdhur, 1922	RF is observed in a 14-year-old teenager.
V. Rele, 1927, T. Bernard, 1939.	RF is identified with the central axis of the anatomy described by kundalini yoga.
M. Enami, 1954	Discovers a branch of RF between the hypothalamus and the epithalamus which he characterizes as a "coalescence of axons."
K. Bonghan, 1960	Attempting to establish a neuroanatomical basis for traditional acupuncture, Bonghan claims that substances injected into the acupuncture point corresponding to the central axis of the acupuncture anatomy travel along a network of ducts to Reissner's fiber, which he renamed the "neural Bonghan duct."
K. Kohno, 1969, A. Castenholz, 1980, Woolam, 1980	Electron microscopy establishes that RF is an aggregation of 5-nanometer filaments that extend to the surface of the cerebral ventricles and central canal.
A.Ermisch, 1970	Showed that the fiber binds neurotransmitters
L. Wakahara, 1972	Showed that the fiber influences morphogenesis.
D. Woolam, 1980	Implicated the fiber in the pathogenesis of hydrocephalus.
L. Wile, 1991	Identified RF with the "silver cord" reported by near-death experiencers and proposes that disembodied consciousness and other varieties of religious experiences are related to quantum effects of the fiber.
G. Nicholls, 1907	Nicholls begins an investigation of the fiber that leads him to conclude that Sargent was mistaken. He concludes that the fiber is an "elastic cord" that transmits varying tensions to regulate posture and movement.

lies beneath Reissner's membrane. He named this novel sensory system the "sagittal organ [21]".

CSF-contacting neurons from the dorsal raphe nucleus, the site of action of lysergic acid diethylamide (LSD) [22], Annal Behav Neurosci, 1(1): 56-65 (2018)

the locus coeruleus, which innervates extensive areas of the brain [23], and opiate receptors surrounding the periaqueductal gray area [24] contact filaments projecting from RF [24]. Some CSF-contacting neurons are photoreceptors [25]. Afferent pathways from the

CNSS could have generated visual interoceptions of the “subtle anatomy.”

Exteroceptions from our external sense organs, and nociceptions, proprioceptions and interoceptions are generally assumed to determine our perception of the world and ourselves, the basis of consensual reality. However, RF’s stimulation of the CNSS could produce neural activity that is commensurate with the activity correlated with consensual reality and thereby create a new perception of reality.

Evolution

While the unique capacity of *Homo sapiens* to create an ever-expanding world of knowledge that liberates us from genetically programmed behaviors and even allows us to engineer our own evolution suggests an evolutionary leap, the neural correlates of that leap are unclear. Einstein [26] proposed that humankind’s first cognitive leap was the commission of the “metaphysical original sin,” the creation of the concept of physical objects independent of our stream of subjective sensations. The differentiation between sense impressions and “mere ideas,” upon which the positing of physical reality is based, cannot be logically justified, hence Einstein’s characterization of the creation of the concept of independently existing physical objects as a “sin”. This, in Einstein’s opinion, is necessary to avoid solipsism.

The road forward from the “metaphysical original sin,” required a leap from an analog to a digitized system of language around 100,000 years ago. Noam Chomsky proposes that this evolutionary leap resulted from a chance mutation that produced the neuroanatomical basis of language in “near perfect form”, planting a seed crystal in a supersaturated solution to create a digital infinity [27]. Given the fiber’s remarkably strategic location, the possibility that its current typical fetal regression mirrors its recent epigenetically induced evolutionary regression is an attractive alternative to the hypothesis that a chance mutation “planted a seed crystal” that created the digital infinity of language. Analyses of human epigenomes from the era in question could test this hypothesis.

Science developed from the desire for logical unification of “primary concepts”, concepts directly connected with sensory experience and propositions connecting them. Scientifically minded individuals created increasingly more unified systems from which this primary layer of complexes of sensory experience could be logically derived. The price paid for this logical

unity is that the deeper levels are increasingly removed from sensory experience. The originators of the earliest mystical traditions claim to have directly experienced ultimate unity beyond logic and sensory experience.

According to the theory proposed here, the originators of mystical traditions resisted the epigenetic suppression of RF. They learned digitized language and “heard” and “saw” the input from the fiber. They cognized deeper levels of language wherein the vibrations of spoken words and the geometry of written words were not merely arbitrary sounds and signs arbitrarily associated with sensations but were intrinsically connected to subtle levels of reality [28].

Standing before ancient Sanskrit, Chinese, and Hebrew scriptures without RF, we are like aphasics lacking Wernicke’s area. Not only have we lost the ability to comprehend the mystical levels of language, but without RF, we no longer perceive the realities to which they refer.

Reissner’s Fiber and the “Subtle Anatomy”

The notion that ancient mystics interocepted subtle neurophysiological processes responsible for supersensory perceptions that are just now becoming accessible to modern technology, has been almost universally dismissed by neuroscientists. The identifications of RF with the central axis of the “subtle anatomy” has been overshadowed by popularized accounts of the “subtle anatomy” based on loose associations with neural plexuses, glands, organs and genitalia, and obscured by the fiber’s role as the “Devil according Baudelaire”. Nevertheless, in 1940, Theos Bernard [29], after meeting with yogis, scientists and scholars in India, wrote in his book *Heaven Lies within Us*. Inside this central (Sushumna) nadi, the Yogi identifies an invisible nadi known in the West as the fibre of Reissner, but which is known here as Chittra (the Heavenly Passage, in Sanskrit). His identification was based largely on Sir John Woodroffe’s [29] translation of the *Shatchakra Nirupana* (“Description of an Investigation into the Six Bodily Centres”) from its original Sanskrit. The text describes three concentric “canals” within the Sushumna nadi, the Vajra. Chittra and Brahma nadis. The second verse states, “Inside the Vajra is Chittra. She is subtle as a spider’s thread”. Inside the Chittra nadi is the innermost nadi, the Brahma nadi whose entrance is described in the forty-eighth verse, as “extremely subtle and like unto the ten-millionth part of the end of a hair”. The later discovery that the several-micron diameter fiber is hollow is consistent with the identification of the Brahma nadi

with the canal running through the fiber [30]. However, RF as the Chittra nadi became the Devil according to Baudelaire disguised as a yogi peddling occult dreams.

In 1973, as a second-year medical student, I rediscovered the identification of RF with the innermost *nadis*. The fiber had played it devilish trick so well, that it was only after 18 months of an intensive investigation of the neurocele, under the guidance of Dr. Charles Loeser, Chairman of the Neuroscience Department, University of Connecticut School of Medicine, that I discovered the fiber by a fortuitous encounter with an article titled, "Studies concerning the function of the complex SCO liquor fibre [31]". It was not until 40 years later, following years of computer searches using various combinations of keywords coupled with RF that I learned of Bernard's earlier identification of the *Chittra nadi* with the fiber.

Shortly before our discovery of the fiber, while searching for the anatomical equivalent of the *Mooladara chakra*--a triangular region at the base of the spinal cord where the *Chittra nadi* coils--we had observed previously unreported circular clusters of cells surrounding the triangular terminal ventricle which are morphologically similar to secretory cells. These structures were later rediscovered and named the "intrapinal organ [32]". The function of the terminal ventricle remains unknown. RF coils in the piscine equivalent of the terminal ventricle [33], the urophysis, which secretes the hormone urotensin.

The "subtle anatomy" underlying Taoist mystical traditions, especially the governing and conception vessels that serve as central reservoirs of *Qi*, closely corresponds with the central *nadis* of yoga. Like the yogic anatomy, the anatomy underlying mystical Taoist practices such as Qi Gong and acupuncture as applied Taoism is generally dismissed as a misinterpretation of poetic metaphors based on primitive anatomical knowledge. However, recent investigations of the anatomical basis of acupuncture provide evidence that the governing vessel corresponds to RF.

In 1960, a North Korean scientist named Kim Bonghan [34] injected radioactive phosphorous (P^{32}) into acupuncture points on a rabbit's abdomen. He found that injections into these points followed meridians along a novel network of ducts. Injections into other sites dispersed. Injections into the acupuncture point corresponding to the Governing Vessel labelled a thread-like structure inside the central canal. Bonghan made no reference to RF and named the labelled structure the

"neural Bonghan duct".

Bonghan was praised by the North Korean government for discovering a "monumental theory in global science" and elevated to a high position in the government. However, amidst political intrigue and allegations that he'd withheld details of his methods he was discredited and banished. The scientific community dismissed Bonghan's findings for several decades. In 2005, neuroscientists "rediscovered" the network of Bonghan ducts and proposed that they act as optical channels for coherent biophotons [35]. In 2008, his team reported the discovery of a novel thread-like structure in the cerebral ventricles and central canal in a rabbit [36]. They claimed the "novel thread-like structure" they had observed was different from RF yet occupies the same space!

The Kabbalistic counterpart to the central *nadis* and the governing vessel is the central pillar of the *Sephirot*, the symbolic representation of the divine image in which man was created. Wary that anatomical descriptions of the human microcosm could lead to anthropomorphic conceptions of God, Kabbalists have traditionally interpreted the *Sephirot* in abstract psychological and spiritual terms. Nevertheless, Charles Ponce has proposed that the *Sephirot* represent a lost form of yoga [37]. His explanation of Kabbalah provides an unintended poetic allusion to the fiber:

There's an Adam within each of us, in exile from the Garden. The aim of Kabbalah is the restoration of the divine man in the medium of mortal man. We are the laboratory. If one can learn to connect the thread dangling free from the *Sephirot* with the thread of one's own being, one may begin the work of restoration.

Unlike the mystical traditions of India and China which developed yoga, acupuncture and Qi Gong, the Hebrew tradition focused on the moral laws of the Torah. Its anatomical secrets were lost. However, the miraculous fasts of 40 days and 40 nights by three key Biblical figures, Moses, Elijah and Jesus, who appeared during the Transfiguration of Jesus, is consistent with a functioning RF. The fiber's role in regulating salt and water balance, blood pressure and the biological clock could have averted electrolyte imbalances, hypovolemic shock and produced a state of suspended animation.

If near-death experiences are evidence of disembodied, mystical experiences, then perceptions of the "silver cord" might be a variety of an interoception of the "subtle

anatomy". As the brain's energy drains centripetally toward its phylogenetically ancient core, the CNSS might generate a percept of a virtual RF [38].

Reissner's Fiber and Quantum Biophysics

Ever since physicists encountered the mysterious borderland between entangled, immaterial quanta and material reality, it has been fertile ground for speculations about mysticism. Wolfgang Pauli called for "a synthesis embracing both rational understanding and the mystical experience of unity," that would be achieved when "natural sciences will out of themselves bring forth a counter pole in their adherents, which connects to the old mystic elements [39]". Erwin Schrodinger recommended, "a bit of a blood-transfusion from Eastern thought," but warned, "we must beware of blunders - blood transfusion always needs great precaution to prevent clotting. We do not wish to lose the logical precision that our scientific thought has reached [40]".

By the 1950's, however, quantum orthodoxy rejected mysticism [41]. While mystics claim that supersensory perceptions of absolute truth are possible, physicists hold that we must be content with "mysteries without mysticism [42]". The nature of quanta is beyond any perception or conception. We are, under currently known circumstances, denied perception of quanta because somewhere along the pathway to the occipital cortex that subserves visual perceptions, quanta probabilistically transition from quantum super positions to classical realities via collapse of the wave function, decoherence, or splitting into parallel universes.

This paper proposes that the identification of RF with the central axis of the "subtle anatomy" implies that perceptions of quantum coherences of the fiber could provide a way to go beyond "mysteries without mysticism" and achieve the mystic's goal of supersensory perception of ultimate reality. Werner Heisenberg stated:".

The use of classical concepts is finally a consequence of the general way of thinking. There is no use in discussing what could be done if we were other beings than we are [43]". The regeneration of RF, however, could make us beings other than us.

Weighing against this hypothesis is the long held conventional wisdom that quantum effects are negligible in the warm noisy brain. Macroscopic systems were long thought to exist only at temperatures near absolute zero such the Bose-Einstein condensate that was produced

in a vapor of rubidium atoms that was cooled to 170 nanokelvin in 1995. However, the recent discoveries of quantum coherences in photosynthetic systems [44], the retina [45], the avian compass [46], and new understandings of quantum feedback and control, suggest that non-trivial quantum effects in the brain are possible [47],[48]. RF is uniquely well-suited to implement the principles of quantum entanglement, coherence and information processing that are currently being harnessed by quantum technologies. Biophotons emitted by the fiber could stimulate photoreceptors of the CNSS whose signals would be analyzed by the brain which would send biophotonic signals to promote quantum coherences in a manner analogous to quantum cavity electrodynamic systems. Such promotion of quantum coherences could arise spontaneously from dissipative processes and enhanced by biofeedback.

The hypothesis that quantum coherences in RF can apprehend supersensory realities is similar to the hypothesis that quantum coherences in microtubules can apprehend mathematical truths existing in a Platonic realm [49]. However, because RF is a single, isolated, macroscopic structure unlike the trillions of embedded microscopic microtubules, it is much more accessible to measurements.

Contributions from Current Neurotheological Models

The long association of meditation and entheogens with religious experiences has provided neurotheologists with attractive subjects for investigations. Recently, Andrew Newberg has investigated advanced meditators with functional MRI and PET. Subjects reporting blissful unity, described as dissolution of the self and external reality, showed deafferentation of the posterior superior parietal lobules. Newberg, dubbed this experience "Absolute Unitary Being" (AUB), where "there are no competing versions of the truth; there is only truth itself [50]". However, AUB's nullification of the intellect and deafferentation of sensory is closer to a regression to oceanic feelings prior to the separation and individuation of the ego rather than transcendence of the ego. Nevertheless, if direct consciousness of RF or its interoception by the CNSS is central to religious experiences, then the deafferentation associated with AUB could promote such perceptions.

Fifty years after tumultuous proselytizing for the use of psychedelics to induce religious experiences, researchers have begun investigating these drugs using rigorous

scientific methods. Investigators at Johns Hopkins have concluded that, "Psilocybin can occasion mystical type experiences having substantial and sustained personal meaning and spiritual significance [51]". RF's intimate contact with the CSF-contacting neurons of the raphe nucleus that mediate the action of LSD provides an opportunity to explore the hypothesis that the psychotropic activity of entheogens is correlated with the energy of the highest molecular orbital rather than its antagonistic action on serotonin receptors [52].

The Road toward a Neurocosmological Neurotheology Organized around Reissner's Fiber

The road toward testing the hypothesis that RF is the "subtle anatomy" described by mystical traditions is long and difficult and travels along several converging paths. One hundred and twenty years after Sargent expressed his astonishment that such an evolutionarily conserved strategically located structure had been neglected, the fiber still plays the Devil's loveliest trick of convincing neuroscientists that it doesn't exist.

However, as quantum biophysical models of consciousness challenge the existing materialist paradigm that understands consciousness as an emergent property of networks of binary neural spikes, RF is emerging from the shadows. If consciousness is fundamental and coeternal with quantum fields, the fiber's 5-nanometer filaments are uniquely well-suited to serve as an interface between those fields and neural events.

Twenty years ago, my team of scientists led by Professor Vasili Kharchenko, Harvard-Smithsonian Center for Astrophysics and Harvard Physics Department, and Professor Alexander Sergienko, Department of Physics, Boston University Photonics Center, began searching for quantum coherences in the fiber. We have developed a novel micro-spectrometer to analyze biophotonic emissions from the fiber in living zebrafish larvae and similarly transparent adult zebrafish mutants (Caspar line) using the technology of correlated photon counting with superconducting single-photon detectors coupled to a time-correlated counting system with picosecond resolution. Our apparatus is equipped with femtosecond pulsed infrared lasers to perform photon echo-based experiments similar to those recently used to reveal the quantum mechanisms involved in light harvesting during photosynthesis. We have also begun searching for electron spin coherences using nitrogen vacancy diamonds. Thus far, the signal-to-noise ratio has been

too low to draw meaningful conclusions.

In addition to collecting data, we are developing mathematical models based on string theories. Because strings operate near Planck units of length, (10^{-35} meters), energies required to collect data astronomically exceed the most power particle accelerators. Because they interact with branes of higher dimensions in a in a cosmic landscape of 10^{500} parallel universes, they can accommodate almost any prediction. A condensate of strings running through the hollow core of RF could amplify the effects of strings to detectable levels. The ultimate identification of RF with the central axis of the "subtle anatomy" would be a translation of mysticism's core belief that we are a microcosm of the macrocosm into a neurocosmology in which the 1-dimensional thread running through the center of the fiber is commensurate with the initial cosmic singularity and the cosmos by applying holographic principles [53].

My team has also developed a transgenic zebrafish in which the expression of green fluorescent protein is under control of the promoter for F-spondin. F-spondin, a protein associated with the fiber, plays a key role in neurogenesis [54] and circadian rhythms [55]. It has been implicated in the pathogenesis of Alzheimer's disease because overexpression of f-spondin improves memory and reduces amyloid- β levels in mice [56]. We are also using confocal imaging techniques to better understand the terminal ventricle's glandular function.

Conclusion

RF eluded observation for thousands of years. During the 20th century, after a brief interlude in the spotlight, it played its role as the Devil according to Baudelaire. Now the fiber is poised to reveal its secrets. The possibility that interceptions and neuroimaging of RF can achieve a synthesis of empirical science and the original mystical experiences of unity is becoming a testable hypothesis as a neurocosmological neurotheology. The circumstantial evidence supporting the hypothesis is intriguing, but, thus far, insufficient to persuade the skeptic.

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