



SCIENCE & SPIRITUAL QUEST

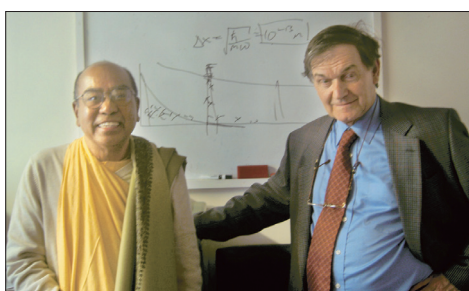
BHAKTIVEDANTA INSTITUTE

STUDENTS' EZINE

JUL-AUG 2022, ISSUE No. 58

आ नौ भद्राः कर्तवो यन्तु विश्वतोऽदृग्घासो अपर्रीतास उद्भिद्ः । (RgVeda) *Let noble thoughts come to us from every side*

Science-Spirituality Dialogue Big Bang Unexplained



A Discussion with
Sir Roger Penrose (right),
Nobel Laureate in Physics. and
Dr. T. D. Singh (left);
*Founding-Director of
Bhaktivedanta Institute*

Dr. T. D. Singh: Can you please comment on the future of the Big Bang Theory?

Sir Roger Penrose: Well, it seems to be very consistent with observations, and if you take Einstein's General Theory of Relativity seriously, then it's hard to avoid. It's both an observed feature of the universe as well as a theoretical one. You might also take the view, as some do, that there is a previous phase of the universe. Maybe there is a collapse and again there is a subsequent explosion. I have a lot of trouble accepting it, mainly because it does not fit with the second law of thermodynamics. One has an extraordinarily highly organized ordered initial state of the universe. Otherwise we wouldn't have the second law of thermodynamics. This law is a consequence of the fact that the universe is in a highly organized state and is subject to gradual degradation as time evolves. If you had a previous phase of the universe, which has collapsed to produce this one, you have an even bigger mystery. How is it that this highly organized state could have originated from a random like explosion? That argument doesn't seem to be very helpful. But it doesn't necessarily mean that. I think we just have to say that we do not know what laws became important at the time of the Big Bang, which have consequently produced this phase in which we find ourselves now. Maybe our present day physical notions are simply inappropriate or inadequate and we may have to talk about them in a quite different way in the future. But these things are all conjecture. We have no real idea. ...

Dr. T. D. Singh: When people are used to one type of thinking or paradigm, it is not very easy to change. Our Institute's journal, Savijnanam is sub-titled as *Scientific Exploration for a Spiritual Paradigm*. This suggests that paradigms are very hard to change. However, scientific paradigms are likely to be changed. Thus if we see discrepancy in a paradigm in the search for truth, we should change it to a better

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Report
Summer School 2022
A Glimpse



*Beneath the surface of life ... there are unsuspected
deeps and great spiritual forces which condition and
control our small lives.*

— Evelyn Underhill
Poet, Novelist and Mystic

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

paradigm. On the other hand, spiritual paradigm or timeless truth or -Absolute Truth or eternal truth should be unchanging.

Sir Roger Penrose: It is true. It is very much like that. It is also a challenge. When people learn about QM (Quantum Mechanics) at the university, they get puzzled, "Oh! How is that? I do not understand this" [laughs]. After a while they have to form some mental picture, which they are happy with or at least one that they are reasonably happy with. Then they go forward and pass their examinations and so on. Once they have got that state of mind, they just do not want to change that. It is always uncomfortable for humans to change their basic views. We are always very reluctant to do that. ...

[Excerpt from the book, *Savijnanam* vol-3-4 —*Scientific Exploration for a Spiritual Paradigm*, Bhaktivedanta Institute, Kolkata]

On the Shoulder of Giants

Blaise Pascal

Mathematics, Infinity and God

Blaise Pascal, a rare and extraordinary genius, contributed greatly to science and continues influencing us nowadays. He entered the history of natural sciences as a tremendous physicist and mathematician. Pascal's earnest yearning for truth led from science to metaphysics of divinity and God.

Blaise Pascal was born on 19 June 1623 at Clermont-Ferrand (France) with a feeble constitution. He suffered many pains and diseases throughout his life, yet he turned out to be a child prodigy, exhibiting great curiosity to know about everything. He observed the daily oddities of Nature, and puzzle over their justification. Sometimes Pascal designed his experiments to investigate and find a satisfactory explanation. His father, Étienne, taught him only at home and admired his extraordinary geometric skill. At the age of eight, Pascal junior solved Proposition 32 of Book I of *Euclid*, even without any prior knowledge of the subject. At the age of eleven, Pascal produced a small '*Treatise on Sound*,' and at twelve he had discovered the Pythagoras Theorem. This made him the talk of all Paris.

Admiring his creativity and originality of investigation, Pascal's father introduced him to the scientific circle; they met regularly at Marin Mersenne's, a French polymath. There, also attended many scholarly elites such as Pierre de Fermat, Desargues, René Descartes and Pierre Gassendi.

Blaise Pascal found great interest in the works of Girard Desargues on conic sections. When he was just sixteen-year-old, Pascal made considerable advances in this subject and published an article called *Essai pour les Coniques*, presenting the famous theorem, known as the Mystic Hexagram. In 1647, he produced an irrefutable proof of the vacuum existence and the variability of air pressure in *New Experiments on the Void*. In 1653, he wrote *A Treatise on the Equilibrium of Liquids*, the first complete system of hydrostatics and formulated the theory of hydrostatic equilibrium. Pascal's achievements in physics entitle him "hydrostatics and hydrodynamics founder." The SI unit for pressure, the pascal (*Pa*), is named in his honor. Along with Fermat, he laid the foundations for the probability maths. Among Pascal's striking inventions include, at the young age of 19, the calculating machine (Pascaline), syringe, hydraulic machine, barometer, and the omnibus (the first transport system in Paris). Such a famous mathematical genius and versatile inventor!



Blaise Pascal (1623 – 1662)

Pascal's favorite mathematical topic, geometry, led him to a deeper deliberation about ways of discovering unknown truths. He examined that notion such as motion, number and space include infinite largeness and simultaneously smallness. This contemplation of the double infinity led him to analyze the fragile splendor of human existence in the gigantic mathematical world. He learned that the scientific quest into the infinity problem surfaces out the limits of reason. Thus we become aware of learned ignorance. Pascal points out that this learned ignorance does not ask one to renounce more research. Instead, it makes us conscious that the object of contemplation—the infinite, cannot be experienced through the senses, nor can the intellect comprehend it yet its existence is recognized.

Pascal draws a striking parallel between mathematical infinity and the divine infinity: "We admit the existence of an infinite, and we do not know its nature. We know false the finiteness of numbers, and real the numerical infinity. But we do not know of what kind; it is untrue that it is even, or odd; for the addition of a unit does not change its nature — yet every number is odd or even. Thus we may well know that the God existence without knowing what He is."

Pascal shows us that faith or conviction in spiritual realities constitutes the journey one chooses to make by Divine grace and mercy. And the process eventually will illuminate the heart enabling him to witness the self-revealing Truth of God. Pascal introduces the first step toward belief in God in terms of his famous You should bet, or wager, on God because of what's at stake: 'you have lots to gain and not much to lose.' Thus Pascal believes God's existence may not be rationally proved but can be responsibly presupposed.

The *Provincial Letters* and *Pensées* represent Pascal's most celebrated works on spirituality, about God. Pascal observes that the man's handy tools in the quest for truth includes not just senses, reason and mind but also the heart where new horizons of knowledge are revealed. This revelation, gift of the divine, can be received by a submissive and sacred heart bathed in Divine grace. Pascal saw his lifelong illness as a blessing in disguise that urged him to ponder upon higher truths about life's meaning, purpose and God.

Thus, we witness that Pascal's life and works echoes these words of Francis Bacon, the founding father of Modern Science, "A little philosophy make the men apt to forget God, but depth of philosophy bring the man back to God again."

Vedanta & Science

Morality, Ethics and Free will

The spiritual field prescribes the moral code of living, identifies right and wrong actions, and recognizes the limitations of human intellect. It also suggests introspection and how to control the negative emotions of life like anger and passion for accumulation of worldly things. Religious study also provides the facility to meditate on the fate of human life after death. These are some of the traits that distinguish human life from other forms of life. In studying these different areas, the religious person always depends on divine mercy and the direction of God, the Supreme Being.

In the present time, many scientists do not accept this divine paradigm. Why is that? The religious person would say that we are all children of God and others will say that we are children of the cosmos. At least we can all agree that we are all in the same human family. Still we have different visions, beliefs and desires, and we see the nature of reality from different angles. We can say that it is the free will of the individual that allows him or her to choose a certain path.


Religion means the laws given by God. If one follows these laws, one is using one's free will properly and will make spiritual progress in life's journey. If one does not follow these laws, then one will suffer sooner or later in life. This concept is similar with the Newton's third law of motion, which states that for every action there is an equal and opposite reaction. There is also a statement in the Bible-"As you sow, so shall you reap". Similarly, if one is a chain smoker, most likely, he or she will get a lung cancer or some other ailment. On the other hand, if one practices prayer and meditation, one will get peace of mind and can earn wisdom to tolerate the extremes of life. Such an individual will

be concerned with the well-being of everyone and will do no harm to anybody else. This is the meaning of *ahimsā*. Mahatma Gandhi says, "Non-violence is the greatest force at the disposal of mankind. It is mightier than the mightiest weapon of destruction devised by the ingenuity of man."

At this time there are many organizations and much talk is directed towards the need for compassion, animal rights, protection of wildlife and endangered species and environmental and ecological balance, etc. Yet it is ironic that at the same time we daily kill millions of innocent animals, birds and fish just to satisfy our tongues. Such activity is a misuse of our free will and intelligence. Today misdirected science seems quite ignorant about such moral and ethical laws, the tenets of religion.

Both science and religion are dedicated to the search for truth and human happiness. Our free will should be utilized properly to achieve these goals. Religion has its moral codes of conduct given in all the revealed scriptures. Although religious fanatics may misinterpret some of these scriptural injunctions and may act sometimes in a very irrational and unreasonable way, a truly religious person will abide by these guidelines in a more realistic and practical way. Science, however, does not have its own ethics as yet. But, scientists also need ethical guidance. In this connection we can mention Einstein's statement, "But science can only be created by those who are thoroughly imbued with the aspiration toward truth and understanding. This source of feeling, however, springs from the sphere of religion." In other words, religious and spiritual wisdom can help in framing the moral and ethical codes of science. Thus science and religion should be complementary and mutually dependent upon each other in all human enterprises.

[Excerpt from the book, *Thoughts on Synthesis of Science and Religion*, Bhaktivedanta Institute, Kolkata]



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Book

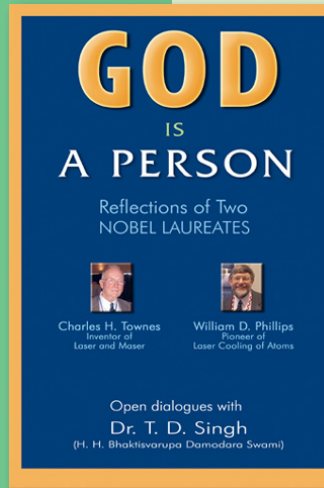
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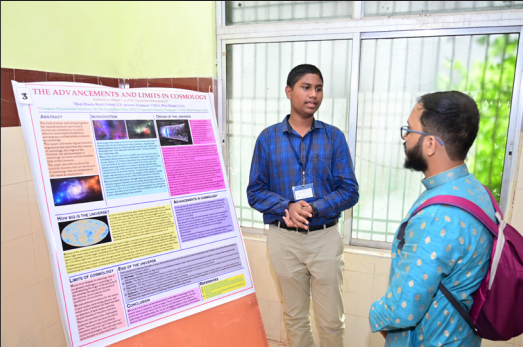


Open reflections of 2 Nobel Laureates: Charles H. Townes, inventor of laser and maser, & William D. Phillips, pioneer of laser cooling of atoms.

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