

# *Responses to Darwin in the Religious Traditions*

with John Hedley Brooke, "Intrepreting the Word and the World"; Ernan McMullin, "Darwin and the Other Christian Tradition"; Shai Cherry, "Judaism, Darwinism, and the Typology of Suffering"; Marwa Elsbakry, "Muslim Hermeneutics and Arabic Views of Evolution"; David L. Gosling, "Darwin and the Hindu Tradition: 'Does What Goes around, Come around?'"; and Christopher Southgate, "Re-reading Genesis, John, and Job: A Christian Response to Darwinism"

## DARWIN AND THE HINDU TRADITION: "DOES WHAT GOES AROUND COME AROUND?"

by David L. Gosling

*Abstract.* The introduction of English as the medium of instruction for higher education in India in 1835 created a ferment in society and in the religious beliefs of educated Indians—Hindus, Muslims, and, later, Christians. There was a Hindu renaissance characterized by the emergence of reform movements led by charismatic figures who fastened upon aspects of Western thought, especially science, now available in English. The publication of Darwin's *On the Origin of Species* in 1859 was readily assimilated by educated Hindus, and several reformers, notably Vivekananda and Aurobindo, incorporated evolution into their philosophies. Hindu scientists such as Jagadish Chandra Bose were also influenced by Darwinian evolution, as were a number of modern Hindu thinkers. The results of an investigation into the religious beliefs of young Indian scientists at four centers were also summarized. The view that "what goes around comes around" appears increasingly to be open to doubt. Many educated Indians, not only Hindus, are raising more probing questions that call for deeper dialogues between science and religion, especially about what each believes it means to be truly human.

*Keywords:* Darwin; evolution; Hindu; reincarnation; Vivekananda

---

From a methodological point of view, it is easier to consider relationships between modern science and the Hindu tradition historically. This is because the tradition is polycentric, a unity in diversity, "Hindu" being

David L. Gosling was until recently Principal of Edwardes College, Peshawar, and is a Life Member of Clare Hall, University of Cambridge, Cambridge CB3 9AL, UK; e-mail [dlg26@cam.ac.uk](mailto:dlg26@cam.ac.uk).

essentially a geographical and cultural term. (For this reason we shall avoid “Hinduism,” except in quotes.)

The historical approach also has merit because the late nineteenth and early twentieth centuries experienced a renaissance in Indian religious and social thought that continues to shape contemporary life. Thus the northern campus of Delhi University boasts statues of the Buddha and Swami Vivekananda, and the sparse collections of books on the shelves of student rooms are more likely to contain the latter’s teaching than that of more contemporary thinkers. And—as we shall see—Vivekananda had quite a lot to say about Darwin and the problems raised for Hindu theism by human suffering.

#### HIGHER EDUCATION AND SCIENCE

In 1835 the British administrators in India decided that English should be the language of instruction in higher education. This opened the floodgates for European political and social ideas to enter the subcontinent, but above all, for science, which was assimilated so enthusiastically that within a few decades Indian scientists were able to take their place alongside the best in Europe. In due course C. V. Raman and Abdus Salam obtained Nobel Prizes in physics.

Exposure to Western secular ideas created a ferment in Indian religious and philosophical thought, which underwent a renaissance under the leadership of Ram Mohan Roy, Debendranath Tagore (father of Nobel Prize-winning Rabindranath Tagore), Keshub Chandra Sen, Dayanand Sarasvati, Swami Vivekananda, and many others. The views of these leaders and of the movements surrounding them have been classified elsewhere as representing the reassertion, adaptation, and rejection of previously held traditional orthodoxy, and the process of modification has been described as secularization, following M. N. Srinivas (Gosling 2007, 14–17).

Those who reasserted religious orthodoxy in the face of Western secular influences would include Dayanand Sarasvati and the Arya Samaj—which paved the way for some of the more recent Hindu extremist groups such as the Vishwa Hindu Parishad. Rejecters of tradition were few in the nineteenth century—their number in the twentieth might include M. N. Roy and Jawaharlal Nehru.

It is the adapters of tradition who represent the most interesting category of response to secularization, because many of them made use of scientific notions such as Darwinian evolution to bolster their religious and philosophical beliefs. Vivekananda, Aurobindo, and, post-Independence, Sarvepallai Radhakrishnan and Swami Ranganathananda are good examples in this group. The threefold classification of responses to secularization can be applied to Muslims and Christians as well as Hindus—thus Syed Ahmad Khan and Muhammad Iqbal both adapted

Islam in the light of new scientific discoveries. Iqbal called for a *biological* renewal of the modern world (Gosling 2007, 25–27).

#### DARWIN AND THE HINDUS

Darwin's *On the Origin of Species* was published in 1859, shortly after the Sepoy Uprising in 1857, which damaged relationships between Hindus and Muslims and the British. But the ground had to some extent been prepared for Darwin's views, and the notion of evolution was not completely unfamiliar. Doubts were increasingly expressed about Archbishop Ussher's simplistic chronology. Darwin amassed a vast quantity of evidence that indicated very clearly that biological species could be explained scientifically without reference to a divine act of creation or some mysterious vital urge. T. H. Huxley's *Man's Place in Nature* and Darwin's *The Descent of Man* were published in 1863 and 1871, respectively, and applied the evolutionary theory to humans. Earlier, in 1861, Paul Du Chaillu published an account of his travels in Africa, and brought the existence of the gorilla to the attention of the general British public, many of whom objected to comparisons (Ellegård 1959, 43).

Among educated Indians, no such reactions occurred. In support of this assertion we cite the results of a survey made of the leading Bengali journals of the day. These were essentially the publication organs of the reform movements that constituted the Hindu renaissance—especially the Brahma Samaj. The *Samachar Darpan*, published from Serampore, the *Sambad Prabhakar*, a widely read if somewhat conservative daily newspaper founded in 1839, and the *Tattvabodhini Patrika*, founded by Debendranath Tagore in 1853, all reported the latest European science. Between 1843 and 1880 a regular column in the *Tattvabodhini Patrika* called "Science News" contained articles on geology, zoology, physics, chemistry, and a few other branches of science, but no reference to Darwinism. From 1873 onward, brief illustrated items about anthropology and the evolution of human life began to appear, but there was no sign of any debate about the implications of Darwinism for religion or philosophy.

The *Sambad Prabhakar* contained well-informed editorials about new discoveries in science and technology, but made no reference to any debate about Darwin's theory between 1860 and the end of the century.<sup>1</sup> In August 1898 the *Indian Mirror* recorded a claim by a Swami associated with the Ramakrishna Mission that: "Evolution has exploded many a superstition and furnished new light on subjects of which there were theories so long" (*Proceedings of Fourth Decennial Missionary Conference* 1902, 342). But it is not clear from the context whether the "superstitions" were Hindu, or Christian, or both. Many of the Christian missionaries were hostile to Darwinism, and tried to keep it out of higher education syllabi.

Careful scrutiny of these sources at the time of and subsequent to publication of *On the Origin of Species* and the later works of Huxley and Darwin indicates that there was no reaction to Darwinism comparable to that which occurred in certain sections of English society. The extent of this reaction has been questioned, but it certainly did not occur at all among educated Hindus.<sup>2</sup>

The reasons why Hindus did not react to Darwinism are easy to explain. Assuming—as we have argued elsewhere—that elements of Victorian England were opposed to Darwinism because it presupposed a common ancestry between animals and humans, then no such problem would be faced by Hindus, for whom even the gods can assume animal features (Gosling 2001, 40–41). In theory humans can be reborn as animals (though few of the Hindu reformers appear to have taught this, and Ram Mohan Roy totally disbelieved in rebirth).

There are other, more technical, reasons. The Hindu *vedāntic* tradition is one of six major systems (*darśanas*) that claim to be based on the Vedic corpus of scripture. Of these, the Sāṃkhya posits an evolutionary cosmology that strongly influenced the most prominent *vedāntin*, Shankara. According to the Sāṃkhya, evolution is signified by the Sanskrit term *pariāma*, which several nineteenth-century Hindu reformers equated with Darwinian evolution. Also within the *vedāntic* tradition, Rāmānuja incorporated in his system of thought the notion of an *antaryāmī* or “inner controller,” which lies within everything.

Much has been written about the similarities and differences between these Sanskrit Hindu concepts and their apparent scientific “counterparts.” However, most of these studies are flawed because they fail to recognize the differences between the scientific level of understanding (i.e., how things work and where they come from), and the religious level (Does life have any purpose in an ultimate sense? Does God exist?). Thus Michael A. Cremona’s *Human Devolution: A Vedic Alternative to Darwin’s Theory* (2003) is based on flawed assumptions about the scope and methodology of both science and religion. In addition to the scientific and religious levels of understanding, there are others that are moral and ethical, aesthetic and personal. We shall not review this extensive literature, which includes recent attempts to read the pseudo-scientific theory of Intelligent Design back into *vedāntic* thought.

#### EVOLUTION AND THE REFORM MOVEMENTS

Of the major world religions, Buddhism sits loosest in its relationship to its scriptures, whereas Islam is relatively rigid. Christianity and the Hindu tradition occupy intermediate positions, of which the latter is arguably more flexible.

Hindu canonical scripture is *śruti*, but there is a lesser authoritative tradition, known as *smṛti* (“that which is remembered”). The Bhagavadgītā is secondary scripture, and yet under the influence of Gandhi and others it has become of primary importance—to such an extent that scholars such as Amartya Sen have gone to great lengths to develop a consequential evaluation of it (Gosling 2001, 153–154). Comprehensive Vedānta is a reformed interpretation of the Hindu tradition that many, if not most, educated Hindus regard as authoritative. Its main exponent is Swami Vivekananda, but we shall consider other Hindu reformers under this rubric.

Ram Mohan Roy, the first leader of the Brahma Samaj, was enthused by all aspects of Western science, but died before Darwin published *On the Origin of Species*. His successor, Debendranath Tagore, was less impressed by the West, and showed no interest in Darwinism. The third Brahma leader, Keshub Chandra Sen, was besotted with Western science, and regarded the sequence of *avatārs* in the Purāṇas as comparable to the successive stages of a historical evolutionary ladder: “The Purāṇas speak of different manifestations or incarnations of the Deity in different epochs of the world’s history. Lo! The Hindu *avatār* rises from the lowest stage of life through the fish, the tortoise and the hog up to the perfection of humanity. Indian *avatārisim* is indeed a crude representation of the ascending scale of Divine Creation. Such precisely is the modern theory of evolution” (Sen 1969, 65).

Dayanand Sarasvati, the leader of the Arya Samaj, has been justifiably criticized for reading modern science uncritically back into the Vedic scriptures. But unlike Roy and Debendranath Tagore, he believed in the doctrine of reincarnation to the extent that it was for him both the determinant of what happens to human and animal souls at death, and the means whereby God’s impartial justice is guaranteed:

If you don’t believe in the pre-existence of souls, you must admit that God is partial; for, how can He consistently with his justice and equity give people poverty and other kinds of misery without their committing sin in a previous life. . . ? But God’s justice is maintained to the letter by awarding people pleasure and pain according to their merits and demerits of previous existence. (Sarasvati 1970, 243)

This is a very rigid version of the dictum that “what goes around, comes around.” Consistent with such uncompromising determinism, Sarasvati rejected the possibility of divine miracles. He also rejected astrology as a means of altering the course of future events, though he did not quite rule it out in his expositions of the laws of Manu on the subject of marriage: “A youth should not marry a girl of yellow color, of larger size. . . garrulous, or with brown or inflamed eyes. . . Nor one with the names of a constellation. . . He should marry a girl with sleek proportionate limbs. . . with the gait of a swan or she elephant” (Sarasvati 1970, 79).

Sarasvati believed that the Sāṃkhya system was most suited as a framework for the discoveries of science, and God, matter, and the human soul were differentiated accordingly. At a philosophical level his preference for the Sāṃkhya as a framework for understanding Western science and his belief in correspondence between nature and the Vedas were an important facet of Arya thinking. But for rank and file Samaj members who knew nothing of Western science and were unable to read Sanskrit, the force of Sarasvati's success lay in his bold assertion that all the discoveries of science were to be found somewhere or other in the Vedas.

Before considering the reformer who incorporated Darwinism most decisively into Vedānta, we briefly mention Sri Aurobindo, who made extensive use of Darwin's theory, but who is difficult to evaluate on account of the complexity of his philosophy and the fact that he appears to have borrowed much of it from unacknowledged Western sources.

Aurobindo Ghose came from a sophisticated Bengali family who sent him to England for his studies. He rebelled against the excessive Westernization of his father, and took an active part in the beginnings of the national struggle, for which he was put in prison. On his release he settled in an ashram in Pondicherry. The impact of Western science upon Aurobindo's philosophy is most apparent in relation to his understanding of evolution. He accepted the principle of evolution, but argued that it is meaningless unless the goal is defined, and this is Ultimate Reality. This Reality gives meaning to evolutionary processes, and it possesses a threefold character defined as *sat-cit-ānanda* (roughly, "being," "consciousness," and "bliss"). "The conscious existence involved in the form comes, as it evolves, to know itself by intuition, by self-vision, by self-experience. It becomes itself in the world by knowing itself; it knows itself by becoming itself. Thus possessed of itself inwardly, it imparts also to its forms and modes the conscious delight of Sachchidananda. . . The Unknowable knowing itself as Sachchidananda is the one supreme affirmation of Vedānta; it contains all the others or on it they depend" (Aurobindo 1970b, 43).

Aurobindo's concepts of involution and evolution are complicated and involve a special terminology. He believed that before evolution from lower to higher forms could occur, Absolute Reality needed to enter into every conceivable aspect of matter. The process of evolution began with the lowest inorganic forms and advanced to the present stage of human existence. At some time in the future it will reach a superhuman stage: "This third status is a condition in which we rise progressively beyond the struggle for life by mutual devouring and the survival of the fittest by that struggle; for there is more and more a survival by mutual help and a self-perfectioning by mutual adaptation, interchange and fusion. Life is a self-affirmation of being, even a development and survival of ego, but of a being that has need of other beings" (Aurobindo 1970b, 203).

Thus as evolution proceeds, the competitive aspect of existence is replaced by more harmonious relationships between individuals. Whereas Vivekananda tended to bypass the struggle for survival altogether, Aurobindo argued that it applies only at a particular stage of development.

Aurobindo believed that a sequence of *avatārs* evolved from one state to the next, and that the reincarnating soul prepares its successive bodies:

The Gita. . . applies the doctrine of reincarnation, boldly enough, to the Avatar himself, and in the usual theory of reincarnation the reincarnating soul by its past spiritual and psychological evolution itself determines and in a way prepares its own mental and physical body. The soul prepares its own body, the body is not prepared for it without any reference to the soul. Are we then to suppose an eternal or continual Avatar himself evolving, we might say, his own fit mental and physical body according to the needs and pace of the human evolution and so appearing from age to age, *yuge yuge*? In some such spirit some would interpret the ten incarnations of Vishnu, first in animal forms, then in the animal man, then in. . . the awakened spiritual man. (Aurobindo 1970a, 157)

The evolutionary sequence of *avatārs* is similar to Keshub Sen's, and may have been taken over from him. Although Aurobindo posited a linear type of human development from primitive life-forms to superconsciousness, he does not appear to have explicitly denied the traditional picture of a cyclical cosmology.

Aurobindo may be classified together with Vivekananda and the early Reformers who responded to secularization by adapting the Hindu tradition. His personal experiences played an important part in his reaction against the West, but his critique of Western science as something that created artificial divides between objects and people was an important point which has subsequently been taken up by others. His idea of an evolving universe, though technical and confused in its detail, was an imaginative adaptation of traditional Hindu thought, though he would probably have been unable to conceive of it without borrowing from unacknowledged Western writers.

#### VIVEKANANDA'S COMPREHENSIVE VEDĀNTA

Although the Ramakrishna Mission was named after the mystic Sri Ramakrishna, its driving force was Narendranath Datta, better known as Swami Vivekananda, whose Comprehensive Vedānta incorporated many facets of Western science, especially Darwinian evolution.

Vivekananda subscribed to Shankara's view that Reality is one, but that it exists in many forms that merge into one another. Everything is truly real and continuous, but by a process of mental abstraction we create discontinuities. To say that the universe is *māyā* does not mean that it is illusory, but that it contains all sorts of apparent contradictions: "The

world has neither existence nor nonexistence. You cannot call it existent because that alone truly exists which is beyond time and space, which is self-existent” (quoted in Naravane 1964, 93).

Space, time and causality are responsible for *māyā*—the appearance of ultimate Reality as *Īśvara*, *jīva*, and *jagat*. *Īśvara* is the personal Lord, *jīva* the individual self, and *jagat* the physical world. Thus the scientist can explore the world, but cannot directly encounter ultimate Reality.

Vivekananda believed that in spite of the limitations imposed by the illusion of discontinuity, science was beginning to discover underlying relationships between apparently unrelated parts of the universe. The West had long regarded nature and humanity as separate, but the theory of evolution proved such a view to be incorrect:

The theory of evolution, which is the foundation of almost all the Indian schools of thought, has now made its way into the physical sciences of Europe. It has been held by the religions of all other countries except India that the universe in its entirety is composed of parts distinctly separate from each other. God, nature, [humanity]—each stands by itself, isolated from one another . . . Knowledge is to find unity in the midst of diversity—to establish unity amongst things which appear to us to be different from one another. (Vivekananda 1964c, 519)

Vivekananda also tried—somewhat unconvincingly—to use the concept of evolution in order to explain the basis of different Hindu schools of thought—Advaita, Dvaita, and Viśiṣṭādvaita. He conceived these as being three stages on an evolutionary ladder. The synthesis was ingenious, but it did violence to what the traditional schools actually believed, and also obscured the differences between evolution as understood in Sanskrit texts and as conceived by, say, Darwin or Herbert Spencer.

Vivekananda thought that only in India was the true significance of what was happening in the West to be understood and interpreted as the fulfillment of an insight first grasped by the *rishis*:

Thinkers in ancient India gradually came to understand that the idea of separateness was erroneous, that there was a connection among all those distinct objects—there was a unity which pervaded the whole universe—trees, shrubs, animals, man, Devas, even God Himself; the Advaitin reaching the climax in this line of thought declared all to be but the manifestations of the One. In reality, the metaphysical and the physical universe are one, and the name of this One is Brahman. (Vivekananda 1964c, 519)

Science is therefore the study of the variations that have been manifested by *Brahman*, and since *Brahman* is ultimately one, all branches of knowledge should finally converge. It is possible that Vivekananda’s exposition of this view influenced the biologist Jagadish Chandra Bose in his decision to do research on the border regions of the established scientific disciplines in order to investigate the possibility of pain in plants (Gosling 2007, 91–95).



Like Sarasvati, Vivekananda based much of his thinking upon the Sāṃkhya system and this provided him with a framework for both his biological and cosmological speculations. Thus biological evolution was not so much a struggle for survival as a gradual development from one stage to the next: “Our theory of evolution and of *ākāśa* and *prāna* is exactly what . . . modern philosophers have . . . Belief in evolution is among our Yogis and in the Sāṃkhya philosophy. For instance, Patañjali speaks of one species being changed into another by the infilling of nature” (Vivekananda 1964c, 298).

He believed that humanity was latent in the ape, and the Absolute is gradually emerging from humanity. And since emergence is a natural progression from one species to a higher one, the Darwinian “struggle for existence” is a misnomer: “Our education and progression simply mean taking away the obstacles, and by its own nature the divinity will manifest itself. This does away with all the struggle for existence. The miserable experiences of life . . . are not necessary for evolution. Even if they did not exist, we should progress. It is in the very nature of things to manifest themselves” (Vivekananda 1964c, 277).

But this is not the same as the theory of natural selection according to which the struggle actually determines the character of the next member of the species. Elsewhere Vivekananda couples the theory of heredity with reincarnation, but it is not clear whether or not he has fully appreciated the manner in which heredity was believed by biologists to operate: “We have the gross bodies from our parents, as also our consciousness. Strict heredity says my body is a part of my parents’ bodies, the material of my consciousness and egoism is a part of my parents’ . . . Our theory is heredity coupled with reincarnation. By the law of heredity, the reincarnating soul receives from parents the material out of which to manufacture a [person]” (Vivekananda 1964a, 440).

According to this way of looking at heredity, the role of parents is purely functional, and the real character and destiny of the individual is determined by the process of reincarnation.

Unlike Sarasvati, Vivekananda was able to find room for divine grace and a merciful God whose influence is consistently positive. Thus although reincarnation is the primary determining factor in birth, God can mitigate its bad side without upsetting the total process: “[God’s] infinite mercy is open to every one, at all times, in all places, under all conditions, unflinching, unswerving. Upon us depends how we use it . . . Blame neither man, nor God, nor anyone in the world. When you find yourselves suffering, blame yourselves, and try to do better” (Vivekananda 1964a, 225).

Vivekananda was aware of the importance of reincarnation as a solution to the problem of undeserved suffering, and was able to find room for divine grace and personal devotion to a loving God. Among the leaders of

the Reform movements he was the only one to give rational arguments in support of the theory of reincarnation.

#### REINCARNATION AND DARWINISM

Vivekananda's arguments in support of reincarnation may be divided into three groups—those derived from Western sources, traditional Indian arguments, and arguments that appear to be of his own devising. The first group is not particularly convincing, and in some cases the argument for reincarnation seems to be a mere rhetorical plea for some sort of immortality: “The great English philosopher Hume, nihilistic though he was, says in the skeptical essay on immortality, ‘The metempsychosis is therefore the only system of this kind that philosophy can listen to.’ The philosopher Lessing, with a deep poetical insight, asks, ‘Is this hypothesis so laughable merely because it is the oldest? . . . Why should I not come back as often as I am capable of acquiring fresh knowledge, fresh experience?’” (Vivekananda 1964b, 267).

Vivekananda quotes Schopenhauer's claim that shortly after the time of the Black Death, twin births became very frequent as though nature needed to maintain a constant balance between reincarnating souls and new bodies for them to inhabit.

Vivekananda was also at pains to refute objections to reincarnation, and was aware of the argument used by the Cārvākas (Materialists) that whereas there ought to be memories of previous lives, in actual fact there are not. But, he argues, the entire soul of a person is not necessarily bound up with the faculty of memory; memory is not the test of existence, and a person who loses his memory in a coma does not cease to exist.

Vivekananda's main defense of reincarnation was based upon moral issues raised by the existence of suffering and inequality: “We see children born to suffer, perhaps all their lives, and that owing to no fault of theirs. Why should it be so?” (1964b, 269).

There are three possible types of answer, Vivekananda argues. The injustice can be attributed to a “hideous, cruel, and ever-angry God,” who by virtue of his creation of all things *ex nihilo* is causally responsible for the situation. Second it can be explained in a way that completely side-tracks the religious and moral problem by appealing exclusively to the process of hereditary transmission. And third, there is the argument that solves the moral problem by attributing the deprivations of this life to past actions, and which leaves a merciful, loving God free to be morally above criticism, though no longer completely omnipotent in the face of the law of karma.

Vivekananda occasionally appealed to traditional arguments in support of reincarnation:

An argument which the philosophers of the Nyāya school have always advanced in favor of reincarnation . . . is this: Our experience cannot be annihilated. Our actions (karma) though apparently disappearing . . . reappear again in their effect as tendencies. . . Even little babies come with certain tendencies—fear of death, for example. Now if a tendency is the result of repeated actions, the tendencies with which we are born must be explained on that ground too. Evidently we could not have got them in this life; therefore we must have to seek for their genesis in the past. Now it is also evident that some of our tendencies are the effects of the self-conscious efforts peculiar to [humans]; and if it is true that we are born with such tendencies, it rigorously follows that their causes were conscious efforts in the past—that is, we must have been on the same mental plane which we call the human plane, before this present life. (1964b, 270)

The main thrust of Vivekananda's concern to defend reincarnation was moral, and it seems likely that the climate which made it imperative for him to pose the problem of suffering in this particular way was provided by Christianity. He was also aware of the possibility of giving some sort of materialistic biological account of a situation that permitted people to be born with inherent deficiencies, but there is no suggestion that he saw biological science as a challenge to the doctrine of reincarnation. His severest criticisms were reserved for those who believed in a "hideous, cruel, and ever-angry God"—namely Christians and Muslims: "So far as explaining the tendencies of the present life by past conscious efforts goes, the reincarnationists of India and the latest school of evolutionists are one; the only difference is that the Hindus, as spiritualists, explain it by the conscious efforts of individual souls, and the materialistic school of evolutionists, by a hereditary physical transmission. The schools which hold to the theory of creation out of nothing are entirely out of court" (Vivekananda 1964b, 271).

Vivekananda responded to the secularization of traditional Hindu thought by adapting it with concepts many of which were borrowed from Western science. He tended to overlook essential differences as for example between evolution according to the Sāṃkhya and the Darwinian process of natural selection. His conviction that true knowledge is to be found by searching for unity in diversity was expressed at a time when different branches of science in the West were moving closer together and inspired a generation of Indian scientists to explore the unity underlying all manifestations of ultimate reality.

#### DARWIN AND THE HINDU RENAISSANCE SCIENTISTS

It may be a testimony to the single-mindedness of the distinguished Bengali chemist Prafulla Chandra Roy that, in the course of his mammoth,

six-hundred-page account of the scientific world of Bengal during the late nineteenth and early twentieth centuries, *Life and Experiences of a Bengali Chemist*, not a single mention is made of Darwinism. Not so his mentor, Brajendranath Seal, who went to great lengths to reinterpret classical Sāṃkhya in accordance with Darwinism: “The world evolves out of Maya, so that Maya in the Vedānta replaces the Prakṛiti of the Sāṃkhya. But Maya, and by implication the world, originate out of Brahma, not by a process of evolution, but of Vivarta (self-alienation). The self-alienation of the Absolute, acting through Maya, produces in the beginning Akāśa—one, infinite, ubiquitous, imponderable, inert, and all pervasive. The world thus begun goes on evolving in increasing complexity” (Seal 1915, 85).

Seal may have been instrumental in encouraging the biologist Jagadish Chandra Bose to investigate the response of plants to external stimuli: “The Hindu Scriptures teach that plants have a sort of dormant or latent consciousness, and are capable of pleasure and pain” (Seal 1915, 175).

We have considered Jagadish Chandra Bose’s researches on the possibility of pain in plants elsewhere (Gosling 2007, 91–95). His philosophical language was strongly colored by Sāṃkhya terminology, and his overarching view that all branches of science were coming together under common heads was in line with Shankara’s teaching that underlying the manifestations of diversity there is One, that is *Brahman*. Bose considered creation to be ever-evolving: “In my scientific research . . . an unconscious theological bias was also present . . . It is forgotten that He, who surrounded us with this ever-evolving mystery of creation, the ineffable wonder that lies hidden in the microcosm of the dust particle, enclosing within the intricacies of its atomic form all the mystery of the cosmos, had also implanted in us the desire to question and understand” (Bose n.d., 203).

Most of the galaxy of brilliant Hindu scientists who distinguished themselves in the late nineteenth and early twentieth century were physicists who had little professional interest in Darwinism (Ramanujan was a mathematician). They were struck by similarities between certain scientific ideas which resembled ancient Hindu notions, such as the concept of evolution (*pariṇāma*), the ether (*ākāśa* or space), intuition (*anubhava*) as a means of scientific discovery (in addition to reason), and so on. But more than anything else they saw the coming together of the various scientific theories under common theories as evidence of the oneness at the heart of all existence presupposed by Shankara’s *advaita* Vedānta. It is also possible, though Darwin’s theory may not have been sufficiently comprehensive during their lifetimes, that they were impressed by the unification within biology implicit in Darwinism. This has been pointed out by the late evolutionary biologist Ernst Mayr: “The theory of evolution is quite rightly called the greatest unifying theory in biology. The diversity of organisms, similarities and differences between kinds of organisms, patterns of distribution and behavior, adaptation and interaction, all this was merely

a bewildering chaos of facts until given meaning by the evolutionary theory” (Mayr 1988, quoted in Spencer and Alexander 2009, 54).

The theory of evolution through natural selection (the scientific version, not the polemical versions of Herbert Spencer and others) is the most supremely elegant explanation of all relevant biological data. But it cannot be the final arbiter as to whether or not God or *Brahman* exists any more than it can assess the literary merit of Chaucer’s *Canterbury Tales*.

#### EVOLUTION IN MODERN HINDU THOUGHT

The same general scheme of responses to secularization can be used to classify modern Hindus who have rejected, reasserted, or adapted tradition in the light of scientific discoveries, especially in the biological sciences. But there are far too many to attempt an exhaustive survey. We shall therefore mention a few significant individuals together with the results of a social survey.

The teachings of Swami Vivekananda, Dayanand Sarasvati, and the others we have mentioned are readily available in publications by the Ramakrishna Mission and the Arya Samaj together with publishing houses such as the Bharatiya Vidya Bhavan, which was founded in 1938 at the instigation of K. M. Munshi “to span the gap between the past and the present” (*Bhavan’s Journal*, 7 March 1971, 19). Contributors to its glossy weekly, *Bhavan’s Journal*, tend to be adaptive or reassertive in their advocacy of Hindu orthodoxy, and are keen to incorporate the latest scientific discoveries into their arguments. According to one particular editorial commenting on an article by Swami Keshavadas on reincarnation: “In this research article . . . Sadguru Keshavadas says that modern science is today affirming the veracity of the doctrine of reincarnation which is an article of faith with the Hindus from the Vedic times” (30 May 1971, 37). The Bharatiya Vidya Bhavan also published most of Swami Ranganathananda’s works, which are very popular among students at Delhi University. The following extract illustrates his view that human and animal life can be demarcated by self-consciousness: “Modern biology detects the presence of the psyche in the living cell, in the form of a rudimentary awareness. After millions of years of cosmic evolution, a new value thereby appears in evolution, what Vedanta calls ‘cit,’ that is, consciousness and its concomitant of experience over and above the value of ‘sat,’ that is, ‘existence’ or ‘being,’ obtaining at the pre-organic stage. The cosmos ‘exists’ but has no ‘experience’; the living cell has” (Ranganathananda 1971, 515).

Although Ranganathananda says nothing specifically about reincarnation in relation to sub-human species, it would seem to be implied from this quotation and elsewhere that the human soul does not assume animal forms. Ranganathananda rejects the idea of the supernatural, and leans heavily on Vivekananda at many points in his interpretation of the

Upanishads. He allows himself considerable freedom in interpreting the principal Upanishads, which he regards as the “gist or essence of the Vedas” (Ranganathananda 1971, 11).

Sarvepallai Radhakrishnan’s exposition of Hindu thought falls into the adaptive category of response to secularization. If *Bhavan’s Journal* functions rather like the *Reader’s Digest* of Hindu India, then Radhakrishnan’s *Hindu View of Life* (1960b) is a summary of what large numbers of middle-class, mainly northern, Hindus like to think they believe.

Radhakrishnan’s philosophy represents the most systematic and comprehensive reinterpretation of Hinduism in the light of modern scientific thought. The heart of his adaptation is the idea that the world possesses a provisional reality in which purposeful human effort can have real meaning:

It is said that for the Hindu all true existence is non-material, unchangeable and eternal and therefore the material, changeable, temporal existence is false. So it is said that the good of man consists not in transforming the world which is a vale of woe but in transcending it . . . The world is not a deceptive façade of something underlying it. It is real though imperfect . . . *māyā* has a standing in the world of reality . . . In Hindu thought, *māyā* is not so much a veil as the dress of God . . . We must work for better conditions for the material and spiritual development of human beings, for civilization is material and spiritual progress for both the individual and society. (Radhakrishnan 1960a, 156)

From the point of view of Indian philosophy Radhakrishnan leans heavily on Shankara, but rejects both abstract monism which undermines individuality and personal values, and the sort of radical pluralism which would make a rapport with modern science extremely difficult. He is able to accept chance, disorder, contingency, and the existence of God without giving up the divine unity of the world.

It is not always clear how Radhakrishnan understands the relationship between subject and object or between God and the Absolute (*Brahman*), but his philosophical framework is sufficiently flexible to accommodate the most recent discoveries in science. Quantum mechanics, relativity, Gestalt psychology, Darwinism, the possibility of life on Venus and Mars, all find mention in *An Idealist View of Life*, which more than any other of his works deals with specific issues posed by scientific discovery. Unlike Vivekananda, who tended to minimize the differences between scientific methodologies, Radhakrishnan recognizes the importance of understanding the relationship between different scientific disciplines: “We select phases of events for study in science. We can look upon man as either a physico-chemical being with certain weight and measurement, or a biological unit of the human species, or as a psychological, ethical, or religious being. The subject-matter of science is abstractions from the real, plane diagrams from the solid object” (Radhakrishnan [1932] 1957, 224).

In discussing discoveries that were comparatively recent in 1932 when *An Idealist View of Life* was first published, Radhakrishnan draws heavily

on Eddington, Jeans, and their contemporaries, but follows none of them *in toto*.

Radhakrishnan's understanding of space-time is a development of Vivekananda's earlier view that space and time are, in a manner of speaking, lenses through which ultimate Reality appears in the form in which we see it. But how is the individual soul related to the space-time continuum, and what is the relationship between reincarnation and the time sequence? In answering these questions Radhakrishnan seems to be struggling to maintain a position that is consistent both with Shankara and the contemporary stress upon human and biological individuality:

Shankara is generally regarded as favoring the hypothesis of the absorption of the individual in the eternal Brahman, when release is obtained. It seems to be an inference from his repeated assertions that eternity means non-temporality. If temporality is the mark of finite individuality, anything non-temporal is non-individual. But we find a large number of passages in Shankara which indicate that while the released soul attains at the very moment of release a universality of spirit, it yet retains its individuality as a centre of action as long as the cosmic process continues. The loss of individuality happens only when the world is redeemed, when the multiple values figured out in it are achieved. The world fulfils itself by self-destruction. The freed soul, so long as the cosmic process continues, participates in it and returns to embodied existence not for its own sake but for the sake of the whole. (Radhakrishnan [1932] 1957, 306)

Individuality within the time sequence is thus preserved, and release from rebirth implies the transcendence of an evolving cosmic history: "Rebirth is subject to time and it is inevitable so long as we stick to the individualistic position. If we transcend individualism, we rise superior to the phenomenon of time and thus escape from rebirth . . . Cosmic history is working toward its highest moment when the universal tendency toward spiritual life becomes realized in one and all" (Radhakrishnan [1932] 1957, 304).

Thus Radhakrishnan commits himself to an evolutionary world view with a final goal that does not deny a place to individuality. There is a single world order, which may legitimately be described by philosophers, scientists, and any other specialists who are prepared to accept the givenness of the Universe without taking refuge in a supernatural realm.

To Radhakrishnan the difference between the living and the nonliving is one of complexity, and the soul is not an extra ingredient possessed by the living, but a consequence of the fact that the whole is more than the sum of its parts: "The soul is the actuality of the organic body in man, even as vision is the actuality of the eye" ([1932] 1957, 261). The soul, therefore, does not introduce any fundamental distinction between matter and life.

Radhakrishnan challenges the traditional understanding of reincarnation as a recurrence, and replaces it with the idea of unidirectional movement:

Life is not a mechanical recurrence but a significant process. We cannot say that the wheel turns ceaselessly, creating souls whose ideal is to cease to exist. Even in the material world, we have not got mere mechanical recurrence. Rebirth is not an eternal recurrence leading nowhere but a movement from man the animal to man the divine, a unique beginning to a unique end, from wild life in the jungle to a future Kingdom of God. The soul is constantly performing the miracle of self-embodiment which is a means for self-renewal, a growth into light. (1960a, 193)

Having rejected eternal recurrence, Radhakrishnan is able to bring reincarnation into line with evolutionary theories. But what is it that the process of reincarnation actually transmits, and how is reincarnation related to biological rules governing heredity? He solves the first part of this problem by postulating the existence of a “psychic power”: “If we posit an element in us which cannot be accounted for by the principle of heredity, a psychic power behind the veil of material process, then it presupposes a past and admits a future evolution other than that of the race mind and physical necessity. Human life manifests itself in a body but is not the product of the body. Its characteristics are determined jointly by those which the self had when it began to animate the organism and by the nature of the organism which it animates” (Radhakrishnan 1960a, 202).

In other words reincarnation and biological heredity are complementary processes governing the birth and characteristics of human beings.

As an apologist Radhakrishnan is at pains to justify reincarnation, and most of his arguments in support of it appear in the Introduction to his translation of the *Brahma Sutra*. To begin with, Radhakrishnan asks, what need is there to posit any additional process to biological heredity? “There are differences . . . among children of the same parents brought up under the same conditions and these cannot be accounted for exclusively by heredity. While the physical heredity (i.e., bodily characteristics) is derived from the parents, social heredity is derived from the family, race, nation, and religion; there is a psychological heredity that is not derived from the parents or the society. This controls physical and social heredity” (1960a, 202).

Presumably psychological heredity is governed by “psychic power.” But granted that the psychic power associated with reincarnation can explain differences between children brought up in the same family under the same social conditions, how does it explain the similarities? Radhakrishnan answers this objection with an analogy from chemistry: “A pre-existent self becomes associated with a certain organism at the moment when the latter is conceived. In nature this kind of adaptive affinity occurs frequently, in chemical affinity, in the selective affinity of spermatozoa for ova of the same species. Minds and organisms attract each other in the same way. The reincarnating ego is attracted to parents from whom it can inherit a particular set of qualities” (1960a, 202).



The validity or otherwise of the analogy is not of primary concern here, but the argument serves as a good example of the way in which Radhakrishnan invokes science to make reincarnation sound plausible. The main weakness of this type of argument is that scientific theories may be replaced eventually by different ones so that analogies drawn from them can never be more than temporarily convincing.

Jawaharlal Nehru, M. N. Roy, and E. V. Ramasami all have in common the fact that they rejected Hindu orthodoxy in the name of science (and for other reasons). They had little to say about Darwinism, which they accepted along with other scientific theories. We have considered their reasons for rejecting Hindu orthodoxy elsewhere (Gosling 1973, 191–193). In the case of Nehru and Roy they include the influence of Marxism; Ramasami reviled the casteism of Southern brahminism, and hence the religious beliefs associated with it.

#### RESULTS OF A SURVEY

An investigation was conducted by the author into the religious beliefs of predominantly Hindu scientists at four university centers in India. The investigation was conducted over a number of years, most recently in the late 1990s, and the results have been published elsewhere (Gosling 2007, chapter 7). We shall review them briefly noting only their relevance to Darwinism.

The four centers were Bangalore, Kottayam, Madurai, and Delhi, and the institutions where questionnaires were distributed and interviews conducted included the national Indian Institute of Science in Bangalore (IISc), the CMS College in Kottayam (where there is a high proportion of Christians), the American College in Madurai (which has a much higher proportion of non-brahmins than at the IISc), Miranda House (women only), and St Stephen's College in Delhi University (where the author has been both an *ad hoc* and a visiting faculty member).

Approximately 800 questionnaires were distributed by faculty members at the various institutions, and just under 700 were completed. A hundred and fifty-five interviews were conducted by the author. The significance of responses was assessed with the chi-square test.

The following two questions will indicate the manner in which biological evolution was featured in the questionnaires:

*Which, if any, of the following do not agree with a religious outlook?*

- (1) Biological evolution
- (2) Theories of universe's origin
- (3) Technological progress
- (4) The use of reason

**Table 1.** A comparison of responses to specific areas of possible conflict between science and religion (percentages) (Gosling 2007, 111)

	Delhi		Bangalore		Kottayam		Madurai	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Science								
Evolution	54.0	46.0	60.0	40.0	38.9	61.1	39.6	60.4
Universe's origin	63.0	37.0	62.0	38.0	38.9	61.1	49.0	51.0
Technological progress	69.8	30.2	79.0	21.0	90.7	9.3	86.9	13.1
Reason	73.5	26.5	78.5	21.5	70.4	29.6	77.1	22.9
Proof	58.0	42.0	66.1	33.9	57.4	42.6	56.7	43.3
Other	97.0	3.0	94.5	5.5	98.2	1.8	96.1	3.9
Religion								
Existence of soul	48.1	51.9	53.8	46.2	48.1	51.9	54.8	45.2
Prayer	61.7	38.3	72.0	28.0	74.1	25.9	71.8	28.2
Life after death	38.5	61.5	47.1	52.9	35.2	64.8	43.5	56.5
Reincarnation	59.0	41.0	48.5	51.5	40.7	59.3	54.8	45.2
Miracles	53.9	46.1	48.8	51.3	53.7	46.3	58.6	41.4
Other	93.1	6.9	91.5	8.5	98.2	1.8	94.0	6.0

Note: (1) means "no conflict," (2) means "conflict."

(5) The necessity for proof

(6) Other

*Which, if any, of the following do not agree with a scientific outlook?*

(1) Existence of the soul

(2) Prayer

(3) Life after death

(4) Reincarnation

(5) Miracles

(6) Other

Table 1 shows the responses to these two questions at each of the four centers.

It must be remembered that these percentages reflect the responses of young scientists from all religious traditions, though the majority were Hindu, except in Kerala (Kottayam), where 60 percent of the students were Christian. These respondents had more difficulty reconciling evolution and their religious beliefs than the predominantly Hindu ones in Bangalore and Delhi. The high Madurai result is probably partly due to the fairly high proportion of Christians, the presence of a large number of non-brahmins (compared to the IISc), and the American ethos of the college.

The interviews were much clearer. According to a Hindu science finalist at Miranda House in Delhi University, “I have rejected religion since doing pre-medical studies. . . It is wrong to think that good parents will have children and bad parents will be denied children by God. It just is not true. Genetics determines what sort of children you have and not God.”

The majority of respondents did not seriously question the biological theory of evolution. Those who did were mainly fundamentalist Christians, a small number of Muslims, some orthodox Hindus, and members of certain sects. A member of the Adi Sanatan Deity Religion doing research in biochemistry at the IISc completely denied the possibility of evolution: “A human soul can only go into a human body. Man can never have evolved from an ape. Darwin is wrong.”<sup>3</sup> It is interesting that the crux of this respondent’s objection was not that religious revelation is threatened by evolution, but that Darwinism presupposes a common ancestry for humans and animals.

The following statements reflect a range of attitudes:

You can’t prove that God exists. . . but it’s important because you feel God exists and you can’t accept that you’re just another animal. (Hindu, Brahma Samaj, Indian Institute of Technology, Delhi)

There is a prejudice about the common origin of humans and animals but this is really no problem for Hindus. No supernatural being is responsible for an act of creation. (Hindu, IISc)

Hindu creation mythology is in the Purānas . . . Krishna existed first, then humans and animals co-existed together—this idea does not conflict with Darwinism. Through rebirth we are basically the same as animals, though the best animal. (Hindu, IISc)

Darwinism is very similar to the ten incarnations of Vishnu. (Hindu, Iyengar, IISc)

Darwinism agrees with the Rāmāyaṇa: at the time of the war between Rama and Rāvana there were two species, the monkeys and the *rākṣasas*. (Hindu, Indian Institute of Technology, Delhi)

Brahmā created—Darwin’s theory applies at a later stage. (Hindu, Neogi brahmin, IISc)

According to science the earth evolved. According to religion God created Manu and his girl, and then there was a flood. (Hindu, Indian Institute of Technology, Delhi)

According to Hinduism after a period of havoc Manu collected all specimens and planted them. Darwinism does not conflict with this general idea. (Hindu, Ramakrishna Mission, IISc)

Two interviewees at the IISc, a Hindu Iyer and a Madhva brahmin, suggested that karma and reincarnation were alternative and rival processes to biological evolution. Another IISc respondent observed that whereas the

Hindu tradition presupposes a cyclical time sequence, Darwinism is linear in its concept of development.

From these statements it will be clear that discussions in the interviews raised a number of problems directly related to the biological issues that were important in the nineteenth century—in particular the idea of a common ancestry for animals and human beings, and attitudes to scripture and religious revelation in general.

The results of the statistical test for responses to the part-question about evolution were also obtained. For three degrees of freedom chi square is large for both the Delhi and Bangalore samples, and in each case the level of significance is better than 0.001.

Some thoughtful observations about this issue were as follows:

The human mind is still searching for the origin of the universe. All is *māyā*. . . Relativity shows that an observed fact in science may not be a real one. (Hindu, IISc)

According to Hinduism Brahmā creates all things at once. . . This may be correct; even science says that the planets came from a huge star—perhaps this can be interpreted as Brahmā. The meson is the elementary building block of science—perhaps Brahmā is a huge meson. Everything converges to Brahmā—the Oneness. (Hindu, Smārtha brahmin, IISc)

According to the theory of relativity time is relative and one second may be thousands of years. This type of interpretation can overcome conflicts with Hindu theories. (Hindu, IISc)

As far as the cooling of the sun is concerned Hindus believe that the universe existed from infinite time and had no origin. (Hindu, Ramakrishna Mission, IISc)

Cosmology may be cyclic unless Fred Hoyle is correct. Let science decide. (Hindu, Iyengar, IISc)

With the exception of the last respondent, a Homi Bhabha research fellow, the tendency was to adduce cosmology and relativity to support religion rather than to “let science decide.”

The following statements are illustrative of the variety of responses that arose in the interviews over reincarnation and life after death:

I feel that people do not always get what they deserve—some good people have a hard time as though something done in a previous existence might be responsible. (Hindu, Nambūdrī brahmin, IISc)

Science permits reincarnation. . . Religion does not permit such artificial scientific methods [as birth control]. Controlling birth may mean controlling someone's reincarnation. (Hindu, Arya Samaj, Indian Institute of Technology, Delhi)

I believe in rebirth. In the *Gītā*, Krishna says, “In every age I come back.” (Hindu, IISc)

Science training has modified my beliefs and the idea of rebirth has been discarded first. (Hindu, Ramakrishna Mission, IISc)

Reincarnation is not possible; when you're dead, you're dead. (Hindu, IISc)

None of the interviewees mentioned Radhakrishnan's attempts to adapt reincarnation. There were, however, several references to Vivekananda's teaching on the subject. One respondent, whose father seems to have been a full-time palmist and astrologer, claimed to have been particularly impressed by Vivekananda's works from an early age: "At the age of fourteen I was challenged by an exposition of Vivekananda's teaching. Vivekananda has been very important to me ever since. [He says] 'The body will die, but I shall not die.' The idea of karma . . . in this passage . . . implies rebirth and the timing is related to the stars and planets." (Hindu, IISc)

Several references were made to parapsychology during the interviews, and opinions were divided as to whether or not any scientific experiment could ever prove or disprove the theory of reincarnation. One respondent expressed interest in experiments in parapsychology, adding the comment: "Personally I do not believe that one soul coupled with another body makes sense" (Hindu, Bhumiar brahmin, IISc). This type of argument against belief in reincarnation is essentially the same as one of the major criticisms urged against rebirth by the Cārvākas.<sup>4</sup>

Many respondents frequently quoted the opinions of the leaders of the nineteenth-century reform movements, particularly Vivekananda and Ramakrishna. The former was praised by one respondent for his ability to see the universe "as a whole," and by another for his religious universalism: "Vivekananda . . . is the ideal Hindu because he can live with and accept other religions" (Hindu, Smārtha brahmin, IISc).

One research scientist paid regular visits to the Swami Ramakrishna Ashram: "I go twice a year to the Swami Ramakrishna Ashram to stay two weeks at a time. . . Science has increased my interest in religion. . . Religious and scientific approaches run parallel. . . I have been influenced by Vivekananda" (Hindu, Iyer, IISc).

Publications by the Bharatiya Vidya Bhavan were extremely popular, and articles about science and religion in *Bhavan's Journal* were frequently referred to during the interviews. Swami Ranganathananda's *Message of the Upanishads* was in circulation among a section of students and lecturers at Delhi University. Commentaries on the Gītā were very much in evidence at the IISc, but most of them were in Tamil or Malayalam. One respondent was particularly fond of Gandhi's *Discourses on the Gītā*.

In contrast to the nineteenth century when Western scientific ideas first entered India on a large scale, some important Hindu concepts were no longer felt to be adequate. In particular some respondents had misgivings about belief in reincarnation and karma. In the nineteenth century neither of these doctrines was felt to be vulnerable to scientific advances, and it

could be argued that the reason why Darwinism never posed a problem for educated Hindus was that through the doctrine of reincarnation the common origin of humans and animals was perfectly natural.

Many Christians and Muslims were unable to reconcile Darwinism with scripture, and some Hindus went to great lengths to demonstrate similarities between Brahmā's creation, Vishnu's incarnations, and scientific theories of evolution. Few respondents seemed sufficiently well informed to argue about quantum theory or relativity, but there was some interest in cosmology among scientists at the IISc. The demand for rationalism and proof was frequently made, often without consideration for whether or not a type of proof used in a particular scientific discipline was legitimate when transferred to another. In some cases failure to fully understand the methods of science produced unnecessary conflict with religious beliefs—a situation paralleled in the nineteenth century, and currently in parts of the United States.

Some of the major findings of the questionnaire and interview investigation may be summarized as follows:

- (1) The popular idea that scientists keep their scientific and religious beliefs completely separate and never consciously try to relate them is not correct. Between 60 and 90 percent of respondents at all four centers visited maintained that there is some relationship between the two, the nature of the relationship as indicated by the investigation being that the degree of conflict between science and religion in specific areas can be inversely correlated with the importance attached to religion.
- (2) While it may not generally be true that science is a cause of conflict between science and religion, it is often associated along with other factors with changes in belief. Quite often the change is one in which religion is given less importance and sometimes rejected completely. There is, however, a significant proportion of scientists whose beliefs have been strengthened by the study of science.
- (3) A superficial grasp of science can be the cause of more conflict between religion and science than a more mature understanding.
- (4) Several of the areas that played an important role historically continue to exercise scientists today. Darwinism and scientific-historical approaches to scripture raise questions, and reincarnation, which was not problematic historically, seems to be becoming increasingly so today.

But there is no organized or substantive move to challenge Darwinism in the name of the Hindu tradition, and the general mood is to welcome the fruits of genuine scientific research at every opportunity.

## CONCLUDING COMMENTS

We have considered the context of the encounter between Darwin's theory and the Hindu tradition in terms of the extensive use of the English language in higher education in India from the mid-nineteenth century onward, and how this stimulated and nurtured wide-ranging reforms in many areas of religion and society. Invoking the notion of secularization, we categorized responses to it as reassertive, adaptive, and rejecting, noting that the major reform movements fell into one or other of these groups, often borrowing terms and concepts from European science to buttress their arguments.

We considered the broad reaction of Darwinism among educated Hindus in the main publications of the reform movements, some in Bengali, from which it is clear that Darwin's theory was welcomed and routinely assimilated. There was no public reaction of the kind that is claimed to have occurred in England, though that may have been exaggerated. Some of the qualifications that apply in the English case are discussed by Brooke (2009), Livingstone (2003), and Moore (1979).

The leaders of the Hindu Reform movements, some distinguished scientists and a contemporary sample of young scientists at four university centers in India were studied from the perspective of their appreciation of Darwinism, which, of course, became better established as the twentieth century progressed.

Ram Mohan Roy died before *On the Origin of Species* was published, but his strong advocacy of European science set the scene for an enthusiastic appreciation from his influential Brahmo Samaj—more so from Keshub Sen than from Roy's more immediate successor Debendranath Tagore. Dayanand Sarasvati was too uncritical in his attempts to read modern science back into the Vedas, and we were wary of Sri Aurobindo on account of his complex terminology and use of unacknowledged sources.

Sri Ramakrishna was not interested in science, but his protégé Swami Vivekananda developed the remarkably erudite, if occasionally flawed, system of thought known as Comprehensive Vedānta. An important feature of this was his ability to reconcile Darwinian and post-Darwinian notions of heredity with the Hindu theory of reincarnation in such a manner that God could continue to be loving and gracious in the face of human suffering. Although the later Hindu reformers were familiar with Herbert Spencer, it does not appear that they were impressed by his rather bullish rendering of survival of the fittest. We considered the biologist Jagadish Chandra Bose who, like Vivekananda, believed that the coming together of the various branches of science under common heads was an expression of the underlying oneness presupposed by Shankara's *advaita* Vedānta.

With the notable exception of Ram Mohan Roy, none of the Hindu reformers had any doubts about reincarnation. However, our concluding

survey of young scientists suggests that this is no longer the case, and that exposure to new scientific ideas is casting doubts on this cardinal doctrine of Hindu orthodoxy, and with it the associated view of karma. While many people—and not just Hindus—believe that “what goes around comes around,” the more educated ones are asking more probing questions that call for deeper dialogues between scientists and religious proponents than are currently taking place, especially about what each believes about what it means to be truly human.

All religions have important things to say about what it means to be human, and considerable common ground exists between them. But they need to dialogue more effectively with the scientists whose new discoveries are forcing the pace of change. And within that dialogue, representatives of the nonwestern world must be invited to play a greater role.

#### NOTES

1. Back issues of the *Tattvabodhini Patrika* and *Sambad Prabhakar* are available in the library of Calcutta [Kolkata] University. For the purposes of this study, Sri Sukumar Mitra, a contributor to *Studies in the Bengal Renaissance* (National Council of Education, Calcutta, 1958), kindly went through them and translated relevant passages. An early editorial in the *Sambad Prabhakar* expresses very clearly the mood of educated Bengal in the mid-nineteenth century: “God desired that man should know the secrets of all that existed around him. Man’s knowledge should help him to acquire various skills and he must use those skills to promote his own good” (June 8, 1847). The *Bibidhartha Sangraha* was established and edited by Rajendralal Mitra in 1851, but did not become as popular or influential as the *Tattvabodhini Patrika* and *Sambad Prabhakar*. S. K. Das, another contributor to *Studies in the Bengal Renaissance*, maintains that: “Rajendralal Mitra was prepared to go ahead with the history, geography, natural science, zoology and other sciences from Europe, for widening the horizon of his national literature.” The important points are that science seems to have been welcomed by Bengal society as a whole and not just by a handful of aristocratic English-speaking individuals like Roy, and that Darwinism was eventually assimilated in much the same way as other branches of science.

2. Spencer and Alexander (2009). These authors challenge the conventional view that Darwinism created a major rift between science and religion.

3. The Adi Sanatan Deity Religion was founded in 1937 at Mount Abu in Rajasthan and has approximately 200 branches in India. It is an ascetic sect whose aims include self- and God-realization through yoga. The founder of the sect was a diamond merchant in Kolkata until, at the age of 60, he became the corporeal medium of Godfather Śiva. The ultimate aim is to re-establish a Golden Age of one government and a single religion. The sect believes that history is cyclical and repeats itself every 5000 years.

4. For further details of the arguments used by the Cārvākas against reincarnation see Smart (1964, 160).

#### REFERENCES

- Aurobindo. 1970a. *Essays on the Gita*. Pondicherry: Sri Aurobindo Ashram.  
 ———. 1970b. *The Life Divine, Book 1*. Pondicherry: Sri Aurobindo Ashram.  
 Bose, Jagadish Chandra. n.d. “Literature and Science.” In *Sir J. C. Bose, Life and Speeches*, 203. Chennai: Ganesh and Co.  
 Brooke, John H. 2009. “Darwin and Victorian Christianity.” In *The Cambridge Companion to Darwin*, ed. Jonathan Hodge and Gregory Radick, 2nd edition, 197–218. Cambridge: Cambridge Univ. Press.  
 Cremo, Michael A. 2003. *Human Devolution: A Vedic Alternative to Darwin’s Theory*. Los Angeles: Bhaktivedanta Book Publishing, Inc.



- Ellegård, Alvar. 1959. *Darwin and the General Reader: The Reception of Darwin's Theory of Evolution in the British Periodic Press 1859–1872*. Gothenburg: Gothenburg Studies in English VIII.
- Gosling, David L. 1973. "The Impact of Science on Indian Society." Doctoral dissertation. Lancaster.
- . 2001. *Religion and Ecology in India and Southeast Asia*. London: Routledge.
- . 2007. *Science and the Indian Tradition: When Einstein met Tagore*. London: Routledge.
- Livingstone, David N. 2003. "Replacing Darwinism and Christianity." In *When Science and Christianity Meet*, ed. David C. Lindberg and Ronald L. Numbers, 183–202. Chicago: University of Chicago Press.
- Mayr, Ernst. 1988. *Toward a New Philosophy of Biology—Observations of an Evolutionist*. Cambridge, MA: Harvard Univ. Press.
- Moore, James R. 1979. *The Post-Darwinian Controversies*. Cambridge: Cambridge Univ. Press.
- Naravane, V. S. 1964. *Modern Indian Thought*. Asia Books.
- . *Proceedings of Fourth Decennial Missionary Conference*. 1902. Chennai: Christian Literature Society.
- Radhakrishnan, Sarvepallai. [1932] 1957. *An Idealist View of Life*. London: Allen & Unwin.
- . 1960a. *The Brahma Sutra*. London: Allen & Unwin.
- . 1960b. *The Hindu View of Life*. London: Unwin.
- Ranganathananda, Swami 1971. *The Message of the Upanishads*. Mumbai: Bharatiya Vidya Bhavan.
- Roy, Prafulla Chandra. n.d. *Life and Experiences of a Bengali Chemist*. London: Kegan Paul, Trench, Trubner & Co., Ltd.
- Sarasvati, Dayanand. 1970. *Light of Truth*. New Delhi: Jan Gyan Prakashan.
- Seal, Brajendranath. 1915. *The Positive Sciences of the Ancient Hindus*. London: Longman and Green.
- Sen, Keshub. 1969. *That Marvellous Mystery, the Trinity*. ed. M. M. Thomas. London: SCM Press.
- Smart, Ninian. 1964. *Doctrine and Argument in Indian Philosophy*. London: George Allen & Unwin.
- Spencer, Nick, and Denis Alexander. 2009. *Rescuing Darwin: God and Evolution in Britain Today*. London: Theos.
- Thomas, M. M. 1970. *The Acknowledged Christ of the Indian Renaissance*. Chennai: Christian Literature Society.
- Vivekananda. 1964a. *Complete Works*, Vol. II. Almora: Advaita Ashram.
- . 1964b. *Complete Works*, Vol. IV. Almora: Advaita Ashram
- . 1964c. *Complete Works*, Vol. V. Almora: Advaita Ashram.