

THE HARMONIZER

Science, Philosophy, Religion, and Art
All Branches of the Same Tree of Knowledge

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Worlds in Collision: The Stability of the Solar System

Bhakti Madhava Puri, Ph.D.

The Revolutionary Science of Spiritual Cosmology

Sir Isaac Newton (1642–1727) discovered a problem in theoretical physics that is still unresolved to this day. He recognized that the periodic forces of gravity produced by the planets of the solar system degrade their orbits over long time spans, to produce either collisions of planets, ejections of planets into interstellar space, or incineration in the Sun. Although the calculated effects may be small for a given instant of time, over millions of years those small effects accumulate to produce problems of instability of the solar system. Fully aware of this situation, he therefore wrote,

“... the Planets move one and the same way in Orbs concentrick, some inconsiderable Irregularities excepted, which may have arisen from the mutual Actions of Comets and Planets upon one another, and which will be apt to increase, till this System wants a Reformation.”

Due to the fact that the various planets in the solar system gravitationally interact with one another and thus perturb the orbital paths they follow, Newton realized that the system was ultimately unstable and thus divine intervention was needed to restore the balance in the planetary orbits that we observe today. In an original letter to Richard Bentley on December 10, 1692, Newton wrote (in Olde English):

“... the motions which the Planets now have could not spring from any naturall cause alone but were imprest by an intelligent Agent. ffor since Comets descend into the region of our Planets & here move all manne{r} of ways going sometimes the same way with the Planets sometimes the contrary way & sometimes in cross ways in planes

inclined to the plane of the Ecliptick at all kinds of angles: its plaine that there is no naturall cause which could determin all the Planets both primary & secondary to move the same way & in the same plane without any considerable variation. This must have been the effect of Counsel. Nor is there any natural cause which could give the Planets those just degrees of velocity in proportion to their distances from the Sun & other central bodies about which they move & to the quantity of matter contened in those bodies, which were requisite to make them move in concentrick orbs about those bodies. Had the Planets been as swift as Comets in proportion to their distances from the Sun (as they would have been, had their motions been caused by their gravity, whereby the matter at the first formation of the Planets might fall from the remotest regions towards the Sun) they would not move in concentric orbs but in such excentric ones as the Comets move in. Were all the Planets as swift as Mercury or as slow as Saturn or his Satellites, or were their several velocities otherwise much greater or less then they are (as they might have been had they arose from any other cause then their gravity) or had their distances from the centers about which they move been greater or less then they are with the same velocities; or had the quantity of matter in the Sun or in Saturn Jupiter & the earth & by consequence their gravitating power been greater or



less than it is: the primary Planets could not have revolved about the Sun nor the secondary ones about Saturn Jupiter & the earth in concentric circles as they do, but would have moved in Hyperbolas or Parabolas or in Ellipses very excentric. To make this system therefore with all its motions, required a Cause which understood & compared together the quantities of matter in the several bodies of the Sun & Planets & the gravitating powers resulting from thence, the several distances of the primary Planets from the Sun & secondary ones from Saturn Jupiter & the earth, & the velocities with which these Planets could revolve at those distances about those quantities of matter in the central bodies. And to compare & adjust all these things together in so great a variety of bodies argues that cause to be not blind & fortuitous, but very well skilled in Mechanicks & Geometry.”

The great philosopher-mathematician, Gottfried Leibniz, criticized Newton’s subjection of God to such menial tasks as directing the planets. For Newton, the laws governing material nature were a manifestation or reflection of the rationality of the Creator, not that God personally acted within Nature. The gravitational laws he discovered were a feeble proof of the rationality of the cosmos, but never meant to be a complete comprehension of the supreme intelligence of God. In other words, his idea was not to separate God from His creation as the Deists later concluded, in which the universe would work mechanically according to certain laws. Rather, the idea of a clockwork universe was something Newton eschewed and refuted, although this fact is rarely admitted in teaching physical science. He considered the whole of the universe in space to be what he called the sensorium of God. Thus for Newton the universe was not mechanical and certainly not pantheistic or identical with God, but it was the subservient domain over which God was the Lord (Gr. *Pantokrator*).

Einstein held similar views to Newton in this case. He was also not a pantheist, but a panentheist. As Einstein saw it,

“Every one who is seriously involved in the pursuit of science becomes convinced that a spirit is manifest in the laws of the Universe — a spirit vastly superior to that of man, and one in the face of which we with our modest powers must feel humble.”

And,

“The human mind is not capable of grasping the Universe. We are like a little child entering a huge library. The walls are covered to the ceilings with books in many different tongues. The child knows that someone must have written these books. It does not know who or how. It does not understand the languages in which they are written. But the child notes a definite plan in the arrangement of the books—a mysterious order which it does not comprehend, but only dimly suspects.”

Despite Newton’s fear that his laws would be misinterpreted by the mechanists, a century later, what Newton understood as

the rationality of God reflected in the law-like nature of the universe, became for Pierre Simon Laplace (1749–1827) the ultimate intelligibility of the universe for Man. Thus he wrote in his treatise, *Celestial Mechanics*:

“An intelligence knowing all the forces acting in nature at a given instant, as well as the momentary positions of all things in the universe, would be able to comprehend in one single formula the motions of the largest bodies as well as the lightest atoms in the world, provided that its intellect were sufficiently powerful to subject all data to analysis; to it nothing would be uncertain, the future as well as the past would be present to its eyes. The perfection that the human mind has been able to give to astronomy affords but a feeble outline of such an intelligence.”

He was quite convinced that the universe was governed by intelligible laws that an ultimate intelligence could fashion. This represented the extreme limit of determinism that took hold of science, but which modern theories of quantum physics have overthrown. We find a long list of notable mathematicians, astronomers, and physicists who held on to the mechanistic dream and attempted to solve the problem of the solar system’s stability, including Carl Friedrich Gauss, Andrei Kolmogorov, Joseph Lagrange, Jürgen Moser¹, Henri Poincaré, Siméon Poisson, Malhotra² and many others. Yet the problem remains unresolved to this day. Several “proofs” of stability have been touted based on specific approximations, but none of them are accurate over the age of our solar system and thus fail to justify its stability. In the process this has led to the discovery of many new mathematical methods to deal with this problem, including perturbation theory, non-linear dynamics and chaos theory.

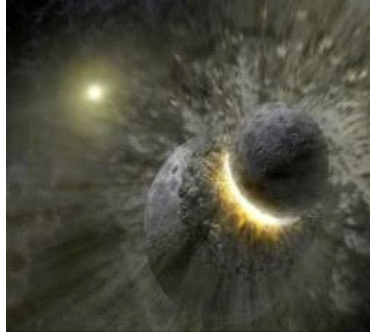
The Large Hadron Collider (LHC) must guide protons over a hundred million revolutions or more, presenting a problem similar to the long term behavior of the solar system. The discovery of other planetary systems in the universe means that they also have to face the same requirement of stability over billions of years. Even the theory of evolution has now come under the domain of chaos theory:

“It is impossible to predict how a given species will respond to environmental change . . . the neat concept of adaptation to the environment driven by natural selection, as envisaged by Darwin in *On the Origin of Species* and now a central feature of the theory of evolution, is too simplistic. Instead, evolution is chaotic.”³

What this signifies is that the whole problem of determinism exists not only at the subatomic quantum level, but also at the macroscopic cosmic level, and thus has become a central problem in numerous fields of modern scientific study. Thus the days of a purely deterministic science are over. Although chaos theory assumes the necessity of deterministic laws, those laws are not sufficient to explain or predict complex phenomena in the world. Errors in initial values or truncation errors in computations are inescapable, due to the inherent limitations of our numerical methods, accuracy of measurements and

computing ability. The small errors they each entail produce catastrophic effects in the long run. This has forced scientists to re-think their whole conception of science in order to be able to practically deal with what are in fact complex systems of reality that are not reducible to a small set of simple laws.

Computer simulations of the solar system can be followed for a few billion years, with accurate data on planetary masses, orbits, and interplanetary forces, as well as forces from passing stars, Galactic tidal fields, comets, asteroids, moons/satellites, etc. One of the problems here arises from truncation errors due



to the inherent limitations of computational machines and our numerical methods of dealing with computed values. This adds up to a considerable problem of accuracy over billions of computational cycles. The other problem has to do with processing time, which is somewhat alleviated by the increased performance speed of modern computers, and the possibility of shared distributive computing over thousands of other computers. This would seem to solve the time problem, but the calculations have shown that small changes in initial parameters that determine the masses, positions, etc. of the planets lead to catastrophic exponential divergences from stability. We simply do not have the means necessary to accurately determine those initial values precisely.

Mathematically, those systems in which small changes in initial conditions produce large catastrophic behavior overall are called chaotic systems. What this means practically is that the orbits of the planets in our solar system in the long range are as unpredictable as long range weather forecasting. As astronomer Jacques Laskar writes, “. . . it becomes essentially impossible to predict the motion of the planets with precision beyond one hundred million years.”^{4,5} This is considerably less than the astronomer’s belief in the billions of years that the solar system has existed.

The neat deterministic universe Laplace imagined is today replaced by a ruthlessly realistic chaotic picture that gives no assurance that the planets may not collide in the distant future. The deeply held conviction that the universe can be understood by a handful of physical laws is one of modern science’s most comforting and abiding delusions. This belief in a strictly deterministic, law-governed universe, forms the very ground of the mechanistic world view of Nature and Life that still dominates much of contemporary scientific thinking. But the fundamental unpredictability of subatomic measurements that Heisenberg’s principle established must exist inextricably in the largest dimensions of the universe as well. These quantitative limits to scientific knowledge are insignificant compared to its qualitative limits, since modern empirical science has not even developed the concepts needed to explain the dimension of cognition, emotion and volition (thinking, feeling, and willing) that characterize the aspects of reality that are so essential to

life. Does this mean that the ultimate truth forever lies beyond the bounds of science? Or do the limitations of science only prove what we already believe to be a spiritual truth that will always surpass its reach?

It is easy to understand how the simple mechanical view of the universe has been imbibed by the young and the uninformed or misinformed public, including even scientists who are not directly involved in astronomy. The general picture of the solar system that appears in many books on astronomy and in public planetariums is one of regular circular or elliptical orbits which the Earth follows around the Sun. One year corresponds to one circulation around the Sun and a return to a point from which it started. However, the actual situation is far more complicated. The Earth never returns to any point which it already covered. The movement is so complex that even the elliptical orbit is also revolving around the Sun, the plane of revolution is always changing, the axis around which the Earth rotates is also changing, and the Sun is not stationary.⁶

The Sun is presently moving with respect to neighboring stars at about 43,000 miles per hour (70,000 km/hr) roughly in the direction of the bright star Vega in the constellation of Lyra. In its journey around the Milky Way galaxy, the Sun has to move 483,000 miles per hour (792,000 km/hr). This means that the planets also have to move at that speed to keep up with the Sun, forming spirals, not orbits, in the Milky Way. And we should be mindful that all the speeds given here are not constant, so they are averages. The complexity of the calculations is thus enormous.

Sir James Lighthill, President of the International Union of Theoretical and Applied Mechanics, who held and demonstrated a rigid belief in the mechanical laws of Newton throughout his career, made this remarkable apology⁷ in 1986,

“We are all deeply conscious today that the enthusiasm of our forebears for the marvelous achievements of Newtonian mechanics led them to make generalizations in this area of predictability which, indeed, we may have generally tended to believe before 1960, but which we now recognize were false. We collectively wish to apologize for having misled the general educated public by spreading ideas about the determinism of systems satisfying Newton’s laws of motion that, after 1960, were to be proved incorrect.

“I feel fully justified, therefore, in repeating that systems subject to the laws of Newtonian dynamics include a substantial proportion of systems that are chaotic; and that, for these latter systems, there is no predictability beyond a finite predictability horizon. We are able to come to this conclusion without ever having to mention quantum mechanics or Heisenberg’s uncertainty principle. A fundamental uncertainty about the future is there, indeed, even on the supposedly solid basis of the good old laws of motion of Newton, which effectively are the laws of motion satisfied by all macroscopic systems. I have ventured to feel that this conclusion would be of interest to a Discussion

Meeting on Predictability in Science and Society. For example, there might be some other discipline where practitioners could be inclined to blame failures of prediction on not having formulated the right differential equations or on not employing a big enough computer to solve them precisely or on not using accurate initial conditions; yet we in mechanics know that, in many cases where the equations governing a system are known exactly and are solved precisely, nevertheless, however accurately the initial conditions may be observed, prediction is still impossible beyond a certain predictability horizon.”

The idea of the clockwork universe has thus been overthrown. Even *Wikipedia* summarizes the current situation,⁸

“The best current evidence seems to be that even for classical systems, the argument for a clockwork universe as a strict consequence of Newtonian dynamics is no longer logically valid. Since both complexity and errors accumulate over time, perhaps exponentially, we cannot be certain of determinism even for short times, or even in principle, or even for classical systems. Basically, nature seems to draw a curtain on predictions of mechanical motion in a clockwork universe that is forever beyond our ability to penetrate.”

Theories of natural science consist of testable laws based on regularities that can be expressed mathematically. It is the regularities that make repeatable experiments and precise predictions possible. However, if the world does not consist of mechanically repeatable regularities, but of unique, contingent, singular events, then each event can only be understood in its historical context and has meaning only as part of a whole, inviting the need for theological integration and interpretation.⁹ Indeed the very subtle and complex, non-mechanical and carefully coordinated movements of the members of the cosmos over eons of time take on the appearance of providentially attended systems, much like living organisms.

We can only conclude that a principle beyond mere mechanical physical laws is at work in the creation, maintenance, and destruction that are inherent to the nature of the ever-changing face of the phenomenal world. The modern scientific mind chafes at the idea of accepting that a divine inscrutable influence (*acintya shakti*) governs the whole cosmos and supports its existence. Yet we see that the most advanced scientific knowledge ultimately rests in a blind faith in its own ability to explain reality. It is in faith that science and religion inevitably collide, and it is in faith that they ultimately meet. All knowledge is based on faith, be it in axioms or doctrines, assumptions or revelations. But they are also harmonized at this same meeting point, if we understand them as being complementary ways of confirming the same divine truth that is transcendental to finite means of knowledge.

Classical, relativistic, and quantum mechanical calculations all have their respective domains of validity without contradicting each other. And the domain of one does not necessarily apply

also distinct disciplines that attempt to represent reality, but by their respective methods that are peculiar to each. As such, they must overlap one another because they express the same reality from different perspectives – different angles of vision. It is only the attitude of the exclusive dominance of one field over another that obscures the actual harmonious understanding that they provide.



The search for Truth is called philosophy, while the search for Certainty is known as science. The search for Beauty is expressed in art, and the search for the highest fulfillment of Love is what religion offers us. These are not separate Non-

Overlapping Magisteria (NOMA), as the famous evolutionist, Stephen Gould identified them. They are the aspirations of everyone, and certainly do not occupy mutually exclusive endeavors in our lives. Historically, the satisfaction of these aspirations has found their fulfillment in the greatest conception of all - the all-comprehensive idea of the Personality of Godhead. This primeval knowledge, known even to the most ancient of human civilizations, still finds itself at home in the cutting edge of modern scientific thought.¹⁰

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2. Jurgen Moser: “Is the Solar System Stable?” *The Mathematical Intelligencer*, 1 (1978), 65(71).
3. Keith Bennett, “The Chaos Theory of Evolution,” *New Scientist* 18 October 2010.
4. Refer: http://www.scholarpedia.org/article/Stability_of_the_solar_system
5. Laskar, J.; Robutel, P, Joutel, F, Gastineau, M, Correia, A. C. M., and Levrard, B. (2004). "A long-term numerical solution for the insolation quantities of the Earth". *Astronomy and Astrophysics* 428 (1): 261.
6. See the very instructive animation “Earth’s Motion Around the Sun Not as Simple As I Thought,” <http://www.youtube.com/watch?v=82p-DYgGFjI>
7. Sir James Lighthill, FRS, “The recently recognized failure of predictability in Newtonian dynamics,” *Proc R. Soc. Lond. A* 407, 35–50 (1986)
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9. Stephen M. Barr, “Theology after Newton.” Review of Wolfhart Pannenberg’s *The Historicity of Nature: Essays on Science and Religion*. <http://www.firstthings.com/article/2008/10/003-theology-after-newton-4>
10. James Gleick, *Chaos: Making a New Science*, Penguin Books, NY (1988).

The Science of Spiritual Biology: Replies to Critics – Part 2

B.M. Puri, B.V. Muni, B.N. Shanta

(Continued from the December Harmonizer)

Critic: You cite an article by Swami that “Most biologists and geneticists recognize that their research does not verify objective evolution.” But this is actually NOT the position held by most biologists and geneticists, especially genome biologists, who have accumulated more and more and more data that support evolution. Just go to any genome database, and you will find references to homologs and gene trees! So here, you simply lie.

Reply: We agree that instead of stating “Most biologists...”, it should have been, “An increasing number of biologists...”. For instance, a news article in *The New York Times* describes that a group of 514 scientists and engineers signed an anti-evolution petition.¹⁹ The news article states that, 128 signers hold degrees in the biological sciences and 26 in biochemistry.

Regarding gene trees, the current tentativeness of this idea should be noted, as O’Malley and Koonin²⁰ explain,

“The irrefutable demonstration by phylogenomics that different genes in general have distinct evolutionary histories made obsolete the belief that a phylogenetic tree of a single universal gene such as rRNA or of several universal genes could represent the “true” TOL. However, this irrevocable realization does not immediately dispose of the TOL, which can be reconceptualized in at least two distinct ways. First, the TOL can be treated as an evolutionary hypothesis. The refutation of this hypothesis in the original, strong form, as a single faithful representation of the evolution of organisms, has prompted its modification to the “statistical TOL hypothesis.” The existence of a statistically significant tree-like trend in the “forest” of individual gene trees is a testable proposition that still has to be investigated in detail. Second, the TOL can be deployed as a heuristic for evolutionary studies in which a tree of just a single universal gene can be extremely useful as long as one realizes that it is only a convenient framework for organizing data rather than a fundamental truth about evolution.”

Frontier genome research has already challenged the black box approach of gene-centered Darwinism. James Shapiro, microbiologist at Chicago University, states in his book on evolution,²¹

“The conceptual universe of biology inevitably underwent a radical transformation from the days

of classic thinking about evolution and heredity in the 19th and 20th Centuries. . . . Instead of cell and organismal properties hardwired by an all-determining genome, we now understand how cells regulate the expression, reproduction, transmission, and restructuring of their DNA molecules. The key evolutionary questions no longer center on whether we can establish relationships between different organisms. . . . Today, instead, we endeavor to understand how complex new vital capacities arose in the course of evolution and contributed to the ability of myriad organisms to survive, proliferate, diversify, and reorganize their environment in the course of at least 3.5 billion tumultuous years of Earth history. How did evolutionary inventions help shape the biosphere and influence the nature of the organisms that inhabit it today?”

19. Refer:

<http://www.nytimes.com/2006/02/21/science/sciencespecial2/1peti.html?gewanted=all>

20. O’Malley, A., and Koonin, E. (2011). How stands the Tree of Life a century and a half after The Origin?, *Biology Direct* 6:32

21. Shapiro, J.A. (2011). *Evolution: A View from the 21st Century* New York: Financial Times Prentice Hall. 272 pages, ISBN: 978-0132780933.

Critic: In the same paragraph, you suggest that “they take for granted that geology proves it”. But actually, even Darwin recognized that geology provided the LEAST amount of evidence for evolution. So again, you completely misrepresent the position of the scientists themselves. At least TRY to get the science right before you criticize it!

Reply: This may be the personal belief of a few biologists but the reality is just the opposite. History records that in 1831, on board the *HMS Beagle*, Darwin studied the geographic distribution of plants and animals in terms of the uniformitarian geology based on Charles Lyell’s published *Principles of Geology*. Based on Lyell’s book, Darwin contemplated that the fossils found in rocks were actually evidence of animals that had lived many thousands or millions of years ago. A *BBC* article on Charles Darwin states that, “Lyell’s argument was reinforced in Darwin’s own mind by the rich variety of animal life and the geological features he saw during his voyage.”²² If you go to any museum you will also find the same story repeated. Are you claiming that scientists hold a different opinion on geological evidence than what they teach the public?

Also you cannot deny the fact that scientists were gathering evidence for evolutionary change many years prior to Darwin,

and that evolution theory came to light only with the knowledge of fossils (paleontology) and the stratigraphic record (geology).²³

22. Charles Darwin:

http://www.bbc.co.uk/history/historic_figures/darwin_charles.shtml

23. Harrison, T. (2011). *Paleontology and geology of laetoli: human evolution in context volume 1: geology, geochronology, paleoecology and paleoenvironment. Series: Vertebrate Paleobiology and Paleoanthropology Series, ISBN-13: 9789048199556.*

Critic: You wrote, “Modern science now even threatens to completely eliminate every religion from the face of our earth”: *This is such garbage! Competing religions are doing a much better job of getting rid of each other. Scientists are pacifists! You even ascribe terrorism to scientists! I don't know of any scientist who is a terrorist...instead, it is religious fanaticism that sponsors the greatest majority of terrorism. Thus, you are totally misrepresenting the facts here.*”

Reply: It appears from your statement that you have not understood the context in which science promotes terrorism. Francis Bacon (1561–1626) was one of the prominent personalities in natural philosophy and in the subject matter of scientific methodology during the shift from the Renaissance to the beginning of the modern era. For Bacon the value of power and utility is so immense that frequently truth, power and utility become identical concepts in his understanding. Bacon stated in *Novum Organum*,²⁴

“Truth, therefore, and utility, are here perfectly identical, and effects are of more value as pledges of truth than from the benefit they confer on man... There is a most intimate connection between the ways of human power and human knowledge... and that which is most useful in practice is most correct in theory.”

Newton developed his conception of doing science by deriving inspiration from Bacon’s work. A century later, due to the influence of the work of Lagrange and Laplace, this eventually led to a shift from the harmonious organic or holistic viewpoint to the dangerous mechanistic world view of reductionism. Bourdeau stated,

“For Bacon we must subdue nature, penetrate its secrets and chain it to satisfy our desires. Man is the center of the world and the object of science is to dominate nature.”²⁵

In the past, nature was seen as a worshipable divine gift of God and after Bacon’s campaign all that has changed. Bourdeau further stated,²⁶

“... Now nature is threatened by man who has become detached from it. Technology has endowed humans with the power of a major geological agency, which may act on a continental or even planetary scale (e.g. acid rain, photochemical smog, radioactive contamination, stratospheric ozone

depletion, climate change)...The relationship between man and nature must be reconsidered.”

For Descartes, animals are organic automata (machines), which are much more fabulous than artificial ones, but machines nonetheless. Gaukroger²⁷ writes,

“Descartes completely reshapes the relation between metaphysics and natural philosophy, and develops the first mechanist physical cosmology,... the first mechanist physiology and embryology, the first mechanist account of animal sentience ...”

In *Introduction to Animal Rights*,²⁸ Gary Francione describes the anticipated consequences of the Cartesian view:

“Descartes and his followers performed experiments in which they nailed animals by their paws onto boards and cut them open to reveal their beating hearts. They burned, scalded, and mutilated animals in every conceivable manner. When the animals reacted as though they were suffering pain, Descartes dismissed the reaction as no different from the sound of a machine that was functioning improperly. A crying dog, Descartes maintained, is no different from a whining gear that needs oil.”

The faith that all features of living organisms can be explained by reducing them to their smallest constituents, and the mechanisms through which these interact, forms the foundation of evolutionary biology developed by Darwin and his faithful followers. Lawrence Krauss²⁹ has said,

“Religious belief that the universe is the handiwork of an all-powerful being is not subject to refutation. This sort of reliance on faith may itself have an evolutionary basis. There has been talk of a “god gene”: the idea of an early advantage in the struggle for survival for those endowed with a belief in a hidden patrimony that gives order, purpose and meaning to the universe we experience.”

Atheistic evolutionist Richard Dawkins, explains that religiousness in human culture is basically an outcome of a defective ‘*mental virus*’.³⁰ Therefore, evolution can lead to undermining religion.

Religion must be based on rational scientific faith, not blind faith and sentiment. And an empty or valueless science should not be developed if it is in conflict with religion. Actually, this harmony was the spirit in which Western science was originally created. We believe that situation has changed, not due to scientific truth, but to the adoption of a materialistic metaphysical understanding of life.

24. Graham, R. and Wakely, M. (2004). *The Instauration magna Part II: Novum Organum And Associated Texts.* Oxford: Clarendon, 2004.

25. Bourdeau P. (2004). “The man-nature relationship and environmental ethics.” *J Environ Radioact.*, Vol. 72, pp. 9 – 15.

26. *Ibid.*
 27. Gaukroger, *Descartes' System of Natural Philosophy*, Cambridge University Press, 2002, p. 4.
 28. Francione, G. (2000). *Introduction to Animal Rights: Your Child or the Dog?*, Temple University Press.
 29. Krauss, L.M. (November 8, 2005). "Science and religion share fascination in things unseen." *New York Times*.
 30. Dawkins, R. (1976) *The Selfish Gene*. Oxford: Oxford University Press.

Critic: "You cite Rose and Oakley as evidence that evolution is somehow untrue. This is a total obfuscation. In fact, Rose and Oakley, in this article, EMBRACE evolution and natural selection as major forces shaping life. Of course, there has been progress in understanding how these mechanisms occur, which is what they mean by formulating a new synthesis. In particular, incorporating genomics and developmental biology have led to a deeper understanding...OF EVOLUTION! NOT that evolution is somehow wrong. Thus, you use the citation to obfuscate, not to clarify."

Reply: It is surprising to see your objection to citing the Rose and Oakley's paper, "The new biology: beyond the Modern Synthesis,"³¹ which provides a comprehensive critique of the Darwinian black box approach. Rose and Oakley write in their paper,

"...the view of life that most biologists had from 1935 to 1965 was highly simplified. Naturally, evolutionists, ecologists, and organismal biologists built directly on the foundations supplied by the Modern Synthesis during this period....However, some of the assumptions at the foundation of The Modern Synthesis started to crumble in the 1970's with the discovery of super-abundant genetic variation that arguably often didn't evolve under the strict aegis of natural selection. Then cells were found to incorporate genes, mobile genetic elements, and organelles of diverse historical origins. Furthermore, it became apparent in the last decades of the 20th Century that DNA sequences often evolved in ways that reduced the fitness of the organisms that bore them. It is now abundantly clear that living things often attain a degree of genomic complexity far beyond simple models like the "gene library" genome of the Modern Synthesis."

31 Rose, M.R. and Oakley, T.H. (2007). "The new biology: beyond the Modern Synthesis." *Biol. Direct*. Vol. 24, pp. 2-30.

Critic: *Incorporating genomics and developmental biology have led to a deeper understanding...OF EVOLUTION! NOT that evolution is somehow wrong.*

Reply: And we are also presenting the same in our newsletter. The *deeper understanding* is that Darwin's abiology has no place in 21st century biology, which accepts biological systems as sentient systems. Thus, rejecting Darwin's objective evolution, we believe that 21st century biology explores the scientific explanation of the subjective evolution of consciousness.

Critic: *You suggest, without any evidence whatsoever, that "the major problem with natural selection is that it accounts for altering existing traits but does not explain the generation of new traits or new species." But "new traits" DO arise from the "modification of pre-existing traits"! Even new functions! There have been not only computer simulations to demonstrate this, but also many experiments (e.g. novel enzymatic functions). And in fact, new species have arisen in labs that are reproductively isolated from their parents (e.g. cases of autopolyploidy).*

Reply: This is a misunderstanding. The point is that new traits do not arise from *natural selection* but from intentional modification or mutation of existing traits. Microbiologist, James Shapiro makes this clear, "Innovation, not selection, is the critical issue in evolutionary change." Defying the claim of Darwinian evolution, evidence shows that new functions arise due to directed modification, or 'Natural Genetic Engineering' (coined by James Shapiro), which proposes sentient selection by the organism. Shapiro states in his book, *Evolution: A View from the 21st Century*,

"The significance of this clear pattern of retention, amplification, and readaptation is that the organisms presently on Earth—namely, the organisms that have succeeded over evolutionary time—possess the natural engineering systems needed to duplicate and modify increasingly complex genomic constructs. It requires great faith to believe that a process of random, accidental genome change could serve this function. Indeed, as many biologists have argued since the 19th Century, random changes would overwhelmingly tend to degrade intricately organized systems rather than adapt them to new functions."

Critic: *You concede that dogs exhibit lots of evolutionary novelty that has indeed occurred through selection, but then simply deny that dogs "constantly remain within the species of dogs." Oh, really? How are you defining "species"?*

Reply: No one is *denying* that dogs remain in the same species. Previously, the domestic dog was accepted as a species in its own right. However, overwhelming evidence in 1993 forced American Society of Mammalogists to reclassify the dog (*Canis lupus familiaris*) under the species status of the gray wolf (*Canis lupus*) in Mammal Species of the World.³² Therefore, we can say that dog and wolf are the same species, consequently no change of species is involved. Furthermore, the difference between dog and wolf could not be the result of natural selection, or survival of the fittest. If there is an hereditary relation, it was the result of domestication, not evolution.

32. "ITIS Report: *Canis lupus familiaris*". ITIS Data. Integrated Taxonomic Information System. Retrieved 16 April 2010.

Critic: *You write that the "answer" to the question of how novel gene networks arise is a "fatal blow" to evolution (which you continue to associate with "Darwinism", another obfuscation, since evolution is true, even though some of*

Darwin's original ideas are false). As a scientist who actually works with genetic networks in different species, I can tell you that the more we research, the more we find evidence in SUPPORT of evolution as the mechanism for making different genetic networks. (I'm quite astonished that you refuse to cite any of Sean Carroll's work when you talk about this type of research!) So again, an outright lie.

Reply: We have seen that evidence in the 21st century biology does not support Darwinian evolution based on assumptions of natural selection and random mutation. You seem to agree with this to some extent. So until you or science can describe a valid scientific mechanism for what you want to continue to call 'evolution,' it appears at the moment to be just an empty name or ideology which you are attached to.

Critic: *Again, the OVERARCHING PROBLEM with your newsletter is that you seek to construct a biological/scientific foundation that will be somehow supportive of your religious views. But sadly for you, this will not work. You are creating bad religion by doing this. Instead, if you truly seek a holistic truth, you need to recognize that evolution IS true, AND God is good.*

Reply: Statements like "evolution is true," only creates *bad science*, in our opinion. It is not mere dogmatic faith in evolution that makes it scientific. A scientific statement should be a conclusion from evidence and proof, not an a priori presumption of truth. The nature of scientific knowledge is that it *may* be wrong, as has often been the case in the past. Creation from the goodness of God and evolution from the atomic fragments of material nature are not the same process.

In the Upanisads it is stated that God or the Absolute creates the world, not by evolution, but by producing it whole, from the Complete Whole (*om purnam adah purnam idam*). (Of course, this should not be mechanically understood. It is a spiritual conception.) This idea is central to the concept of creation, yet it is not known or ignored by those unfamiliar with Vedanta. It is from this fundamental principle that we find the only empirically confirmed principle that life comes from life, not from matter. Life is a whole, just as a person is a whole. They cannot be constructed piecemeal. Thus objective evolution has no role in this process. The subjective evolution of consciousness is involved only in the progression from materially conditioned knowledge/life back to one's original spiritual identity. The diversity of life forms is only a display of the biospectrum of consciousness in different stages.

Critic: *"If you make the false contingency that "IF evolution is false, THEN God exists; or IF God exists, THEN evolution is false", you will only serve to denigrate religion, spew falsehoods about science, and disenfranchise rational people."*

Reply: This was never stated by us. Nobel Prize winner George Wald may have said something like that,³³

"There are only two possibilities as to how life arose. One is spontaneous generation arising to evolution; the other is a supernatural creative

act of God. There is no third possibility. Spontaneous generation, that life arose from non-living matter was scientifically disproved 120 years ago by Louis Pasteur and others. That leaves us with the only possible conclusion that life arose as a supernatural creative act of God. I will not accept that philosophically because I do not want to believe in God. Therefore, I choose to believe in that which I know is scientifically impossible; spontaneous generation arising due to evolution."

Our argument is that scientific evidence confirms that biological evolution is subjective, due to cognitive changes effected by consciousness, in contrast with Darwinian evolution, which claims it is due to merely fortuitous material changes of the body. To some extent, physical evolution or adaption does occur due to changing environments, but this does not extend to the degree of originating completely new species.

33. Johnson, E.D. (2010). *Programming of Life*. Big Mac Publishers. p. 123. ISBN 9780982355466. "Biologist George Wald dismissed anything besides physicalism with, "I will not believe that philosophically because I do not want to believe in God. Therefore, I choose to believe in that which I know is scientifically impossible: spontaneous generation arising to evolution."

CONCLUSION

1. It is readily acknowledged that sentient organisms display behavior, i.e. cognitive control and regulation of their bodies. Biomolecular research has observed this to be true even at the molecular level. This simply adds the level of intentional behavior to the traditional theory of undirected evolution, without undermining it.

A timely article on this point by James Shapiro can be found in a recent *Huffington Post* article (Dec 4, 2012).³⁴

34. http://www.huffingtonpost.com/james-a-shapiro/inconvenient-truths-why-a_b_2228277.html

2. Evolution, understood as the process of an organism's adaption to changing environments, does not impinge on any moral or religious principles. Reductionism, that claims a metaphysical ontology of all life in terms of mere matter, does have moral and religious-philosophical implications for our understanding of the spiritual significance of life.

3. The *Sri Isopanisad* gives a clear explanation of process of creation in the following verse (in Sanskrit);

*om purnam adah purnam idam
purnat purnam udacyate
purnasya purnam adayah
purnam eva vasisyate*

Translation: OM (the Personality of Godhead) is

perfect and complete, and because He is completely perfect, all emanations from Him, such as this phenomenal world, are created as perfectly complete wholes. Whatever is produced of the Complete Whole is also complete in itself. Because He is the Complete Whole, even though so many complete units emanate from Him, He remains the complete balance.

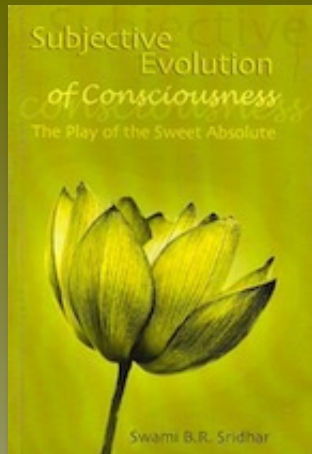
There is no gradual process of evolution mentioned here. The world/universe is created whole, as an emanation, reflection or projection from the Mind/Personality of Godhead. We believe this is confirmed by modern research that now recognizes that the tree of life is a bush or network of life, in which all of life is interdependent and could not have come about in a completely ancestral step-wise development that the traditional Darwinian evolutionary conception presumes.

The material world is like a reflection of the spiritual world within consciousness conditioned by ignorance. Consciousness is what we identify as (or call) the Concept of the world, which is necessarily based on our knowledge of the world. When our knowledge changes, our consciousness or Concept of the world changes, and consequently the objective world also changes for us, i.e. we see the objective world differently. In this sense, what we call "the world" is based on our consciousness/knowledge/concept of it. Even the atoms and

molecules that are considered to be the ultimate realities of the world for chemists and biologists, dissolve into mathematical wave functions from the standpoint of quantum physics. And it is from physics that the electronic ideas of atoms and molecules came from originally.

It is very easy for the human mind to imagine simple steps transforming one object into another, simply because they appear similar. The reason it is so easy to imagine is because, we can do it quite readily by mechanical manipulation of our own manufactured objects. However, to anthropomorphize inanimate matter as having the same ability would be fallacious reasoning. Therefore, evolution may have local validity, over a small region of Nature, but not globally, over the whole of Nature, and is certainly not applicable to the origin of life.

Science is an empirical method for acquiring knowledge. It is, therefore, inherently limited by what we can observe with our senses. To go beyond the limited range of what is observable to the bigger picture of the origin and nature of life or the universe, crosses over into territory that belongs to the domain of philosophy and religion. When it does this, certainly there will be conflict if science takes its empirical moorings into that region that is not subject to sensuous experience, especially when it seeks the sentient ground that makes experience itself possible.



Subjective Evolution of Consciousness

Evolution is generally thought of as something merely objective. But objective evolution is a misperception of reality. Evolution is actually based on consciousness, which is subjective. Subjective evolution, however, seems to be objective evolution to those who are ignorant of this perspective. Consciousness seems to be the unessential embedded in a concrete substance, but actually it is just the opposite. Consciousness is the substantial and its objective content or world is floating on it connected by a shadowy medium like mind. This view finds surprising support in advanced modern science from which physicists like Paul Davies have concluded

that it is necessary to adopt "a new way of thinking that is in closer accord with mysticism than materialism."

The dynamic super-subjective living reality that produces as much as is produced by its constituent subjective and objective fragmental parts or moments is in and for itself the embodiment of ecstasy, i.e. forever beyond the static reification of materialistic misunderstanding. With an irresistible passion for truth, Srila Bhakti Raksak Sridhar Dev-Goswami Maharaja, the author of *Subjective Evolution of Consciousness* takes us to an incomparable synthesis of thought from Descartes, Berkeley and Hegel in the West to Buddha, Shankara, and Sri Chaitanya in the East to reveal the ultimate conception of reality in all its comprehensive beauty and fulfillment.

To obtain a copy of the book *Subjective Evolution of Consciousness* please contact us at:

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