The Theory of Naturalism in Origins Science

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1. Summary

The scientific investigation into the origin of the natural world, Origins Science, and pre-historic events in the natural world, Pre-Historic Science, is a vast and fascinating one. The volume of research into the fundamental question: 'how did we/the universe come to exist?' indicates that this is the most vexing question facing the human race. With so much research one would be forgiven to think that we are close to answering this question and yet the more we find out the further we move from a reliable answer. The truth is that the anomalies continue to accumulate indicating the field is in the midst of a Kuhnian crisis.

Thankfully there is a way out of the crisis, all we need to do is allow a paradigm shift in the fundamental methodology of Pre-Historic/Origins Science. From there we will be able to achieve the breakthrough that will enable progress towards describing reality as accurately as possible.

The required paradigm shift requires three phases. The first is for the scientific community to acknowledge that Pre-Historic/Origins Science is different to Normal Science because conventional experiments cannot be conducted. Secondly, acknowledgment that this difference causes the assumption of naturalism to be unjustified and unfalsifiable in Pre-Historic/Origins Science. Thirdly, acknowledge that perfect scientific freedom and achievement of falsifiability requires the analysis of both natural and supernatural pre-historic/origins theories. And finally, journals specifically for Pre-Historic/Origins Science need to be published to enable maximum clarity for the scientific community to review proposed theories and enable the cycle of continuous improvement. Within this new paradigm descriptions will progress towards describing reality as accurately as possible, the goal of science.

2. The Anomalies: A Literature Review

A brief literature review of Origins and Pre-Historic Science reveals that there are fundamental questions still unanswered and findings that contradict predictions. An investigation into why this is the case is perfectly reasonable and even warranted. The following quotes are a small sample of the known anomalies.

2.1 Cosmology

"We are really amazed – these are the earliest, oldest galaxies found to date. Their existence was not predicted by theory… we're detecting galaxies we never expected to find, having a wide range of properties we never expected to see." [1]

[1] "Astronomical Surprise: Massive Old Galaxies Starve to Death in the Infant Universe", *Science Daily*, 21 March 2005. www.sciencedaily.com

"The discovery of such a complex and mature structure so early in the history of the universe is highly surprising. Indeed, until recently it would have been deemed impossible." [2]

"We expected to find basically zero massive galaxies beyond about 9 billion years ago, because theoretical models predict that massive galaxies form last. Instead we found highly developed galaxies that just shouldn't have been there, but are." [3]

"Cosmologists have another saying they like to cite: 'You get to invoke the tooth fairy only once,' meaning dark matter, 'but now we have to invoke the tooth fairy twice,' meaning dark energy." [4]

"We just simply don't know the answer to the question 'how did the universe begin?'. There are things that all cosmologists don't know the answer to, many questions, that's one of the main ones, how did the universe begin?" [5]

"The presence of such fully evolved galaxies so early in the life of the cosmos is hard to explain and has been a major puzzle to astronomers studying how galaxies form and evolve." [6]

"Most of us are persuaded that stars form out of more diffuse material which must, therefore, condense, contract, accrete etc. nevertheless, nearly all observations of pre-main-sequence and proto-stars are dominated by outflowing stuff." [7]

"We don't understand how a single star forms, yet we want to understand how 10 billion stars form." [8]

"The origin of stars represents one of the most fundamental unsolved problems of contemporary astrophysics." [9]

"If none of us knew in advance that stars exist, frontline research would offer plenty of convincing reasons for why stars could never form." [10]

"Nearly a century after the true nature of galaxies was established, their origin and evolution remain great unsolved problems of modern astrophysics." [11]

"The formation of galaxies and large scale structures remains 'TMIUPIMA'… 'The most important unsolved problem in modern astrophysics'…" [12]

"A completely satisfactory theory of galaxy formation remains to be formulated." [13]

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[2] ESO Press Release, "Surprise Discovery of Highly Developed Structure in the Young Universe." 2 March 2005. www.eso.org

[3] Glazebrook, K. "Glimpse at Early Universe Reveals Surprising Mature Galaxies" *Science Daily* July 2004.

[4] "Out There", *New York Times Magazine*, 11 March 2007.

[5] Frenk, C., Royal Society Summer Science Online, filmed on 17 July 2020. (https://royalsociety.org/science-events-and-lectures/2020/summer-science-online/programme/friday/)

[6] "Old Galaxies Stick Together in the Young Universe", *Science Daily*, 4 April 2008.

[7] Trimble, V., Aschwanden, M. J., "Astrophysics in 2000." *Publications of the Astronomical Society of the Pacific*, 113:1025-1114, September 2001.

[8] Frenk, C. as quoted in "Surveys Scour the Cosmic Deep." *Science* 303:1750, 19 March 2004.

[9] Lada, Charles J., and Shu, Frank H., 4 May 1990. "The Formation of Sunlike Stars." *Science* 248:564.

[10] Tyson, Neil Degrasse, *Death by Black Hole and Other Cosmic Quandaries*. New York: W.W. Norton and Co. 2007, p. 187.

[11] West, M.J., Cote, P., Marzke R.O., and Jordan, A. "Reconstructing Galaxy Histories from Globular Clusters." *Nature* 427:31-35, 1 January 2004.

[12] Trimble, V., Aschwanden, M. J., "Astrophysics in 2000." *Publications of the Astronomical Society of the Pacific*, 113:1025-1114, September 2001.

[13] Silk, J., *The Big Bang,* New York: Henry Holt, 2000, p. 23.

"The processes that led to the formation of the planetary bodies in the Solar system are still not fully understood." [14]

"How the first stage of this process, primary accretion, works is a fundamental unsolved problem of planetary science." [15]

"Growth of planets may occur through their gravitational accretion into large bodies. Just how that takes place is not understood." [16]

"The formation of planetesimals, the kilometre-sized planetary precursors, is still a puzzling process." [17]

2.2 Biology

"Evolution: Still a Theory in Crisis." [18]

"I would really really like to know how life started, it is something that we absolutely don't know at the moment." [19]

"Nobody knows how a mixture of lifeless chemicals spontaneously organised themselves into the first living cell." [20]

"Hot acidic waters containing clay do not provide the right conditions for chemicals to assemble themselves into pioneer organisms." [21]

"Some biologists marvel that there is any evolution at all, considering the possible pitfalls of change. The idea is that organisms are so complex that it is very hard to change one aspect without wrecking everything else."[22]

"The feature of living matter that most demands explanation is that it is almost unimaginably complicated in directions that convey a powerful illusion of deliberate design." [23]

"Macroevolution posed a problem to Darwin because his principle of descent with modification predicts gradual transitions between small-scale adaptive changes in populations and these larger-scale phenomena, yet there is little evidence for such transitions in nature. Instead, the natural world is often characterized by gaps, or discontinuities. One type of gap relates to the existence of 'organs of extreme

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[14] Blum, J., "Evidence for the formation of comet 67P/Churyumov-Gerasimenko through gravitational collapse of a bound clump of pebbles", *Monthly Notices of the Royal Astronomical Society*, Volume 469, Issue Suppl_2, July 2017, Pages S755–S773, https://doi.org/10.1093/mnras/stx2741, 25 October 2017.

[15] Cuzzi, J., "Planets: the first movement" *Nature* 448 (30 Aug 2007) p. 1003.

[16] Harwit, M, *Astrophysical Concepts*, 2nd Ed., p. 553.

[17] Blum, J., Wurm, G., "The Growth Mechanisms of Macroscopic Bodies in Protoplanetary Disks" *Annual Review of Astronomy and Astrophysics*, Vol. 46: 21-56 (Sept 2008) p. 21.

[18] Denton, M., *Evolution: Still a Theory in Crisis,* Discovery Institute Press, 2016.

[19] Dawkins, R., "Life, The Universe, And Everything", filmed on 17 April 2015 at the Academia Film Olomouc Science Film Festival, Czech Republic. (https://www.youtube.com/watch?v=mGHUZ3ncz5A)

[20] Davies, P., "Was life on Earth born lucky?" *New Scientist*, 12 July 2003. (https://www.newscientist.com/article/mg17924034-700-was-life-on-earth-born-lucky/)

[21] Morelle, R., "Darwin's warm pond idea is tested" *BBC News*, 13 February 2006. (news.bbc.co.uk)

[22] Dicks, L., "The creatures time forgot", *New Scientist* 164(2209):39, 1999.

[23] Dawkins, R., *A Devil's Chaplain: Reflections on Hope, Lies, Science, and Love,* London, Weidenfeld and Nicholson, 2003, p. 79.

perfection', such as the eye, or morphological innovations, such as wings, both of which are found fully formed in present-day organisms without leaving evidence of how they evolved." [24]

2.3 Palaeontology

"Studies conducted since Darwin's time have failed to produce a continuous series of fossils as predicted."[25]

"The Cambrian strata of rocks, in which we find most of the major invertebrate groups, and we find many of them already in an advanced state of evolution, the very first time they appear. It is as though they were just planted there, without any evolutionary history." [26]

"When flowering plants show up in the fossil record, they appear with a bang, with no obvious series of intermediates… The ancestor just is not there." [27]

"Schweitzer was studying thin slices of bones from a T. rex. under a microscope, it appeared that the bone was filled with red disks. Later, Schweitzer recalls, 'I looked at this and I looked at this and I thought, this can't be. Red blood cells don't preserve.' …maybe the textbooks were wrong about fossilization." [28]

"They concluded that the arched back seen in so many fossils was the result of the expiring dinosaur's final death throes and immersion in water." [29]

These anomalies are just the tip of the iceberg. So, do they arise just because it is difficult to obtain reliable data when conventional experiments cannot be conducted? Or is there a deeper problem, one that is a Kuhnian crisis that needs a paradigm shift to progress? These questions cannot even be answered until the scientific community acknowledges that Pre-Historic/Origins Science is different to Normal Science because conventional experiments cannot be conducted.

3. How does science work when you cannot conduct conventional experiments?

The definition of science is associated with what is called the demarcation problem and normally conventional experiments are included as part of the process that achieves the goal of science, to progress towards describing reality as accurately as possible. Experiments and tests build the accuracy of the measurements that can be made during empirical observations. So if an experiment cannot be conducted it means we need to build the accuracy of descriptions some other way. But it does not stop science, as the other fundamental characteristics of science remain in play. Generally these characteristics are considered to be: 1. Measurement of observations that are then written in a logically falsifiable manner. 2. Descriptions of regularities of nature must make predictions. And finally, 3, all science must be published for review by

[24] Reznick, D. N., Ricklefs, E., "Darwin's bridge between microevolution and macroevolution", *Nature*, 457(7231):837, 12 February 2009.

[25] Hickman, C., *Animal Diversity*, McGraw Hill, New York, p. 123, 2008.

[26] Dawkins, R., *The Blind Watchmaker: Why the Evidence Reveals a Universe Without Design*, New York, Norton, 1987, p. 229.

[27] Pennisi, E., "On the origin of flowering plants", *Science* 324(5923):28,30, 3 April 2009.

[28] Schweitzer, M. as quoted in "Dinosaur shocker", *Smithsonian Magazine*, May 2006.

[29] Switek, B., "Watery secret of the dinosaur death pose", *New Scientist*, 23 November 2011. (https://www.newscientist.com/article/dn21207-watery-secret-of-the-dinosaur-death-pose/)

the scientific community who can verify or falsify the descriptions or at least note anomalies or inaccuracies such that there is a cycle of continuous improvement. This process is what enables descriptions to progress towards describing reality as accurately as possible, the goal of science.

Interestingly the subset of science that encapsulates pre-historic events (of which origins events are a further subset) includes many proposed events that cannot be repeated in an experiment. Without the option to conduct an experiment the scientist proposing the pre-historic event must base the proposal on how systems are observed to change over short time spans in the present and then theoretically reverse time. This is what Darwin did with *On the Origin of Species*.

This method has been used since Darwin, it is extremely inductive and exasperates the problem of induction because no observations were made of pre-historic events and an experiment cannot be conducted. One result is the accumulation of anomalies of which a small sample are presented above. The other result is that scientists make a variety of claims about what is and is not science. For example:

James Gunn: "Cosmology may look like a science, but it isn't a science... A basic tenet of science is that you can do repeatable experiments, and you can't do that in cosmology." [30]

Michael Turner: "Cosmology is a reconstructive science, we are trying to put together the history." [31]

Christopher Smeenk and George Ellis: "Cosmology provokes questions about the limits of scientific explanation because it lacks many of the features that are present in other areas of physics... [Cosmology] lacks independent experimental probes of physics at the relevant scales. …What can we mean by 'laws' for a unique object (the universe as a whole) or a unique event (its origin)?" [32]

Ijjas, Steinhardt and Loeb: "Inflationary cosmology, as we currently understand it, cannot be evaluated using the scientific method." [33]

Tim Maudlin: "There are particular physical problems, problems of explanation, which arise in thinking about the entire universe, which don't arise when you consider only its smaller systems." [34]

Stephen Hawking: "One can regard a singularity as a point where the Einstein equations, and presumably the other presently known laws of physics, break down." [35]

Karl Popper: "…natural selection, is difficult to test. …really severe tests of the theory of natural selection are hard to come by, much more so than tests of otherwise comparable theories in physics or chemistry." [36]

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[30] Gunn, James in Cho, A., "A Singular Conundrum: How Odd Is Our Universe?" *Science* 28 Sep 2007:Vol. 317, Issue 5846, pp. 1848-1850 DOI: 10.1126/science.317.5846.1848.

[31] Turner, Michael S., video of Panel 1 at the Origins Symposium, Arizona State University, 3 April 2009. (http://thesciencenetwork.org/programs/origins-symposium).

[32] Smeenk, Christopher and George Ellis, "Philosophy of Cosmology", *The Stanford Encyclopedia of Philosophy* (26 Sep 2017), Edward N. Zalta (ed.), URL = https://plato.stanford.edu/archives/win2017/entries/cosmology/)

[33] Ijjas, A., Steinhardt, P., Loeb A., "Pop goes the universe", *Scientific American*, January 2017.

[34] Andersen, R., quotations of Tim Maudlin in "What happened befor the Big Bang? The new Philosophy of Cosmology", *The Atlantic*, 19 January 2012.

[35] Hawking, S., Ellis, G., *The Large Scale Structure of Space-Time*, Cambridge University Press, Cambridge, 1973, p. 287.

[36] Popper, K. "Natural Selection and the Emergence of Mind." *Dialectica* Vol 32, Wiley, 1978, pp 32: 339-355. http://www.jstor.org/stable/42970324.

Ernst Mayr: "Evolutionary biology, in contrast with physics and chemistry, is a historical science—the evolutionist attempts to explain events and processes that have already taken place. Laws and experiments are inappropriate techniques for the explication of such events and processes."[37]

Phil Skell: "Darwinian evolution, whatever its other virtues, does not provide a fruitful heuristic in experimental biology." [38]

Are these scientists correct or is there another way to manage pre-historic science? If they are correct, what is the solution to the demarcation problem within the subset of pre-historic events that are not repeatable? Some have started to think about possible solutions, for example, Tim Maudlin, Philosopher of Physics at New York University, proposes that: "maybe there might be special sorts of laws, or special sorts of explanatory principles, that would apply uniquely to the initial state of the universe." [39]

Maybe, but this proposal still does not address the problem that the proposed events do not repeat in the present day, they are unique events. They are in the unobservable past and cannot be replicated in an experiment because their physical scale is too large and the time scale is too large for us to conduct experiments. As such they do not satisfy the requirement of science that predictions of the theory be falsifiable via experiment and observation of results.

Brustein and Kupferman also make a proposal regarding the origin of the universe: "Of course scientists cannot claim to know the definitive truth. But we can approach the question from a scientific viewpoint and see what we find out. How do we do that? First, we look to the data. Thanks to modern technology, we have much more information than did people of previous ages who asked the same question. Then we can use scientific methods and techniques to analyze the data, organize them in a coherent way and try and extract an answer." [40]

This proposal is vague, but if they specifically mean by "modern technology" that we now have powerful computers that can simulate the change over time of the universe then that is in fact what is being done. It is regularly done in Cosmology and Astrophysics and Nelson points out, "Mathematical models are widely used in modern evolutionary biology." [41]

Modern computer models are very useful because they actually satisfy the requirements of the definition of science. The first element, measurable observations, is satisfied because the computer model can be compared to observations in the present. They also satisfy the second requirement, that theories of changing system make predictions. A good pre-historic/origins theory will model the systems in the past and how they change over time. The model then will make a measurable prediction about what we should observe in the present. If the predictions of the model do not align with present day observations then the model is tweaked until it does align. This is actually similar to replication experiments, it's just that the 'experiment' is virtual, a mathematical model. The third requirement is satisfied if the results from the computer simulations are published.

Therefore the conclusion is that Pre-Historic Science, including Origins Science, meets enough of the criteria of the definition of science for the fields to progress, but that there are two key differences. One,

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[37] Mayr, E., Darwin's Influence on Modern Thought, *Scientific American,* 24 November 2009, (https://www.scientificamerican.com/article/darwins-influence-on-modern-thought1/).

[38] Skell, P., "Why Do We Invoke Darwin?", *The Scientist*, 28 August 2005. (https://www.the-scientist.com/opinion-old/why-do-we-invoke-darwin-48438).

[39] Andersen, R., quotations of Tim Maudlin in "What happened befor the Big Bang? The new Philosophy of Cosmology", *The Atlantic*, 19 January 2012.

[40] Brustein, R., Kupferman, J., "The Creation of the World-According to Science", *History And Philosophy Of The Life Sciences*, 2012 (https://arxiv.org/abs/1202.0623).

[41] Nelson, R., "The sciences are different and the differences matter", *Research Policy* 45 (2016) 1692–1701. (https://www.sciencedirect.com/science/article/pii/S0048733316300981)

observations of the actual events cannot be made and two, most of the experiments are virtual or mathematical models.

So, does this answer the earlier question: Do the anomalies arise because it is difficult to obtain reliable data when conventional experiments cannot be conducted? This question is answered with a no, the use of computer simulations and mathematical models has enabled pre-historic and origins science theories to be analysed within the definition of science and the data produced is valuable and reliable.

This then brings us to the next question: Do the anomalies mean that there is a Kuhnian crisis that needs a paradigm shift to progress the science?

What are the anomalies actually telling us? As an example the first anomaly from above can be looked at closer.

"We are really amazed – these are the earliest, oldest galaxies found to date. Their existence was not predicted by theory… we're detecting galaxies we never expected to find, having a wide range of properties we never expected to see." [42]

The anomaly is that the model did not predict the galaxies found by observation, thus the observation is actually falsifying the theory or at best telling us the theory needs improvement. All the other anomalies are similar, they are situations where observations do not match the predictions of the theory.

In Normal Science there is a general process that moves towards a precise observation-theory match. In his famous descriptions of "normal science" Thomas Kuhn makes this clear, he says: "Determination of significant fact, matching of facts with theory, and articulation of theory—exhaust, I think, the literature of normal science." And: "Normal science leads to a detail of information and to a precision of the observation-theory match that could be achieved in no other way." [43] In other words in a paradigm of normal science the main and general feature is puzzle solving and progress towards being able to make predictions that precisely match observations.

This clearly is not the current state of affairs in Pre-Historic/Origins Science, rather we have multiple unsolved puzzles and multiple instances where predictions do not match observation. Therefore it is clear the next phase of the process is required, as Kuhn says: "Failure of existing rules is the prelude to a search for new ones." [44]

Here he is not only talking about possible scientific theories, he is talking about the framework of the field, the fundamental principles, he says: "It demands large-scale paradigm destruction and major shifts in the problems and techniques of normal science." [45] Again, because we cannot observe pre-historic events nor conduct an experiment to replicate many of them it is clear that a paradigm shift is the only way forward.

Some may argue that origins/pre-historic science is still in the pre-paradigm phase, but how long can that go on for? Has the Kuhnian "invention of alternatives" phase been exhausted? As Kuhn says: "…invention of alternates is just what scientists seldom undertake except during the pre-paradigm stage of their science's development…" [46]

Many scientists have indeed invented alternative explanations and they too have added to the list of anomalies and it continues to grow. Therefore, it is now time to admit a crisis is actually under way and that the only way forward is a paradigm shift and a breakthrough, as Ijjas, Steinhardt and Loeb said

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[42] "Astronomical Surprise: Massive Old Galaxies Starve to Death in the Infant Universe", *Science Daily*, 21 March 2005. www.sciencedaily.com

[43] Kuhn, Thomas. *The Structure of Scientific Revolutions 3rd Edition*, Chicago: University of Chicago Press, 1996. p. 34 and p. 65. (First published 1962)

[44] *Ibid*, p. 68.

[45] *Ibid*, p. 68.

[46] *Ibid*, p. 76.

regarding the origin of the universe: "Today we are fortunate to have sharp, fundamental questions imposed on us by observations. The fact that our leading ideas have not worked out is a historic opportunity for a theoretical breakthrough." [47]

4. Philsophical Prerequisites for a Paradigm Shift

The founders of Philosophy have paved the way for science to flourish by asking that we doubt everything and then investigate with perfect scientific freedom and great courage. René Descartes suggests that we should begin investigations by first doubting everything, he said:

> "That whoever is searching after truth must, once in his life, doubt all things; insofar as this is possible." [48]

The Latin inscription on the Arms of the Royal Society of London effectively says this too, it says "Nullius in verba" and about it the Royal Society says:

> "It is taken to mean 'take nobody's word for it.' It is an expression of the determination of Fellows to withstand the domination of authority and to verify all statements by an appeal to facts determined by experiment." [49]

In the context of Pre-Historic and Origins Science then, since we are going to embark on a critical review and carry out a new investigation, then we should doubt all origins theories, doubt all preconceived ideas and doubt all assumptions. Then from the position of doubt we shall follow the evidence where it leads. W. K. Clifford asks us to only place reliance on a scientific theory that has sufficient evidence and to not suppress doubts, he said:

> "It has been judged wrong to believe on insufficient evidence, or to nourish belief by suppressing doubts and avoiding investigation." [50]

Therefore this investigation into the paradigm at the foundation of Pre-Historic and Origins Science must review all the assumption, even those so dearly held, as Bertrand Russell said:

> "None of our beliefs are quite true; all have at least a penumbra of vagueness and error. The methods of increasing the degree of truth in our beliefs are well known; they consist in hearing all sides, trying to ascertain all the relevant facts, controlling our own bias by discussion with people who have the opposite bias, and cultivating a readiness to discard any hypothesis which has proved inadequate. These methods are practised in science, and have built up the body of scientific knowledge." [51]

Therefore before building a new paradigm we must "hear all sides" with perfect freedom, as Immanuel Kant said:

> "For this enlightenment, however, nothing is required but freedom, and the freedom in question is the most innocuous form of all – freedom to make public use of one's reason in all matters." [52]

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[47] Ijjas, A., Steinhardt, P., Loeb A., "Pop goes the universe", *Scientific American*, January 2017.

[48] Descartes, René, *Principles of Philosophy*, Translated by Miller, V. and Miller, R., Huron College, University of Western Ontario, London, Ontario, Kluwer Academic Publishers, Holland, 1982. First published in Latin, in 1644, p. 3.

[49] The Royal Society of London, (https://royalsociety.org/about-us/history/).

[50] Clifford, William K., *The Ethics of Belief*, Read at the Grosvenor Hotel, London, 11 April 1876, p. 4.

[51] Russell, Bertrand, *Free Thought and Official Propaganda*, B. W. Huebsch, Inc., New York, 1922, p. 14. Delivered at the South Place Institute, London, 24 March 1922.

[52] Kant, Immanuel, *An Answer to the Question: What Is Enlightenment?* , Penguin Books Limited, 2013, Translated by H. B. Nisbet, Originally published in the *Berlin Monthly*, Dec 1784.

However, perfect scientific freedom will be met with opposition, as John Stuart Mill points out:

> "Unmeasured vituperation, employed on the side of the prevailing opinion really does deter people from professing contrary opinions and from listening to those who profess them." [53]

Epicurus encourages us to carry on with the investigation even if it is difficult, he said:

> "The greater the difficulty, the more glory in surmounting it." [54]

And Kant encourages us with:

> "The motto of enlightenment is therefore: Sapere aude! [Dare to be wise!] Have courage to use your own understanding!" [55]

Since the prerequisite for a paradigm shift is to courageously doubt everything then that includes the foundational assumptions of the current paradigm. Only after everything is pulled down can a new paradigm be built for Pre-Historic Science. Interestingly the fundament questions that comes to the forefront most often in a philosophical discussion about origins/pre-historic science is the metaphysical question regarding a supernatural being, i.e. does God exist? Philosophers have filled abundant pages for millennia discussing this question. As the question most often asked then the associated assumptions with this question will be the first to be analysed. The key assumption to investigate is naturalism. Is naturalism assumed in Pre-Historic Science and if so, is it a justified assumption?

5. Is Naturalism Assumed in Pre-Historic/Origins Science?

The Royal Society states on their website that "Natural Knowledge" is the only knowledge they seek:

> "We who have hereunto subscribed, do hereby promise, that we will endeavour to promote the good of the Royal Society of London for improving natural knowledge." [56]

With such a directive it is therefore logical that the origins research conducted by the Royal Society and published in the society journals is limited to natural origins theories.

A brief literature review of papers and books on Pre-Historic Science reveals the current position. The following statements were all made in the context of Pre-Historic or Origins Science. This context is of utmost importance!

> "And this takes us to the heart of the matter. Most Darwinists see science as inherently committed to methodological naturalism; they argue that this approach is therefore not up for democratic debate. One does not have to accept methodological naturalism, but if one rejects it, then one is no longer viewing the world as a scientist… Within science proper they need to proceed as if only natural causes are operative." [57]

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[53] Mill, John Stuart, *On Liberty*, Hackett Publishing Company, Inc., Indianapolis, 1978, p. 51. Originally published in 1859 in London.

[54] Epicurus, *The Sayings of Epicurus*, Messer, William, Bibliomundi E-book, 2021. Epicurus (341 – 270 BC).

[55] Kant, Immanuel, *An Answer to the Question: What Is Enlightenment?* , Penguin Books Limited, 2013, Translated by H. B. Nisbet, Originally published in the *Berlin Monthly*, Dec 1784.

[56] Royal Society of London, (https://royalsociety.org/fellows/elections/).

[57] Menuge, A., Dembski, W., Ruse, M., *Debating Design: From Darwin to DNA,* Cambridge University Press, 2004, p. 44.

> "Science holds to naturalism… not allowing itself to appeal to miracles or other supernatural interventions." [58]
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> "Within science proper they need to proceed as if only natural causes are operative." [59]
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> "Could a hypothesis that makes reference to God be part of science? Science does not allow for this possibility." [60]
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> "Science is obliged to leave out any appeal to the supernatural." [61]
>
> "Scientific theories are therefore explanations about aspects of nature without reference to God. This means they are natural, and we call this context methodological naturalism." [62]
>
> "Invoking the hand of God to explain natural phenomena breaks the rules of science." [63]
>
> "Supernatural explanations are not part of science." [64]
>
> "We cannot allow a divine foot in the door." [65]
>
> "In science, explanations must be based on naturally occurring phenomena." [66]

The context of these statements is important because none of the statements themselves actually include the words Pre-Historic or Origins. (The titles of the references below give most of the context.) The other thing to note is that none of these statements talk about assumptions. This is because the assumption of naturalism in normal science is so well justified that we have all but forgotten that it is an assumption. However, regarding the above statements, it is clear that naturalism is assumed in Pre-Historic/Origins Science.

Now, in Normal Science Richard Lewentin says of naturalism that it is "…an a priori adherence to material causes to create an apparatus of investigation and a set of concepts that produce material explanations..." [67]

Note how Lewontin uses the Latin based term "a priori" which literally translates as "from the previous". What he is referring to is the fact that centuries of 'previous/ a priori' science has shown that naturalism is a justified assumption. The theories that describe the regularities in nature are reliable and when tested there is no interference by a supernatural being. We take it for granted that chairs, light switches and gravity always work. On the contrary, it makes sense that, for example, nuclear scientists do not say that a supernatural being is going to make their reactor operate safely. That would endanger the lives of many people because any such (hypothetical) supernatural theory of nuclear physics has not been shown to be repeatedly reliable or regular. Whereas centuries of 'a priori' science has discovered the regularities in nature. It is the

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[58] Pennock, R., Dembski, W., Ruse, M., *Debating Design: From Darwin to DNA,* Cambridge University Press, 2004, p. 134.

[59] Menuge, A., Dembski, W., Ruse, M., *Debating Design: From Darwin to DNA,* Cambridge University Press, 2004, p. 32.

[60] Ruse, M., Pennock, R., *Intelligent Design Creationism and Its Critics,* MIT Press, 2001, p. 371.

[61] Haught, J., Dembski, W., Ruse, M., *Debating Design: From Darwin to DNA,* Cambridge University Press, 2004, p. 231.

[62] Staver, John R., Evolution & Intelligent Design*, The Science Teacher,* Vol. 70, No. 8, November 2003, p. 34.

[63] Fields, H. "Dinosaur Shocker", *Smithsonian Magazine*, May 2006. (https://www.smithsonianmag.com/science-nature/dinosaur-shocker-115306469/)

[64] Jones, John E., Tammy KITZMILLER, et al., Plaintiffs, v. DOVER AREA SCHOOL DISTRICT, et al., Defendants. No. 04cv2688. United States District Court, M.D. Pennsylvania. December 20, 2005. MEMORANDUM OPINION, JONES, District Judge.

[65] Lewontin, Richard C., Billions and Billions of Demons (review of *The Demon-Haunted World: Science as a Candle in the Dark* by Carl Sagan, 1997), *The New York Review of Books*, p. 31, 9 January 1997.

[66] National Academy of Science, *Science, Evolution, and Creationism,* The National Academies Press, 2008, p.10.

[67] Lewontin, Richard C. Billions and Billions of Demons (review of The Demon-Haunted World: Science as a Candle in the Dark by Carl Sagan, 1997), The New York Review of Books, p. 31, 9 January 1997.

repeatability of the regularities that enables us to build things like nuclear reactors with confidence in how they will operate.

There is a practical reason too, a supernatural act cannot be predicted nor controlled in an experiment, as Eugenie Scott said:

> "In experimental research an omnipotent deity cannot be 'controlled'." [68]

Therefore, in Normal Science the assumption of naturalism is completely justified and it has been so well established that it does not get listed as an assumption in science papers along with the other assumptions. It is so justified that it is not even mentioned and this practice is accepted and even expected by the scientific community.

But what about the subset of science that deals with pre-historic events and origins events? It has been shown that origins events are unique past events that cannot be observed nor replicated in an experiment. It has also been shown that pre-historic/origins science uses reverse time change models to help describe the proposed events. Inherent in reverse time change models/theories is an assumption about how systems changed in the past. We abductively infer the most likely way objects/systems changed in the past but we do not actually know how the change occurred in the past or what actual changes occurred in the past. On this note then, if we are honest, we have to also admit that we do not actually know if there was any supernatural intervention during the proposed pre-historic events. As such we are not justified in ruling out the possibility of a supernatural intervention in the past, rather we are obligated to carefully investigate the evidence. The investigation will be extremely difficult because we cannot repeat the proposed pre-historic event to verify if it is a regularity of nature, nor can we observe the event. For now we just need to acknowledge that the assumption of naturalism in pre-historic/origins science is not justified and adjust our scientific methodology accordingly.

One possible small first step change is for Pre-Historic and Origins Science papers to list naturalism along with the other assumptions. The next step however is an extremely different approach to Pre-Historic/Origins Science and as such extensive analysis will be required. The proposal is that the paradigm for Pre-Historic/Origins Science (not for Normal Science) is changed from one with naturalism as an assumption to a new paradigm where naturalism is not assumed. One foundation of science that will help build the new paradigm is scientific freedom.

6. Scientific Freedom and Pre-Historic/Origins Science

Betini, Avgar and Fryxell remind us of a barrier to science that Platt, Chamberlin and Bacon wrote about in their time:

> "Chamberlin was concerned with the tendency of some scientists to put more weight on evidence that supports favoured ideas more than other evidence that is available, which is today known as confirmation bias." [69]

Naturalism is an extremely important achievement of the scientific revolution and as such must remain the overarching principle that it is in Normal Science. However, since it has been shown that Pre-Historic/Origins Science is different then maybe it is because of confirmation bias that Naturalism is still applied. Either way we need to take a step back, doubt everything and begin building the new paradigm for Pre-Historic/Origins Science. Eugenie Scott (while expressing her opinion of creationists) expresses what scientific freedom

[68] Scott, E., Gross, P., Levitt N., Lewis M., *The Flight from Science and Reason*, New York Academy of Sciences, 1996, p. 518.

[69] Betini, G.S., Avgar T., Fryxell J.M., "Why are we not evaluating multiple competing hypotheses in ecology and evolution?", *Royal Society Open Science*, 5 December 2016.

should look like when all confirmation bias is removed. It is a picture of simply allowing competing and opposing theories and data to be carefully and exhaustively compared. She says: "They seek out only the data that is compatible with their view, which is why, even though what they do looks like science it isn't actually a legitimate form of science." [70] In other words when any field of science excludes data based on an unjustified assumption then that field needs improving to bring it back in line with the required characteristics of science.

Scott's advice is that we should investigate all the data. Therefore at the heart of the origins question 'how did we/the universe come to exist?' is the issue of perfect scientific freedom. The American Association for the Advancement of Science (AAAS) released a statement about freedom of inquiry in science in 2017 and part of it states:

> "Scientific freedom is the freedom to engage in scientific inquiry, pursue and apply knowledge, and communicate openly." [71]

The AAAS statement from 1937 has more detail and directly addresses the problem of dogma, it says:

> "The American Society of Naturalists observes with regret an increasing tendency in certain parts of the world to require of investigators the conformity of their research to officially prescribed doctrines. This society wishes to emphasize that intellectual progress is compatible only with perfect freedom in the conduct of investigation and in the announcement both of results and of conclusions based upon those results. Attention is called also to the fact that the scientific world can place no reliance upon reports of research carried on under conditions which limit its freedom by an enforced agreement with any preconceived views or dogmas." [72]

Taking the 1937 statement at face value we must conclude that perfect scientific freedom is our goal and the way to achieve that is to weed out all forms of dogma.

Is Methodological Naturalism dogma? It has been shown earlier that in Normal Science naturalism is a justified assumption and that in Pre-Historic/Origins Science it is not justified. Therefore it can be argued that Methodological Naturalism applied in Pre-Historic/Origins Science is done so as dogma. Very few scientists have analysed this situation, refer to the Bibliography.

John Calvert analysed if naturalism is a justified assumption in Origins Science and concluded:

> "modern Origins Science is dogmatic, not objective." [73]

He placed the cause on the 'orthodoxy' of Methodological Naturalism, he says:

> "There are at least three reasons modern origins science is not in fact objective: (1) its investigation and explanations are determined by the orthodoxy of Methodological Naturalism and not by an objective weighing of the relevant evidence, (2) due to the orthodoxy, it violates the logic necessary for the conduct of the historical science it is, and (3) because the use and the effect of the use of the orthodoxy is generally concealed." [74]

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[70] Scott, E. "Reason and Creationism" presentation at the Global Atheist Convention, 13 April 2012.

[71] AAAS Statement on Scientific Freedom and Responsibility. *Science*, 27 Oct 2017:Vol. 358, Issue 6362, pp. 462 DOI: 10.1126/science.358.6362.462-b (https://science.sciencemag.org/content/358/6362/462.2).

[72] Scientific Freedom. *Nature* 139, 185 (1937). https://doi.org/10.1038/139185b0 (https://www.nature.com/articles/139185b0).

[73] Calvert, John H. "The Absence of Religious Neutrality in K-12 Public Science Education" *Liberty University Law Review* Vol 12:571, 2018, p. 645. (https://digitalcommons.liberty.edu/lu_law_review/vol12/iss3/4/).

[74] *Ibid*, p. 592.

By calling it an orthodoxy, Calvert is effectively saying exactly what the AAAS warns against, "enforced agreement with any preconceived views or dogmas". Timothy Williamson addressed the question and concluded that: "Naturalism as dogma is one more enemy of the scientific spirit." [75]

The scientific spirit is, of course, perfect scientific freedom. How might this be framed in Pre-Historic/Origins Science? To start with the pursuit of freedom means that all origins theories are worthy of investigation. Otherwise, if all supernatural origins theories are excluded with no scientific investigation then naturalism is just dogma and if all natural origins theories are excluded with no scientific investigation then supernaturalism is just dogma. It is the aim of science to avoid dogma, and so all origins theories need to be compared and scientifically analysed to see which one explains more of what we observe.

Since we want confidence in our answer to the question 'how did we/the universe come to exist?' then we need to ensure dogma is removed. The new best practice and overarching principle in Origins Science should no longer be Methodological Naturalism but rather, as Robert Delfino says, it should be:

> "Methodological Neutralism…[where] scientists should simply search for causes without setting any a priori conditions on what ontological status those causes must have." [76]

To be clear, such a principle of methodological neutralism must be limited in application to only Pre-Historic/Origins Science. Neutralism must not be applied to Normal Science, as shown above. This new paradigm of perfect freedom in Pre-Historic/Origins Science will ensure careful, honest, thorough inquiry into all natural and supernatural origins theories and will enable the goal of science to be achieved, to describe reality as accurately as possible. The new paradigm will look something like this: Both natural and supernatural origins theories will be compared to see which ones explain more observations.

Thankfully there is some who are already debating this new paradigm. Massimo Pigliucci touched on an example of one small aspect of the debate when he said: "physicalism is the idea that everything that exists is made of matter, and clearly numbers, moral values and thoughts don't fall into that category." [77]

There are a myriad of examples of the debate that could be referenced in the 'unscientific' literature, and sadly the debate is ignored in scientific literature. Sean Carroll admits:

> "debates continue between naturalism and spiritual or religious or dualistic worldviews, and those debates are worth having." [78]

Sean Carroll is correct, the debate between natural and supernatural origins theories is "worth having". What must be recognized though is that the only way the debate can produce reliable knowledge is if the debate is conducted in accordance with AAAS perfect scientific freedom and officially reported in scientific journals, otherwise the debate is worthless because it is not peer reviewed and not reviewed by the scientific community. This review process is a required characteristic of science.

Currently the debate is not being conducted in scientific literature and within the current paradigm of naturalism that is the logical outcome. However, with the new paradigm for Pre-Historic/Origins Science where both natural and supernatural theories are compared then science journals can publish papers regarding such comparisons and the debate can take place with peer review and review by the entire scientific community so that Pre-Historic/Origins Science can progress towards describing reality as accurately as possible.

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[75] Williamson, T. "What Is Naturalism?" *New York Times*, 4 September 2011. (https://opinionator.blogs.nytimes.com/2011/09/04/what-is-naturalism/).

[76] Delfino, Robert A. "Scientific Naturalism and the Need for a Neutral Metaphysical Framework" in *Science and Faith within Reason: Reality, Creation, Life and Design*, ed. by Jaume Navarro (Surrey, England: Ashgate, 2011), p. 47.

[77] Pigliucci, Massimo, "Stephen Law on humanism and naturalism", *Scientia Salon*, 19 September 2014. (https://scientiasalon.wordpress.com/2014/09/19/stephen-law-on-humanism-and-naturalism/).

[78] Carroll, Sean, (https://www.preposterousuniverse.com/naturalism2012/).

Debate and comparison of competing theories is a common scientific practice and is encouraged. Betini, Avgar and Fryxell say:

> "The use of multiple working hypotheses to gain strong inference is widely promoted as a means to enhance the effectiveness of scientific investigation… first developed by Chamberlin in 1890, who believed that scientists usually 'fall in love' with their favourite hypothesis, leading to the unfortunate practice of trying to fit all evidence into a single explanation instead of finding genuine explanations for the phenomenon they study. The solution, according to Chamberlin, is to cultivate the habit of developing and comparing alternative hypotheses to explain any phenomenon observed… One useful antidote to perceptual bias is to work directly with other scientists with different perspectives. The results of such collaboration could yield a more even-handed, informative, and constructive contribution to the literature than either side is likely or able to contribute on their own. Debate among researchers with different points of view is crucial for the development of any scientific field." [79]

Therefore the only way to enable scientists with different perspectives to collaborate in Pre-Historic/Origins Science is to build a new paradigm that enables exactly that. Comparing competing theories was also a key element of Karl Popper's falsifiability method. "Popper stresses that we ascertain whether one theory is better than another by deductively testing both theories." [80]

Coming full circle then the obvious question is will the new paradigm satisfy the requirements of the definition of science.

7. The New Paradigm for Pre-Historic/Origins Science

As shown earlier the current paradigm for Pre-Historic/Origins Science is already slightly different to Normal Science because the theorised events were not observed and cannot be replicated in an experiment. Rather the field relies on modern era observation of changing systems and then theoretical models reverse time and propose events in the pre-historic past. The models are also used to simulate changing systems from the origin, through the pre-historic past and then to the present day. The predictions of these models regarding what we should observe now can are compared with what we actually observe in the real world. This process satisfies the goal to move towards precision of the observation-theory match.

With the new paradigm this process is still employed. The only difference is the freedom to critically analyse proposed supernatural intervention in origins theories and pre-historic events. Any such supernatural simulations/models would need to clearly define the proposed supernatural interventions in the model and clearly show the changes that the intervention makes in the predictions regarding what we should observe now in the real world.

The advantage of the new paradigm is that the predictive success of the supernatural models can be compared to the predictive success of the natural models. The model with the best observation-theory match is the one that is progressing towards describing reality as accurately as possible, the goal of science. This clearly satisfies the idea of collaboration of scientists with different perspectives, but even more importantly it satisfies the requirement that scientific descriptions be written in such a way that they are falsifiable. Therefore this new paradigm is superior to the current one. As Karl Popper famously said: "In so far as a scientific statement speaks about reality, it must be falsifiable." [81] This is why Avi Loeb of the Center for Astrophysics at Harvard University said: "Falsifiability should be a hallmark of any scientific theory." [82]

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[79] Betini, G.S., Avgar T., Fryxell J.M., "Why are we not evaluating multiple competing hypotheses in ecology and evolution?", *Royal Society Open Science*, 5 December 2016.

[80] Stanford Encyclopedia of Philosophy, Karl Popper, 7 August 2018.

[81] Popper, Karl. *The Logic of Scientific Discovery*, (London: Routledge, 2002) p. 316. (First published 1959).

[82] Loeb, Avi. As quoted in "What Happened Before the Big Bang?" *Center for Astrophysics* Release No.: 2019-10. (https://www.cfa.harvard.edu/news/2019-10).

The new paradigm enables natural origins theories to be falsifiable by allowing the possibility of supernatural origins theories. Whereas the current paradigm does not enable the natural theories to be falsified, we are stuck with only natural theories regardless of reality. If we want science to progress towards describing reality as accurately as possible then we must allow naturalism in Pre-Historic/Origins Science to be falsifiable. The only way to achieve this improvement is to build a new paradigm specifically for Pre-Historic/Origins Science where both natural and supernatural origins theories are compared with each other and where all theories are falsifiable. In such a paradigm then the concept of naturalism is no longer a dogma but rather a genuine scientific theory that is written in such a way that it is falsifiable. In brief it could be called The Theory of Naturalism in Origins Science.

This review of Pre-Historic/Origins Science reveals a problem for all current natural and supernatural origins theories. The supernatural ones have not be reviewed in science journals, so we can have no confidence in them and the natural origins theories conform to the dogma of naturalism and so we can have no confidence in them either. Therefore we need to start from scratch, as Kuhn said: "It demands large-scale paradigm destruction and major shifts in the problems and techniques of normal science." [83]

This paradigm shift will require three phases. The first is for the scientific community to acknowledge that Pre-historic/Origins Science is different to normal science because proposed events cannot be observed nor replicated in experiments. Secondly, acknowledgment that this difference causes the assumption of naturalism to be unjustified in (and only in) Pre-Historic/Origins Science. Thirdly, acknowledgment that perfect scientific freedom requires the comparison of natural and supernatural origins theories and that this improves the theories because they are now falsifiable.

This brings us to the final requirement of science, publishing. One could argue that the required change in publishing due to the new paradigm is small. It is already a standard expectation that science papers state the assumptions and the justification for those assumptions. So in this new paradigm papers can just ensure they state up front that naturalism is or is not assumed and justify it. This seems simple enough, but the ramifications are more significant.

Is it reasonable to expect science journals to accommodate these changes? One recent example is when the journal *PLOS ONE* published an article with the statements "design by the Creator" and "the Creators invention" the response from the scientific community was enough that PLOS ONE "decided to retract the article." [84]

A literature review reveals that it is extremely rare for a paper to analyse supernatural origins theories, but of course in the current paradigm this is to be expected. The giants of the scientific revolution showed that observations and experiments reveal the regularities of nature and modern science has shown that many of these regularities are extremely reliable. We make confident predictions daily in engineering, medicine and applied science. We also use these regularities in everyday life with complete confidence. For example we learn from a very early age the regularities in nature, for example the red crayon always leaves a red line on paper.

However, in Pre-Historic/Origins Science we are attempting to answer a different type of question 'how did we/the universe come to exist and be as it is?' We are not actually searching for regularities in nature that can be applied in daily life, engineering, medicine and applied science with complete confidence. Inherent in origins research is the desire to discover if past origins events were actually unique rather than regular, basically because we do not observe the events in the present. For example there is only one Moon around Earth and no new moon is forming before our eyes.

Therefore it can be seen that the goal of Pre-Historic/Origins Science is slightly different to normal science because it is not seeking to make predictions about the future, it is limited to only explaining the past. On

[83] *Ibid*, p. 68.

[84] Cressey, D. "Paper that says human hand was 'designed by Creator' sparks concern" *Nature*, 3 March 2016. (https://www.nature.com/news/paper-that-says-human-hand-was-designed-by-creator-sparks-concern-1.19499).

this point alone it could be argued that the field should have its own set of journals. Now with the new paradigm of comparing natural and supernatural origins theories we have another reason for journals specifically for origins, because normal science journals deal only with the regularities of nature and by definition a supernatural event is an irregularity.

Therefore, it is unreasonable to expect the current set of science journals to publish papers in the new paradigm. As such the new paradigm will require new journals to be published that are specifically for Pre-Historic/Origins Science. This will enable the debate between natural and supernatural theories to be conducted with perfect scientific freedom without causing confusion in the fields of normal science.

And finally all the theories can be published for review by the scientific community who can verify or falsify the descriptions, note anomalies or inaccuracies and suggest improvements. Enabling the cycle of continuous improvement that is so extremely vital for science to progress towards describing reality as accurately as possible.

The papers in these journals will be free to clearly state assumptions regarding naturalism and their justification. They will be free to clearly present competing natural and supernatural origins theories and analyse which ones explain more of the observations around us. This clarity and freedom can only be achieved if the research and reports are published in journals specifically for Pre-Historic and Origins Science.

Therefore the proposed new paradigm meets the requirements of science and improves on the current paradigm. Firstly, observations of the present are measured. Secondly, models can be used to simulate the past and make predictions about what we should observe. Thirdly both natural and supernatural models are compared so that all theories are falsifiable. And finally, journals specifically for Pre-Historic/Origins Science can be published so that all of the proposed theories can be reviewed by the scientific community and enable the cycle of continuous improvement. Within this new paradigm descriptions will progress towards describing reality as accurately as possible, the goal of science.

8. Discussion

8.1 Precedent

There is a precedent in Pre-Historic/Origins Science where competing natural and supernatural origins theories were compared with each other, in *On the Origin of Species by Means of Natural Selection* by Charles Darwin. Darwin includes analysis and comparison of competing natural and supernatural origins theories. Darwin correctly allowed each theory to be falsifiable and does not dogmatically insist on naturalism. He just compared how much of what we observe around us is explained by each theory and allowed the one with the best observation-theory match to be the one that more accurately describes reality.

The following quotes are examples of Darwin comparing the competing natural and supernatural origins theories of his time. These are quoted from the 5th edition published in 1869.

“The great majority of naturalists have believed that species were immutable productions and have been separately created.” (Preface, p. v)

“Let us now see whether the several facts and rules relating to the geological succession of organic beings, better accord with the common view of the immutability of species, or with that of their slow and gradual modification, through descent and natural selection.” (p. 273)

“In the following remarks I shall not confine myself to the mere question of dispersal; but shall consider some other facts, which bear on the truth of the two theories of independent creation and of descent with modification.” (p. 339)

“How inexplicable on the theory of creation is the occasional appearance of stripes on the shoulder and legs of the several species of the horse-genus and in their hybrids!” (p. 411)

"Why, it may be asked, have nearly all the most eminent living naturalists and geologists rejected this view of the [im]mutability of species? It cannot be asserted that organic beings in a state of nature are subject to no variation; it cannot be proved that the amount of variation in the course of long ages is a limited quantity." (p. 417)

"Although naturalists very properly demand a full explanation of every difficulty from those who believe in the [im]mutability of species, on their own side they ignore the whole subject of the first appearance of species in what they consider reverent silence." (p. 419)

"If it could be demonstrated that any complex organ existed, which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down." (p. 169)

"Geology assuredly does not reveal any such finely graduated organic chain; and this, perhaps, is the most obvious and gravest objection which can be urged against my theory. The explanation lies, as I believe, in the extreme imperfection of the geological record." (p. 246)

"All the organic beings which have ever lived on this earth have descended from some one primordial form, into which life was first breathed." (p. 420)

As it can be seen then, Darwin compared the competing natural and supernatural origins theories of his time and showed which one explains more of what we observe around us. Darwin thus provides us with a precedent for the correct paradigm in which Pre-Historic/Origins Science should be conducted.

8.2 Potential Concerns

8.2.1 Testable predictions are key to science because it is a process that can show if a theory is reliable or not. In Pre-Historic/Origins Science predictions are made regarding what we should observe in the present. For example, Darwin predicted we should find a "finely graduated organic chain" (p. 246) in the geological record.

Some claim that supernatural origins theories do not make predictions of what we should observe in the present. For example, the AAAS states in their Resolution on Intelligent Design Theory that "the ID movement has not proposed a scientific means of testing its claims." [85]

Similarly the *Nature Methods* article titled An Intelligently Designed Response claims that "[ID] does not generate testable hypotheses." However in the same article they say "[ID] postulates that some features in nature are too complex to have evolved."[86]

This statement reveals that the authors are actually contradicting themselves because such a postulation is a testable hypothesis. Darwin said so himself: "If it could be demonstrated that any complex organ existed, which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down." [87]

Another contradiction is also presented in the Understanding Science website hosted by Berkeley University where they say: "Intelligent Design is untestable." Then in the next sentence they say "ID proponents have made testable claims."[88]

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[85] AAAS Board Resolution on Intelligent Design Theory, 1 July 2013. (https://www.aaas.org/news/aaas-board-resolution-intelligent-design-theory).

[86] "An Intelligently Designed Response", *Nature Methods*, Dec 2007, DOI https://doi.org/10.1038/nmeth1207-983, (https://www.nature.com/articles/nmeth1207-983).

[87] Darwin, C. *On the Origin of Species by Means of Natural Selection 5th Edition*, 1869 p. 169.

[88] Understanding Science: Intelligent Design, Is it Scientific? (https://undsci.berkeley.edu/article/0_0_0/id_checklist).

So it appears there is some confusion regarding the predictions of supernatural origins theories. This is not surprising because until now such theories have not been published in science journals, thus they have missed the key element of science, review by the scientific community. The proposed new paradigm with journals specifically for Pre-Historic/Origins Science will improve this situation.

However, there are some examples of testable predictions made by supernatural origins theories. One is in the paper by Alex Williams in the *Journal of Creation* titled "What Life Isn't" and he concludes that "Water sets a threshold for cellular origin that excludes all scenarios other than Genesis-style fiat creation!" [89] In other words his prediction is that we will not observe in the present living organisms spontaneously generating from non-living matter. This prediction is actually being tested every day in labs conducting abiogenesis experiments with multi-million dollar budgets. So Alex Williams has indeed made a testable and falsifiable prediction based on a supernatural origins theory.

Another example of a testable prediction is in the paper by John Woodmorappe in the *Journal of Creation* titled "The Cambrian Explosion in Colorful, Zoological Context" and he concludes that "Special creation remains the most parsimonious explanation for the Cambrian explosion." [90] In other words his prediction is that we will not find a finely graduated organic chain in the Pre-Cambrian strata. This prediction has been and will continue to be tested every time a Pre-Cambrian dig takes place. So John Woodmorappe has indeed made a testable and falsifiable prediction based on a supernatural origins theory.

There are many other claimed testable predictions made by supernaturalists and they should be analysed and published in a Pre-Historic/Origins Science journal. Only then will we find the theory that explains more observations than the others and progress towards describing reality as accurately as possible.

8.2.2 Will introducing careful analysis of supernatural origins explanations cause further scientific inquiry to be cut off? Alvin Plantinga suggests, "Ascribing something to the direct action of God tends to cut off further inquiry." [91]

In normal science Plantiga's opinion is absolutely correct. Observations and experiments, conducted over centuries now, have found regularities in nature. These do not contain ad-hoc or irregular elements or supernatural interventions. However in Pre-Historic/Origins Science it is different, yes Plantinga's wisdom should be taken into account so that we proceed with caution, but as shown earlier, the assumption of naturalism is unjustified. Rather the competing natural and supernatural origins theories are compared with each other so further inquiry is not "cut off" but rather the inquiry is extended. If managed well we can ensure further inquiry always continues so that we avoid the danger Plantinga warns us of.

The real danger to science is exclusion of theories without great care. Inclusion of competing theories enables science to take place, whereas exclusion of a theory based on an unjustified assumption is what causes science to be 'cut off'. Briefly looking at key historical scientists who proposed competing theories to the supernatural explanations of their day, like Copernicus, Galileo and Darwin it can be seen that they refused to accept the lack of competing theories. Rather, these scientists pursued their goal to propose a competing theory so that science would progress. They were inhibited, but it was not because the competing theory was supernatural, rather it was because people (the church leaders mostly) attempted to exclude their theory by application of an unjustified assumption. If we are to learn from history then we need to realise that if we, today, exclude a theory from careful analysis and honest, thorough inquiry, then that act of exclusion is what inhibits scientific progress. Thus to allow Pre-Historic/Origins Science to flourish we need to carefully include all theories in our analysis so that the theory that explains the observations around us can be discovered and reports of the results can be published and reviewed by the scientific community.

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[89] Williams, A., "What Life Isn't", *Journal of Creation* 29(1) 2015.

[90] Woodmorappe, J., "The Cambrian Explosion In Colorful, Zoological Context", *Journal of Creation* 27(3):37–40, December 2013. (https://creation.com/cambrian-explosion-and-animal-biodiversity).

[91] Plantinga, A. "Methodological Naturalism?", *Perspectives on Science and Christian Faith* 49 (September 1997): 143-154.

8.2.3 Another common assertion is "You can't put God in a test tube." [92] However in Origins Science it is necessary to find a way to achieve this to some approximation because it is equally as difficult to put nothing in a test tube so as to test the natural coming from nothing. However just because both theories are difficult to analyse does not mean we give up, rather it should spur us on to even more vigilant analysis, because in science we must find the cause, as Albert Einstein said: "All natural science is based upon the hypothesis of the complete causal connection of all events." [93]

So too in Origins Science we should search for the cause(s) that make things originate. It does not matter if the cause is 'nothing' (which can be said to be immaterial, unphysical or unnatural) or supernatural, both sets of causes are unnatural. In the new paradigm for Pre-Historic/Origins Science all proposed theories can be examined to see which theory explains more observations. As such we will be able to 'put God in a test tube' and actually put supernatural origins theories to the test and falsify them.

8.2.4 Another common concern is that it is difficult to define the term supernatural. There are of course a myriad of definitions in Philosophy and Religion, but there is one in particular that is helpful in Science: A supernatural event is one when a regularity in nature has been violated. This is helpful because as soon as an event is experimentally repeated regularly or predicted to occur using the known 'laws'/regularities in nature it immediately becomes a regularity in nature and it is no longer supernatural by definition. Similarly if the origin of something can theoretically be shown to be the result of the known regularities in nature then that origins event/process is no longer supernatural by definition. However, if an origins event theoretically has a required initial state that violates a regularity in nature or several regularities, then it could be argued that such an event has a supernatural cause.

Therefore origins scientists can theorize differently and look for irregularities. Of course any irregularities will be completely useless in engineering, medicine and applied science, but they will be extremely useful in answering the question 'how did we/the universe come to exist?'

9. Conclusion

How did we/the universe come to exist? Answering this question with confidence is currently very difficult as can be seen by the numerous anomalies presented in the literature. The anomalies tell us that Pre-Historic/Origins Science is in fact in the midst of a Kuhnian crisis. To eradicate the crisis we need to allow a Kuhnian paradigm shift to take place. The proposed new paradigm shift will require three phases. The first is we acknowledge that Pre-historic/Origins Science is different to normal science because proposed events cannot be observed nor replicated in experiments. Secondly, we acknowledge that this difference causes the assumption of naturalism to be unjustified in (and only in) Pre-Historic/Origins Science. Thirdly, we acknowledge that perfect scientific freedom requires the comparison of natural and supernatural origins theories which also enables falsifiability. And finally, the scientific work in the new paradigm will need to be published in journals specifically for Pre-Historic/Origins Science so that we have clarity to achieve the continuous improvement review cycle. Then we will progress towards the goal of science, to describe reality as accurately as possible.

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[92] Scott, E., *Evolution Vs. Creationism: An Introduction*, University of California Press, Berkeley, 2004, p. 50.

[93] Einstein, Albert, "On Boltzmann's Principle and Some Immediate Consequences Thereof", Zürich Physical Society Lecture, 2 November 1910, translated by Duplantier B. and Parks E, reprinted in *Einstein*, 1905-2005, Birkhäuser Verlag, Basel – Boston – Berlin, 2006.

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The author is also the owner of the url originsscience.com.

10. Bibliography

This bibliography focuses on papers on naturalism in Pre-Historic/Origins Science and are placed in four categories:

1. The following analyse if Naturalism should be applied to Pre-Historic/Origins Science:

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Williamson, T. "What Is Naturalism?" *New York Times*, 4 September 2011. (https://opinionator.blogs.nytimes.com/2011/09/04/what-is-naturalism/)

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2. The following do not mention Naturalism, but should have done so to be a complete analysis of Pre-Historic/Origins Science:

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Shermer, Michael. "The Woodstock of Evolution", *Scientific American*, 27 June 2005. (https://www.scientificamerican.com/article/the-woodstock-of-evolutio)

3. The following mention Naturalism in the context of Pre-Historic/Origins Science, but do not carry out an analysis of it, they just assume it is justified:

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"*Science, Evolution, and Creationism*" The National Academies Press, 2008. National Academy of Science, says "In science, explanations must be based on naturally occurring phenomena." (p. 10) and "hypotheses must be restricted to testable natural explanations" (p.43).

"Science, Religion, and Evolution", National Center for Science Education, 12 June 2001. (https://ncse.ngo/science-religion-and-evolution)

The Wikipedia article titled "Creation Evolution Controversy" (https://en.wikipedia.org) only mentions it to state that "supernatural explanations are outside the realm of science."

4. The following actually carry out an in depth analysis of Naturalism in Pre-Historic/Origins Science but do not analyse if it is a justified assumption:

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Barr, Stephen M., *Modern Physics and Ancient Faith*, University of Notre Dame Press, 2003. He states that "Materialism is a philosophical opinion… is not science" but does not analyse the falsifiability of materialism in the context of Origins Science.

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Hayashi, Adam, Kitzmiller v. Dover: A Public Policy Analysis, University of Florida, 2010.