

The Cradle of Life? *(Comments on the recent New Scientist article)*

1. “Necessity is the Mother of Invention”, but you also need the Funding!

An article entitled *The Cradle of Life* in *New Scientist* (2730) is an interesting contribution to this discussion, but in a rather surprising way.

Throughout the piece the author, Nick Lane, of University College, London brings forward the works of Peter Mitchell, along with those of Mike Russell, of NASA, to *explain* the Origin of Life!

But, he repeatedly uses the verb “to evolve”, which is a surprising choice for the transition from inanimate Matter to Living Things, and you might think that these contributors are finally moving towards an Emergentist position.

But, that turns out NOT to be the case! The use of “evolve” is well within the generally agreed use because the contributions detailed in the article do **not actually** address the Origin of Life.

The title *The Cradle of Life* gives it away, because what is presented here are the earliest developments in Life *after* its Origin.

Surely, a site for the actual Origin would be called something like the “Crucible of Life”. A Cradle is a protective environment for a Life already born!

Now, I have been arguing for many years against that School of explanation on the Origin of Life, which looks **solely** to pre-existing processes within the preceding non-Life Level, and I argue against their whole approach and “revealed causes”, because they do NOT explain the actual Origin at all. Even the contributions of Miller and Oparin were NOT the causes of the Origin but merely pre-requisites for when the real and appropriate causes did finally appear.

Here we encounter a similar approach, but this time working *downwards* from within the Life Level, and burrowing as deep as possible towards the actual Event of Life’s Emergence.

But, in both these approaches there is a basic assumption which *prevents* them **ever** unearthing the actual causes.

They assume the usual banker of Reductionism - that continuous links which connect each and every phenomenon with its causes, are appropriate *right through* this revolutionary transition also.

Ultimately, there is the assumption that sufficient contributions by workers such as Miller and Oparin of preceding factors, will finally abut seamlessly with the sort of post-Emergence phenomena that are dealt with in this article.

Now, such an assumption is, I’m afraid, wholly incorrect!

Such a continuous, reductionist stream of causes cannot be established for such an Event, and the reason is that the Origin of Life was in fact an **Emergence** – a revolutionary cataclysm in which old stabilities were actually destroyed, and a wholly NEW set actually *created* within a many-phased tumult of Qualitative Change.

The word “creation” is never a part of reductionist explanations because they are totally limited to wholly and directly explicable developments within a Level.

Level Change itself is a product of a very different set of processes, where literally all significant Qualitative Change occurs.

It is NOT part of the universally accepted methodologies of Science which are, themselves, only applicable *within* a given Level.

Now, I will be addressing this New Scientist article from the ground of this research in a following paper, but here I want to start with the **motives** of those involved.

It is more than interesting that Mike Russell works for NASA.

The old “Mankind has to explore” reasoning for NASA’s activities doesn’t work any more in getting the prodigious funding required for Space Exploration, and without which the whole scheme simply becomes impossible.

A *new* argument HAD to be found and made credible to those who hold the purse strings of the ONLY possible sources for such vast amounts of funding.

It was decided the *Finding Life elsewhere in the Solar System* argument would be sufficient to loosen the purse strings and release the sums necessary for a continuation of NASA rather expensive forays into outer Space.

But to convince those politicians that this was *even possible* would be no easy task. The vast bulk of evidence from Space Exploration and Research so far has produced a total sum of evidence for the existence of current, or even of past, Life has amounted to precisely **zero**.

NOTE: The fiasco of the Martian meteorite, which even culminated in an International News Conference to announce the “first indisputable evidence “ of Life outside of Earth, proves just how urgent it had become to furnish *the* reason for continuing NASA’s activities.

No-one will be releasing many billions of dollars on a Wild Goose Chase!

Both the politicians, and the general public, had to be convinced that Life was possible even in the most hostile conditions. So many researchers were deployed world-wide to find Life here on Earth in the most inhospitable circumstances – the so-called **extremophiles**! If such were found, it would indisputably “prove” that Life could exist where it would have been thought to be impossible. And, indeed, Life was found in Many (but not all) of the most unlikely places.

From the snows of Antarctica to the Black Smoker vents on the mid Ocean Ridges at the bottom of the deepest seas, and even within the rocks buried deep underground, peculiar life forms were found.

But, I’m afraid that could not be, of itself, sufficient. It was a chicken and egg situation. Did Life originate there, or did it first occur in much more conducive places, and only then migrate into the interstices where they were now finding it. These peculiar forms could have been, and most certainly were, backwards evolutions from the more normal life forms vastly populating FIRST all the most conducive places, before they slowly also migrated into the tiniest and most hostile niches.

BUT, and it is a very big BUT, the presence, at the locations of the Black Smokers, of highly developed life forms, clearly closely related to those at the Earth’s surface, which could ONLY have originally developed there, meant that the possibility of the Origin of ALL Life at such inhospitable places was evidently not established.

Nevertheless, these remarkable locations for Life were NOW put forward as the locations for its **actual Origin!**

First, peculiar places to find Life meant that it could occur in amazing places on other planets, and their discovery there would even throw a different light on the Origin of Life on Earth.

This was now THE only way that NASA would get the money.

They HAD to prove that Life could have actually originated down at the sub Ocean vents, AND also, if they could pull it off, that it could ONLY happen there and nowhere else on Earth.

NOTE: Plan B was also elaborated, which positioned the Origin of Life OUTSIDE of Earth, elsewhere in the Solar System, and of course, this too would support further Space Exploration. So, other NASA scientists set about “filling out” this alternative. If sufficient “scientific evidence” could be amassed, they just might bring it off.

The whole tenor of this NASA funded and inspired research was to demonstrate that only THEY could answer the Question of Life, the Universe and Everything, and the answer would NOT be 42!

Now, the last element, in this sequence or arguments, was perhaps the most difficult for the scientists to prove. This was that it was the very exceptional nature of these inhospitable places that made them **ideal** for the miracle of the first Life.

Now it is easy to unearth near-impossibilities in the search for the Origin of Life. They are legion! BUT, what our searchers had to deliver were situations, that were absolutely necessary for the process of Origin to be successfully completed, which could ONLY be found in one or another of these extreme places, and especially if such places were also possible elsewhere in the Solar System, and **could be found there!**

If such very special circumstances could be found which “filled a few holes” in any reductionist segments of arguments for the Origin of Life in such places, the argument for finding them on a moon of Saturn (say) was increased many-fold.

This article is certainly of that ilk!

It is meant to prove that Life **requires** these hostile and extreme conditions to bridge the unbridgeable gaps and produce self-replicating and self-maintaining systems which can, and will **persist!**

I must emphasize that this is NOT an acceptance of my own position involving Emergences, but merely backs into attempts at unique and momentous gap-filling steps instead.

Let us be very clear! First, these ideas do not in any way abandon the standard pluralist approach to Science: they are philosophically and methodologically conservative.

And secondly, they are driven by self-interested necessity: they have to convince people that the necessary billions will be well spent.

You funded the discovery of Life elsewhere in the Solar System! How magnificent!

2. The Nature of Creative Processes!

Previously, I have written on the recent New Scientist article *The Cradle of Life* from the point of view of the motives of the author and contributors in attempting to continue to ensure the funding for NASA which it certainly requires to continue with its Space Programme.

I briefly mentioned there the methodology employed by all those authors, and stated that such an approach could **never** actually deliver an explanation of such an Event as the Origin of Level, which to me can be no other type of Momentous Change than that which must appear in an Emergence.

There can be absolutely no doubt that such a world-changing happening could never be brought about gradually, by merely tiny incremental changes, no matter how many were involved. Such a turn as is embodied in the Origin of Life could only be brought about by a veritably colossal cataclysm – by a Revolution.

I inferred that the usual methodology, which was evidently still being used by these workers, was totally incapable of revealing the trajectory of neither an Emergence, nor its multi-Stage complex dynamic. And the reason was that their methodology was based on a pluralist standpoint, and required an uninterrupted application of Reductionism to deliver all causes, and hence all explanations, of everything involved in the revolution from start to finish.

But, an Emergence actually terminates every single reductionist explanation because every prior, pre-Event circumstance and the entities involved in producing its associated relations disappear in an Emergence, and if there are NO continuities of these, the relations also bite the dust.

An Emergence is initially a seeming catastrophe, in which all forms seem to be being dismantled, and its result inevitably seems to indicate Total Chaos.

Clearly what happens **before** the avalanche of destructive change contributes to THAT, and not to what happens thereafter in the later stages of the Emergence. The incremental causes do have a role prior to the Event, in that they accumulate to finally push the stable situation over the edge and precipitate the headlong dive towards chaos. But, we must be clear; this initial precipitous drop destroys all the elements which maintained the previous Level and its entities and laws.

We have no difficulty conceiving of times in the distant past *before Life*, before even molecules, and maybe even before atoms. We must see the result of an Emergence's destructive Phase as returning everything towards such early absence of Forms.

It cannot be exactly the same of course, for the history must still leave vestiges of itself, no matter how devastating the calamity has been. But, the nature of the post-catastrophe situation is crucial in allowing an entirely NEW set of processes to commence and ultimately produce a new revolutionary Level, which has never existed before.

NOTE: The image of "The Ladder" is very seductive, but progress is not rung-by-rung. It proceeds significantly *only* via Emergences.

The point about this understanding of the initial phase of an Emergence is vital in explaining why pre-Event entities and Laws cannot explain the creation of a New Level, such as that which brought in Life for the first time.

Those who attempt to explain Life using such entities and relations are bound to fail. Such an explanation cannot be available. The necessary continuity was destroyed by this Phase!

Indeed, we can go even further!

The methodology of such scientists who, via the pluralist standpoint, deliver explanations of Emergent Events of any sort in terms of isolated, extracted and abstracted Parts, prevents them from adequately dealing with the first demolition stage, and then bars them from in any way being able to cope with the later and crucial creative Stage, which finally erects the New Level.

The point here is about the role of pluralist methods in all scientific explanation. It can only work *within* a Level – within a situation where overall stability rules. It is the method of stable-world study epitomized by, "Mix thoroughly and wait for equilibrium before measuring". And why are you told to do this? It is because if you don't do this, you will be gathering incoherent results from various sequential, yet occasionally simultaneous intermediate and localized processes, from which you will never be able to isolate, extract and abstract any clear and dependable individual relations. So even *within* a Level such situations have to be avoided like the plague, while an Emergence is like such a complex and incoherent situation *writ large!*

Indeed, such problems will always be the case in the midst of qualitative Change, and the solution has to be to investigate ONLY when stability is guaranteed, for example on either side of the turmoil of Change.

Indeed, we can go further, the necessary isolation and extraction phases of pluralist experiment are imperative if the significant multiple simultaneous effects of many causes are to be avoided. Clearly, the necessary removal of what are called systematic errors is necessary for they will impart a bias to all your results and mislead you significantly.

Pluralist Science only works if the necessary rigid controls are applied TWICE: **once** when *extracting* the relations and a **second time** when *using* them.

The dynamic of all real Qualitative Change has to be avoided like the Plague.

Elsewhere, I have suggested a new version of Miller's Experiment – the one which used the components of the Earth's primaeval atmosphere to see what could be produced by "weather" alone.

He famously produced amino acids – crucial building bricks in Living Things!

But Miller's Experiment was NOT pluralist!

In fact it was condemned as wholly unscientific because it was a holistic experiment. This, of course, meant that it could NOT reveal what was actually going on between the beginning of the experiment and its final results. It was a "Black Box", out of which only the final products could be obtained. Many different contributing processes, both simultaneously and sequentially were evidently occurring during the Experiment, but NO intermediate results and even no indication of what processes were involved were available.

So, in spite of its significance, this Experiment was NOT the start of a whole integrated set of researches to reveal these crucial inner workings. No-one had any idea of how to keep the Experiment totally holist while sampling, testing and determining these intermediate requirements.

My suggestion attempts to do precisely that!

But, it will be horrendously expensive, because it will require maintaining the uninterrupted holistic and natural sequence of processes, while revealing all the necessary timings and participant substances and products as and when they occur.

When we see the enormous sums spent on Space Exploration and even the famed Large Hadron Collider (which will NOT deliver the expected Higgs Boson), we see that to answer the major questions such as the processes involved in the Origin of Life on Earth, we must first develop a non-pluralist (indeed a holistic) methodology, and use such sums to bring about just such holistic experiments as I have outlined above, but with full and detailed delivery of what is happening, and when, throughout the full set of interacting holistic processes.

To keep such an experiment entirely holistic, while analysing its moment by moment components will indeed involve major and expensive subordinate experiments.

But the gains that will be possible from these kinds of experiment will be enormous.

3. Can Sequences of Causes carry right-through an Emergence?

One feature of the New Scientist (2730) article entitled *The Cradle of Life* is the by now universal approach of the delivery of isolated morsels of “truth”, which, if arranged in some sort of “logical line”, will seem to infer a continuous progress of Cause along that line unquestioningly “linking” all the individual contributions into a “unified” argument.

The justification for such a sampling approach has to be the now universally accepted pluralist methodology, which identifies fairly indistinct “Parts”, carefully organises the contexts (by necessary controls and exclusions of each Part, until each is clearly revealed), and then separately extracting data for each by experimental means. Thereafter, for each individual case, a relation is obtained from the given set of data, and via sufficient extra necessary data by which each relation is refined until it fits its context and phenomenon very closely.

This is, of course, the justifiably famous and crucially important Experimental and Theoretical Methodology which is at the heart of all Science.

But, such arrangements are never trivial, nor are they identical for each individual relation, so the study of everything involved begets the various tasks which have to be addressed separately, and then the produced “line” of relations implies the necessarily unique patches around each and every one.

Now, the problems should be evident!

Direct juxtaposition of all elements in the sequence cannot be justified, as each and every relation requires its OWN “territory” or penumbra. This being the case, how can the whole sequence be directly related?

Now, there is a “ground” that has been developed to make such juxtapositions quite reasonable. It is termed **Plurality!**

This is the idea that all Wholes can be analysed into their constituent Parts, and these then can, in turn, be similarly processed.

By “infinite” regress, such an approach ultimately implies a final set of immutable entities and laws from which everything is produced. This leads to Reductionism and hence to the “linking” of the relations as described above, because they are independent and the difficulties are put down as merely due to noise. Amid all this noise (of other non-significant processes) the individual relations link to one another and produce their final outcome. They are all seen as existing independently of their required context for extraction and hence the “line of dots” is joinable. The only trouble is that even if this were the case (which it is NOT) every single dot along the line would be necessary and that availability is *never* the case

And in such tumultuous events as revolutionary Emergences, wherein a rapidly changing sequence of very different circumstances are inevitable, these methods are always totally useless!

Indeed, the assumptions about joining the dots are invariably completely illegitimate.

NOTE: It is always both surprising and interesting how such ideas as those I am dealing with here are “discovered” and “adapted” in very different contexts. The idea of a certain “line of Dots” being inadequate, is also the position of modern physicists, BUT they apply it to actual *physical* dots, as they appear in a Wilson’s Cloud

Chamber, when they insist that we cannot interpret them as revealing an actual “path” of the movement of an entity of some sort, which appears to leave a trail of condensed water droplets, as it passes through the cloud.

It is interesting because they are wrong in their insistence that we cannot do that. We certainly can! The question that arises is, “Where did they get this idea from?” We are always told how sophisticated are the philosophical bases for Modern Physics, so we must assume that they got the idea from philosophers who were perhaps criticising the form of “joining the dots”, which I too have been criticising above. But, of course, it could well be that the philosopher was no physicist and the physicists were no philosophers. They BOTH got it wrong when peering across the vast gulf between their separate disciplines.

The isolated “instants”, with their momentarily appropriate conditions, can tell us absolutely NOTHING about the transition from one dot to the next.

NOTE: I am impelled to quote Zeno’s Arrow Paradox to highlight what I mean here.

In this Paradox Time and Space are assumed to be divisible into discrete units (like our dots), and with this assumption he is able to prove that the actual movement of the arrow is impossible!

He takes the instant when the arrow is in a given position, and considers where it will be by the next irreducible interval of Time. It must (if there is movement) be in another adjacent position. But that means that it must vanish from the first position and then re-appear in the next position. And that is, of course, impossible!

Now, this may seem a very infantile mistake for anyone to make, but even today it occurs very frequently.

Such a standpoint makes the consideration of movement into the summation of many stills. And, as I have proved in my work on Dance Videos and Analysis, such is also the case there too. To take such an assumption, makes real movement and its study of its *dynamics* totally impossible. Yet, in the now universal use of Digital Video to capture both Dance and Sport, the accurate delivery of movement is via a series of pristine stills, so it also is incapable of delivering the real dynamics of both types of movement. It can only deliver a “line of dots” which can show the path, BUT NOT its *dynamics*. What happens between the dots is vital! My colleagues and I were able to show that real movement and its essential dynamics could ONLY be approximated by the right kind of Analogue Video. And even then, it required quite sophisticated pedagogical procedures to deliver what was really required.

[The Multimedia Pack: *Choreographic Outcomes*, and the later Performance Pack *Vocalise* by **Bedford Interactive** are the only aids that get anywhere near what is required].

So, returning the New Scientist article, we do NOT find a coherent, comprehensive and causally continuous case made, but a series of signposts with “inferred linkages” **only!**

When presenting such a muse (for that is what it is), the author has to deliver as many “dots” as possible, and bid the reader to make the implied “connections”. The readers, of course, depart with a new set of points to argue over with their colleagues.

The actual integration is clearly impossible by any particular group of scientists. The number of required steps is both too large and too diverse to be comprehensively tackled by a single discipline.

In addition, it must once more be stressed that something as unique as the Origin of Life on Earth could never be inevitable and gradual. Even with the usual rider of Long Odds and Random Chance the inference that the “dots” can be joined as a sequence of clearly possible steps – indeed, as a *gradualist Emergence of Life*, is NOT supportable.

Yet such an Event DID indeed occur, and must have been a complete revolution. And the nature of any such Revolution is, initially at least, wholly destructive.

Current theories of such Emergences, see them as, first of all, a disaster for the prevailing Order. Such a cataclysm of destruction would dismantle the maintaining bonds of order in a seeming descent into total chaos. And only then, when the barriers to qualitative change have been removed, could revolutionary NEW Forms, entities and even Laws emerge.
Not really “joining the dots” is it?

Why Probability and Chance are considered the Essence of Qualitative Change.

4. Threading the Beads on a Necklace of Causes

Once more I return to the article The Cradle of Life, and this time it is to reveal why its , altogether, pluralist methodology requires such ideas as Random Chance, Long Odds and Probability.

The employed approach of the article always addresses each encountered impasse in the attempt to construct a coherent and continuous narrative about the Emergence of Life, by finding places, substances and processes that can (no matter how unlikely) be woven into a plausible sequence.

I must state that such methods are not so much explanations as constructed rationalisations, and they abound everywhere, because they are so much easier to formulate, than the search for the actual truth.

Not only do our researchers embrace the necessity of involving Hydrothermal Vents at the bottom of the oceans, but go on to choose the rare sort termed Alkaline Hydrothermal Vents. These were brought in because NO single link between the development of the innards of the primaeval cell and that of an enclosing membrane could be demonstrated. They seemed to have quite different histories. The Alkaline Hydrothermals were brought in because they produced “foam-like” rock depositions, which are full of the right size of holes to contain the bundles of living tissue PRIOR to their unification (from elsewhere) with the appropriate fatty-acid membranes. This juxtaposition of fragments with believable causal histories is seen as the unavoidable and ONLY way of bringing everything into a single reductionist narrative (or muse?).

Notice that NO cataclysms of change, producing NO wholly new forms are described. The basic process is one of gradualism and re-mix. The line of causes producing the “Foam-like” rocks is *by chance* brought together with the organic chemistry in *membrane-less* “cells”, which then “live” in the rock-pores, until such time as convenient membranes can be come across, which could be “donned” like a tailor-made suit, allowing the cells to leave their “caves” and go out into the wide world.

Elsewhere, I have written on how Random Chance and Probability are always used in explaining such momentous events. Everything is allocated some quantified “chance” of happening, and even if these “odds” are colossal, vast eons of time are considered to be sufficient for the necessary long odds to still come to pass, and “the impossible happens”.

Needless to say I have always dismissed such nonsense, because the only basis for theories of Probability and Chance were from finite concrete cases (often in games of chance) where all possibilities have an equal chance of happening. The whole thing was originally constructed by mathematicians from idealised situations involving things like dice and playing cards, along with “perfect” shaking and shuffling to ensure the necessary basis for calculating probabilities. Essentially, such concepts only work if the components are both identical and immutable. And, as soon as any elements we are considering change, and even evolve, the whole probability edifice crumbles and becomes nonsense. Yet, here they are used to explain crucial events in the Origin of Life.

Such things are descriptions of an immutable and ideal world, and can NEVER be causes.