

सविज्ञानम् SAVIJÑĀNAM

Scientific Exploration for a Spiritual Paradigm

Vol. 8

2013

Consciousness,
Environmental Ethics and
Science-Religion Dialogue

A Dialogue with Holmes Rolston III,
Professor of Philosophy and Templeton Laureate

Why I (Still) Believe in
Free Will and Responsibility

David Hodgson, Judge of Appeal of
the Supreme Court of New South Wales,
Australia

Towards a Dogma-free Science:
The Restoration of Creative
Intelligence

Amit Goswami, Quantum Physicist

Consciousness: Scientific
and Vedantic Perspectives

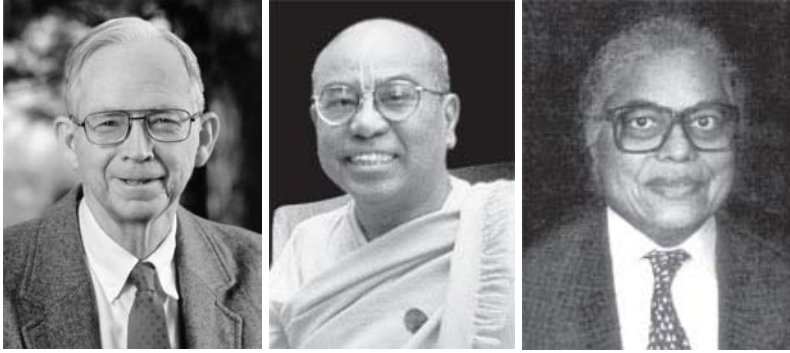
T. D. Singh, Physical Organic Chemist

Scientific Exploration for a Spiritual Paradigm



Journal of the Bhaktivedanta Institute

**CONSCIOUSNESS, ENVIRONMENTAL ETHICS
AND
SCIENCE-RELIGION DIALOGUE**



A Dialogue among

Prof. Holmes Rolston III

Templeton Laureate and
Professor of Philosophy at
Colorado State University,
USA

Dr. T. D. Singh

Founder-Director,
Bhaktivedanta Institute,
Kolkata, India

Prof. J. N.

Srivastava

Statistician, Colorado
State University

held at Fort Collins, Colorado, USA on 19th May 2003

T. D. Singh (Henceforth **TDS**): Congratulations for your Templeton prize!

Holmes Rolston (Henceforth **HR**): Thank you! It came as a surprise; life sometimes has surprising moments. With his Foundation, John Templeton has indeed done a number of pioneering researches and discoveries.¹

TDS: I saw you for the first time at the conference on Science and Spirituality that took place in Bangalore, India.²

HR: Yes, Templeton wanted the events to be more international. So he deliberately had those in India and in Japan among other countries in Asia. One was in Paris, and I also went to one in Spain.

TDS: In Bangalore, we saw a large number of Indian scientists participating in the conference. It is a good sign for India because India is becoming materialistic, and religious wisdom is often neglected.

HR: Every viewpoint is supposed to have always been in India. There were also materialists in the past in India.

TDS: One of the things I'm favorably impressed with is that nowadays there are many well known scientists talking about the nature of consciousness, the nature of free will, and freedom. Some say we need a new science. Some scientists admit we have free will and others admit we have consciousness, but they can't explain that with the modern scientific tools we have. They say we need a new science. To me that new science means we have to bring spirituality within the modern scientific framework. In that way the science and spiritual traditions need to be combined together.

HR: I think neuroscience has made enormous advances, so we've got accounts now of how the cells work; that are marvelous accounts. But one thing does strike me. I sat in a neuroscience class here at the university a year or two back. It strikes me that there's nothing at all in that theory which deals with how it is that conscious experience appears to be with and under all the molecular activity. So, there isn't any good theory about where and how consciousness emerges.

The behaviourists³ all would like to stay out of the question of the mind in that sense. But I guess a lot of psychologists see behaviorism as too incomplete, or partial. Neuroscience is where a lot of action is and we get really good details about the electrical circuits, how the ions flow across the cell wall this way and that way. But nothing there suggests how it is that this felt experience appears,

So, there isn't any good theory about where and how consciousness emerges.

— Rolston

or the capacity to experience and reflect fear or such things as being sorry or sad or something being funny or whatever. All these kinds of everyday experiences are a long way from having any adequate account.

TDS: It seems to me that we have not come to any understanding about the study of the mind. Some people think that the mind is a product of the brain function. So this question remains, even after having been repeatedly studied in various fields like physics, philosophy, etc (see figure 1). I think it is rather a stumbling block within this brain and consciousness study.

HR: Yes, it is. It's very much as you put it, a stumbling block. To give an adequate account of the relationship of the mind to the brain or to the body is a very tortured debate. I don't think we have any adequate account.

Prof. Srivastava⁴: Does the mind perceive them or is the mind a result of their interactions?

HR: Well, the kind of mind which we experience as human beings, I do think is a result of brain function. If you're out and see a dog or if you see a wolf, they have different brains and they have different kinds of experiences, some of them are similar, but dogs have a sense of smell that's very different from ours. And I think that the kind of experience of which we are capable is related to the kind of brains that we have. So yes, I would like to say that mind in the human form is related to seeing and tasting, and we have color vision, smell. So the kinds of thoughts that we have are made possible by the interactions between our cognitive capacities and our perceptual capacities; and if we had another kind of brains, our thoughts would certainly be different. I think wolves, dogs and birds have different kinds of experiences because they have different kinds of brains.

The thing about the human brain that is different, however, is that we can be scientists, we can be cops or priests or whatever, and then we have in our mind a capacity to get broader or universal truths. So scientists can work out, let's say, the Pythagorean theorem, or Einstein can work out the theory of relativity, relating mass to energy. We do that with a human mind, not every mind is capable of doing that, but at least there are some human minds that can do those things.

Now it seems to me that humans have an access to more universal or global insights into the way in which the world is rationed or structured/constructed. At that point I would say it may well be that humans with their minds are detecting the mind of God, detecting a deep rationality that is in the nature of things. Then

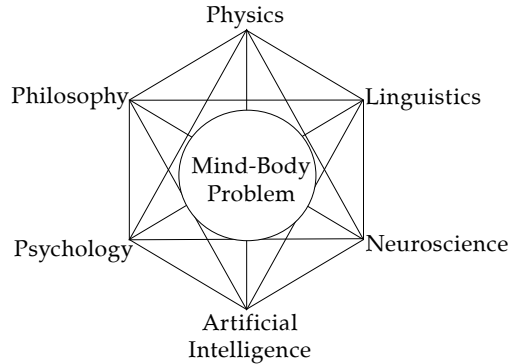


Figure 1: Integration of various fields in scientific study of the mind and its processes

... we have in our mind a capacity to get broader or universal truths. ... humans with their minds are detecting the mind of God, detecting a deep rationality that is in the nature of things.

— Rolston

I can begin to connect up with a super mind or a cosmic mind. Then I'll begin to be metaphysical and to have religious feelings about a divine mind that is within and under the order of the universe. I am a monotheist, I do think that God created the world, and the attributes of the divine mind are incorporated and embodied in the rationality of the world and its beauty.

TDS: The Vedantic tradition reveals that the different living beings – be they mammals, birds, insects, etc. – have different brain capacity. This is definitely true. Therefore for humans it's also different; and undeniably, brain is regarded in our tradition as an instrument that actually carries whatever function the mind wants to do. Mind is not regarded as a brain function in our Vedantic tradition. Rather, mind is regarded as an element, a separate element, that constitutes the subtle body, along with the power of discrimination (called intelligence) and the identification with the body (called false-ego); these three elements are called the subtle elements.⁵ Mind is not regarded as an ordinary element. It has the capacity to switch on either to the spiritual side or to the material side, according to the situation. For example, if I am sick and I like to pray, I'm

Mind is not regarded as a brain function in our Vedantic tradition.

— T. D. Singh

praying for the blessings of the Lord. When I pray like this, some kind of good feeling is relieving me, maybe some blessings are coming from the Lord. Many patients are feeling better in this way.⁶

But then some people argue that this feeling good has nothing to do with spirituality or some higher source. It's depending on the nature of the development of the individual. If this individual is spiritually oriented, the mind switches on the spiritual side, then he connects with the divine source, he appreciates the presence of the divinity, thus he can explain, I feel good because of the presence of the divine. On the other hand the person who is not so tuned to this type of consciousness, may just switch to the bodily side, the material side, and he might not have the mind connected to this good feeling.

So our Vedantic tradition says that the mind is a separate element that exists as a part of nature. This could be an interesting field of research for modern scientists. It seems to me that unfortunately there is a gap, or a barrier, between Western thought and Eastern thought, in the context of science and religion. Although historically philosophers and psychologists have studied about the mind, in this present scientific age, it seems it would be very appropriate to study more about this property of the mind in a scientific way.

HR: You should apply for a grant from Sir John Templeton's Foundation! He wants research into spiritual realities.

TDS: Do you also see it as a reasonable conception? Because in the West, sometimes the mind is identified as the soul.

HR: Yeah, there's a soul. When I die, I believe, I hope that my self, my mind, my soul, if you like, my personality, will survive death and will go to heaven; that who

I am can survive the destruction of my body. So in that sense, yes I believe that there is something like what is traditionally called a soul or spirit. I believe that, but I don't have much experience, so it's hard for me to say what it would be like to be a mind that had no ears and no eyes, had no taste and had no smell. I don't have much idea of what that might be. In the Western Christian tradition, the picture is that people die, go to heaven and play the harp or something.⁷ They go through gates made of pearls and gold. They play the harp and they wear white robes. But that's mostly poetry, I think, and metaphor. If you ask me what it would be like to be a disembodied mind, I guess my answer is I don't know.

... our Vedantic tradition says that the mind is a separate element that exists as a part of nature. This could be an interesting field of research for modern scientists.

— T. D. Singh

TDS: In the Vedantic tradition it is said we also have a spiritual body. Now we have this *yantra* (instrument), material body. Similarly, there is a spiritual body, that has spiritual ears and spiritual eyes.⁸ Therefore when we leave this body, when we die, we don't lose our identity, our sense of identity; we only become better once we are free from this material conditioning. We have this material body so there is also a spiritual body. So in this way there is a spiritual mind like there is a material mind. In this way there is an evolution, we are making progress in life's journey.

HR: But I thought that for the most part you believe that at death your soul is incarnated again in another body so you don't have so much need for a mind with no body because you go from one body to another body to another body and so on.

TDS: Reincarnation actually has a deeper meaning. First of all, when we die, unless the individual has done his *sadhana* (*sadhana* means his spiritual discipline, austerity, it's called *tapasya* in Sanskrit), unless the person practices *tapasya* in his active life, most probably he will circle around in this cosmic world, having to repeatedly accept a material body. In this case, when the person dies, the soul is carried by the three subtle elements (mind, intelligence and false ego) to another gross body. Sometimes the soul doesn't reincarnate immediately, according to the *karma*, the activity the individual has done. Because of the laws of *karma*⁹ at

... the person who has sincerely practiced deep spiritual principles, *sadhana*, such a person doesn't have to incarnate in any of these material forms again. He goes directly to the spiritual kingdom.

— T. D. Singh

work, sometimes the person may appear in a human form of life, and at other times in other forms of life, this is a possibility, but that depends on the result of the work done called *karma*. On the other hand, the person who has sincerely practiced deep spiritual principles, *sadhana*, such a person doesn't have to incarnate in any of these material forms again. He

goes directly to the spiritual kingdom. In other words he has completely finished this material life; he will be promoted to the spiritual world. Actually, to put it in a different way, it is the desires which make one reincarnate. The mind and soul are full of desires. When a person comes to the spiritual platform, that means he has no more material desires; he exclusively has the pure spiritual desire to be with God.

Prof. Srivastava: You said about heaven... Now there is also hell... One thing that I would like to ask, is it possible that souls are permanently put into heaven or permanently put into hell? You say that God has created all of us; why has God created us all the same, ultimately to put some of us permanently into hell?

HR: Well I don't pay much attention to hell. I rather doubt that hell exists as some other place. Some people who seem to me to be pretty miserable are almost living in hell right now. I have no fear that when I die I will go somewhere and be punished. So far as that is part of the Christian tradition, I guess I've given up on that. I don't know what to make of that. It's hard enough to believe I might survive and go to heaven. But I don't have the fear that I might die and go to hell. I hope there is a life to come, but I don't worry about it. I think maybe that's a misfortune in the Christian tradition that at times when people get tired of worrying about getting to heaven, they cease to be interested in this present life. So I want this present life to remain important and I would like us to spend this time, energy and effort, in justice and in love, in this very life. It doesn't seem to me to be a good thing to neglect living well here in order to somehow think that you will later on be in heaven. So Christians have sometimes neglected living well on earth with too much concern for going to heaven. But I must say I think the same thing may have happened in India in former times. It is regularly claimed that the Hindu concept of this world being illusion (*maya*) tends to devalue the present life in favor of deeply valuing some future life.

Maybe this is the reason why I got the Templeton prize: what I tried to say about science and religion is that we should look at the present world as a gift, as a

place of grace, as a place of wonder, a place that needs to be revered, respected. So I want to celebrate the value and importance of what has happened on this planet, and I hope that if we do that well here, then the next life will be good. Let me put it this way, sometimes people say, “do you believe in a life to come, another life?” And I say, well! It seems a little difficult

... we should look at the present world as a gift, as a place of grace, as a place of wonder, a place that needs to be revered, respected. ... and I hope that if we do that well here, then the next life will be good.

— Rolston

to believe. But let's remember that if I find myself living in a next life, that will be less of a miracle than the one that's already happened. So what I'm saying is, for life to continue in another world doesn't seem to me to be as miraculous as the fact that once upon a time there was nothing, and this earth, this world was created. For my mind, being here is almost a miracle enough.

TDS: *Maya*, or illusion, is one aspect in our tradition. In Hinduism, there are two main paths, one is called *māyāvādī*¹⁰, other is *vaiṣṇava*¹¹ tradition. The *vaiṣṇava* tradition explains that this world is a place of tribulation for the ultimate journey. In fact, there is a very nice passage in the *Bhagavad-gītā* (verse 7.19)

*bahūnām janmanām ante jñānavān mām prapadyate
vāsudevaḥ sarvaṃ iti sa mahātmā su-durlabhaḥ*

It says that after many many cycles of birth and death, when one comes to the human form of life and takes the opportunity to develop one's knowledge, wisdom and intelligence, one will have the mood of approaching the Lord, surrendering to Him. Such individuals, by their sincere spiritual practice (*sadhana*), will be promoted to the spiritual world. Therefore this world is a platform for preparing for the final journey.

I would like to ask you about this concept of the soul in Christianity, especially from the scientific perspective. Most of my Christian friends, priests and *paṇḍits*¹², say, according to the Bible – if not misinterpreted (as some of them also suggest) – only humans have souls, other forms of life don't have. This has troubled me, as all forms of life have souls according to the Vedantic tradition.¹³ You are also a minister, and I would be glad to hear your opinion.

HR: I don't think that even Hindus think that plants, trees have souls, so there are living things that don't have souls. I don't know what you think about insects? I don't think you think that insects have souls.

TDS: We think insects have souls; all organisms have.

HR: But not plants?

TDS: Plants and trees also have.

HR: Plants have souls?

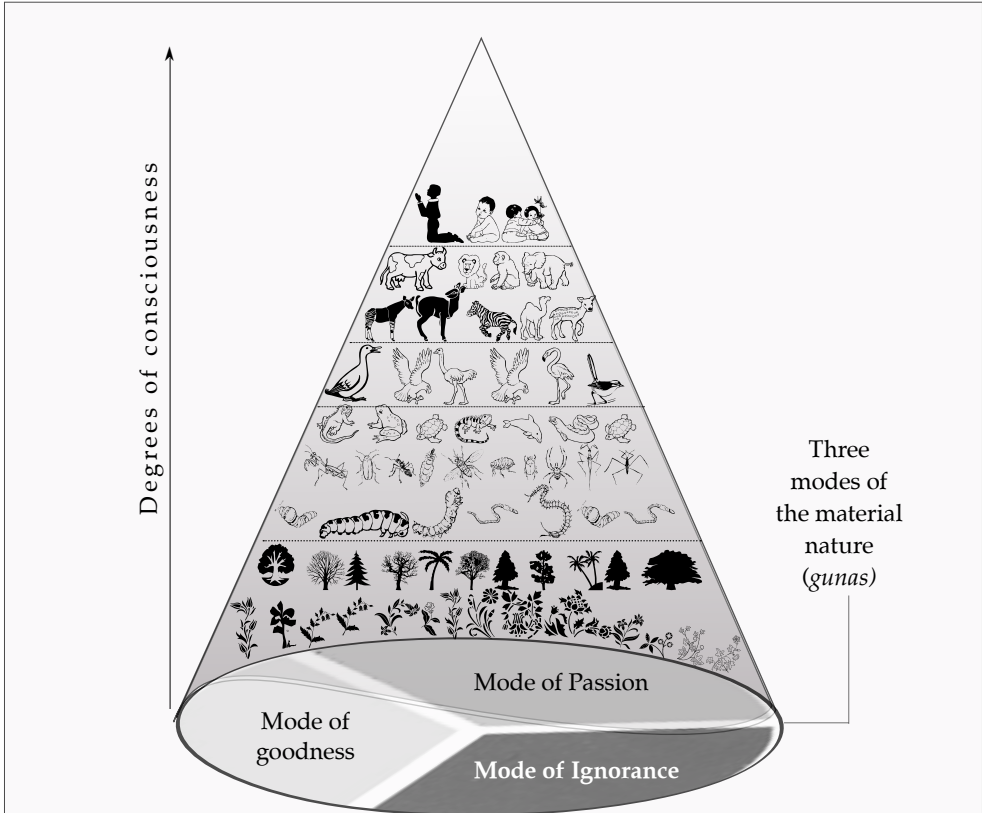
Prof. Srivastava: It sounds logical that all and only living things have souls. An entity is called a living entity because of the self.

An entity is called a living entity because of the self.

— Prof. Srivastava

HR: Well, I was beginning to make the point that various living things might be valuable, worthwhile, and not have souls. There could be levels of life, and so it doesn't have to be the case that every good thing, everything that's worthy of being respected, has to have any soul or spirit, in that sense. It may be then that humans are the only beings that have certain kinds of achievements. I think only humans are the self reflective moral agents. So I have a world-view that permits many different kinds of levels of value and achievement and worth and respect, in that sense. I'm not particularly inclined to think that all the insects, birds, or trees or whatever, have to be eternal to be worthwhile. Maybe they can be good things even though they come and go. In that sense I'm not particularly inclined to populate the world with a soul attached to everything that goes in. Maybe the birds have no soul but are still to be respected.

TDS: Our Vedanta says that every living being has a soul, a spiritual entity, from microorganisms up to human beings. But they are conditioned differently because of association. There are three modes of the material nature called *gunas* in the Sanskrit language: the mode of goodness or harmony (*sattva*), the mode of passion or creation (*rajas*), and the mode of ignorance or inertia (*tamas*). These are the cosmic elements that force the spirit soul to associate to the material nature at different degrees. According to the proportion of association with the mode of goodness, the mode of passion and the mode of ignorance, they have different levels of consciousness.¹⁴ Take for example the plant; although a plant is alive and has a soul, its consciousness is very minimal, very low level. The human form of life has a much more developed intelligence and consciousness. Therefore, there is no doubt that the human being is most qualified to sustain and develop himself and also to help others. This principle of all living entities having a soul is the foundation principle of the Vedantic tradition. So when you say, for example, that animals or birds don't have a soul that means the conception of the soul is taken as an exception. That's why I wanted to find out what is this difference. If we observe some birds, and especially the swan, we acknowledge their intelligence and their feedback. Why wouldn't they have a soul? You train



Different degrees of consciousness are expressed through different bodies/ forms of living entities.

According to Vedic scientific views, there are 8.4×10^6 varieties of life (microorganisms, plants, aquatics, birds, reptiles, animals, humanoids and human beings) counted on the basis of different states or degrees of consciousness.

According to the proportion of association with the mode of goodness, the mode of passion and the mode of ignorance, the living entities have different levels of consciousness. The different bodies or forms of living entities to accommodate a specific conscious being are arranged by the nature within the cosmic plan. In other words, all these living beings are covered by different degrees of the three modes of material nature.

The foundation principle of the Vedantic tradition is that all living entities have souls and consciousness is the fundamental property of soul. Microorganisms exhibit very little symptom of consciousness because of the very thick layers of covering of the material modes. However, they possess consciousness. The well-known biologist, George Wald and others such as, Lynn Margulis indicated that Protozoa, single-celled animals and bacteria also possess consciousness. Plants also have soul, but their consciousness is minimal. The human form of life has a much more developed consciousness.

a bird, establishing a relationship with the bird, the bird also responds. It seems to me to be an area to be explored, common elements in the dialogue between East and West could be useful. Once this is resolved scientifically, personally I think it will be much easier to relate to different cultures.

HR: Yes, we certainly need to interrelate different cultures in today's world.

TDS: I'm impressed with your work on ethics, environmental ethics.¹⁵ You point out that we need to respect this entire cosmic nature. You say that we humans are anthropocentric; the perception we have of the world is that we are the most important, so we tend to do anything we like to other forms of life. Your opinion is that this should no longer be; it's very similar to what we are thinking.

HR: We have privileges as humans, but the privilege is accompanied with responsibility. So we are all stewards, or overseers of the creation. So, I think there's a sense in which humans are the most important in the creation; we have more powers to produce culture, and to learn about the way the world was built. We are the only creatures who know we inhabit the planet like this. So there's a way in which humans are on top, or the most important of the creatures, but there are other ways in which we're not so important. I was taken to task once because I made the statement that grass was more important than people.

TDS: Or equally as important!

HR: I said, if there was no grass there would be no people or anything else. I'm trying to make the point that photosynthesis, which takes place in green plants, is fundamental and foundational to our whole energy cycles (see figure 2). It's more primitive, but it's more foundational. So if you were to take humans off the planet, then the wolves, the birds, or the grass would just continue uninterrupted. But take all the green plants off, and everything shuts down. So now I can say humans are important in some sense, but I've got other senses in which the green plants are in the system just as important or more important than the human beings.

TDS: Yes, I agree.

HR: So I've got a way in which I work out value in nature at different levels. It doesn't just attach to human beings, it doesn't just attach to birds, it doesn't just attach to individuals, this bird or that bird, this tree or that tree. It doesn't attach to them. It attaches to the processes and to the system, to the community in which these things are fitted together. So if you like, I have a sense of what interdependence or solidarity is; the energy with which I'm talking to you at this moment was once the energy of some kind of plant!

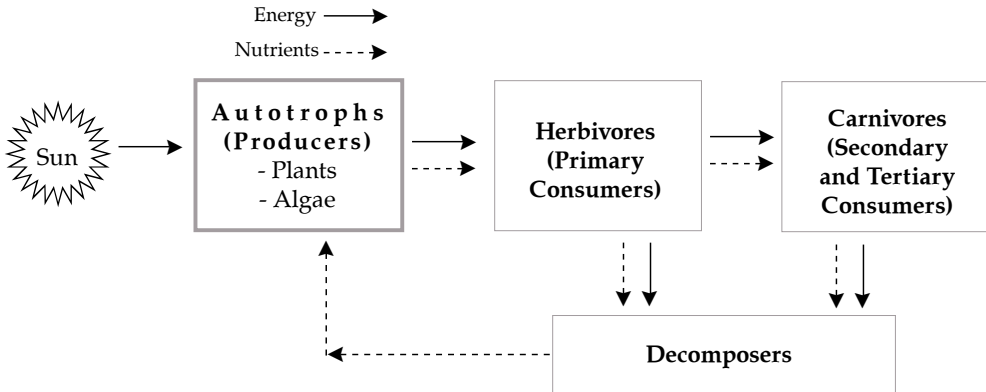


Figure 2: The primacy of autotrophs in the ecological food chain.

TDS: Respecting all forms of life is essential, as you mentioned. The human being has a well developed brain and consciousness, plus a big responsibility. We are all sisters and brothers. In the Vedic historical scriptures, it is said that the citizens of the world are not only human beings, but the animals, birds and plants are also citizens of the earth planet.¹⁶ We have to treat them equally. We should not discriminate them. Today, some animals even receive protection in the United States and other countries.

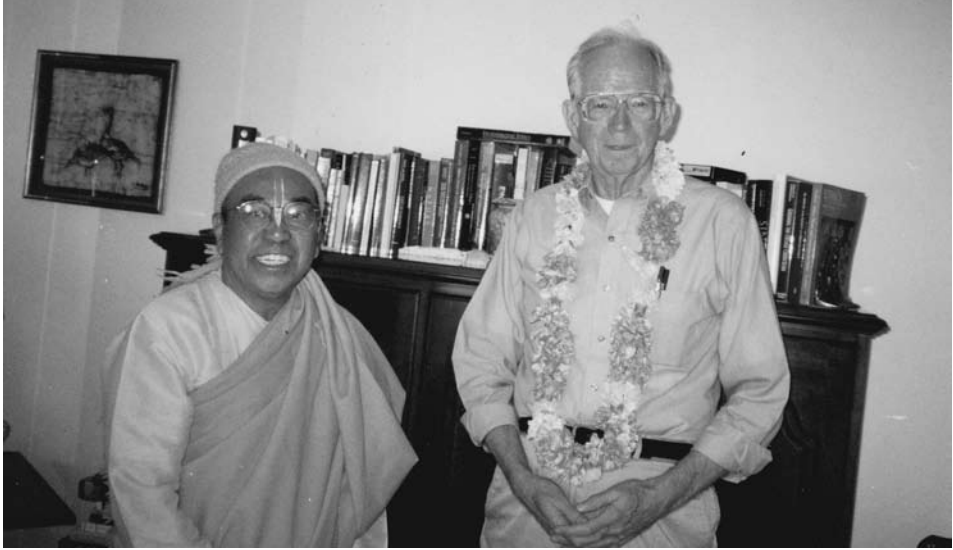
HR: Yes, there are various animal protection groups.

TDS: We need to respect the nature and the forms of life. There were various university studies showing that the cows you treat very lovingly and with care tend to give more milk than those treated differently.¹⁷ I think feeling especially among the human beings is fundamental. If this world could be understood by some scientific study, I think we may have some kind of a new science.

HR: Now I have gotten myself in trouble in India.

TDS: What was the trouble?

HR: It was four or five years ago, I did write an article about what's called feeding people versus saving nature¹⁸, and in that article I said that India is doing the right thing to set aside these parks for the tigers and other animals, and keeping people out of the parks even though these people may be hungry. So I've been much attacked for being cruel and unkind. Mostly by people in the United States but also several people in India said, "he loves trees and tigers but he hates people". Anyway I've been defending some of your wildlife parks that other people don't like, and that has caused me to get some criticism.



TDS: I am amazed that you said all those things. Some of your points are connected with what our scriptures say.

Prof. Srivastava: What about self-producing life?

HR: I think that if in some disaster, catastrophe, if all the people on earth were destroyed, I suspect that mind would evolve again.

TDS: Is this the mind and the soul you were talking about? Or are they separate?

HR: If the people were destroyed may be their souls would survive and they would all be in heaven, but I'm just thinking that once upon a time on earth, in the evolutionary history, there were no human beings. Once upon a time there were very simple animals, and as far as I'm concerned there were no minds, there were no nervous systems, but after a while the evolutionary history continues, and it gets richer and more complicated, things appear with hands, and things appear with eyes, wings, legs. What I'm claiming is that the development of more and more skills and capacities generates mind. Now lots of things don't even get minds, plants don't have minds. But on earth brains have steadily evolved.

There are a lot of brains in different kinds of primates and in the human mind, it has marvelous kinds of powers. I think that it is in-built into the system, so that if there was some kind of tragedy, and it were to happen again, I think for example wings would evolve again. Just like if something happened and all the

birds got killed, I think wings would evolve another time. I think wings have evolved more than once in evolutionary history. I think that if somehow all the creatures on the land got killed, but only the creatures in the sea remained, then I think again life would come out onto the land. So I think the major events in evolutionary history are revealed to us, the nature of nature. Now here's where I'm encouraged about mind and spirit. It seems to me that a regular feature of evolutionary history is that there's a new discovery of information. And it happens largely in genetics for a long period of time. Every time a new species evolved there was new information that's been discovered in the genes. Now I think after a while that genes produce mind. That's a very simple mind in the beginning. Various forms of lizards or dinosaurs. The dinosaurs had brains, but then they get better, they get warm blooded minds, they get bigger minds. Now I'm thinking that what evolutionary history is doing is groping for more and more information, groping for more and more mind, enriching and enlarging the capacity for experience. So now I'm finding you begin with matter and energy but you end up with spirit. I'm saying that's a tendency of the universe to develop or evolve to produce more spirit.

Prof. Srivastava: You see this kind of thinking has some other consequences and it seems that you could think of this by seeing different kind of organisms and biological conclusions. So if we follow this line through the end then it means that if we developed computers which are much more better than these creatures, then they might develop a mind of their own and consciousness. Do you agree with that or not?

HR: Well I don't know. The future is unknown, but I do think that computers already give us vast powers for processing information that we did not previously have. So we have mind, and it takes mind to build the computers and program the computers. Computers are enriching our capacity to think; we can solve problems with computers that we couldn't solve before. So the whole appearance of computers is enriching the possibilities for thinking and understanding, and solving problems, and so forth. Might we some day build a computer that has a mind of its own, or artificial intelligence that's smarter than we are? It's a scary thought. Actually, before we do that, there might be something that's just as difficult to think about. It looks like that once we understand our genetics it might be possible for us to produce people who have bigger brains, or smaller brains, or maybe more athletic children or whatever. So we can reprogram ourselves. Then I don't know what that is. That's why I'm glad, I'm an old man and I don't have to be around another four or five hundred years. I just don't know what's going to happen in the future, but it's going to be more information, it's going to be more understanding, it's going to be more capacity to do things than we've ever had before, and it's probably going to carry risks that are as serious as ever. So five hundred years from now

it might be that every high school kid has enough sense to build a bomb that would blow up the whole world. It's frightening to think about this explosion of information that's taking place. Think back a hundred years, back to 1900; we had no electricity, no motors, no telephones. All that has happened in a hundred years. But think back 40 years, we had no computers. So if we try to think ahead a 100 years, 200 years, 500 years...

TDS: But what is the source of this evolution? How does consciousness appear?

HR: I've said already we don't have any suggestion in neuroscience how consciousness appears within these molecules. I don't think we have any hint from a computer of what it would mean for a computer to be afraid, or a computer to be glad, or a computer to be sorry. So those emotional dimensions of life don't seem to be anywhere on the horizon for computers, and you're right, there's a lot that goes on in the mind that we don't have any hint of in machines like computers.

TDS: If we are looking from a religious or spiritual viewpoint, let's say you're showing me a scientific argument, materially scientific, but you are bringing in some kind of a divine element within this framework. You're saying that if the whole world were destroyed by some catastrophe, some bomb, then, assuming the time and circumstances were right such that the Lord will create, will bring in the divine element in creation. Creation is a part of the theological and scientific understanding about cosmology. Our scriptures say that cosmology always goes in cycles without stopping, like changes of seasons. Within cycles, the cosmic creation and annihilation take place.¹⁹ So from that Vedic conception, the creation will take place maybe starting from some point. That's an area for conjecture or study.

Prof. Srivastava: And among the billions of other planets and stars, there must also be beings there. It is a bigger phenomenon than we think, as we center only on this earth.

HR: But we don't have much to do with or say about those other places, so let's just take good care of this one place where we are.

Prof. Srivastava: Of course.

TDS: I was wondering about this interface between science and religion becoming very prominent after this recent 9/11 tragedy²⁰. So I was wondering your vision in this connection? What do you think? Which way are we going? Is it that the interface between science and religion will determine spirit of humanity?

HR: Well I think the interface between science and religion will remain a center of interest. I think the interface between religion and physics, astronomy is fairly congenial now, they get along pretty well. The big bang theory permits religious interpretation fairly easily. I think the interaction between religion and biology is more difficult, but it's still possible and I've spent most of my time thinking about that. What do I

I predict that the account of the universe will not get any simpler and that the universe seen from the perspective of astronomy and physics will continue the same, a marvelous astounding kind of place, and will invite religious interpretations.

— Rolston

predict about the future? I predict that the account of the universe will not get any simpler and that the universe seen from the perspective of astronomy and physics will continue to be the same, a marvelous astounding kind of place, and will invite religious interpretations. I predict in biology that the sort of Darwinian picture of life as a big struggle and waste, and one thing eating another, that in the light of molecular biology Darwin will not go away, but that life will turn out to be more complicated, more sophisticated, that the molecules will turn to be more clever and that life will with increasing revelation of biology turn out to be more of a wonderful thing and less of a nature driven by tooth and claw. Now the element of struggle will not leave, life will always remain a struggle. That means I predict that biology will continue to invite and permit religious explanations in this miracle of creation. Now on the value question, in the Christian tradition we have the seven deadly sins, like greed and jealousy, and we have the seven virtues: love, charity, justice and so forth.²¹ Now what I would predict for the future is that those value questions will remain as intense as they ever were. The need for love and justice and the need to deal with repair, hate, jealousy, greed, that's going to be around 500 years from now. I may not be too sure about the relativity theory; I think it's probably here to stay. But heat, energy is mass times the speed of light squared, those kinds of things, are probably true, but I'd like to say that the golden rule: do unto others as you would have them do unto you, that's a likely to be true 500 or a 1000 years from now.

... I predict that biology will continue to invite and permit religious explanations in this miracle of creation.

— Rolston

TDS: Regarding your environmental ethics, tying into this dialogue of science and religion, it seems it's a very complimentary kind of approach.

HR: It is. One place that biologists and people who are interested in religion and biology may still debate about: where we came from, how we got here and so forth. But they're often interested when you look to the future. The biologists and the religious people can join together in conserving and protecting endangered species, so in that sense the possibilities of cooperation in the future are great, even though some problems about evolutionary history may remain unsolved.

... I'd like to say that the golden rule: do unto others as you would have them do unto you, that's a likely to be true 500 or a 1000 years from now.

— Rolston

TDS: Thank you Professor Rolston. It was interesting to exchange all these ideas with you.

HR: I appreciate your coming, and thank you for your books.

Notes and References

1. Sir John Templeton (1912–2008) was an American-born British stock investor, businessman and philanthropist. The John Templeton Foundation is a philanthropic organization established in 1987 that funds inter-disciplinary research about human purpose and ultimate reality. In the year 1972 it established an annual award, The Templeton Prize, for persons who have rendered exceptional contributions affirming life's spiritual dimension or discoveries about Spiritual Realities.
2. Science and the Spiritual Quest (SSQ) is an international program conducted by the Center for Theology and the Natural Sciences, Berkeley, California in collaboration with several partner organizations including John Templeton Foundation. The major conferences were held at San Francisco, Boston, Paris, Israel, India, and Japan. The final SSQII conference took place at National Institute for Advanced Studies, Bangalore, India, in January 2003.
3. Behaviourists are psychologists who regard the objective observation of the behaviour of organisms (usually by means of automatic recording devices) as the only proper subject for study and often refuse to postulate any intervening mechanisms between the stimulus and the response.

4. Prof. J. N. Srivastava(1933-2010) was an Indian-born mathematician, statistician and a professor at Colorado State University. Srivastava is known for the research in the area of Design of experiments, Multivariate analysis and Combinatorial mathematics. Srivastava was a Fellow of Institute of Mathematical Statistics.

5. (a) A. C. Bhaktivedanta Swami Prabhupada, *Bhagavad Gita as it is*, Chapter 7, Text 4, Bhaktivedanta Book Trust, Mumbai, 1995 : *bhūmir āpo 'nalo vāyuh kham mano buddhir eva ca ahaṅkāra itīyam me bhinnā prakṛtir aṣṭadhā* Translation: Earth, water, fire, air, ether, mind, intelligence and false ego — all together these eight constitute My separated material energies.(b) Ibid, Chapter 3, Text 42: *indriyāṇi parāṇy āhur indriyebhyaḥ paraṁ manaḥ manasas tu parā buddhir yo buddheḥ paratas tu saḥ* Meaning: The working senses are superior to dull matter; mind is higher than the senses; intelligence is still higher than the mind; and he [the soul] is even higher than the intelligence.

6. Over last forty years extensive research have been done to study the healing outcome of prayers and other spiritual practices. The positive outcome of complementary therapy with prayers are seen in patients with chronic illness such as cancer (VandeCreek et al.,1999), coping up stress prior to surgery (Saudia, et al, 1991), treatment of alcoholism (Bergmark 1998; Carroll 1993; Eisenbach-Stagl 1998; McCarthy 1984). Prayers also have been valuable in care for the elderly (Chatters and Taylor 1989; Foley, Wagner, and Waskel 1998; Garrett 1991; Gorham 1989;Koenig, Bearon, and Dayringer 1989; Koenig, Hays, George et al.1997; Markides 1983; Reed 1987; Taylor and Chatters 1991). Numerous studies are conducted to recognize the healing effect of prayers in various other conditions such as heart diseases, cancer, headaches, muscle twitches to anxiety, depression, suicidal feelings and mental breakdown. (Duckro and Magaletta 1994; McCullough 1995). Dossey. L, *Healing Words: The Power of Prayer and the Practice of Medicine*, New York: Harper. Collins1993; Duckro.P and Magaletta. P, The effect of prayer on physical health: Experimental evidence,*Journal of Religion and Health* 1994, 33(3), 211-219.

7. Revelation 21:10-27, *The Holy Bible*, King James Version, 1999.

8. *sa vā eṣa brahma-niṣṭha idaṁ śarīraṁ martyam atisṛjya brahmābhisampadya brahmaṇā paśyati brahmaṇā śṛṇoti brahmaṇaivedaṁ sarvaṁ anubhavati* (from *Mādhyandīnāyana-śruti*). It is stated here that when a living entity gives up this material embodiment and enters into the spiritual world, he revives his spiritual body, and in his spiritual body he can see the Supreme Personality of Godhead face to face. He can hear and speak to Him face to face, and he can understand the Supreme Personality as He is (Quoted in A. C. Bhaktivedanta Swami Prabhupada, *Bhagavad Gita as it is*, Bhaktivedanta Book Trust, Mumbai 1986, pg. 721, chapter 15 text 7).

9. Law of *Karma* states that every living entity has a predestined happiness and distress in his/her present body according to the actions performed by the living entity in his/her previous and present life.

10. *māyāvādī* – an impersonalist.

11. *vaiṣṇava*- a devotee of Lord Vishnu.

12. *paṇḍits*—Learned men.

13. In *Bhagavad- Gita*(15.7), *mamaivāṁśo jīva-loke jīva-bhūtaḥ sanātana*, meaning, all living beings are eternal and conscious particles (spiritual spark or souls) of the Supreme Lord; A. C. Bhaktivedanta Swami Prabhupada, *Śrīmadbhāgavatam*, Canto 11, Ch. 3 verse9

14. A. C. Bhaktivedanta Swami Prabhupada, *Bhagavad Gita as it is*, Chapter 14 Bhaktivedanta Book Trust, Mumbai, 1986.

15. Nicholas Bunnin and E. P. Tsui-James, *Environmental Ethics*, *The Blackwell Companion to Philosophy*, 2nd ed. eds.Oxford: Blackwell Publishing, 2003, pp. 517-529.

“Ethics is significantly a matter of respecting others for what they are in themselves, apart from my self-interests,... We have, if you like, a right to eat; we also have a responsibility to respect the vitalities of the fauna and flora around us. A full ethics is inclusive of every living organism.” – Holmes Rolston,

16. A. C. Bhaktivedanta Swami Prabhupada, *Śrīmadbhāgavatam*, Canto 7, Ch. 14 verse9 Bhaktivedanta Book Trust, Mumbai, 1995, pp. 776-777 ; Canto 1, Ch. 12 verse 4, purport by A. C. Bhaktivedanta Swami Prabhupada.

17. Catherine B., Peter R., Exploring stock managers perceptions of the human-animal relationship on dairy farms and an association with milk production, *Anthrozoos: A Mutidisciplinary Journal of the Interactions of People and Animals*, Volume 22, Number 1, March 2009 , pp. 59-69.

18. William Aiken and Hugh LaFollette, eds., *World Hunger and Morality*, 2nd ed. Englewood Cliffs; NJ: Prentice-Hall, 1996, pp. 248-267.

19. Vedanata and Science Series: Life and Origin of the Universe, Dr. T.D. Singh, Kolkata, 2005, pp.61-70.

20. The September 11 attacks (also referred to as 9/11) were a series of four coordinated terrorist attacks upon the United States in New York City and the Washington, D.C. metropolitan area on Tuesday, September 11, 2001.

21. According to Christianity, the seven virtues are chastity, temperance, charity, diligence, patience, kindness and humility. The seven deadly sins are wrath, greed, sloth, pride, lust, envy, and gluttony.