

GODS ARE DREAMS OF MEN: The Story of Darwin, Creationism, Evolution and Law Courts

{This is the text of talk delivered by Justice Yatindra Singh (Judge, Allahabad High Court, email: ysingh@allahabadhighcourt.in) in the inaugural function of Zoological Society University of Allahabad held at DR Bhattacharya auditorium, Nehru Science Centre, on 31st October 2009.

It is a tribute to Charles Darwin on his bicentennial birth anniversary and 150th year since publication of 'On the Origin of Species'. It talks about his life, origin of species, objections of the creationists, and the cases banning teaching of 'Origin of Species' or requiring the schools to teach Creationism/ Intelligent Design.}

Five of my life's finest years, have been spent in this University and two out of these were spent here, in the science faculty. In the year 1968, when I took admission (ours was the first batch with statistics), NCC was compulsory unless one represented the University in some game. At that time Nehru Science Centre was not there and this used to be an open field. I spent some time parading here until I was selected in the University table tennis team. Thank you for bringing back those fond memories.

Arre (अरे), some tense faces in the audience. Oh, I understand, you are bothered about the title of my presentation. You must be wondering if I am going to hurt with your religious sentiments?

I have no intentions of doing so.

The title is a quotation and it is not mine; it is of Carl Sagan, a well known scientist, who, perhaps, has popularised science more than anyone else in the last century. This phrase was used by him in the most popular thirteen episode science TV serial of 80's – 'Cosmos: A Personal Voyage'. Later a book, based on this TV serial entitled 'Cosmos' was also published. By this phrase, Carl was describing the most dominant religion in our lives - Hinduism. An obvious question,

'Why have I used it as the title of this presentation?'

I have used it as it epitomises the life and theory of Darwin. And perhaps this is the reason that his theory – the Origin of Species - is so controversial. It is so controversial that the latest British film 'Creation', based on Darwin's life has not

been able to find a film distributor in US. They are afraid of protests, demonstrations by creationists.

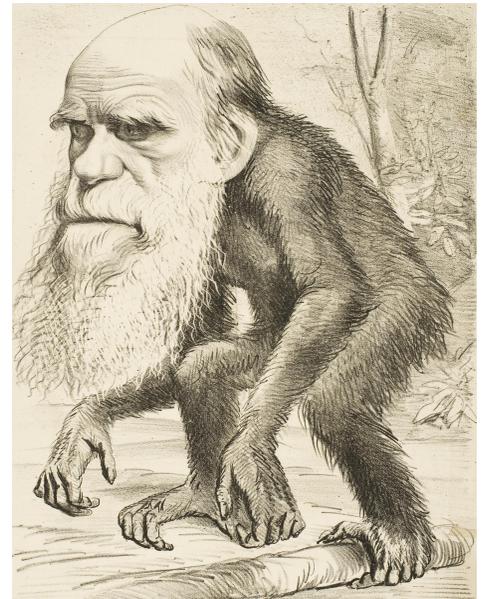
Creationists - who are they?

Broadly, creationism refers to religious beliefs that Universe, life, species were created by a supernatural power. Jews, Christians, Muslim accept the old testament, Book of Genesis and the story of Adam and Eve. Parsis and Iranis are Zoroastrians and they believe in Ahura Mazda, who created the primal man Gayomaerd from whose seed the first couple Mashya and Mashyoo were born. There are many stories regarding creationism in Hinduism but shlok number 32 of the first chapter of Manusmriti says, 'Dividing his own body, the Lords became half male and half female; with that (female) he produced Virag'. (For details see Appendix-1). Creationism is there in all religion. Evolution negates it. It is for this reason that Darwin's theory is debatable, controversial.

DARWIN'S EARLY LIFE

Charles Darwin was born on February 12th, 1809 at Shrewsbury. He lost his mother at the young age of eight. His father was a medical practitioner. He thought of following his father's footsteps but soon realised that he could not stand blood and he dropped it.

("A Venerable Orang-outang", a caricature of Charles Darwin as an ape published in The Hornet, a satirical magazine on 22 March 1871)



On the advice of his father, Darwin started studying theology and wanted to become a cleric. Then he dropped that as well.

Darwin was interested in Natural History and started studying it under the supervision of his Botany Professor John Stevens Henslow.

In 1831 at the age of 22, Darwin was a young man without any career: his future in

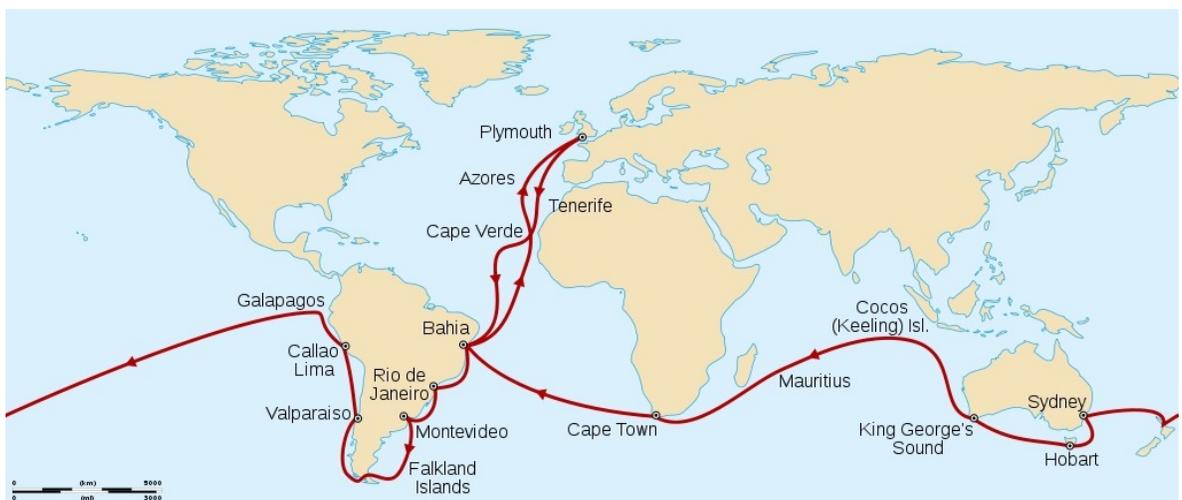
ruins. It is at this time that he received a letter - courtesy Henslow - inviting him to sail around the world on HMS Beagle as a naturalist. This not only changed Darwin's world but the World too.



(HMS Beagle in the seaways of Tierra del Fuego, painting by Conrad Martens during the voyage of the Beagle (1831-1836), from The Illustrated Origin of Species by Charles Darwin, abridged and illustrated by Richard Leakey ISBN 0-571-14586-8.)

Beagle's Sea Voyage

The sea voyage was to take two years starting on 27th Dec 1831 but took about five years and ended on 2nd Oct 1836. During the sea voyage Darwin was traditional and often used to quote the Bible but as the journey was coming to an end, he started losing faith in the Bible. He started doubting the story of creation in the 'Book of Genesis' in the Bible. This belief took such a strong hold on him that in his later life, he stopped going to church.



(The voyage of the Beagle)

Darwin returned from the sea voyage with some astonishing facts. A new theory, about the origin of species, started taking shape in his mind. It was against the

Book of Genesis. It was so revolutionary that he could not bring himself to publish it. After all, at some point of time in his life he wanted to become a cleric and his wife was a devout Christian.

During the sea voyage, Darwin also went to Galápagos Islands. They are in the Pacific ocean and are about 972 Kilometers from Ecuador. The birds and animals found there, were different from those found in the rest of South America but there were important similarities too. Here, Darwin collected some specimen of birds. It was later found that all of them were finches but their beaks were different.

Darwin started thinking about how did this happen? Was it possible that these finches had a common ancestor? Did their beaks become different with passage of time? Was it, in order to find food, to be in tune with the environment?

Darwin also thought that if finches could change then why could it not happen with other species? Was it possible that all species had one common ancestor? Did it happen because of chance mutation, natural selection and survival of the fittest.

In 1838, Darwin also read a book entitled 'Essay on the Principle of Population' by Thomas Malthus. This book put definite ideas in his mind about the new theory; the specimen of the insects and birds collected during the sea voyage also pointed towards it—but he could not bring about to publish it. It is only when he received a letter on 18th June 1858 that he changed his mind.

LETTER RECEIVED BY DARWIN – ORIGIN OF SPECIES

The letter received by Darwin on 18th June 1858 was written by Alfred Russel Wallace. He talked about the same principle regarding origin of life that was arrived at by Darwin but he did not have evidence to justify it. The evidence was with Darwin: he had collected them during his sea voyage on the Beagle.

(Alfred Russel Wallace)



Ultimately, a paper explaining the origin of life, was read in the joint name of Darwin and Wallace on 1st July 1858 in the Linnean Society of London. Broadly, it stated that evolution is a result of chance mutation and natural selection, where survival of the fittest played crucial role. His book 'On the Origin of Species' was published on November 24, 1859. Initially its full title was 'On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life'. It was later on shortened (for the sixth edition of 1872) to the present title.

Darwin was a man of character. It was quite easy for him to hide the letter of Wallace and publish the theory with the facts and evidence in his name alone. But he chose not to do so. It shows his greatness; unlike many other scientists he was not wicked.

Slavery was common those days. However, Darwin was opposed to it. In Brazil he was enchanted by the beauty of greenery of the jungles but slavery pained him. After leaving the country, he wrote
'I thank God I shall never visit slave country.'

Robert FitzRoy, Captain of the Beagle, approved slavery. Darwin criticised him and nearly lost his job as naturalist on the ship.

The origin of species did create enemies; strongest amongst them were the upholders of orthodox religious beliefs. If the theory of evolution was true then the account of creation in the Book of Genesis was incorrect; and if evolution worked automatically, there was no room for divine guidance. So controversial was Darwin's theory of evolution that the first edition of his book 'Origin of Species' was sold out within 24 hours of its publication. A record yet to be equalled.

It was about this theory that most talked about debate of all times took place between Bishop Samuel Wilberforce and Thomas Henry Huxley. It was held on 30th June 1860 at the meeting of the British Association for the Advancement of Science at Oxford University. Bishop Samuel thought that this gathering presented an opportunity to squash the 'dangerous'



new evolutionary theory.

(Caricature of Wilberforce published in Vanity Fair in 1869)

Huxley sat quietly while the bishop spoke 'with inimitable spirit, emptiness and unfairness.' There is no written record of the debate but Bishop Wilberforce made the fatal error of voicing an offensive personal inquiry about Huxley's simian ancestry, whereupon Huxley murmured to his neighbour,

'The Lord has delivered him into my hands.'

Soon Huxley was called out for the reply, which he did with devastating effect,

'If . . . the question is put to me, would I rather have a miserable ape for a grandfather or a man highly endowed by nature and possessed of great means of influence, and yet who employs these faculties and that influence for the mere purpose of introducing ridicule into a grave scientific discussion--I unhesitatingly affirm my preference for the ape.'

(Caricature of Huxley published in Vanity Fair in 1871)



OBJECTIONS OF CREATIONISTS

Broadly, creationism says that Universe and life was created because of super natural power through some intelligent design. However, if Darwin's theory of evolution is correct then, there is no need for the creator, no need for any super natural power. This is the basic conflict between the two. Creationists have two basic objections against Darwin's principle,

- (i) In case there was a common ancestor then where is that common ancestor at this time. Where is the missing link. What is the evidence of that common link.

(ii) Evolution violates the second law of Thermodynamics.

The First Objection—Missing Link

Evolution does not take place in one life time. It takes millions of years to happen, it cannot be seen in one life time. But this does not mean that it is not correct. One does not have to see in order to prove correctness. No one has seen that earth goes round the sun but this does not mean that it is not true. It is correct because, only if sun is taken to be centre of the solar system then the movement of planets can be explained. This is the basis for accepting any principle or fact in science.

Palaeontologists study fossils. These fossils are also kept in the museums. They contain the evidence of the missing link. DNA testing of the animals shows that life is connected with each other.

The age of a fossil can be find out by carbon dating. This is the standard form to find out the age. It shows many fossils to be millions of years old - much older than the life created under the book of Genesis.

The Second Objection - Violation of the Second Law of Thermodynamics

The second law of Thermodynamics states:

'In a closed system, entropy always increases.'

Broadly, it also says that things proceed from order to dis-order. In evolution life has progressed from lower life form to the higher life form i.e. towards more ordered form. It means that entropy is decreasing. According to creationists, it cannot happen: evolution violates the second law of Thermodynamics.

The second law of Thermodynamics is true for a closed system and not otherwise. Light and heat from the sun have a special role to play in origin of life. If there was no sun then there would have been no light, no heat and the life would not have evolved. Sun is producing light and heat by converting mass into energy. This is increasing entropy. This is much more than the decrease in entropy on earth. If both are taken together then entropy is increasing and not decreasing.

CASES IN LAW COURTS

The Monkey Trial

The Christian fundamentalist do not accept Darwin's theory regarding origin of

species. They are most vocal in US. They got anti evolution law enacted in most of the states in US. In March 1925, the Tennessee legislature almost unanimously (75 is to 5) passed a law:

‘which declared unlawful, teaching of any doctrine denying the divine creation of man as taught in the Bible.’

It banned the theory of evolution as propounded by Darwin.

John T. Scopes was a high school teacher at a government public school at Dayton. He decided to violate it as a test case and the Civil Liberties Union promised to defend him free of cost. Scopes was arrested and indicted by a grand jury for teaching the theory of evolution. His trial attracted World-wide attention and has come to be known as ‘The Monkey Trial’.

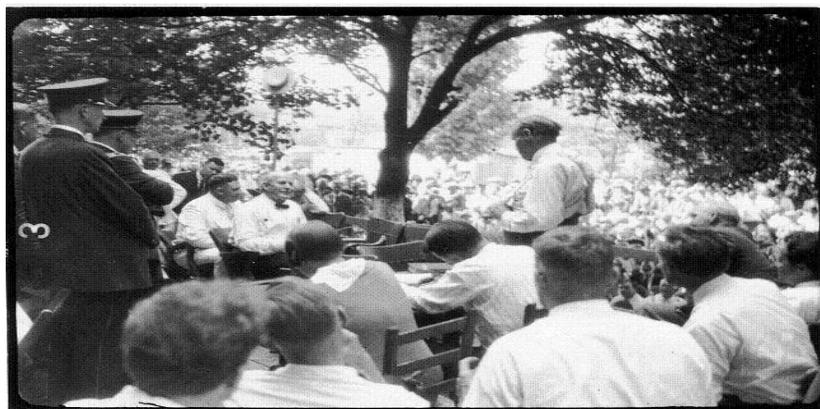
William Hennings Bryan led the prosecution side and Clarence Darrow the defence side. Bryan opened the case with the remark,

‘The trial uncovers an attack on religion. If evolution wins, Christianity goes.’

Darrow retorted with,

‘Scopes is not on trial, civilization is on trial.’

During the trial, the courtroom echoed with laughter, applause, and demonstration. There were chances that the floor might give way. The judge ordered the trial to be transferred to the court house lawn. The Judge, Jury, and counsel were seated on the raised platform and below the platform tables were set out for newspaper, telegraph and radiomen. The lawn was filled with 5000 spectators. It is in these surrounding that ‘The Monkey Trial’, described as the most amazing court scene in Anglo Saxon history by the New York Times, took place.



{William Jennings Bryan (seated at left) being interrogated by Clarence Darrow,

during the trial of State of Tennessee vs. John Thomas Scopes}

The defence was prevented by the judge from producing any expert to prove the authenticity of the theory of evolution. At this stage, Darrow asked his adversary if he would like to testify as an expert on the Bible. The offer was accepted and Bryan, the chief prosecuting counsel entered the witness box. But by doing so, he invited his own doom. During cross-examination, Darrow tore him apart. The next day the judge ruled to strike out Bryan's entire testimony on the ground that it was not relevant. This sealed the fate of the defence case. It was admitted that Scopes had taught the theory of evolution. He was convicted and fined one hundred dollars. Bryan died a day after the judgement. Many say he could not withstand Darrow's cross-examination.

The matter did not end there. An appeal was taken to the Tennessee Supreme Court. Five judges heard the case. It took a year for the decision to come. By the time one of them had died. Only four delivered the judgement. The decision was unanimously reversed. Surprisingly, it was not set aside on the merits but on a technicality. The Supreme Court of Tennessee held that the conviction was illegal as the judge, instead of the jury, had fixed the amount of fine. Only one judge held that the anti-evolution law was unconstitutional; two of the judges had held that it was constitutional. The fourth judge had held the law to be constitutional but it neither barred the teachers to teach Evolution theory nor it applied to the Scopes case.

Anti Evolution Law—Illegal: The Eperson Case

In most of the States of US, Anti-evolution Law continued. Arkansas is also one such State. Ultimately Susan Eperson challenged this law and it was unanimously so declared. (Eperson V Arkansas: 393 US 97: 21 LEd 2d 228). The Court, on 12.11.1968, held that:

'Arkansas' law cannot be defended as an act of religious neutrality. Arkansas did not seek to excise from the curricula of its schools and universities all discussion of the origin of man. The law's effort was confined to an attempt to blot out a particular theory because of its supposed conflict with the Biblical account, literally read. Plainly, the law is contrary to the mandate of the first, and is violation of the fourteenth, Amendment to the

Constitution.'

(See Appendix-2 for the first and fourteenth amendment to the US Constitution. Apparently the first amendment applies to the Congress and not to the States' legislatures. The discussion in Appendix-3 may be seen why first ten amendments to the US constitution are applicable to the States. Appendix-4 may be seen for the relevant provision in our Constitution.)

The Edwards Case

Louisiana enacted a law known as 'Balanced Treatment for Creation-Science and Evolution-Science Act'. Broadly it states that Darwin's evolution theory should not be taught in the schools. In case it is taught then creationism should also be taught. This was challenged by a teacher called Donald Aguillard. This law was held to be ultra vires not only by the Louisiana Supreme Court but also by the Supreme Court of US (Edwards V Aguillard, 482 US 578 96 L Ed 2d 510). The Court, on 19.6.1987, held that:

'The Louisiana Creationism Act advances a religious doctrine by requiring either the banishment of the theory of evolution from public School classrooms or the presentation of a religious viewpoint that rejects evolution in its entirety.

The Act violates the Establishment Clause of the First Amendment because it seeks to employ the symbolic and financial support of government to achieve a religious purpose.'

The Tammy Case

The religious fundamentalists did not accept defeat. They had published a book entitled 'Of Pandas and People'. This talks about creationism but uses the word, 'Intelligent Design' for the same. Broadly, it asserts that Universe, life, species are best explained by an intelligent cause and not by undirected process natural selection. It is a refined version of creationism – without identifying the nature or identity of the designer. They also saw that the Dover Area School Board of Directors pass a resolution that:

Students will be made aware of gaps/ problems in Darwin's theory and of other theories of evolution including, but not limited to, intelligent design.

Subsequently, it was also announced that teachers would be required to read the following statement to students in the ninth grade biology class:

The Pennsylvania Academic Standards require students to learn about Darwin's Theory of Evolution and eventually to take a standardized test of which evolution is a part.

Because Darwin's Theory is a theory, it continues to be tested as new evidence is discovered. The Theory is not a fact. Gaps in the Theory exist for which there is no evidence. A theory is defined as a well-tested explanation that unifies a broad range of observations.

Intelligent Design is an explanation of the origin of life that differs from Darwin's view. The reference book, 'Of Pandas and People', is available for students who might be interested in gaining an understanding of what Intelligent Design actually involves.

With respect to any theory, students are encouraged to keep an open mind. The school leaves the discussion of the Origins of Life to individual students and their families. As a Standards-driven district, class instruction focuses upon preparing students to achieve proficiency on Standards-based assessments.

This was challenged in *Tammy Kitzmiller V Dover Area School District*. The Court held on 20.12.2005,

'A declaratory judgement is issued in favour of Plaintiff ... that Defendant's [School's] policy violates the First Amendment of the Constitution of the United States and Article 1& 3 of the Constitution of the Commonwealth of Pennsylvania.

... Defendants are permanently enjoined from maintaining ID Policy in any school within Dover Area District.

The religious fundamentalists have not accepted defeat. Laws to teach creationism/Intelligent Design were proposed in Alabama, Florida, Michigan, Missouri and South Carolina but were not passed and became dead in 2008. However Louisiana did pass a statute known as 'Science Education Act'¹ (see Appendix-5) in June 2008. Will this Act reopen this debate in law courts. Will similar laws be enacted in other countries? Religious fundamentalism is on the rise: you never know what the future holds (See Appendix-6 for a survey

1 See here:
<http://www.legis.state.la.us/billdata/streamdocument.asp?did=503483>

conducted by Ipsos MORI on the request of BBC).

Note: The photograph of Lord Krishna has been taken from the popular TV Serial Sri Krishna. The photograph of Scopes trial on the lawns was taken on July 20, 1925, by Watson Davis, Managing Editor of Science Service, and is courtesy Smithsonian Institutional archives (<http://siarchives.si.edu/research/scopes.html>). The remaining photographs have been taken from Wikipedia.

Appendix-1

CREATION - RELIGIOUS STORIES

Jews, Christians, and Muslims

Abraham (Ibrahim) was one of the three sons of Terah (Aazar). They used to live in Mesopotamia (presently Iraq). He is said to be the 10th generation from Noah (Nooh) and 20th generation from Adam. Abraham (Ibrahim) had two sons

- (i) Ishmael; and
- (ii) Isaac.

It is said that followers of Abraham (Ibrahim)—Ishmael became Muslims and the followers of Ibrahim (Abraham)—Isaac became Jews.

Jews believe in God who is almighty but is formless. Unlike Hindus, they do not believe in reincarnation of God. They accept 'Old Testament': it contains many books. One of them is 'Book of Genesis'. It talks about creation of Universe and life. It also talks about the story of Adam and Eve and their expulsion from heaven.



Jesus Christ was a Jew. His teachings are contained in the 'New Testament'. His followers became Christians. The religious book for Christians is the Bible that contains the old as well as the new testament. He called himself son of God, reincarnated in the human form. He was charged for blasphemy by the Jews and was crucified.

Saint Muhammad lived around the seventh century AD. According to Muslims, God sent his message through him. According to the Muslim faith,

- This message of God superseded the prior message contained in Zabur (Psalms) (Hebrew bible) (old testament) {teaching of saint Daud (David)}, Tawrat (Torah) (religious book of Jews), and Ingil (New Testament) (religious book of Christians).
- The new message given by God is in Quran: this is God's final word; it is to be accepted and followed.

Broadly, the starting point for these religions is the same and so is their story of creation of Universe and life. They believe in the story of Adam and Eve.

Zoroastrians

About 1300-1700 BC (there is some doubt regarding age)— there was a saint by the name of Zoroaster (Zortosht) (Zorathushtra). The followers of Zoroaster are called Zoroastrians.

About a thousand years ago, Zoroastrians were prosecuted in Iran and fled. They settled in India. They are known as Parsis. Many Zoroastrians fled afterwards and are known as Irani.

Like Jews and Muslims, Zoroastrians also believe in formless worship of God. They refer to their God as Ahura Mazda. He is the one who has created the Universe and diverse forms of life. He created his helpers, called the Amesha Spentas, before creating Universe. He created Gayomaerd, the Primal man from whose seed the first human couple Mashya and Mashyoo were born. Ahirman is Satan who wants to destroy everyone. After 9000 years of this creation, three holy men will come and defeat Ahiram: darkness will vanish, corruption will end, peace will return, and Earth will become heaven.



According to all of the aforesaid religions (Judaism, Christianity, Islam, and Zoroastrianism), God has created this Universe and species. They exist in the same form as they were created; there has not been any change. It means that there is no place for evolution. According to them, this creation is not old and is within 10,000 years.

Hindu Religion

Hindu religion is much older. It talks about many stories regarding creation of Universe and life.

One of the stories is that the universe is under infinite number of creations and destructions. Carl Sagan, Ph.D. in Astronomy, was a well known person. He has made a TV serial called 'Cosmos'. It was about evolution of universe and civilization. Subsequently a book by the name of 'Cosmos: Story of Cosmic Evaluation, Science and Civilization' was also published. In this book Carl says (page 285)

The Hindu religion is the only one of the world's great faith dedicated to the idea that the Cosmos itself undergoes and immense, indeed an infinite number of deaths and rebirths. It is the only religion in which the time scales correspond, no doubt by accident, to those of modern scientific cosmology. Its cycles run from our ordinary day and night to a day and night of Brahma, 8.64 billion years long, longer than the age of the Earth or the Sun and about half the time since the Big Bang. And there are much longer time scales still.

There is the deep and appealing notion that the universe is but the dream of the god who, after a hundred Brahma years, dissolves himself into a dreamless sleep. The universe dissolves with him – until, after another Brahma century, he stirs, recomposes himself and begins again to dream the great cosmic dream. Meanwhile, elsewhere, there are an infinite number of other universes, each with its own god dreaming the cosmic dream. These great ideas are tempered by another, perhaps still greater. It is said that men may not be the dreams of the gods, but rather that the gods are the dreams of men.

How long is the period of creation and destruction? There is a puzzle that explains it.

It is said that Brahma created a temple. In this temple, there are three rods of diamond. In one of the rods, there are 64 golden plates of different sizes, the biggest one is at the bottom and the smallest one is on top. There is a priest and his job is to transfer the plates from one rod to the other so that in the other rod plates are placed in the same fashion. In this process he can use the third rod but he has to obey the following conditions:

- (i) Only one plate can be moved at a time; and
- (ii) The bigger plate cannot be kept over the smaller plate.

The day all plates are transferred to the other rod, the universe will come to an end and the process for creation will start.

If you think this will take a short time then you are mistaken. In case, it takes one second to transfer one plate to another rod then it will take 5×10^{11} years about five hundred billion (British) years or half billion (American) years. The total number of

moves is $2^{64}-1$ or 18,446,744,073,709,551,615.

Fritjof Capra, Ph.D. in Physics from Vienna University, has also popularised science. He has written a book entitled 'The Tao of Physics'. In this book, he says, (page 256-259),

The Eastern mystics have a dynamic view of the universe similar to that of modern physics, and consequently it is not surprising that they, too, have used the image of the dance to convey their intuition of nature.

...

The metaphor of the cosmic dance has found its most profound and beautiful expression in Hinduism in the image of the dancing god Shiva. Among his many incarnations, Shiva, one of the oldest and most popular Indian gods, appears as the King of Dancers. According to Hindu belief, all life is part of a great rhythmic process of creation and destruction, of death and rebirth, and Shiva's dance symbolizes this eternal life-death rhythm which goes on in endless cycles.

...

The Dance of Shiva symbolizes not only the cosmic cycles of creation and destruction, but also the daily rhythm of birth and death which is seen in Indian mysticism as the basis of all existence. At the same time, Shiva reminds us that the manifold forms in the world are maya – as he keeps creating and dissolving them in the ceaseless flow of his dance.

...

For the modern physicists, then, Shiva's dance is the dance of subatomic matter. As in Hindu mythology, it is a continual dance of creation and destruction involving the whole cosmos; the basis of all existence and of all natural phenomena. Hundreds of years ago, Indian artists created visual images of dancing Shivas in a beautiful series of bronzes. In our time, physicists have used the most advanced technology to portray the patterns of the cosmic dance. The bubble-chamber photographs of interacting particles, which bear testimony to the continual rhythm of creation and destruction in the universe, are visual images of the dance of Shiva equalling those of the Indian artists in beauty and profound significance. The metaphor of the cosmic dance thus unifies ancient mythology, religious art and modern physics.

Perhaps this may be the reason that there was no objection against Evolution: atleast Jawarlal Nehru thinks so. This is what he says in his book 'The Discovery of India' published by Oxford University Press page 116,

'Nevertheless the Old Indians, unlike the other ancient nations, had vast conceptions of time and space. They thought in a big way. Even their mythology deals with ages of hundreds of millions of years. To them the vast periods of modern geology or the astronomical distances of the stars would not have come as surprise. Because of this background, Darwin 's and other similar theories could not create in India the turmoil and inner conflict which they produced in Europe. The popular mind in Europe was used to a time scale which did not go beyond a few thousand years.'

According to another story from the Hindu religion, one does not know how the universe was created and even its creator might not be knowing. This is contained Shlok number 129 from the 10th Chapter of Rigved. It is as follows:

नासंदासीन्नो सदासीत्तदानीं नासीद्रजो नो व्योमा पुरो यत्।

किमावरीवः कुह कस्य शर्मन्नम्भः किमासीद्गहनं गभीरम् ॥१॥

Neither there was non-existent; nor there was any realm or region. How could there be existing this unfathomable profound plasma?

न मृत्युरासीद्मृतं न तर्हि न रात्र्या अह्न आसीत्प्रकेतः।

आनोदवातं स्वधया तदेकं तस्माद्धान्यन्न पुरः किं चनासं ॥२॥

Neither there was death nor at that period immortality. There was no indication of day or night. That breathless one breathed upon as if by its own automation. Apart from that one, there was nothing else whatever.

तम आसीत्तमसा गूळहमग्रेऽप्रकेतं सलिलं सर्वमा इदम्।

तुच्छयेनाम्बपिहितं यदासीत्तपसस्तन्मद्भिनाजायतैकम् ॥३॥

Darkness there was; covered by darkness, a plasmic continuum, in which there was nothing distinguishable. And thence, an empty (world), united

under a causal covering came out on account of the austere penance (of that Supreme one).

कामस्तदग्रे समवर्तताधि मनसो रेतः प्रथमं यदासीत्।

सुतो बन्धुमसंति निरविन्दन्हृदि प्रतीष्या कृवयो मनीषा॥४॥

In the beginning, there was the Divine Desire, which was the first seed of the Cosmic Mind. The sages, seeking in their hearts, have discovered by their wisdom the bond that operates between the existent (the manifested) and the non-existent (the unmanifested).

तिरश्चनो विततो रश्मिरेषामधः स्विदासी ३ दुपरि स्विदासी ३त्।

रेतोधा आसन्मद्विमान आसन्स्वधा अवस्तात्प्रयतिः परस्तात्॥५॥

Their controls (rays or reins) were stretched out, some transverse, some below and others above. Some of these were shedders of the seed and the others strong and superb—the inferior, the causal matter here, and the superior, the creator's effort there.

को अद्वा वेद क इह प्र वोचत्कुत आजाता कुत इयं विसृष्टिः।

अर्वाग्देवा अस्य विसर्जतेनाथा को वेद यत आब्रूव ॥६॥

Who really knows, who in this world can declare it, whence came out this (manifested) creation? Whence was it engendered? Whence will it end? Nature's bounties came out much later, and hence who knows whence this creation came into manifestation?

इयं विसृष्टिर्यत आब्रूव यदि वा दधे यदि वा न।

यो अस्याध्यक्षः परमे व्योमन्त्सो अङ्ग वेद यदि वा न वेद॥७॥

He from whom this creation arose— verily He may uphold it or He may not (and then of course, none else can do so). The one who is the sovereign in

this highest heaven, He assuredly knows, or even He knows not (and then none else would ever know the secrets).

(Sanskrit Shlok and English translation is from 'RGVEDA SAMHITA' written by Svami Satya Prakash Sarasvati and Satyakam Vidyalkar Volume XIII page 4635-4637).

Some years ago, Doordarshan had made a TV serial based on the book 'Discovery of India' written by Jawahar Lal Nehru. It is titled as 'Bharat ki Khoj'. The title song of this serial is Hindi translation of this Shlok and perhaps it captures the meaning in its true spirit.

सृष्टि से पहले,

सत नहीं था,

असत भी नहीं,

अन्तरिक्ष भी नहीं,

आकाश भी नहीं था।

छिपा था क्या, कहां ,

किसने ढका था

उस पल तो अगम, असल जल भी कहां था।

सृष्टि का कौन है कर्ता

कर्ता है वह अकर्ता

ऊचें आकाश में रहता

सदा अदृश्य बना रहता

वही सचमुच में जानता

क्या नहीं है जानता ,
 है किसी को नहीं पता, नहीं पता
 नहीं है पता, नहीं है पता।

Perhaps, this may be closest to the truth regarding creation of Universe.

Nevertheless, one of the stories in Hindu religion is similar to one in other religions. In chapter 9 and 11 of Geeta shlok 18 and 32 are as follows:

गतिर्भर्ता प्रभुः साक्षी निवासः शरणं सुहृत् ।

प्रभवः प्रलयः स्थानं निधानं बीजमव्ययम् ॥१८॥

(I am) the goal, the upholder, the lord, the witness, the abode, the refuge and the friend. (I am) the origin and the dissolution, the ground, the resting place and the imperishable seed.



(Sri Krishna showing his true form to Arjun during Mahabharat (Geeta) – Picture from TV serial Sri Krishna)

कालोऽस्मि लोकक्षयकृत्प्रवृद्धो लोकान्समाहर्तुमिह प्रवृत्तः ।

ऋतेऽपित्वा न भविष्यन्ति सर्वे येऽवस्थिताः प्रत्यनीकेषु योधाः ॥३२॥

Time am I, world-destroying, grown mature, engaged here in subduing the world. Even without thee (thy action), all the warriors standing arrayed in the opposing armies shall cease to be.

The Sanskrit version is taken from the Geeta published by Geeta press Gorakhpur.

Its English translation has been taken from 'The Bhagavadgita (With an Introductory Essay, Sanskrit Text, English Translation and Notes) by S. Radhakrishnan (Published by HarperCollins Publishers India) (Chapter IX para 18 page 245).

Shlok number 31 and 32 of the first chapter of Manusmriti says:

लोकानां तु विवृद्धयर्थं मुखबाहूरूपादतः।

ब्राह्मणं क्षत्रियं वैश्यं शूद्रं च निरवर्तयत् ॥ ३१॥

But for the sake of the prosperity of the worlds, he caused the Brahmana, the Kshatriya, the Vaisya, and the Sudra to proceed from his mouth, his arms, his thighs, and his feet.

द्विधा कृत्वाऽऽत्मनो देहमर्धेन पुरुषोऽभवत्।

अर्धेन नारी तस्यां स विराजमसृजत्प्रभुः॥ ३२॥

Dividing his own body, the Lords became half male and half female; with that (female) he produced Virag.

(Sanskrit Shlok has been taken from Manusmriti published by Arya Sahitya Prachar Trust. Its English translation is from the book 'The laws of Manu' by G Buhler edited by F. Max Muller page 13-14).

However the creation in other religion is within 10,000 years but this creation in the Hindu religion took place billions of years ago.

Arthur C. Clarke has also popularised science in the last century. He has written many books. One of the books is entitled 'Profiles of the Future'. It has a chapter 'About Time'. Here, he says (page 138):

Time has been a basic element in all religions ... Some faiths (Christianity, for instance) have placed creation and beginning of Time and very recent dates in the past, and have anticipated the end of the Universe in the near future. Other religions, such as Hinduism, have looked back through enormous vistas of Time and forward to even greater ones. It was with reluctance that western astronomers realized that the East was right, and

that the age of the Universe is to be measured in billions rather than millions of years – if it can be measured at all.

Irrespective of many stories about creation in Hindu religion, the creationism is there also: it is a common link in all religions. The reason is not far to seek: perhaps it was the easiest way to explain the origin of life.

Appendix-2

The Relevant Provision of the Constitution of United States of America are as follows. How 1st amendment came to be applied to the States, see note after the 14th amendment.

1st Amendment [1791]

Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances.

14th Amendment (1868)

1. All persons born or naturalised in the United States and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside. No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of laws.
2. Representatives shall be apportioned among the several States according to their respective number, counting the whole number of person in these State, excluding Indians not taxed. But when the right to vote at any election for the choice of electors for President and Vice-President of the United States, representative in Congress, the Executive and judicial officers of a State, or the member of the legislature thereof, is denied to any of the male inhabitants of such State, being twenty-one years of age, and citizens of the United States, or in any way abridged, except for participation in the rebellion, or other crime, the basis of representation therein shall be reduced in the proportion which the number of such male citizens shall bear to the whole number of male citizens twenty-one years of age in such State.
3. No person shall be Senator or Representative in Congress, or elector of President or Vice-President, or hold any office, civil or military, under the United States, or under any State who, having previously taken an oath, as a member of Congress, or as an officer of the United States or as a member of any State Legislature, or as an Executive or judicial officer of any State, to support the

Constitution of the United States shall have engaged in insurrection or rebellion against the same, or given aid or conform to the enemies thereof. But Congress may by a vote of two-third of each House, remove such disability.

4. The validity of the public debt of the United States, authorised by law, including debts incurred for payment of pensions and bounties for services in suppressing insurrection or rebellion, shall not be questioned. But neither the United States nor any State shall assume or pay any debt or obligation incurred in aid of insurrection or rebellion against the United States, or any claim for the loss or emancipation of any slave; but all such debts, obligations and claims shall be held illegal and void.

5. The Congress shall have power to enforce, by appropriate legislation, the provisions of this article.

Appendix-3

1st amendment to the US Constitution binds the States

US Constitution was ratified on June 21, 1788. Except for some provisions, it did not have protection for traditional liberties. This protection has been recognised in the first ten amendments that were ratified on December, 15, 1791. But are they applicable to the States?

Except for the first and the seventh amendment, the remaining amendments did not specifically refer to the Federal agencies. Nonetheless, the US Supreme Court in *Barron Vs Baltimore* 7 pet. {243 (1833)} (Where applicability of the fifth amendment to the State was involved) held:

'The constitution was ordained and established by the people of the United State for themselves, for their own government, and not for the government of the individual states.'

Fourteenth amendment was ratified, immediately after American Civil War (1861-1865), on July 9, 1968. It ensured that the States could not deprive any person of life, liberty or property, without due process of law. But are the liberties described in the first ten amendments or more specifically in the first amendment included in the word 'liberty' used in the fourteenth amendment?

It was through property-oriented, substantive due process passage that these liberties came to be included in the fourteenth amendment. After *Meyer Vs Nebraska* {262 US 128 (1923)} and *Pierce Vs Society of Sisters* {268 US 510 (1925)} were State action was invalidated, the US Supreme Court in *Gitlow vs. New York* 268 US 6 (1925) observed,,

'For present purpose, we ... assume that freedom of speech and of the

press ... protected by the 1st amendment from abridgement by Congress—are among the fundamental personal rights and “liberties” protected by the due process clause of the 14th Amendment from impairment by the States.’

In this case, the appellants, members of left wing section of the socialist party, were convicted under the State law for causing criminal anarchy. They had challenged the legality of the Statute. It was held to be valid.

In *Cantwell vs Connecticut* {310 US 296 (1940)}, the appellants—members of Jehovah's Witnesses (a Christian denomination)—were seeking converts on public road in a pre-dominant Roman Catholic area. Some of them were convicted for inciting breach of peace; the case of some was sent back for retrial. The US Supreme Court holding the freedom of religion in the first amendment to be binding on the States, reversed the conviction. The court held:

‘The fundamental concept of liberty embodied in [the Fourteenth] Amendment embraces the liberties guaranteed by the First Amendments.’

Everson vs. Board of Education {330 US 1 (1947)} was the first case, when the court to examined the state-religion relationship in the context of establishment.

The State law had authorised local School district boards to frame rules for making contract of transportation of children to and from schools. The school board authorised reimbursement of payment of money spent by parents in sending their children on the public transport. This included parents of those children, who studied in a Catholic School imparting—religious instructions conforming to the Catholic faith along-with secular education. The appellant, a taxpayer, challenged its validity. The Court held that:

‘Prior to the adoption of the Fourteenth Amendment, the First Amendment

did not apply as a restraint against the States.

...

The “establishment of religion” clause of the first amendment means at least this: Neither a state nor the federal government can set up a church. Neither can pass laws which aid one religion, aid all religions or prefer one religion over another ... No tax in any amount ... can be levied to support any religious activities or institution ... Neither a state nor the federal Government can ... participate in the affairs of any religious organisation or groups ... [T]he clause against the establishment of religion by law was intended to erect a wall of separation between Church and State'

The court held that the wall between religion and the State was not breached in this case.

Appendix-4

The Relevant Provision of the Constitution of India

The Constitution of India

Preamble

We, the people of India, having solemnly resolved to constitute India into a sovereign socialist secular democratic republic and to secure to all its citizens:

Justice, social economic and political;

Liberty of thought, expression, belief, faith and worship;

Equality of status and opportunity; and to promote among them all.

Fraternity assuring the dignity of the individual and the unity and integrity of the Nation;

In our Constituent Assembly this twenty-sixth day of November, 1949, do hereby adopt, enact and give to ourselves this Constitution.

RIGHT TO FREEDOM OF RELIGION

25. Freedom of conscience and free profession, practice and propagation of religion.- (1) Subject to public order, morality and health and to the other provisions of this Part, all persons are equally entitled to freedom of conscience and the right freely to profess, practise and propagate religion.

(2) Nothing in this article shall affect the operation of any existing law or prevent the State from making any law-

(a) regulating or restricting any economic, financial, political or other secular activity which may be associated with religious practice;

(b) providing for social welfare and reform or the throwing open of Hindu religious institutions of a public character to all classes and sections of Hindus.

Explanation I.- The wearing and carrying of kirpans shall be deemed to be included in the profession of the Sikh religion.

Explanation II.- In sub-clause (b) of clause (2), the reference to Hindus shall be construed as including a reference to persons professing the Sikh, Jain or Buddhist religion, and the reference to Hindu religious institutions shall be construed accordingly.

26. Subject to public order, morality and health, every religious denomination or any section thereof shall have the right-

(a) to establish and maintain institutions for religious and charitable

purposes;

- (b) to manage its own affairs in matters of religion;
- (c) to own and acquire movable and immovable property; and
- (d) to administer such property in accordance with law.

27. Freedom as to payment of taxes for promotion of any particular religion.- No person shall be compelled to pay any taxes, the proceeds of which are specifically appropriated in payment of expenses for the promotion or maintenance of any particular religion or religious denomination.

28. Freedom as to attendance at religious instruction or religious worship in certain educational institutions.- (1) No religious instruction shall be provided in any educational institution wholly maintained out of State funds.

(2) Nothing in clause (1) shall apply to an educational institution which is administered by the State but has been established under any endowment or trust which requires that religious instruction shall be imparted in such institution.

(3) No person attending any educational institution recognised by the State or receiving aid out of State funds shall be required to take part in any religious instruction that may be imparted in such institution or to attend any religious worship that may be conducted in such institution or in any premises attached thereto unless such person or, if such person is a minor, his guardian has given his consent thereto.

CULTURAL AND EDUCATIONAL RIGHTS

29. Protection of interests of minorities.- (1) Any section of the citizens residing in the territory of India or any part thereof having a distinct language, script or culture of its own shall have the right to conserve the same.

(2) No citizen shall be denied admission into any educational institution maintained by the State or receiving aid out of State funds on grounds only of religion, race, caste, language or any of them.

30. Right of minorities to establish and administer educational institutions.- (1) All minorities, whether based on religion or language, shall have the right to establish and administer educational institutions of their choice.

(1A) In making any law providing for the compulsory acquisition of any property of an educational institution established and administered by a minority,

referred to in clause (1), the State shall ensure that the amount fixed by or determined under such law for the acquisition of such property is such as would not restrict or abrogate the right guaranteed under that clause.

(2)The State shall not, in granting aid to educational institutions, discriminate against any educational institution on the ground that it is under the management of a minority, whether based on religion or language.

Appendix-5

Act No. 473

Senate Bill no 733

To enact R.S. 17:285.1, relative to curriculum and instruction; to provide relative to the teaching of scientific subjects in public elementary and secondary schools; to promote students' critical thinking skills and open discussion of scientific theories; to provide relative to support and guidance for teachers; to provide relative to textbooks and instructional materials; to provide for rules and regulations; to provide for effectiveness; and to provide for related matters.

Be it enacted by the Legislature of Louisiana:

Section 1. R.S. 17:285.1 is hereby enacted to read as follows:

§285.1. Science education; development of critical thinking skills

A. This Section shall be known and may be cited as the "Louisiana Science Education Act."

B.(1) The State Board of Elementary and Secondary Education, upon request of a city, parish, or other local public school board, shall allow and assist teachers, principals, and other school administrators to create and foster an environment within public elementary and secondary schools that promotes critical thinking skills, logical analysis, and open and objective discussion of scientific theories being studied including, but not limited to, evolution, the origins of life, global warming, and human cloning.

(2) Such assistance shall include support and guidance for teachers regarding effective ways to help students understand, analyze, critique, and objectively review scientific theories being studied, including those enumerated in Paragraph (1) of this Subsection.

C. A teacher shall teach the material presented in the standard textbook supplied by the school system and thereafter may use supplemental textbooks and other instructional materials to help students understand, analyze, critique, and review scientific theories in an objective manner, as permitted by the city, parish, or other

local public school board unless otherwise prohibited by the State Board of Elementary and Secondary Education.

D. This Section shall not be construed to promote any religious doctrine, promote discrimination for or against a particular set of religious beliefs, or promote discrimination for or against religion or nonreligion.

E. The State Board of Elementary and Secondary Education and each city, parish, or other local public school board shall adopt and promulgate the rules and regulations necessary to implement the provisions of this Section prior to the beginning of the 2008-2009 school year.

Section 2. This Act shall become effective upon signature by the governor or, if not signed by the governor, upon expiration of the time for bills to become law without signature by the governor, as provided by Article III, Section 18 of the Constitution of Louisiana. If vetoed by the governor and subsequently approved by the legislature, this Act shall become effective on the day following such approval.

Appendix-6

(A part of survey conducted by Ipsos MORI on the request of BBC. The complete survey can be downloaded from

<http://spreadsheets.google.com/ccc?key=rxg1LZkuZ5f6KX1PNcN7Z4w>).

Countries	There is scientific evidence for Evolution Y/ N	Possible to believe in God and evolution together	Teach Evolution/ alongside other theories
Argentina	44/ 7	62	23/ 65
China	55/ 7	39	19/ 42
Egypt	8/ 19	45	18/ 19
Great Britain	51/ 7	54	21/ 54
India	38/ 2	85	37/ 40
Mexico	52/ 9	65	28/ 56
Russia	39/ 8	54	10/ 53
South Africa	8/ 4	54	11/ 29
Spain	39/ 5	46	34/ 31
USA	33/ 24	53	21/ 51