



# SCIENCE & SPIRITUAL QUEST

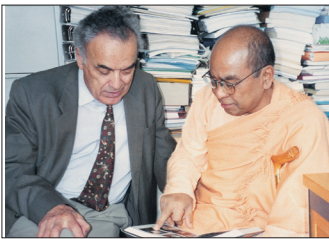
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आ नौ भद्राः कर्तव्यो यन्तु विश्वतोऽद्भ्यासो अपर्रीतास उद्भिदः । (RgVeda) *Let noble thoughts come to us from every side*

## Science-Spirituality Dialogue What Is That Internal Strength in Nature?



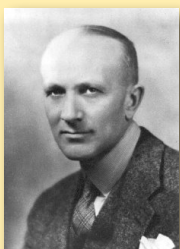
**A Discussion with  
Professor Werner Arber** (left),  
*1978 Nobel Laureate in  
Physiology or Medicine and  
Dr. T. D. Singh* (right),  
*Physical Organic Chemist,  
Founding-Director of Bhaktivedanta Institute*

**Dr. T. D. Singh:** You are trying to interpret Genesis of the Bible from a scientific point of view. This is a new approach in the search for the interface between science and spirituality and this approach may have a very important future in scientific research, especially in life sciences. ...

**Prof. Werner Arber:** Well, you know I have given some thoughts to spirituality, particularly in the context of my occupation, the field of microbial genetics and evolution. ...

The principle of duality of the functions of the genome is very important for me. I think that until recently no one thought that there are other genes than those helping your own life. I have the genes that are important for my own individual life as a multicellular organism. The same is true for plants and microorganisms. But we also carry genes that ensure a steady evolution of the populations of organisms. I find this is exciting from the philosophical point of view and is very important. Of course, we are aware that when genetic variants occur, they do so not as a direct response of some pressure from outside. They occur more randomly. We cannot see any scientific evidence that nature would do this reflectively. It is by natural selection, a concept introduced by Charles Darwin, that in the long-term the most appropriate life forms overgrow the less adapted organisms.

Now we could ask where and what is that internal strength in nature? Certainly, the products of evolution genes are involved, and the structure of matter, atoms, electrons and molecules has also some intrinsic potential for self-evolution and self-organization. I must confess that I don't know how. It must be this internal strength that allows for a steady evolution to occur towards higher complexity and biodiversity in various forms of life. ...



*"In spite of all these disquieting triumphs in the field of natural science, it's astonishing how little man has learned about himself, and how much there is to learn.*

— Wilder Penfield  
Neurosurgeon

To Know about Life, Matter, and their Interactions is called Knowledge

## INSIDE

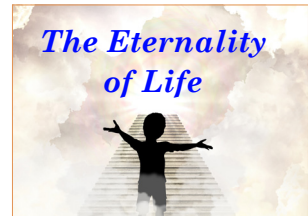
► *On the* \_\_\_\_\_  
**SHOULDERS of**  
**GIANTS** \_\_\_\_\_



**André Marie Ampère**

► **VEDANTA and**  
**— SCIENCE —**

*The Eternity  
of Life*



► **NEWS BIRDS**



**New Book Release**

\* *Tattvajijñāsā Vol-3*

\* *Scientist & Saint*

Whether you want to assign the evolutionary process to a divine force is, to my mind, a matter of philosophical definition of divinity. This is outside the reach of natural sciences. We are here at an interphase between the natural sciences and religious beliefs. Take the doctrine that all things are in God, referring divine causality. This doctrine can be consistent with an evolutionary process based on self-organization as seen by the natural sciences. ...

There is an important aspect of God that is omnipresent throughout the world. The divine spirit is impregnated in everything including natural processes. This divine influx must have an important role in the duality of the functions of the genome and thus in the evolution of life. ...

The high degree of flexibility and biodiversity encountered can stimulate respect for the results of biological evolution. It remains a matter of attitude to assign this to a divine influence that is all pervading. This is one aspect of God.

[Excerpt from the book, *Saojnanam* vol-5-6— *Scientific Exploration for a Spiritual Paradigm*, Bhaktivedanta Institute, Kolkata]

### On the Shoulder of Giants

André Marie Ampère  
(From *Physics to Metaphysics*)

André Marie Ampère was a French mathematical physicist who found the electrodynamics science. In his honor, we call Ampère or Amp, the unit of electric current; abbreviation: A. He worked in many areas of knowledge, including physics, mathematics, chemistry, language, philosophy and, metaphysics. Ampère also proposed the existence of a particle we now recognize as the electron; he discovered the chemical element fluorine and grouped elements by their properties—over half a century before Dimitri Mendeleev produced his periodic table. We can read Ampère's name among the 72 names engraved on the French Eiffel Tower in recognition for his contributions.

André Ampère was born on January 22, 1775, in Lyons, France. Unlike other children, André Ampère skipped the school. By the influence of Jean-Jacques Rousseau (*Emile*), his father, also a Jean-Jacques, believed that exposing children to a good library, and allowing them to choose their course through, provided a better education. On the other hand, his devout Catholic mother, saw that André Ampère received instruction in the faith. The complementary educations from his father and mother influenced Ampère's philosophy in science and fostered his deep involvement in metaphysics.

André Ampère grew up studying the thirty-volume Denis Diderot's *Encyclopedia*, Buffon's *Taxonomy*, and Descartes's *Philosophy of Science*. André Ampère taught himself Latin to study the works of Euler and Bernoulli. At thirteen, he wrote a treatise on "squaring of the Circle" and published his first memoirs, entitled "The Rectification of an Arc of a Circle, less than a Semi-circumference." By the age of 18, André Ampère had read the *Mécanique analytique* of Lagrange and worked through all the calculations it contains. His curiosity, exceptional memory, and gift for mathematics allowed him to become a teacher of physics, chemistry, and mathematics, even without formal education. In 1802, André Ampère accepted a position as professor of chemistry and physics at the Ecole



André Marie Ampère (1775 – 1836)

Centrale du Département de l'Ain. In 1804 he became an assistant lecturer in mathematics at the Ecole Polytechnique in Paris, and in 1815 was promoted to professor. In 1824, the 'College de France' elected André Ampère to the chair of experimental physics— which he held to the end of life.

André Ampère, rather a careless experimenter, nevertheless had flashes of insight and quickly understood the implications of observations made by others. Only a week after physicist Hans Christian Oersted published a memorable experiment showing the effect of an electric flow on a compass magnetized needle, André Ampère wrote the first of many papers that gave its complete theory. In an article in the *Annales de Chimie et de Physique*, in 1822, Ampère established the now well-known fundamental laws of electrodynamics and thus revolutionized the world of physics. Amazed by these works, James Clerk Maxwell expressed, Ampère personifies truly the "Newton of electricity."

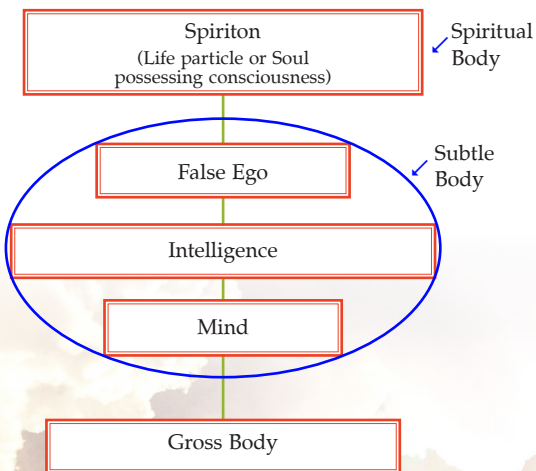
Throughout his life, André Ampère stayed a religious man and believed that he had proven the soul and God's existence. André Ampère seldom passed a day without finding his way into a church, and kept the rosary as his favorite form of prayer. He believed that the correspondence between God's reason, human reason, and the inherent rationality of the universe should make it possible to find the ultimate Truth. In his treatise, "*Essay on the Philosophy of the Sciences*," Ampère has written articles on: The Theory of Relations, The History of Existence, Subjective and Objective Knowledge, and Absolute Morality. He often contemplated the highest questions relating to the distinction between matter and mind, the existence and attributes of the human soul and God. He exclaimed, "... like the real movements of stars are hidden by the apparent movements, and that it is, however these apparent movements which make us discover the real movements; of even God is somehow hidden in His works; and it is by them that we ascend to Him, and that we even glimpse His divine attributes. He further says that, 'This road (examining the orderly universe) gives an incomplete picture of the attributes of its Creator and therefore, God has supplemented the human spirit (by opening to it), by the revelation, a second road that would lead him (the human spirit) to Him.' Thus, like many other pioneers of science, André Ampère's life and works point towards expanding the horizons of receiving knowledge and inspiring us to seek the ultimate truth beyond the physical reality.

## Vedanta & Science

### The Eternality of Life

According to the Vedantic literature, life stands sacred and eternal ((*Bhagavadgītā* 2.14). When the life particle interacts with the material elements, the different symptoms of material life—birth, disease, old age and death—manifest. The life particle, or spiriton, eternal, continues to exist even after death; just an event in the eternal journey of life, as the fundamental life particle, the spiriton, changes its external covering, the material body, from one birth to the next—no question of death for the eternal spiriton.

In the Vedantic paradigm, the biological system appears as an embodiment of subtle and gross bodies with the spiritual particle, spiriton within. The illustration below presents a model explaining the hierarchy of these bodies as enunciated in Vedanta. The life particle or spiriton possesses five fundamental qualities—*cetana* (consciousness), *svicchā* (free will), *sat* (eternality), *cit* (cognition) and *ānanda* (sublime happiness). The subtle body, consisting of false ego, intelligence and mind, just as a medium, reflects the consciousness of living entities in their actions carried out by the gross body. The gross body relates to the material body—five knowledge acquiring senses (eyes, ears, nose, tongue and skin), and five working senses (voice organ, legs, hands, anus and genitals). The five objects of the senses (smell, taste, form, touch and sound) indicate the interaction of gross and subtle bodies.



*Pure and uncontaminated life is said to be beyond matter. The meaning and purpose of life lies in the transcendental domain.*

At death, keeping aside the gross body, the spiritual particle (spiriton) carries away the subtle body; it will shift to another life form according to its *karma* (consequence of activity); the word reincarnation (or transmigration) of the soul (spiriton) express this principle.

According to Vedanta, pure and uncontaminated existence stays beyond matter. The meaning and purpose of life lies in the transcendental domain. In other words, consciousness, the integral feature of the spiriton, is not a product of matter. Vedanta further proclaims that we should use the human life, a rare gift from God, in searching for the science of eternal happiness and to find solutions to all the problems of embodied life. Since consciousness stay eternal (due to the existence of the everlasting spiritual particle namely spiriton), the purpose and meaning of human life is to find one's inherent position in the vast domain of existence; there, we can realize and felt eternal and sublime happiness!

Thus, the transcendental science of the spiriton and its inherent function, *bhakti yoga* (devotion to the Supreme Lord) represent the sublime essence of spirituality.

The *Bhagavadgītā* refers to this science as

*rāja-vidyā rāja-guhyam pavitram idam uttamam  
pratyakṣāvagamaṁ dharmyam su-sukhaṁ kartum avyayam*

“King of education, most secret of all secrets, it displays the purest knowledge; because it gives direct perception of the self by realization, it represents the perfection of religion joyfully performed and everlasting.”

It further enunciates, “The ultimate purpose of human life consists to find our real spiritual identity and our relationship with the Supreme.”

Therefore, a person endowed with the Vedantic understanding can live through the stages of old age with optimism, while preparing for his future journey. He can peacefully face death without any fear because of full knowledge regarding his real nature as a spiritual being (spiriton).

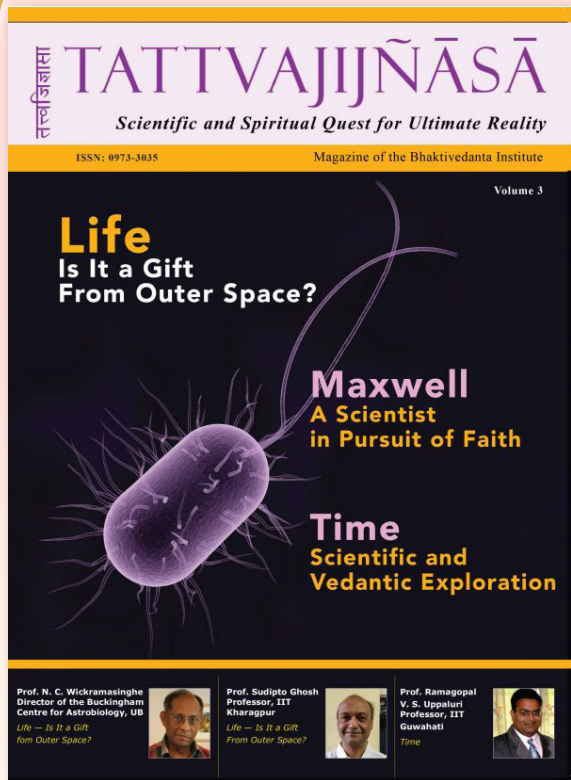
Excerpt from the book, *Vedanta and The Science of Aging*, Bhaktivedanta Institute, Kolkata]

*... the purpose and meaning of human life is to find one's constitutional position in the vast domain of existence where eternal and sublime happiness can be realized and felt.*



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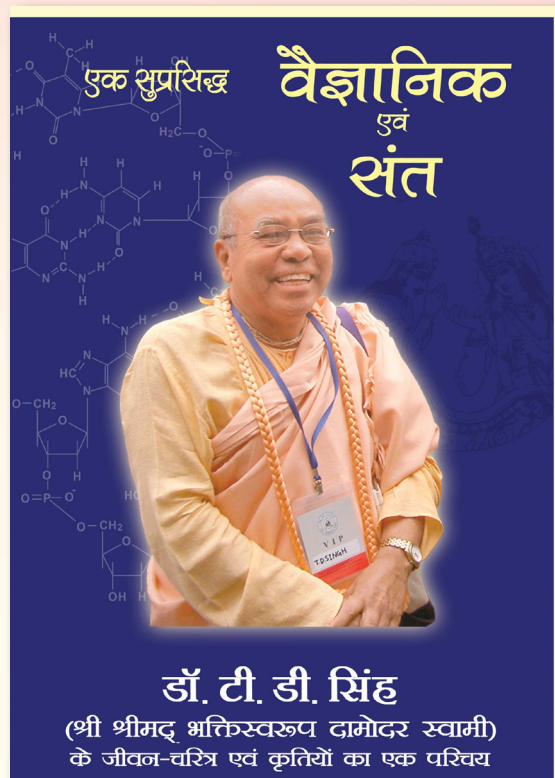
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डॉ. टी. डी. सिंह

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