

CREATIONISM, NEO-DARWINISM AND PANSPERMIA

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Abstract

Creationists and neo-Darwinists have spent the past several decades engaged in a sullen trench warfare, occasionally firing at each other with little effect. We argue in this article that an acceptance of panspermia as a "third way" might lead to a long over-due reconciliation between the contending groups.

Keywords: creationism, evolution, panspermia

1. Introduction

Creationism is widely regarded to be one of the great scourges of the modern technological world. In this article we analyse the genesis of this perception, its validity, and try to understand the causes that lead to the present impasse.

The *Oxford English Dictionary* defines *creation* as follows:

"...the action or process of bringing something into existence..."

and for creationism the definition is the following:

"...the belief that the universe and living organisms originate from specific acts of divine creation, as in the biblical account, rather than by natural processes such as evolution..."

If one were to omit the references to "biblical account" .. "living organisms" ... "divine creation", the above definition would apply to the currently fashionable Big Bang theory of cosmology. According to this theory all matter in the Universe arose in a primordial Big Bang event, an explosion of a gigantic "super-atom", by an unspecified process of special creation. This is a position that is considered to be fully within the purview of respectable science. It is essentially creation *ex nihilo*, and the creation event is posited to have occurred at a definite moment in time, currently placed at some 13.7 billion years ago. One is not permitted within the framework of this type of model to ask the question "what happened before the beginning or what was there before the Big-Bang? " The standard cosmological model, it must be admitted, has all the hallmarks of a scientific rendering of the Biblical story of creation! Indeed many groups of Biblical evangelists use the Big-Bang theory as a vindication of their religious point of view.

For living things a different set of rules apply. If you were unwise enough to hold the view

that life is forbiddingly unlikely to have emerged in the Universe from nonbiological chemicals by natural means, you will be chastised as the enemy of modern science. This includes recent endeavours to argue for intelligent design, a position that is not necessarily linked to any religious dogma.

2. Historical Antecedents

In our reckoning the problem stems from a historical accident that goes back to the latter half of the 19th century and to the famous Thomas Huxley - Bishop Samuel Wilberforce debate of 1860 at the Oxford University Union that followed the publication of Charles Darwin's *The Origins of Species*¹. Up to that time the popular viewpoint espoused by most groups of educated people was that species must have emerged through special acts of creation. More seriously, perhaps, any evolutionary progress of life through geological time would have been denied.

This 19th century world-view espoused by most thinking people was remarkably close to the Biblical account of the creation of living things. The contribution of Alfred Russel Wallace² and Charles Darwin¹ was to change the old world view to one in which a gradual progression of life forms was accepted as an inviolable fact. The progression (evolution) is to be clearly seen in the fossil record leading from the simplest single-celled lifeforms to the most complex plants and animals, and with diversity increasing steadily as time progressed. The sorting out of varieties according to suitability with respect to terrestrial habitat was also clearly demonstrated at this time. The evolutionary world-view was distinctly superior to the one that preceded it and was in better accord with the geological data.

We think that it is because the transition to an evolutionary world-view was not achieved easily that the present problem persists. Any sociological movement that could be construed as even remotely seeking to deny this world-view is perceived as antiscientific. This point of view is not justified in all cases. Whilst sustained macro-evolutionary progress, as evidenced in the geological record, must be accepted as an irrefutable fact, major questions remain in regard to the precise mechanisms by which evolutionary changes are wrought. There is the big question of whether terrestrial biology is an open or closed system. None of these matters were addressed either in the Wallace-Darwin paper to the Linnean Society in 1858, or in Darwin's *Origins of Species* in 1859. Darwin and Wallace sought refuge in generalities, turning constantly to the process of natural selection by which the fittest offspring in every generation survive. Their thesis essentially involved the sorting out of the fittest individual members from amongst the multitude of offspring that are generated through the mechanism of biological replication.

Such a process, operating over a large enough number of generations was then supposed to lead to an ever-increasing diversity of life, including the development of new traits, and eventually the generation of new varieties and species. The observed fact that a distribution of properties always exists among offspring was used to defend this thesis. The source or sources of innovative variations amongst the offspring of any particular species was not addressed by Darwin or Wallace, nor was the question of life's ultimate origin. Such matters had to be left to others who were to follow.

3. Inherent Deficiencies

Mendelian genetics that came immediately after Darwin and Wallace in the late 19th century and the most modern developments of gene sequencing have offered much deeper insights into the mechanics of evolutionary change (Woese³). But mechanisms leading to truly innovative changes, and origins, including origins of species, still continue to elude us. For instance, we have no definite knowledge that life started *de novo* on Earth, and we have no way of excluding the possibility of pre-existing genes from the cosmos contributing to biological evolution in a decisive way (Hoyle and Wickramasinghe^{4,5}. Wickramasinghe, Wickramasinghe and Napier⁶). The emergence of new species, orders, classes may well be contingent upon the input of cosmic genes. A purely terrestrial origin of life, and its subsequent evolution within a closed system, are articles of faith to which most conformist scientists and science journals adhere to with almost evangelical zeal. In our view it is precisely such baseless assertions that cause offence to a vast number of educated and intelligent people and fuel the more radical and irrational forms of creationism.

It must be considered unusual for the scientific community to be seen so strongly at odds with the general public on matters relating to the origins of life. A recent poll shows that two thirds of American adults reject totally the standard text-book account of neo-Darwinian evolution with its emphasis on an origin of life on the Earth independent of the wider cosmos. A number of state legislatures in the US are now busy re-writing the rules so as to allow pupils in their schools to get a more balanced view point on this important matter. In response many scientists see no alternative but to step up their campaign advocating the standard neo-Darwinian story in its narrowest and most restricted Earth-centred context. What they should properly do is to distinguish clearly between firmly established empirical facts concerning evolution and *theories and speculations* about mechanisms. We forget all too easily the fact that any theory of the world has at most a provisional, pro-tem value. It is valid only until it comes to be falsified or a better model is proposed. There are of course some problems in science for which a definite solution is possible, as for instance in the case of mathematics and the science of planetary motions. But the biggest problems about ultimate origin and nature of life clearly do not come under this heading.

4. The “threat” posed by creationism

The intransigence of the Earth-bound neo-Darwinians is, we believe, due to the perceived threat from the most radical brand of "creationist". Such a person is often portrayed as belonging to some potentially dangerous, fundamentalist “religious sect”, a sworn enemy of the scientific method. A person who accepts the *literal* truth of the Gospel falls into this category. The long-term threat from such groups is of course illusory for in the long term the light of knowledge always outshines and dispels the darkness of ignorance!

Nowadays people who hold such restricted creationist views such as belief in a young Earth are hard to find, although in the past they may have constituted an influential group that was difficult to deal with. They may even have included die-hard activists who sought the most radical reforms of State education programs, particularly in the southern states of the US. Such people often sought to deny even the barest facts of evolution in the geological record and insist on an Earth less than 6000 years old! These propositions are undeniably anti-scientific and to be deplored, and it is right that "creationists" holding such antiquated views should be denied the influence they seek⁷.

5. Religion and Science

It is obviously possible to accept a vast number of scientifically derived propositions and yet to identify oneself with one religious world view or another, as indeed many eminent scientists have done. Science and religion most often deal with distinct dominions of human experience, but on a few fundamental questions such as origins an overlap exists and might sometimes cause problems. Revealed "knowledge" is in a sense non-negotiable and immutable. But scientific knowledge can in principle "evolve" and go either in the direction of consonance or discord with a "revealed" point of view. With regard to life's origins there is a good prospect that science might eventually reach consonance with one or other of the many religious world views that prevail. But as for the nature of mind, consciousness, spirituality, purpose ... these may well remain outside the writ of science.

However, the Creation-neo-Darwinism dispute is perceived as a head-on clash between religious dogma on the one hand, and rational inquiry on the other. The situation is of course far from clear-cut. Science and Religion are two great manifestations of the human spirit⁸. Religious dogma is essentially in the nature of a revelation, whilst scientific facts are the result of rigorous experiment and intellectual discipline. Fortunately there is no hopeless conflict between these two types of human endeavour, if they are kept separate, both of which in their own way are celebrations of the human spirit. For science, this separation is maintained if no supernatural events –miracles– are claimed to be necessary at any point in time. For religion, separation requires that the ultimately unexplainable nature of some things –like existence altogether– be acknowledged.

6. Panspermia and Probability Arguments

With these guidelines, a reconciliation between the "creationist and "neo-Darwinian" world views may turn out to be possible within a strictly scientific framework. The first question to be addressed concerns the ultimate origin of life. The standard text book story of a primordial soup on a primitive Earth leading to the emergence of life from non-living matter is beginning to look more unlikely than ever. The fact that the earliest evidence of terrestrial life appears at about 4 billion years before the present (Mojzsis et al⁹), when the Earth was being severely bombarded by comets and asteroids, shows that life in the form of microorganisms was most probably brought here along with the colliding comets. Comets could even be not only the transporters, but also the incubators, of cosmic life⁶.

If comets seeded Earth with microbial life some 4 billion years ago, this process must necessarily have continued to the present day. With cosmic microbes supplying a continual replenishment of genes, it would seem inevitable that neo-Darwinian evolution, including the process of natural selection, must proceed in response to the arrival of new genes that serve as uncorrupted evolutionary potential^{4,5}.

The details of the processes involved leading up to the accommodation of cometary genes within the genomes of evolving terrestrial life-forms is outside the scope of the present article. We note here that several aspects of this general picture are in accord with recent data from molecular biology. Firstly, horizontal gene transfer has recently been shown to play a major role in macro evolutionary progress¹⁰⁻¹². Secondly, many genes appear to be older, when judged through sequence analysis and mutation rates, than they should be according to the position within geological strata in the fossil record of the features they encode. Thus some eukaryotic genes are found to be older than prokaryotic genes, and in the words of

Doolittle¹¹: ".....Many eukaryotic genes seem to have come from nowhere ". The base of the microbial tree of life is looking more elusive than ever before, and the roots of the tree may well turn out to be firmly anchored, not on Earth, but in the deep cosmos.

Probability arguments have been used for many years to demonstrate that the first origin of life from non-life is an exceedingly improbable affair. The odds against such an origin was originally estimated in supra-astronomical numbers like 10^{40000} to 1 (Hoyle and Wickramasinghe⁴). More recent revisions have led to smaller numbers like 10^{1000} to 1, but the difference as far as our argument goes is trivial. It has been argued on the basis of such numbers that the origin of life is an event so improbable that it occurred once and only once in the entire history of the Universe.

The intriguing twist here is in an application of the so-called anthropic principle - that the presence of life may well be telling us something quite profound about cosmology itself. We obviously cannot allow a cosmological model that does not within its framework permit the existence of life! The total amount of matter and time available within the most simplistic Big-Bang-type cosmologies might turn out to be inadequate to explain a mechanistic origin of life. But certain cosmological models like the HGD model of Gibson (ref 14) has distinct advantages over the standard models. The origin of life could be a near-miraculous unique cosmic event requiring the combined resources of all the stars in all the galaxies in the entire Universe. Despite the technological triumphs of observational cosmology in the past decade, past experience tells us that it is always prudent to keep an open mind on the ultimate question of how it all began. It would be unwise to exclude entirely the possibility of an infinite past (Hoyle, Burbidge & Narlikar¹⁵). If so, logically, no origin-of-life in a finite past will be required. And if life comes from the eternal past, there is no origin-of-life issue for creationists and neo-Darwinists to fight about. (The same logic could apply to highly evolved life, and issues about evolution would also vanish!)

Wherever life comes from, it would spread with certainty by virtue of the survival properties of bacteria that have been discovered in recent years. This point of view is in fact the theory known as panspermia⁵. Evidence in favour of panspermia, including evidence for the existence of bacterial particles in space has been accumulating rapidly over the past two decades. One might well wonder why the scientific community at large had taken so long in coming to terms with this evidence and conceding that the Earth-centred, pre-Copernican theory of life is in need of drastic revision. Could it be the fear that such a move would serve as bait for creationists, particularly the less enlightened ones who are perceived as a threat to education and science? We think that this may well be the case. This fear could lie at the root of the current objections to panspermia that has persisted to so long, and it could be the reason that even the latest most compelling evidence for panspermia continues to be ignored (Hoover¹⁶).

The existence of microbial life on a galaxy-wide or cosmic scale was vehemently denied for a long time despite all the evidence⁵. Now with the near certainty that microorganisms have a cosmic provenance, an unproved dictum is gaining ground:

Life must occur inevitably and independently through the conversion of inorganic matter to primitive life. Life is a cosmic imperative against all the odds!

This dictum evidently demands the operation of an untested and unproved process of pre-biotic chemical evolution, one that is directed in some mysterious way towards the

emergence of life against imponderable odds. A single "miracle", the origin of terrestrial life in a "warm little pond" is now be multiplied a trillion-fold, with independent originations postulated for every habitable planetary system in the Universe. This in our view is the mistaken remit of the emergent science of astrobiology – and it is safely removed from fruitful empirical testing for generations.

On the other hand, a limited form of panspermia is coming to be accepted without dissent. This involves the transfer of primitive life within planetary bodies of a single solar-system. Confinement of the process to one planetary system lacks credulity, however. Comets, bolides, clumps of dust infected with primitive life from one particular solar system would by no means be entirely confined to that system alone⁶. Galaxy-wide exchanges of living material must occur and the transfer of viable life by well-attested dynamical processes must surely be vastly more probable than a trillion independent events of origination.

The ultimate question of how a probability, measured as

$$P = 1/10^x$$

with x in the range 40,000 – 100 (refs 4,17) remains largely unresolved. Invoking “cosmic intelligence” to intervene may be outside the realm of empirical science at the moment, but not perhaps in the very long term. Human biochemists in 2011 can assemble bacterial genomes to meet their requirements, and conduct genetic engineering as in the production of GM crops. It is not inconceivable that our distant descendants 1000 years from now might evolve further, becoming, from our perspective, super-humans. They might be able to work out the requirements for directed panspermia, perhaps launching our planet’s entire assemblage of genes into space¹⁸. This might be science fiction today, but science fiction can sometimes turn into science fact. Many distinguished scientists have expressed similar views, including Sir Arthur Eddington, and Sir Fred Hoyle, who wrote¹⁹:

“A commonsense interpretation of the facts suggests that a superintellect has monkeyed with physics as well as with chemistry and biology, and that there are no blind forces worth speaking about in nature.....”

References

- (1) Darwin, C., 1859. *The Origin of Species* (John Murray, Lond)
- (2) Wallace, A.R., 1858. *J.Proc.Linnean Soc. Zoology* **3**(2) 53-62
- (3) Woese, C., 1998. *Proc.Natl.Acad.Sci.*, **95**(12), 6854
- (4) Hoyle, F. and Wickramasinghe, N.C., 1981. *Evolution from Space* (J.M.Dent & Sons, Lond)
- (5) Hoyle, F. and Wickramasinghe, N.C., 1999. *Astronomical Origins of Life* (Kluwer Academic Publ Dordrecht)
- (6) Wickramasinghe, J.T., Wickramasinghe, N.C. & Napier, W.M., 2010. *Comets and the Origin of Life* (World Scientific and Imperial Press, Singapore)
- (7) Scott, E.C., 2004. *Evolution vs Creationism: An Introduction* (University of California Press)
- (8) Dixon, T., 2008. *Religion and Science: A very short introduction* (Oxford University Press)
- (9) Mojzsis, S.J. et al, 1996. *Science*, **117**, 528
- (10) Doolittle, R.F. et al, *Science*, **271**, 470-477
- (11) Doolittle, R.F., 2008. *Scientific American*, **282**(2), 90-95
- (12) Gee, X., 1997. *Mol.Biol.Evol.*, **14**(8), 861-866
- (13) Mojzsis, S.J. et al, 1996. *Science*, **117**, 528
- (14) Gibson, C.H., Schild, R.E. and Wickramasinghe, N.C., 2010. *International Journal of Astrobiology*, Page 1 of 6 doi:10.1017/S1473550410000352
- (15) Hoyle, F., Burbidge, G. & Narlikar, J.V., 2000. *A Different Approach to Cosmology* (Cambridge University Press)
- (16) Hoover, R.B., 2011. *Journal of Cosmology*, Vol 13, March 2011
- (17) Wickramasinghe, C., *The Observatory Magazine*, May, 2011
- (18) <http://www.panspermia.org/howposs.htm>
- (19) Hoyle, F., 1982. The Universe: Past and Present Reflections, *Ann.Rev.Astron.Astrophys.*, **20**, 15