

The Paradigm of Parāvidyā-Aparāvidyā the Hindu Contribution to the Future Development of Science

I Ketut Donder^{1*}, I Gede Suwantana², Sudip Chakravortti³, I Made Pasek Subawa⁴, I Nyoman Witana⁵

^{1,2,4,5} Universitas Hindu Negeri I Gusti Bagus Sugriwa Denpasar, Bali, Indonesia; donderjyothi@gmail.com; suwantana@ubnsugriwa.ac.id; imadepaseksubawa@ubn.ac.id; inyomanwitana@gmail.com

³ Sidho-Kanbo-Birsha University, Purulia, India; sudip.chakravortti@gmail.com

*Corresponding Author: donderjyothi@gmail.com

Citation: Donder, I. K., Suwantana, I. G., Chakravortti, S., Subawa, I. M. P. & Witana, I. N. (2025). The Paradigm of Parāvidyā-Aparāvidyā the Hindu Contribution to the Future Development of Science, *Journal of Cultural Analysis and Social Change*, 11(1), 89-100. <https://doi.org/10.64753/jcasc.v11i1.3197>

Published: December 12, 2025

ABSTRACT

This study examines the *Parāvidyā* and *Aparāvidyā* paradigms within Hindu tradition and their contributions to the development of knowledge in the future. *Parāvidyā*, the highest form of knowledge that transcends the worldly aspects, offers a spiritual and ethical dimension that can enrich modern scientific approaches. On the other hand, *Aparāvidyā*, as worldly knowledge that focuses on understanding the universe, remains relevant in the context of technological and scientific advancements. This research integrates a literature review of classical Hindu texts and a discourse analysis on the application of these two paradigms in contemporary knowledge and technology development. The findings indicate that, although the two concepts focus on different fields, they complement each other and provide a holistic view in addressing global challenges such as climate change and technological progress. The *Parāvidyā-Aparāvidyā* paradigm offers a more balanced model of knowledge between material progress and spiritual well-being, which can promote the development of more ethical and responsible science. Thus, the Hindu tradition provides an important contribution to the future of knowledge by proposing an approach that integrates both worldly and spiritual knowledge to achieve sustainability and human welfare.

Keywords: Paradigm, *Parāvidyā-Aparāvidyā*, Hindu, Knowledge

INTRODUCTION

The positivist paradigm, based on the capabilities of the senses, drives humanity to compete (race) in developing science and technology to the highest extent, in order to satisfy the ego and dominate or conquer others. The competition to create weapons of war as highly destructive tools was carried out by advanced nations, resulting in the deaths of millions of people. This is the negative side of the progress of science and technology based on the positivist paradigm, which cannot be controlled by individual or state power. No human or nation, no matter how great, can control the negative effects of the positivist paradigm, which has been widely criticized by philosophers and thinkers. However, these criticisms have not been accompanied by an alternative paradigm to reduce the negative influences of the positivist paradigm. The presence of the holistic *Parāvidyā-Aparāvidyā* paradigm can serve as an alternative paradigm, or a paradigm of balance and comprehensive consideration, countering the absolutization of the positivist paradigm that has become the doctrine of science for so long.

The *Parāvidyā-Aparāvidyā* paradigm should become the method and fundamental foundation of every Hindu scholar's view and thought. This is because *Parāvidyā-Aparāvidyā* is a characteristic and way of thinking in Hinduism, rooted in the Vedas, which have been implemented since the Upanishadic period, around 600-200 BCE. The

Parāvidyā-Aparāvidyā paradigm is the framework or way of thinking in Vedic knowledge, grounded in knowledge that relates to the soul or spirituality (metaphysical) and knowledge related to the body, which is material (physical). The *Parāvidyā-Aparāvidyā* paradigm is explicitly stated in the Muṇḍakopaniṣat I.I.4. (*tasmai sa hovāca dve vidye vedītanīye iti ha sma yadbrahmavidō vadanti parā caivāprā ca* - The sage said: there are two types of knowledge or *vidyā* which are to be known as *parā* and *aparā* to know or serve the purpose of the Brahman. *Parā* is the higher and *aparā* belongs to the lower stage to achieve knowledge). Again in I.I.5 of Muṇḍakopaniṣat it is said that - the lower or *aparā* is the knowledge of the Rg-veda, Yajur-veda, Sāma-veda, Atharva-veda, phonetics, rituals, grammar, etymology, metrics, and astrology. But the higher or *Parā* is that by which the Imperishable (Brahman) is attained (*tatrāparā ṛgvedo yajurvedaḥ sāmavedo' tharvavedaḥ śikṣā kalpo vyākaraṇaṁ nirkṣaṁ chandojyotiṣamiti atah parā yā tadakṣaramadhigamyate*). Therefore, the knowledge related to the material world, scriptures, and rituals are known as *aparāvidyā* and the knowledge which leads to the realization of the eternal truth i.e., Brahman is termed as *parāvidyā*. From here we can extract the nature of both types of knowledge in this way: *Parāvidyā* is related to the soul and *Aparāvidyā* related to the body. This means that the Vedas, from their inception, have provided holistic guidance for human life, addressing the most essential aspects: the *ātma* (soul), which is intangible (metaphysical), and the body, which is tangible (physical).

It is indeed not easy to convince science experts about the *Parāvidyā-Aparāvidyā* paradigm, as they have adhered to the positivist paradigm, which has become a belief “almost like religion” for them. Even the positivist paradigm has long been a tradition within scientific institutions. Historically and practically, the positivist paradigm has been the standard of truth for about 180 years and is applied to all scientific systems. Thus, a specific scientific structure will only be recognized as valid and true knowledge if it is structured according to positivist scientific guidelines. Because this paradigm has been in place for centuries, it has become ingrained in the identity of scientists, forming the doctrine of scientific truth for both Western and Eastern scholars.

Therefore, the ideology of the positivist scientific paradigm has become the supreme judge of the truth of scientific knowledge, which has permeated the very core of scholars. The positivist scientific paradigm, which is considered the intellectual achievement of the West, has been passed down from generation to generation for at least two centuries and continues to this day. Thus, the effort to establish the Hindu scientific paradigm, namely the *Parāvidyā-Aparāvidyā* paradigm, may seem strange to many.

The positivist method assumes that natural and human objects move deterministically and mechanistically. Humans are more than just inanimate objects that move solely due to stimulus-response, cause and effect. According to Cassirer, humans are symbolic beings (animal symbolicum). Humans are the only beings that possess a symbolic substratum in their minds, enabling them to create a gap between stimuli and responses. This leads to the creation of symbolic systems such as science, art, religion, and language (Adian, 2002: 13). Based on Adian's explanation, it can be seen that although the positivist paradigm has led to rapid development in science and technology, many experts have criticized its negative effects.

The reason for using the holistic *Parāvidyā-Aparāvidyā* paradigm aligns with the growing trend in the West of adopting a new approach called the holistic approach. It is not only a reaction to the misuse of the axiologies of science and technology but also supports the postmodern view. Postmodernism rejects a singular truth, as there is nothing that can be seen as a single truth, because truth is perspective-based. It must be acknowledged that, methodologically, the positivist paradigm is easier to measure in terms of its truth because positivist truth uses the senses as its parameter or tool for measuring truth. The positivist paradigm is a materialist paradigm whose criteria for truth are measured physically, whereas the other side, which is metaphysical (behind the physical), is not the concern of the positivist paradigm.

Thus, it can be stated that the positivist paradigm solely deals with sensory truths that provide worldly or physical satisfaction, such as pleasure, joy, and transient well-being. The positivist paradigm does not deal with spiritual peace, whereas spiritually (*śānti*), peace is an essential need that must be obtained by everyone, as stated in the Mānava-Dharmaśāstra V.109 verse above. Therefore, the *Parāvidyā-Aparāvidyā* paradigm, as a holistic paradigm, must be introduced as an alternative paradigm. This is why this research is seen as highly significant and urgent to conduct.

METHOD

The method used in this research will combine qualitative approaches and text studies. This research will begin with an in-depth literature review of the concepts of *Parāvidyā* (the highest knowledge) and *Aparāvidyā* (worldly knowledge) in Hindu tradition, referring to key texts such as the Vedas, Upanishads (Upaniṣads), and Bhagavad Gīta (Śrīmadbhagavadgītā), as well as contemporary interpretations from Hindu philosophers and scholars. In this phase, the researcher will identify the relevance of both concepts in the context of modern scientific development and how they interact to create a holistic understanding of the world.

Next, the study will conduct discourse analysis on the application of Hindu views regarding *Parāvidyā* and *Aparāvidyā* in the context of contemporary science and technology. The researcher will gather data from various sources, including scientific articles, conferences, and interviews with Hindu philosophers and scientists, to explore how these two types of knowledge can contribute to the development of future knowledge. This research will also include a comparative analysis with the Western scientific tradition, to explore the potential synergy between the two in addressing global challenges such as climate change and technology ethics. Thus, this approach will generate new insights into the possible integration of the Hindu paradigm in addressing the needs of future science and technology.

DISCUSSION

To design a scientific paradigm according to the *Parāvidyā-Aparāvidyā* paradigm, the first and foremost understanding is that Vedanta views the physical material world and the metaphysical world as an inseparable unity that cannot be separated. As stated in the Aitareyopaniṣat I.1.1 (*ātmā vā idameka evāgra āsinnanyatkiñcana / sa ikṣata lokannu sṛjā itī //*), "It is only the Soul that truly exists at the beginning," and also the Chandogya Upanishad VI.2.1 states, "In the beginning, the whole universe is Brahman"; similarly, the Bṛhadāraṇyakopaniṣat I.4.1 (*ātmavedamagra āsītpuruṣavidhaḥ so'nuvīkṣya nānyadātmano'paśyat so'hamasmītyagre vyāharat tato'hamnāmābhavat tasmādapyetarbyāmantrito'hamayamityevāgra uktvāthānyannāma prabrūte yadasya bhavati sa yatpūro'smāsarvasmāsarvānpāmana auṣat tasmātpuruṣab oṣati ha vai sa tam yo'smātpūro bubbhūṣati ya evaṁ veda*) states, "In the beginning, this world is Atman."

Mavinkurve et al. (1995) state that Vedanta is the 'science of science,' or 'knowledge' is not something excessive, because some Western experts in the field of Quantum Physics also assert the same thing. However, many Hindu scholars are less concerned with this extraordinary teaching, as it covers both material and spiritual aspects. Humans, as a whole, consist of both material and non-material spiritual bodies. Therefore, *Parāvidyā* is a spiritual necessity that is inherent, and *Aparāvidyā* includes worldly needs, which are also inherent to humans. Everything material is related to the body, and everything spiritual is related to the soul or atman within the human body. Therefore, it is not an exaggeration to advocate for the holistic *Parāvidyā-Aparāvidyā* paradigm to balance the positivist paradigm, which has long dominated human needs. The Vedas provide all the kinds of knowledge humans need.

Gerald Heard, a Westerner, stated that Vedanta is a very scientific explanation of the laws that govern the universe. Dr. Kenneth Walker also stated that Vedanta is an effort to summarize all human knowledge and make the most of the human experience. At one time, Vedanta was religion; at another, it was philosophy, and at another time, Vedanta was science. Prof. D.C. Morgan, a renowned Western mathematician, without hesitation, stated that even the highest and farthest reaches of modern Western mathematics have not brought the Western world to the threshold of Vedic mathematics in ancient India. The recognition of these Western experts should serve as a foundation for Hindu scholars to feel no shame in claiming the truth, as it was the West that once dismissed the teachings of the Vedas but then reversed and highly respected and upheld the greatness of Vedanta. Thus, it is entirely reasonable for Swami Vivekananda to state, "The discoveries and creations of modern science sound only like a faint echo of the mighty roar of the lion of Vedanta." Hindu scholars should be proud to explore and disseminate the teachings of Vedantic truth (Vivekananda, 2001).

The teachings of the Vedas are known by the term, *sanātana* (meaning "eternal" or "everlasting"). For those who do not understand the Vedas properly, they may mock the term *sanātana*. The meaning of *sanātana* implies eternity, which consequently carries a flexible meaning, able to adapt to changes (Dasgupta, 1922). In the present age of digitization and growing literacy, people's thoughts are also evolving, seeking ways to explain things, including how to explain the process of learning and understanding personal progress in education.

Vedanta, Science, Spirituality, and the *Parāvidyā-Aparāvidyā* Paradigm

Hindu scholars have actually been involved since the beginning of humanity in building knowledge and technology. Unfortunately, the Hindu nation experienced colonization by foreign powers, which resulted in the knowledge possessed by Hindus being plundered and taken away by the colonizers, who then claimed it as the work of their own genius. However, as the *Aupaniṣadic mahāvākya* (great saying) states, *satyameva jayate nārtaṁ* (III.1.6 of Muṇḍakopaniṣat) ("truth will ultimately triumph, not false"), the reality today is that the Vedas continue to inspire scientists to uncover scientific truths that have long been hidden. In *kārika* number 9 of *Sāṁkhyakārikā*, there is a mention of the theory which is known as *sat-kārya-vāda* (*asadakaraṇāt ... satkāryam* – "This conception is based on a theory of causality known as the satkaryavada, according to which an effect is implicitly pre-existent in its cause prior to its production"). The verse number – 16 of Chapter -II of *Śrīmadbhavadgīta* speaks of that there is no existence of *asat* and there is no lack of *sat* (*nāsto vidyate bhāvo nābhābo vidyate sataḥ* "Of the transient there is no

endurance, and of the eternal there is no cessation.”). Swami Jitatmananda explains that the "curiosity" of the Hindu people, as Vivekananda observed, inspired them to discover the first rational cause behind the universe four thousand years ago: *na asato sato jāyate* ("Existence cannot arise from non-existence"). This "curiosity" of the Hindu mind soon developed into "bold analysis" and led to the development of "rigorous science" (Sharma, 2000). In his essay on the Evolution of India's History, Vivekananda spoke of the birth of analytical power in the Vedic rationalists, who boldly discarded even "the creator of the universe" as something irrational and sought the self-evolving causes behind the universe (Jitatmananda, 2006: 1-2).

Recently, with the advancement of information technology, it seems that Western nations, which once felt superior and believed only their own people were pioneers in human thought, are realizing the opposite. The Eastern or Hindu nations are often depicted as people who "enjoy nature" and are not accustomed to critical thinking. This view is entirely incorrect, as digital evidence shows that Western nations collected knowledge from the East, then reconstructed and claimed it as their own. If it were true that only the West used their brains, then Western nations would not have needed to travel to Hindu lands (India) to study Indian philosophy, yoga, and spirituality. It has become more evident that the West went to India because they were attracted to its knowledge, as many things that were not revealed in the West were actually found in the East (Zaehner, 1962).

In the West, Modern Science was born alongside the Greek people. They began investigating the mysteries of existence in the external world through knowledge. The Latin word *scientia* comes from the Greek root, meaning knowledge through "observation, identification, description, experimental investigation, and theoretical explanation of natural phenomena." The idea that Matter is the Highest Reality and that the universe is made of solid material called "*atomos*" or "atoms" was proposed by Democritus. The idea that only the objective world represents an undeniable truth emerged in the West from Aristotle and other Greek philosophers, such as Heraclitus and Parmenides, who stated that rational thought based on the objective, universal world could understand the Absolute Truth.

From the strong objectivity of the external world emerged the philosophy of logical positivism, with its predecessor Mach saying, "Science can be considered a minimal problem consisting of the most complete presentation of facts with as little mental effort as possible." Mach inspired scientists like Einstein to avoid anything related to thought, reasoning, or metaphysics when dealing with experimental methods—observation—inference, all of which were entirely based on the senses of traditional science. Most scientists in the 19th century accepted Democritus' atomic materialism and followed the "traditional monistic materialism," and the new religion of "scientific materialism began its journey of triumph," with four fundamental pillars: strong objectivity, strict causal determinism, local cause-effect relationships, and Epiphenomenalism, which claims that matter produces consciousness (Jitatmananda, 2006: 5).

For Vivekananda, Vedanta is identical to the Upanishads. He referred to Newton and Galileo as "the prophets of physical science" and the seers of the Upanishads as "prophets of spirituality." Vivekananda stated that ultimately, "the entire universe, both mental and material, will merge into one" (Vivekananda, 2012). Every branch of science, even Physics, in the physical world, will ultimately lead to the same goal as the search for truth in the spiritual realm.

Swamiji (Swami Vivekananda) entered the West in 1893, during the peak of the deification of Newtonian science, particularly in London. The more commonly known term among intellectuals at the time was 'scientific naturalism' or 'scientific materialism.' Charles Darwin's *Origin of Species* (1859), which established that men and women did not originate from Adam and Eve, but from monkeys, along with his subsequent writings, displaced the foundation of Christian natural theology. Millions of rational thinkers left the church or lost their belief in Christian theology. Many people became pessimistic and accepted God as Schopenhauer's "blind will." Others turned to Kant and sought solace in his doctrine that the highest reality is "unknowable and unknowable." Science seemed poised to eventually replace religion, and Darwin, a Quaker, was "almost canonized for his brutality in Westminster Abbey" (Jitatmananda, 2006: 6-7).

Vivekananda on the *Parāvidyā-Aparāvidyā* Paradigm

Vivekananda explained how the *Parāvidyā-Aparāvidyā* paradigm meets logical and rational standards. When explaining Patanjali's *Yogasūtra* on Rāja-yoga, Vivekananda adopted a truly rational and scientific approach to the experience of the super-conscious, which is often labelled as false mysticism or even witchcraft in the West. Yet, this experience remains the foundation of the world's major religions. Swami Vivekananda stated that in the teachings of Rāja-yoga, every person is a channel for the ocean of knowledge and infinite power that lies behind humanity (Vivekananda, 2012). He taught that desires and needs exist within humans, that the power of provision also resides within them; and that wherever and whenever there is a desire, need, or prayer fulfilled, the supply will come from its unlimited source, not from any supernatural being, but from within the human being itself.

It is very difficult to refute the supra-logical rational arguments presented by Swami Vivekananda, because that is the true truth. Therefore, the *Parāvidyā-Aparāvidyā* paradigm should have been implemented long ago so that

every human being could understand and feel their transcendence, enabling them to realize that all knowledge must also have a transcendent value, thus grounding human consciousness in the remembrance of God within oneself. Through the awareness of the divinity within, one can see and accept the divinity that exists in all people and all beings. This is the teaching of *tattvamasi* ("That Thou Are"). There is three parts in *tattvamasi*; a) tat, b) tvam & c) asi and it is found in mantra number – VI.VIII.7 of Chāndyogyopaniṣat. As long as humanity lacks the awareness of *tattvamasi*, which enables them to feel one with others and even with all creation, they will continue to reject unity with everything, as taught in Advaita Vedanta (Vivekananda, 1998). This is one of the advantages of the *Parāvidyā-Aparāvidyā* paradigm compared to positivism. It is not a matter of grandiose words, but the question is, if something helps people always remember God, is that something good or bad? Thus, the essence of the *Parāvidyā-Aparāvidyā* paradigm is to make its practitioners always remember God.

The Increasing Need for the *Parāvidyā-Aparāvidyā* Paradigm

Today, the *Parāvidyā-Aparāvidyā* paradigm is increasingly needed to provide enlightenment to the positivist paradigm, which has long been the judge of knowledge. Science, which has relied on the Cartesian-Newtonian framework based on the foundation of materialism, now requires a greener and newer field to advance in its search for reality, particularly in the realm of subatomic particles. In a presidential speech at the World Scientists' Congress held in Washington in 1973, Heisenberg stated: "What is truly needed is a shift in fundamental concepts to abandon Democritus' atomic materialism. We cannot rule out the possibility that, after some time, the themes of current science and technology will be exhausted, and the younger generation will turn to a completely different approach."

Materialism in Science and the Evolution of Atomic Theory

Followers of 'scientific materialism' assert that matter is the ultimate truth. Democritus considered atoms or *atomos* as the building blocks of matter. However, these atoms were found to break apart, and within them, according to Niels Bohr, electrons (discovered by Thomson in 1897) were thought to orbit around the atomic nucleus made of protons (discovered by Rutherford in 1911) and neutrons (discovered by James Chadwick in 1935). Protons, which were once thought to be stable, were later found to decay, with a half-life of 10^{32} years (Jitatmananda, 2006: 10).

In 1914, Einstein, through his discovery of the photoelectric effect, demonstrated that light waves also behave like particles. In 1924, Louis de Broglie showed, through his electron diffraction experiment, that not only photons but even particles like electrons behave like waves. Max Born expanded on this. The wave-particle duality of matter baffled scientists. Erwin Schrödinger, around 1925, proved that electrons are 'standing waves' that can also be quantized (Schrödinger's wave equation). The wave-particle duality still confounds scientists, and Einstein admitted that no one knew the true nature of 'quantized light.' Max Born added to the perplexing scenario, ultimately stating that electrons are not even real waves. They are 'probability waves,' a 'fully abstract mathematical concept that we cannot access' (Jitatmananda, 2006: 10).

For years, the atomic nucleus has split, giving birth to numerous sub-nuclear particles. High-energy particle physics has discovered over 250 such particles, some of which exist for only a few seconds (one particle second is 10^{-23} seconds). The shortest-lived particles are known as Resonances. "Resonance is a particle, but not an object. It is better described as an event, an occurrence, or an incident," says Prof. Fritjof Capra. Sub-nuclear particles are clearly multiplying, in what is known as the 'Particle Zoo,' with each particle interrelated, as shown in Feynman diagrams. Particles appear as dynamic energy patterns that are interconnected. In the final analysis, matter undergoes dematerialization (Jitatmananda, 2006: 10-11).

The Cartesian-Newtonian science, based on the foundation of materialism, now requires greener fields and new pastures to progress in its quest for reality, especially in the realm of subatomic particles. In his presidential address at the World Scientists' Congress held in Washington in 1973, Heisenberg stated: "What is really needed is a change in the fundamental concepts to abandon Democritus' atomic materialism... We cannot rule out the possibility that, after some time, the themes of current science and technology will be exhausted, and the younger generation will turn to an entirely different approach" (Jitatmananda, 2006: 11).

The Vastness of the Universe

The vastness of the universe has long astounded humanity, particularly scientists searching for the truth behind the cosmos. Arthur Eddington, the great English physicist, provided an image of our universe: "One hundred billion stars form a galaxy; one hundred billion galaxies form the universe. Our own galaxy, the Milky Way, contains around one hundred billion stars. This galaxy is so vast. Light, traveling at 300,000 kilometers per second, takes about 10,000 years to cross the Milky Way. However, the Milky Way is just a small dot in the universe we know. The smallest estimate that can support life is one percent. This means there are one billion such places in our own home galaxy; and with one billion galaxies within the reach of our telescopes, the observable universe should contain at least one billion places that could support life" (Jitatmananda, 2006: 17).

Arthur Eddington and James Jeans popularized this view among the general public, who until the early 20th century had only a limited view of our universe. Jeans suggested that the number of stars in the universe might be comparable to the total number of grains of sand on all the world's beaches (Jitatmananda, 2006: 17).

The Scale and Mystery of the Universe

Physicist John Wheeler tells us that the universe we know "is 13 billion years old, has a diameter of 26 billion light years, and is filled with galaxies, now estimated to number in the billions—just one of many possible trajectories of the universe crossing a giant super-space platform whose dimensions are not three or four, but infinite." Astrophysicist Fred Hoyle wrote in his book *The Nature of the Universe*: "No literary imagination could create a story that is one hundred percent as fantastic as the grim facts that have been revealed."

The mystery of black holes has prompted Oxford physicist Roger Penrose to write: "What is the nature of space-time at the Planck scale of 10^{-33} cm or 10^{-43} ? It has been suggested that quantum fluctuations in the gravitational field may result in a 'foam' of turbulence with various topological changes, where detailed quantum phase relationships could actually disappear at this level. One might imagine that phase relationships might indeed 'disappear in the foam' at such a scale... Another suggestion, from Stephen Hawking, is that, in the presence of a black hole, information about quantum states might be 'swallowed' by the hole, and in principle, become lost without recovery" (Jitatmananda, 2006: 18). Today, exploring the mysteries of this highly complex universe, both in the microcosm and macrocosm, has almost become a spiritual passion for physicists.

The Spiritual Quest of Modern Physics

In its current form, physics has evolved into a spiritual quest, consuming the entire devotion of scientists who find justification for human life in the pursuit of this pure knowledge. The sense of awe and respect before the unexplained mysteries of life and the unshakable human aspiration toward perfection creates a tragic impression of human existence. Nobel physicist Steven Weinberg, in 1979, expressed this idea like a writer of tragedy, such as Sophocles or Shakespeare: "The attempt to understand the universe is one of the few things that lifts human life a little above the level of farce, and gives it some of the grace of tragedy." The vastness of the universe inspired James Jeans to write: "The universe can be described, though still very imperfectly and inadequately, as something made of pure thought, thought about what, for lack of a better word, we should describe as a Mathematical Thinker." The philosophical outcome of Jeans' idea about the 'mysterious universe' is undeniable. According to Joad, "It is as though we have created a game for ourselves and set the rules, only to suddenly find that the external world conforms to the rules we have created... That the universe obeys the work of the mind, which has a kinship with our own minds" (Jitatmananda, 2006: 21).

Consciousness as the Most Prominent Feature of Life

The most prominent feature of life is consciousness. Every tree exhibits signs of awareness, and human conscious freedom—this is a fact experimentally verified by Indian biophysicist J.C. Bose in 1901. Since 1927, with the discovery of Heisenberg's Uncertainty Principle, it has been found that in the quantum world, subatomic particles like electrons, the presence of an observer or the act of observation alters the final result of an experiment. For the first time, it was realized that the 'experiment' itself is also a "participant" in the quantum world. The mind or consciousness of the experimenter, for the first time in the history of science, became a crucial factor in all scientific experiments in the quantum world. Today, many leading scientists, including Nobel laureates, have come to explore the vast and unmapped world of consciousness hidden within the recesses of the human mind (Jitatmananda, 2006: 27).

John A. Wheeler and the Role of Consciousness in Physics

Physicist John A. Wheeler believed that the term "observer" should be replaced with the term "participant." According to him, this change would radically redefine the role of consciousness in physics. Instead of denying the existence of objective reality, he further asserted that subjectivity and objectivity co-create each other. Both are "self-existing systems" and manifest through "self-reference." Biophysicist Lyall Watson humorously wrote in his book *Lifetide* about the truth discovered in quantum physics: "The experiment on electrons ultimately boils down to an experiment on the professor."

On January 25, 1931, *The Observer* published "An Interview with Max Planck" by J.W.N. Sullivan. In response to the question, "Do you think consciousness can be explained in terms of matter and its laws?" Max Planck replied that he did not. "Consciousness," Planck continued, "I regard as fundamental. I consider matter as a derivative of consciousness. We cannot be behind consciousness. Everything we talk about, everything we consider to exist, presupposes consciousness" (Jitatmananda, 2006: 28).

Wolfgang Pauli and the Interconnection of Matter and Mind

Nobel laureate physicist Wolfgang Pauli, famous for the Exclusion Principle, wrote in words that could easily be exchanged with those of a mystic: "From the centre of the inner self, the soul seems to move outward, in the sense of extraversion, into the physical world..." Pauli described the inseparable relationship between matter and mind: "For us... the only acceptable viewpoint seems to be one that recognizes both sides of reality—the quantitative and qualitative, the physical and the psychic—as something compatible with each other, and can embrace both simultaneously... It would be more satisfying if physics and the soul (i.e., matter and mind) could be seen as complementary aspects of the same reality" (Jitatmananda, 2006: 28).

Stephen Hawking's Reflections on Physics and Gödel's Theorem

Stephen Hawking recently commented in his lecture, *Gödel and the End of Physics*: "We and our models are both part of the universe we describe. Therefore, a physical theory, referring to itself, is like Gödel's theorem. Thus, one might expect the theory to be inconsistent or incomplete. The theories we have so far are inconsistent and incomplete" (Jitatmananda, 2006: 28-29).

George Wald on Consciousness

Regarding consciousness, Nobel laureate biologist George Wald raised a pertinent question: "But I know that I see. Consciousness reacts to light; so does the garage door that is activated by a photoelectric switch. Does a frog know that it is reacting to light, is it self-aware? Now the dilemma is, there is nothing I can do as a scientist to answer such a question."

Willard Penfield, the great Canadian brain surgeon, researched the location of consciousness. Many years later, he told his friend George Wald, "I'll tell you one thing: It's not in the cerebral cortex!" Eventually, in his book *Mystery of the Mind – A Critical Study of Consciousness and the Human Brain* (Princeton University Press, 1975), Penfield concluded: "Because, in my view, it will always be impossible to explain the mind in terms of neuronal actions in the brain, and because I believe the mind evolves and because computers (which are brains) must be programmed and operated by an agency capable of understanding independently, I am forced to adopt the proposition that our existence must be explained based on two fundamental elements... the mind and the brain as two semi-independent elements."

George Wald commented: "Essentially, it is nonsensical to think about finding phenomena that do not produce physical signals, the existence or non-existence of which—outside humans and similar beings—cannot be identified." However, beyond that, the mind not only cannot be found, it does not have a location. It is not something in space and time, it is immeasurable; therefore—as I said at the start of his paper—it cannot be assimilated as science. Yet, it cannot be dismissed as an epiphenomenon; it is the foundation, the condition that makes science possible. The essence of science is to bring deeper, more subtle aspects of reality to be recognized in our consciousness (Jitatmananda, 2006: 29-30).

Consciousness and Its Challenges to Biological Science

The problem of consciousness tends to embarrass biologists. As they consider it an aspect of living beings, they feel they must understand it and be able to tell physicists about it, though they have little relevant to say. However, physicists live with the problem of consciousness every day. The essence of 20th-century physics is the recognition that the observer cannot be excluded from observation; they are an intrinsic participant in it. To deny the mental aspect, according to Wald, is to "deny the wave nature of all elementary particles" for all matter. Here, Pauli again refers to Bohr's complementarity principle. Mind and matter are complementary aspects of all reality.

The Convergence of Modern Discoveries and Ancient Indian Thought

In his own way, Wald spoke of the striking similarities between modern discoveries and ancient Indian findings: "Let me say that it is not only easier to say these things to physicists than to fellow biologists, but it is easier to say them in India than in the West. Because when I speak about the mind pervading the universe, about the mind as a creative principle possibly primary to matter, every Hindu will agree, will think, 'Yes, of course, he is talking about Brahman.' The Jewish-Christian-Islamic God created the universal universe only once. Brahman thinks the universe and does so in cycles, in endless time. And as the Upanishads tell us, each of us has a share in Brahman, Atman, the eternal, indestructible, true Self. *Tattvamasi* – You are That! That is the essence of the universe, the essence of the mind; and yes, each of us shares in it" (Nikhilananda, 1949).

George Wald felt the need for laws to address consciousness and supported what Niels Bohr said years ago: "We must recognize that nothing can be found in physics or chemistry that has anything to do with consciousness, simply because we have it. Therefore, consciousness must be a part of nature, or more generally, of reality, meaning that, apart from the laws of physics and chemistry as established in quantum theory, we must also consider laws that are of a very different nature" (Jitatmananda, 2006: 30-31). Max Planck, in *Where is Science Going*, said: "Just as

a paleontologist reconstructs a long-extinct monster from its footprints, so does a scientist build his idea from the messages of consciousness" (Jitatmananda, 2006: 31).

Design and Construction Concept of the Tree and Building

Design and Construction is a tradition of translating ideas into the creation of something. This tradition of Design and Construction is commonly carried out by engineers in Architecture or Civil Engineering. The tradition of creating Design and Construction has developed into various activities to provide an initial depiction of something that does not yet exist but can be imagined to already exist through illustrations. Knowledge is initially abstract and can later become tangible. Similarly, the paradigm of *Parāvidyā-Aparāvidyā* represents the map of knowledge as outlined in the Vedas.

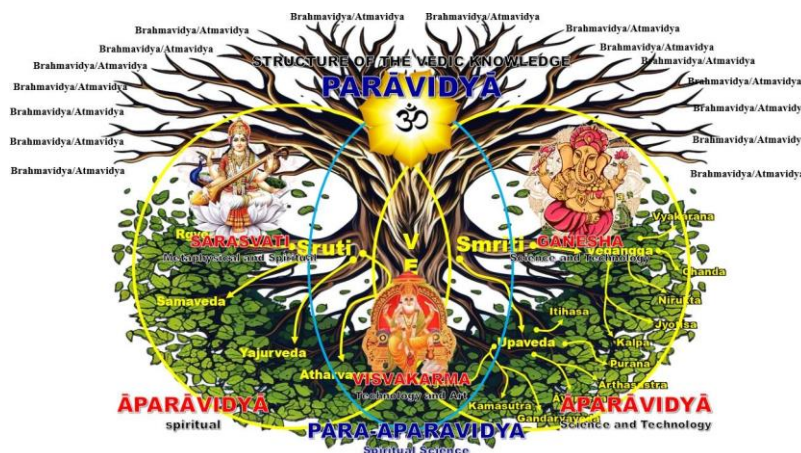
Design and Construction of Astadasa Vidyasthanam in the Tree Concept

The design and construction of all knowledge contained in the map (codification) of the Vedas can be represented in the concept of a tree or building, to depict which parts serve as the foundational pillars of that structure. What is meant by *Astadasa Vidyasthanam (aṣṭādaśa-vidyāsthāna)* in the Vedas is the structure of knowledge consisting of various types of knowledge, as described below:

Veda is *aṅgī* (Veda is the main body, all are included as the parts of the body or the Vedas): (1) Rigveda (Rgveda), contains mantras to praise and invoke various deities; (2) Samaveda (Sāmaveda), contains mantras of Rigveda (Rgveda) sung in musical rendition; (3) Yajurveda, contains procedures which adds to Rigveda (Rgveda) to perform worships and sacrifices; (4) Atharvaveda, contains mantras used in sacrifices to ward off evil calamities. *Aṅgas* of the Veda or *Vedaṅgas* (Branches of Vedas), (5) Shiksha (Śikṣā), the science of pronunciation, (6) Kalpa, procedures to perform Vedic rituals, (7) Vyakarana (Vyākaraṇa), the science of linguistics or grammar; (8) Nirukta, meaning of words together with etymology; (9) Chandas, the science of both Vedic and non-Vedic meters; (10) Jyothisha (Jyotiṣa): the science of astronomy and astrology. *Upa-angas* (Upāṅgas) (Sub-subsidiary aspects) are (11) Mimamsa (Mīmāṃsā), the science of deep understanding and inquiry; (12) Nyaya-vistara (Nyāyavistara), detailed study about the means of knowledge, (13) Purana, contains moral education from Vedas through stories, (14) Dharmashastra (Dharmaśāstra), comprises code of conduct, religious and legal duties. *Upa-Vedas* (Applied knowledge), (15) Ayurveda, the science of life; (16) Dhanurveda, the science of weapons and wars (Teknologi); (17) Gandharvaveda (Gāndharvaveda), the study of fine arts encompassing drama, music, dance; (18) Arthashastra (Arthaśāstra), treatise on wealth, public governance, military strategies.

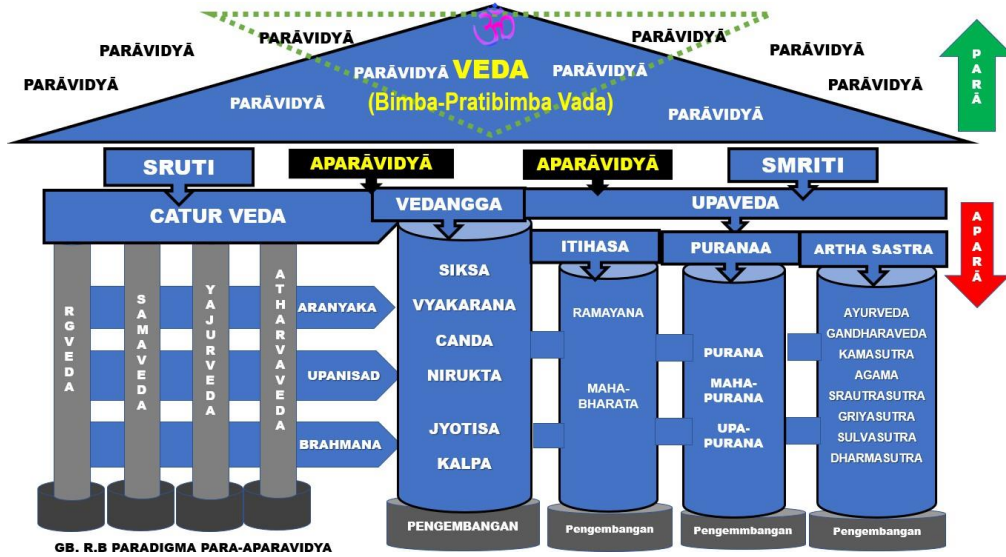
BRANCHES OF VEDIC KNOWLEDGE; 18 VIDHYASTHANAMS		
18 Vidhya-sthanams	1. Veda-angi (The main body, all Upanishads are included in Vedas)	1. Rigveda : contains mantras to praise and invoke various deities. 2. Samaveda : contains mantras of Rigveda sung in musical rendition. 3. Yajurveda : contains procedures which adds to Rigveda to perform worships and sacrifices. 4. Atharvaveda : contains mantras used in sacrifices to ward off evil calamities.
	2. Veda-angas (Branches of Vedas)	5. Shiksha : the science of pronunciation. 6. Kalpa : procedures to perform vedic rituals. 7. Vyakarana : the science of linguistics. 8. Nirukta : meaning of words together with etymology. 9. Chandas : the science of both vedic and non-vedic meters. 10. Jyothisha : the science of astronomy and astrology.
	3. Upa-angas (Sub-subsidiary aspects)	11. Mimamsa : the science of deep understanding and inquiry. 12. Nyaya-vistara : detailed study about the means of knowledge. 13. Purana : contains moral education from vedas through stories. 14. Dharmashastra : comprises code of conduct, religious and legal duties.
	4. Upa-vedas (Applied knowledge)	15. Ayurveda : the science of life (Sains untuk Hidup dan Kehidupan). 16. Dhanurveda : the science of weapons and wars (Teknologi). 17. Gandharva-veda : the study of fine arts encompassing drama, music, dance. 18. Arthashastra : treatise on wealth, public governance, military strategies.

(<https://ramprasadk.wordpress.com/2015/09/27/branches-of-indian-knowledge-18-vidhyasthanams/>, 30-05-2021)



Design and Construction of Astadasa Vidyasthana (*Āṣṭādaśā-vidyāsthāna*: Eighteen Sectors of Knowledge) in the Building Concept

Knowledge in Hindu teachings is called the Veda. The concept of the structure of knowledge in the Vedas is stated to be rooted in God, with the roots of knowledge reaching the sky, while its branches and twigs extend down to the earth. Therefore, the design and construction of knowledge is depicted like a tree, as shown in the image above. Below is an illustration of the Design and Construction of *Astadasa Vidyasthana (Āṣṭādaśā-vidyāsthāna: Eighteen Sectors of Knowledge)* in the form of a building, as follows.



The Design and Construction of Knowledge *Parāvidyā-Aparavidyā*

Sixty-Four Branches of Vedic Knowledge

Due to the vastness of Vedic knowledge, many scholars also find it difficult to organize it simply. As previously discussed regarding the Veda and its branches, this section also presents an explanation of the existence of sixty-four types of knowledge that have existed since ancient times, as stated: "64 ancient Indian knowledges" refers to the concept of "64 Kalas" in ancient India, which is a collection of 64 arts, skills, and fields of knowledge that cover everything from performing arts like music and dance to practical crafts such as cooking, gardening, and even aspects of warfare. Essentially, this signifies an individual who is knowledgeable and cultured, with mastery in various fields. Kalā means 'performing art' in Sanskrit. In Hindu scriptures, Shiva is the master of Kalā. In the Lalita Sahasranama, the goddess is invoked as the embodiment of the 64 fine arts. In some contexts, goddess Sarasvati (*Sarasvatī*) is also attributed with these 64 *kalās* and thus she is called Kalanidhi (*Kalānidhiḥ*) or Chausath Kalamayi (the owner of 64 *kalās*).

No	Name of <i>Vidyā</i> (Pengetahuan)	Rendering of Skills in English (Cabang Atau Ranting)
1	<i>Geeta (Gīta)</i>	singing
2	<i>Vadya (Vādya)</i>	playing on musical instruments
3	<i>Nritya (Nṛṭya)</i>	dancing
4	<i>Natya (Nāṭya)</i>	theatricals or matters related to drama
5	<i>Alekhyā (Alekhya)</i>	painting
6	<i>Viśhakacchedya (Viśeṣakacchedya)</i>	beautifying the various parts of the body with natural and cosmetic ingredients
7	<i>Tandula-kusuma-bali-vikāra (Tandulakusumavalivikāra)</i>	preparing various types of offerings from rice and flowers
8	<i>Pushpastarana (Puṣpāstaraṇa)</i>	decorating with flowers
9	<i>Dasana-vasana-anga-raga (Daśanarsanaṅgarāga)</i>	marking and designing with teeth-bite, cloths, limb, colour
10	<i>Mani-bhumika-karma (Mṇibhumikākarma)</i>	decorating with jewels or making ornaments with precious metals
11	<i>Sayya-racana (Śayāracaṇā)</i>	bed decoration
12	<i>Udaka-vadya (Udakavādya)</i>	playing with musical instruments in water

13	<i>Udaka-ghata (Udakaghaṭa)</i>	splashing with pots and other things in water
14	<i>Citra-yoga</i>	mixing of colours in paintings
15	<i>Malya-grathana-vikalpa (Malyagrathana)</i>	designing and preparation of garlands
16	<i>Sekharapida-yojana (Sikharapasthoyojana)</i>	designing the head and backrest
17	<i>Nepathya-yoga</i>	connecting and dressing in green room
18	<i>Karnapatra-bhanga (karnapatrabhanga)</i>	piercing the ear
19	<i>Sugandha-yukti</i>	application and use of perfume
20	<i>Bhushana-yojana (Bhuṣanayojana)</i>	setting and using ornaments
21	<i>Aindra-jala (Aindrajāla)</i>	glamorous attraction with magic
22	<i>Kaucumara (Kacumāra)</i>	art of beautifying and use of breast
23	<i>Hasta-laghava (Hastalāghava)</i>	freeing the hands
24	<i>Citra-sakapupa-bhaksya-vikarakeriya (Citraśakapupabhakṣyavikarakeriya)</i>	Making of delicious dishes to take as food
25	<i>Panaka-rasa-ragasava-yojana (Paṇākarasarāgasavayojana)</i>	preparing drinks and mixing colour and other ingredients
26	<i>Suci-vaya-karma (sucinādyakarma)</i>	decorative works related to needle and weaving
27	<i>Sutra-kerida (sūtrakṛda)</i>	making dresses things etc. and decorating with threads.
28	<i>Vina-damuraka-vadya (Vinaḍamarukavādyā)</i>	instrumental playing with harp, small drum etc.
29	<i>Prabelika (Prabelikā)</i>	intellectual and skilful in application of riddles
30	<i>Durvaca-yoga (Durvācakayoga)</i>	having profound knowledge to use and solve difficult speeches
31	<i>Pustaka-vacana: (Pustakavacana)</i>	ability in applying and memorising moral sayings
32	<i>Natika-khyayika-darsana (Nāṭikākhyāyikadarśana)</i>	witnessing and representing short drama and stories to bewitch others
33	<i>Karya-samasya-purana (kāryasmasyapūraṇa)</i>	solving the problems related to literary riddle
34	<i>Pattika-vetra-bana-vikalpa (pattikavetranavikalpa)</i>	act of making different types of cane materials, shields and arrows
35	<i>Tarku-karma</i>	works on spinning with spindle
36	<i>Takshana (Takṣaṇa)</i>	act of making material in form of wood working
37	<i>Vastu-vidya (Vastuvidyā)</i>	architect Engineering
38	<i>Raupya-ratna-pariksha (Raupyaatnaparikṣā)</i>	testing silver and gem and use the ornaments prepared from those
39	<i>Dhatu-vada (Dhātuvāda)</i>	techniques related to metals and stone
40	<i>Mani-raga jnana (Maṇirāgajñāna)</i>	knowing the quality and composition of valuable jewel
41	<i>Akara jnana (Akarajñāna)</i>	skill in mining and minerals
42	<i>Vrikshayur-veda-yoga (Vṛkṣāyurvedayoga)</i>	acquiring practical knowledge on vegetation, medicine, medicinal herbs and treatment use of them
43	<i>Mesha-kukkuta-lavaka-yuddha-vidhi (Meśakukkuṭalavakayuddhavidhi)</i>	process of battle with lambs, cocks and birds
44	<i>Suka-sarika-prapalana (Śukasārikaprapalana)</i>	husbandry, training and using male and female parrots
45	<i>Utsadana (Utsadana)</i>	body massaging process
46	<i>Kesa-marjana-kansala (Keśamājanakauśala)</i>	cleaning and combing hair
47	<i>Akshara-mushtika-kathana (Akṣaramuṣṭikakathan)</i>	process of verbal and verbal communication with physical gesture and posture
48	<i>Dharana-matrika (Dhāraṇamātrikā)</i>	knowing the process of using rings, amulets, brooches, periapts etc.
49	<i>Desa-bhasa-jnana (Deśabhāṣajñāna)</i>	Profound knowledge in geographical places, their characteristics and dialects

50	<i>Nirmiti-jnana (Nirmitijñāna)</i>	knowledge of prediction, understanding others and taking decisions
51	<i>Yantra-matrika (Yantramātrikā)</i>	having knowledge in machine, tools, mechanism and mechanical engineering
52	<i>Mlecchita-kutarka-vikalpa</i>	apt in dealing with fabricating and barbarous arguments
53	<i>Samvacya</i>	skilfulness in continuing conversation or dialogue with valid logic
54	<i>Manasi kavya-kriya (Manasikavyakriyā)</i>	ability in making instant verses or poetry in mind
55	<i>Kriya-vikalpa (Kriyāvikalpa)</i>	skilled in finding out alternative work, process or method to diagnose and solve a problem
56	<i>Chalitaka-yoga (Calitakayoga)</i>	well versed in using and applying memory to console others
57	<i>Abhidhana-kosha-cchando-jnana (Abhidhānakośacchandojñāna)</i>	knowledge of dictionary, lexicography and metres
58	<i>Vastra-gopana</i>	hiding process through and under the clothes
59	<i>Dyuta-visesha (Dyutaviśeṣa)</i>	specialised knowledge in gambling
60	<i>Akarsha-krida (Ākarṣakrīḍā)</i>	apt player in dealing with magnet or dice
61	<i>Balaka-kridanaka (Balakakrīḍanaka)</i>	well versed in making and playing with children toys
62	<i>Vainayiki (Vainayikī)</i>	crafty person to enforce anyone with disciplined humbleness
63	<i>Vaijayiki (Vaijayikī)</i>	power to attain success
64	<i>Vaitaliki (Vaitalīkī)</i>	mastery to convince others with brad, minstrel, magic, conjure etc.

These sixty-four skilful performances are included in *Aparavidyāvidya*. These are helpful and have practical usage to lead material life. Again, after the fulfilment of material urge, a man gradually steps to achieve the *Paravidyā* to attain the real truth (*sat*) and peace. As a sequel to this he put forward for ultimate liberation by means of *Paravidyā*. So, both are essential. But we must have the intellectual property in form of cognitive structure to muse and use *Parā* and *Aparā* for the sake of person, community, society, country and universe.

CONCLUSION

The paradigms of *Paravidyā* and *Aparavidyā* in Hindu tradition offer valuable insights for the future development of science. *Paravidyā*, as the highest form of knowledge that transcends worldly boundaries, provides a spiritual perspective that can enrich scientific approaches with moral and ethical dimensions. Meanwhile, *Aparavidyā*, which focuses on worldly knowledge, remains relevant in the context of modern technological and scientific advancements. Although these two concepts focus on different fields, they can complement each other in addressing increasingly complex scientific and global challenges, such as climate change and technological progress.

The integration of these two paradigms opens up opportunities to create a more holistic model of knowledge, one that not only prioritizes technical knowledge but also considers spiritual, social, and ethical values in scientific decision-making. This research also reveals that Hindu tradition can make an important contribution to the development of global science by encouraging a more balanced approach between material progress and the spiritual well-being of humanity. Thus, the future development of science can be directed toward achieving a better balance between worldly knowledge and spiritual achievement.

REFERENCES

- Dasgupta, S. (1922). *A History of Indian Philosophy, Vol. 1*. Cambridge: Cambridge University Press.
- Jitmanada, Swami, 2006. *Vedanta, Science and Spirituality*. Kolkata: Ramakrishna Mission.
- Mavinkurve ddk (penerj. Maswinara), 1998. *Spirituality and Science – The Turn of The Tide in Scientific Thought (Ilmu Pengetahuan dan Spiritual Berdasarkan Veda)*. Surabaya: Penerbit Paramita.
- Nikhilananda, S. (1949). *The Upanishads, Volume 1*. New York: The Ramakrishna-Vivekananda Center.
- Radhakrishnan, S. (1953). *The Hindu View of Life*. London: George Allen & Unwin Ltd.
- Sharma, C. (2000). *A Critical Survey of Indian Philosophy*. Delhi: Motilal Banarsidass Publishers.

- Vivekananda, S. (2012). *The Complete Works of Swami Vivekananda* (Vol. 1-7). Kolkata: Advaita Ashrama.
- Vivekananda, S. (1998). *Jnana Yoga: The Yoga of Knowledge*. Kolkata: Advaita Ashrama.
- Vivekananda, S. (2001). *Bhakti Yoga: The Path of Love*. Kolkata: Advaita Ashrama.
- Vivekananda, S. (2012). *Raja Yoga: The Path of Meditation*. Kolkata: Advaita Ashrama.
- Zaehner, R. C. (1962). *Hinduism: A Way of Life*. London: Oxford University Press.