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The Ascent of Life

## Special Issue 9

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## Papers on “The Ascent of Life” : *Introduction*

Gathered together here is a set of short critical papers in response to the article by Michael Chorost in *New Scientist* (2848) entitled *The Ascent of Life*.

That article briefly presented the work of a series of different groups, that have in common the belief that Evolution is a progressive process, and seek to prove it.

The consensus on this matter (as in many others at this time) puts its faith in non-directional, random changes to explain this seemingly very directed process. That standpoint was developed by Stephen Jay Gould in response to a dominant homocentric belief in directed evolution, often associated with more basic religious motives. But it was, and still is, an inadequate explanation of why Evolution occurred and produced what it did.

All the alternatives to that consensus, as described in this article, do not succeed in delivering a single adequate and acceptable explanation. But they do indicate that the need for a significant alternative is currently being sought in these various research groups.

Of course, such a concise article could not, and does not, do justice to these various offerings, but it does indicate their extensive range of possible lines to follow.

Now, these criticisms of those described positions will certainly suffer from the same inadequacies, but significantly the criticisms included within them are both philosophical and methodological, and expose the inadequacies of the current unquestioned assumptions in these areas.

It is hoped that the readers of these brief statements of a suggested new standpoint and method will think that they “have legs”, and worthy of further study. More detailed and extensive papers on all these questions are available by this author on *SHAPE Journal* such as his *Theory of Emergences* and his various contributions opposing the Copenhagen Interpretation of Quantum Theory such as his *Theory of the Double Slit Experiment*.



## The Ascent of Life I

The article *The Ascent of Life* in *New Scientist* (2848) by Michael Chorost posed a crucial question about Evolution, and by doing so, also inferred its relevance in how we currently see **all** development whenever and wherever it occurs – even in non living processes and phenomena.

The position under attack by these various researchers is that argued for by Stephen Jay Gould in his book *Wonderful Life*, which basically made all changes in genetic materials entirely down to totally undirected Chance damage, but he was only carrying over to Evolution what had become a universally held approach and methodology of the study of Reality in general.

The main plank of Gould's argument was against the idea that any sort of *purposive direction* was involved, and that only a move towards increasing complication was definitely present, which gave a kind of retrospectively-assumed direction to such developments. His original targets are clearly evident. He was against those who required some sort of direction in evolution in support of one prejudice or another, but in doing so he terminated any real investigation to explain evolution accurately. His Random Chance terminated all further considerations.

Yet, the presented range of counter contributions revealed in the article, did not signal any revolutionary new turn in approach. Though these positions did reflect a profound dissatisfaction with that consensus view of evolution, the alternatives were simply, and in each particular case, a variety of unthought-through positions. It may have been triggered by the correct instincts, but, as presented in this article, no coherent or comprehensive standpoint was delivered.

Indeed, some of the points made were confusingly self-contradictory. For example, one argument seemed to be based upon the Second Law of Thermodynamics as the engine for evolution! Whereas, that Law, as it is usually presented, points in the exact opposite direction, insisting that the natural changes in Reality will, of necessity, always be away *from* Order and *towards* Chaos – the effective constant running-down of all things to lower and less-organised structures, ending up with only Random Noise and nothing else!

How that is supposed to explain Life, Consciousness and directed Thinking, is impossible to imagine, and its various components didn't do it! It was a series of beliefs, rather than a thought-through philosophical standpoint, and effectively got us nowhere at all.



## The Ascent of Life II

“*Not a process of inexorable progress, but of contingency*”

Stephen Jay Gould claimed this in his book *Wonderful Life*, in which he was railing against the increasingly prevalent concept of “the Ladder of Evolutionary Progress” (presumably with Mankind at the top looking down on all those contributory processes to his own evident excellence).

But, of course, all such necessary debates and even fights, are necessary not to arrive at profound truths, but to effectively rubbish simplistic and even biased misconceptions, which, in the end, become almost impassable barriers to improvement in our understanding of such complex and important processes.

Although we invariably replace wishful thinking with an alternative that helps to destroy such groundless hopes, in themselves, they do not and cannot, complete a meaningful explanation. For NO reasons for “progress” have been uncovered and explained. The best we have extracted from Reality in general is the exact opposite – The Second Law of Thermodynamics, which insists that the World can only “run down” – move inevitably from relative Order towards increasingly more Chaos – with its “cause” being a guaranteed dissipation of energy.

But, what “cause” directs Reality to construct (to develop) Order to ever higher and more orderly and intricate levels? For millennia, only the “intervening Hand of God” could be seen to fill this evident gulf.

And, it is clear that intentions and plans do indeed exist *in ourselves*, so such moves to Order were assumed in Reality at large, otherwise how could *our* intention arise?

The interesting thing in this article is that, contrary to Gould’s view, there are now researchers who seek to theoretically establish Progress in Evolution *necessitated by Physical Law(?)*

There’s the rub!

They expect to unearth among purely physical laws, the basis for progress in evolution.

Now, this Darwinian standpoint (of Gould) has had to try to explain the clearly evident trajectory of change in Living Things, starting with the very first Life, which clearly appeared out of entirely non-living processes – The actual Origin of Life itself, and thereafter, its obviously continuing development.

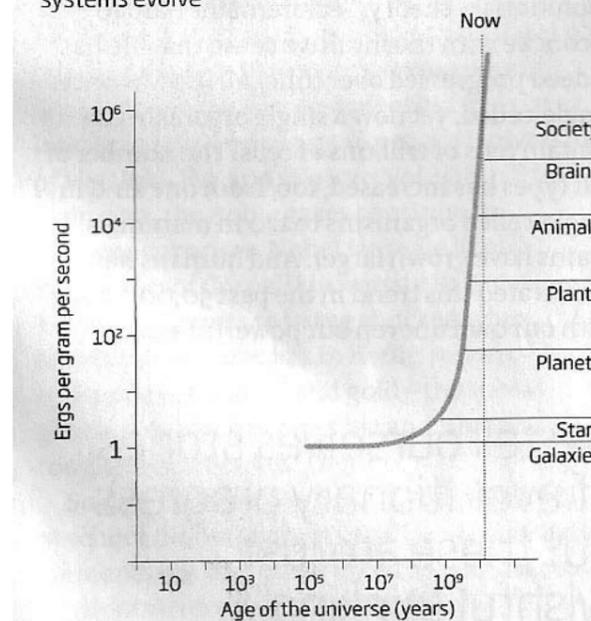
The usually suggested “placeholders” have been **variability** and **complication**, along with the “productive” mechanism of pure, undirected Random Chance. It seemed reasonable that chance could cause different things to occur, and chance could also cause situations in which separate processes could beneficially link together. Thus, the problem of evident development was shelved with a catchall set of conceptions.

NOTE: Similar things have occurred in Sub Atomic Physics, using the same random mechanisms and attendant statistics and probabilities.

Theorists such as John Smart (Free University of Brussels) base their conception of progressive evolution upon four possible arguments.

### Growing energy density

As the universe ages, ever more complex systems evolve



#### A. *Energy Rate Density*

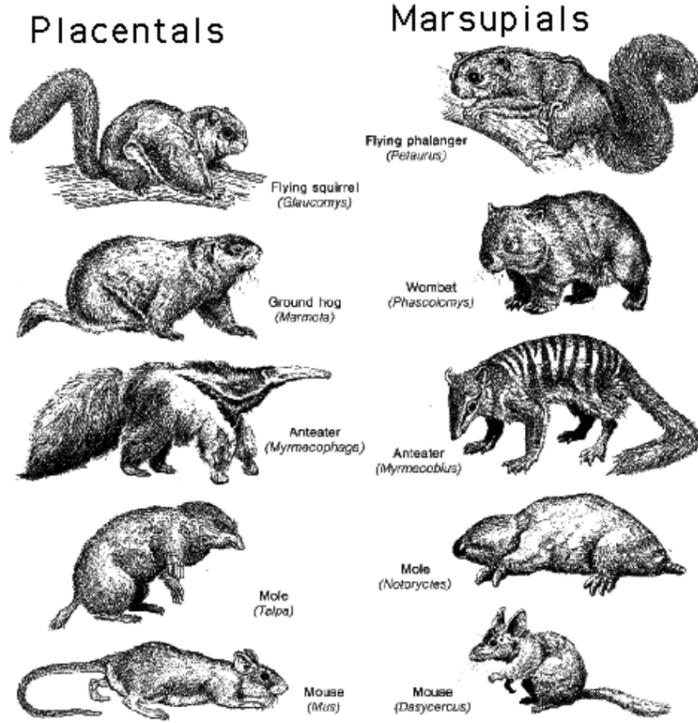
Eric Chaisson (Harvard University) looks for the necessary causal ingredient in **energy rate densities**, and constructs a scale showing that this increases inexorably with evolution. But such is hardly a cause: it is surely more of a consequence and therefore *explains* nothing”



#### B. *Thermodynamics*

J. Miguel Rabi (Barcelona University) says that the Second law is the “right kind of a law”, but it applies only to systems in equilibrium – only stable systems. And expects to find counterpoising laws in much more chaotic situations. He expects that Order actually emerges from Chaos.

Now whether he means “chaos” or Chaos (the mathematical version) is not revealed.



## The Ascent of Life III

Now, there are some crucial elements in the various trends mentioned in Michael Chorost's article in the latest issue of **New Scientist**. Yet only one of the researchers mentioned, a J. Miguel Rabi, goes beyond the usual placeholders in these discussions. He addresses the "one-way-arrow" of the **Second Law of Thermodynamics** as pertaining **only** to stable situations, and looks to Chaos as the real source of developing Order. And such an approach has to be the correct direction in which to look.

Reality, quite evidently, does not change via a single, ever-present Mode. And the usually inferred mode involving totally random fluctuations isn't one of them. Indeed, when that does occur it is always in a situation where many contending processes (or more usually events, can be maintained indefinitely, and are therefore best dealt with overall – that is most satisfactorily by the combined effects on the set up as a whole. In contrast, to this easily conceived of special case, it certainly has **two** distinct, and very different, major Phases.

The commonest, and of by far the longest duration, are the extended periods of self-maintaining Stability, in which a balance of multiple, separate and dominant relations, or processes, has become established **as a System**. And such a stable phase includes many mutually conducive processes, which form persisting and reliable sub-systems, along with particular contending processes, which, remarkably, both benefit from the conducive sub-systems, while opposing any other competing potential stabilities from getting going, and hence acting as defenders of a particular "home" Stability. Such mixes are not merely theoretical suggestions. Close inspection of the bio-chemical processes, present in all living things, reveals **just** such systems. In fact they are so universal in lifeforms that they can be displayed in a single diagram of these so-called **Metabolic Pathways**.

### C. Convergent Evolution

Kevin Kelly (Wired Magazine) says that the clearest evidence for progression in evolution must be in the repeated occurrences in widely different circumstances and at widely different eras of **Convergent Evolution** proves that there is an underlying direction in the processes involved. Nicola Clayton (Cambridge University) and Nathan Emery (Queen Mary College, University of London) seem to agree with this line of reasoning. But, once more, you really have to reveal what **makes** it happen. Recognition alone is not theory.

### D. Catastrophe

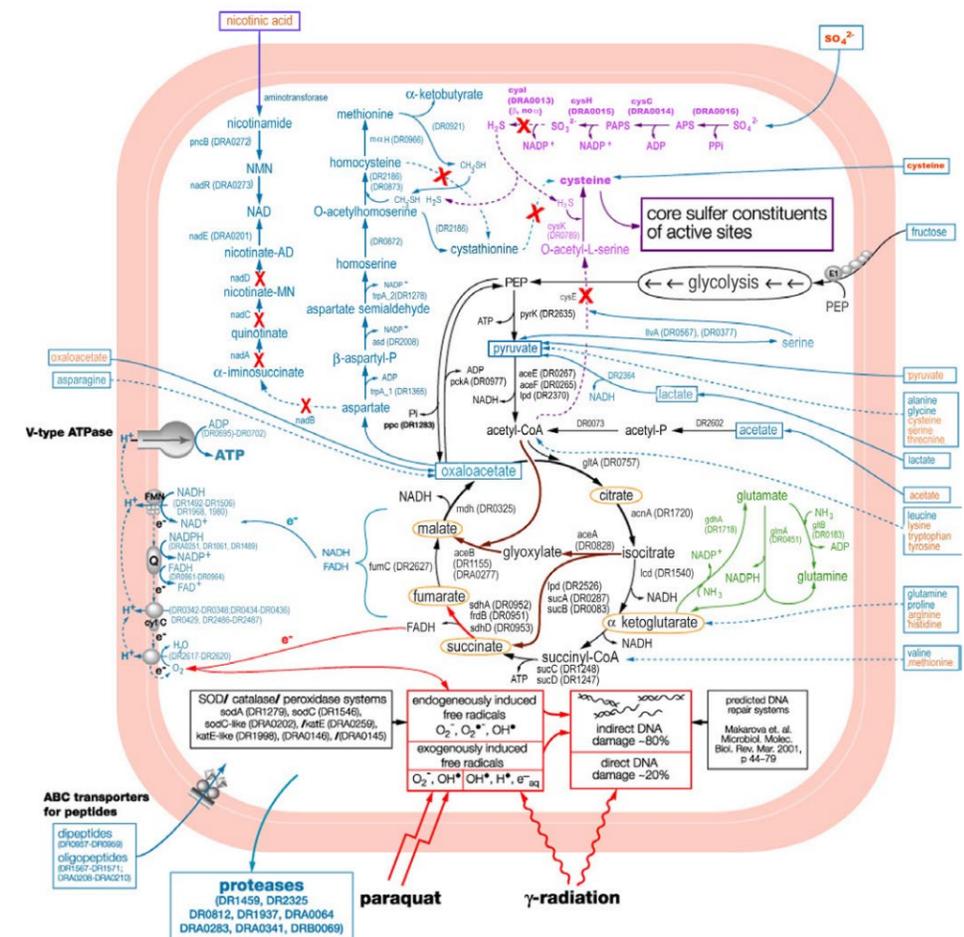
The evident resilience and redirection that inevitably follows the most horrific worldwide catastrophes, also seem to indicate some powerful organising forces, which retrieve such calamities and resume the evident continuing progress from the most debased levels.

But, all this is Form rather than Cause.

What actually causes such recurrences is not revealed. Though Darwin started from such evidence, he knew he had to describe and explain actually occurring causes, which delivered the actual Origin of New Species, and he spent a major portion of his life gathering and interpreting voluminous pieces of evidence.

None of the alternatives described in this article explain their averred Progress in Evolution. And it is a symptom of most Science these days that this vital ingredient in real Theory is omitted. As soon as a pattern is recognised, that is considered enough.

No, it isn't! Any directional component of evolution must be both revealed and **explained!**



To establish exactly how these various components relate to one another, requires a close look at the pathways as a mutually-supportive system, for they are a wholly integrated set of linked sequences of processes and even cycles, which together produce a resilient, self-maintaining system.

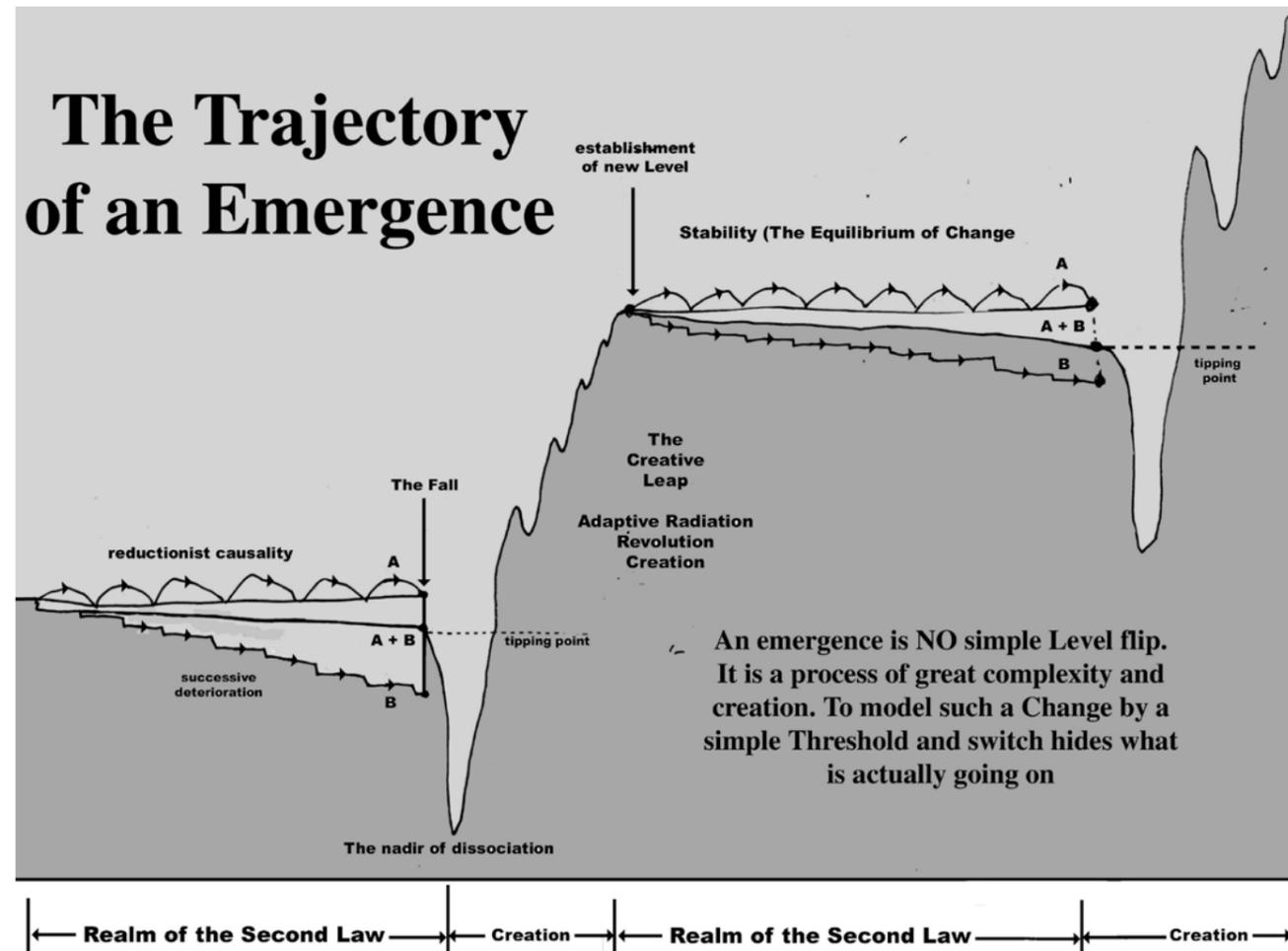
And the most important general law within such complexes of maintained stability is (perhaps surprisingly) the combination of all individual dissociative survivors, which apparently act together to be seen (by ourselves) as the ubiquitous **Second Law of Thermodynamics** – or “*Rust Never Sleeps!*”

Now, literally all Science involves studies and extracted laws solely *within* such Stabilities. But, though long lasting and conservative, stable systems are never eternal.

And their demise is always due to the combined deleterious processes of the Second Law. These can, over time, add up, successively undermining the stability, until a disastrous collapse ensues, and the system, including its defensive sub processes, totally falls apart, and chaos seems to be the only possible outcome.

NOTE: It must also be added in here that such stabilities can also be terminated by catastrophes (coming from outside) such as the meteorite impact that ended the Cretaceous era on Earth.

Now, whatever was the reason for such a wholesale collapse, the result is never the usually expected descent into total Chaos, but a short, yet surprisingly rich interlude of significant qualitative changes, which we term an **Emergence** (or sometimes a Revolution).



These interludes always follow system collapse; indeed they form part of the overall process that includes the collapse – The Emergence. But they are also the only phases of development in which the entirely NEW can emerge, and via a vigorous zigzagging contention between competing proto systems finally result in the

victory of a single dominating system and the establishment of a new and persisting stability.

NOTE: Not all such crises succeed of course! Some fall back in the old stability, but always what occurs is then terminally debilitated, and cannot persist for long.

For it is ONLY within this creative-constructive Phase of an Emergence that the opposite Law to the Second Law of Thermodynamics appears.

It is once again NOT a basic driving Law, but a combination of many processes, which gradually coalesce into a new, self-maintaining System, and at a New Level (**Life** is surely the prime exemplar). And the only area in which some concrete idea of Natural Progress will ever be found is clearly within these **Emergences**. But who studies them?

The answer is “Literally nobody!”

And the reason why this is the case is that the master of these studies was a certain Karl Marx (when studying Social Revolutions). Now, that might have been acceptable, but Marx was not an armchair philosopher. He decided that the role of real Philosophy was not to merely interpret history, but to change it. He became a political activist on behalf of what he recognised as the only available revolutionary class in Society – the Working Class. And such a position condemned his sort of studies as dangerous and even reprehensible.

The study of Emergences survived for a time with Marxists like Lenin and Trotsky, but in the Thermidorian reaction of Stalinism following the Russian Revolution, such studies vanished without a trace.

But, the only place that answers to the questions posed in *The Ascent of Life* article will be found in such studies and nowhere else. And apart from J. Miguel Rabi’s steps in that direction, there is also a body of work by the author of this paper, Jim Schofield, which is still continuing, but in 2010 culminated in his *Theory of Emergences*, published as a *Special Issue* of the *SHAPE Journal* online, but still developing and coming to a more general focus in his forthcoming book *Holistic Science* (effectively the Science of Qualitative Change)

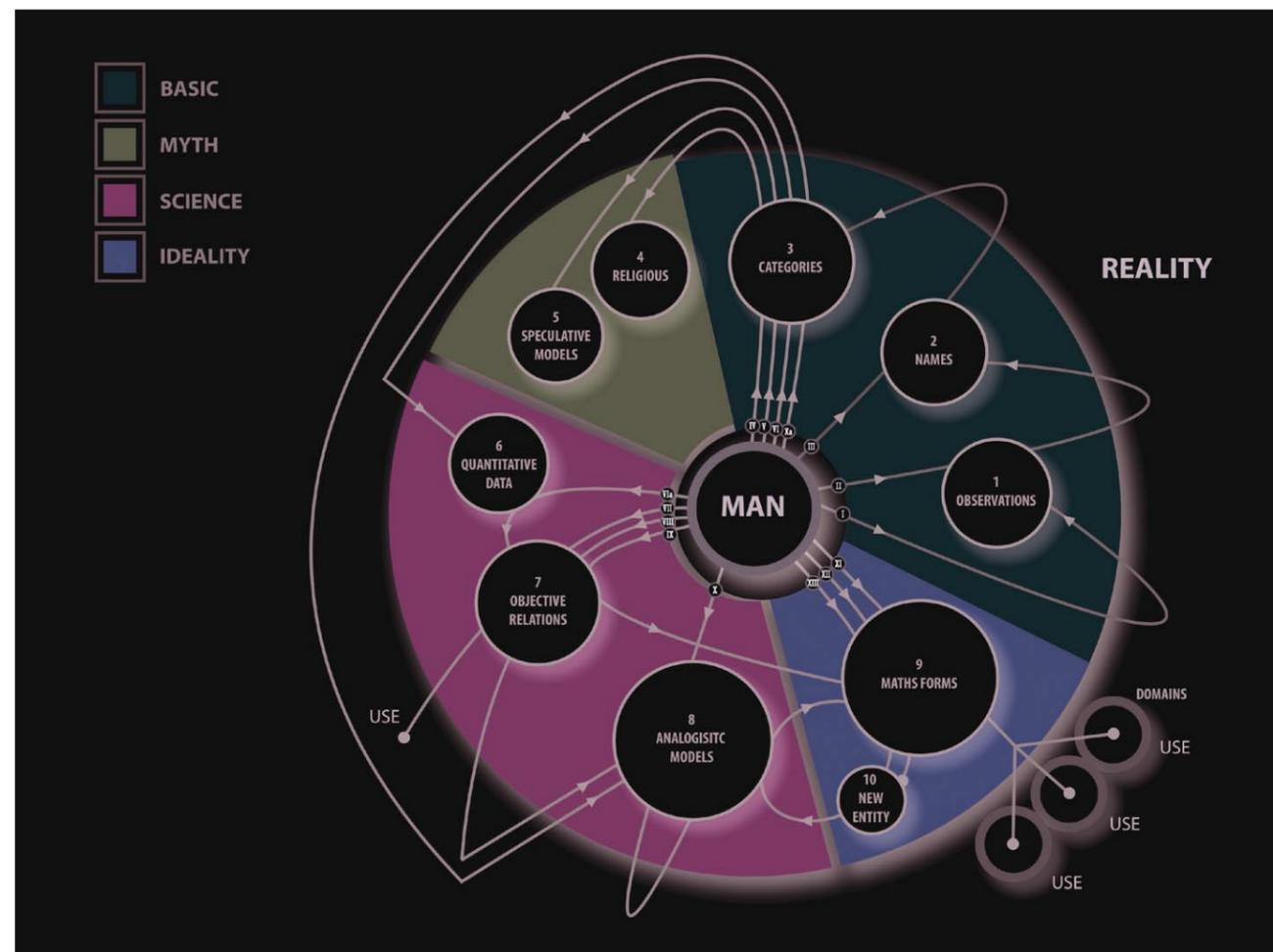


## Why Normal Science Can Never Crack Life!

This series of papers on the *Ascent of Life* article in *New Scientist* cannot support any of the attempts mentioned there to explain Progress in Evolution. Indeed, Classical Science (and that includes those who subscribe to the Copenhagen Interpretation of Quantum Theory) cannot even begin to address such subjects, because of their unshakable faith in its two most basic principles of investigation and theorising. These both limit investigations to stable systems only.

The transitional periods between stabilities are never addressed, nor can they be, for the current development techniques for scientific research involve only the study of stability, and if such conditions cannot be found as naturally occurring, then it is the job of the experimenter to *make* such situations exist by “farming” a section of Reality into what is called a **Domain of Applicability**, and which is a man-made locality of such stability.

This truly remarkable method (applied when finding unfettered Reality impossible to cope with), has to impose extensive constraints upon a chosen situation, to first isolate it, and then constrain it to such an extent that the “filtered” relationship between a small number of controlled variables can be extracted and thereafter used, for accurate prediction – as long as the producing Domain continues to be faithfully maintained.



NOTE: Elsewhere in this author’s studies into **The Processes and Productions of Abstraction**, the above diagram was produced, which not only deals with the methods described briefly above, but also the traverse from Reality into Ideality 0 the World of Pure Forms alone.

Thus via such a methodology, we are no longer interpreters of self-moving Reality, but “in-charge” horticulturalists of our chosen and purposely constrained and restricted “plots”, in which we can “grow” particular phenomena with confidence and reproducibility, and thereby successfully predict outcomes in given conditions.

Such methods have, of course, been wonderfully successful for Production, and can approximate to the truth also in highly stable natural situations too, but are totally useless in any periods of Emergence – Events of significant qualitative changes.

We can do anatomy by first killing the animal, but creation is well beyond our current conceptions, assumptions and methods.

## The Scientific Experimental Method

When presented with a complex, natural situation, not only when including multiple and contending separate sub-processes, but also displaying moment-by-moment variability in such conditions, such situations have to be treated with the standard, universally accepted **Scientific Experimental Method**. For without the required conditions, any attempt to measure anything will inevitably produce an incoherent and unusable mess, so this method is designed to overcome such conditions by subduing them radically – by making the unreliable reliable, and the variable unchanging! For, if you don’t just give up and go away, you have no other choice.

And the reason that we don’t give up is suggested in other more conducive situations where certain relations between evidently dominant contributions have been extracted, while even the most confusing mix shows momentary glimpses of what seem to be existing relations, for these make it evident that what you are seeking is surely there. The question is how to reveal it.

The Scientific Experimental Method was devised to overcome these difficulties by holding as many “non-dominant elements” as possible constant, or even totally removing them from the mix. The experimental context is purposely and radically modified in order to clearly reveal the required relation. We learned to “farm” situations to our advantage.

Well, slowly such technologies became increasingly possible and experimenters became experts at isolating and modifying their environments to clearly expose the previously only glimpsed relations, and measure the involved variables over an extensive and controlled range.

In such arranged circumstances we could indeed go ahead and take the measurements required to allow us to extract from them consistent relations.

Now, as time went on the abilities involved were developed so that a very large number of such set ups could be constructed and relations extracted. BUT, almost all these individual Domains of Applicability were *different!* We didn’t mind this initially, because to *use* our extracted relations we only had to replicate the exact same conditions from which we had originally extracted them.

But, we also found symbolic and generalised ways of delivering these relations as **Equations**, and these made reliable predictions easy, which was good!

But that also led to our comparing these equations with one another, and when we did we could not but notice that the same equations recurred in widely different areas: such, therefore, all displayed the same **Form**, which seemed very good! But it also was significantly bad.

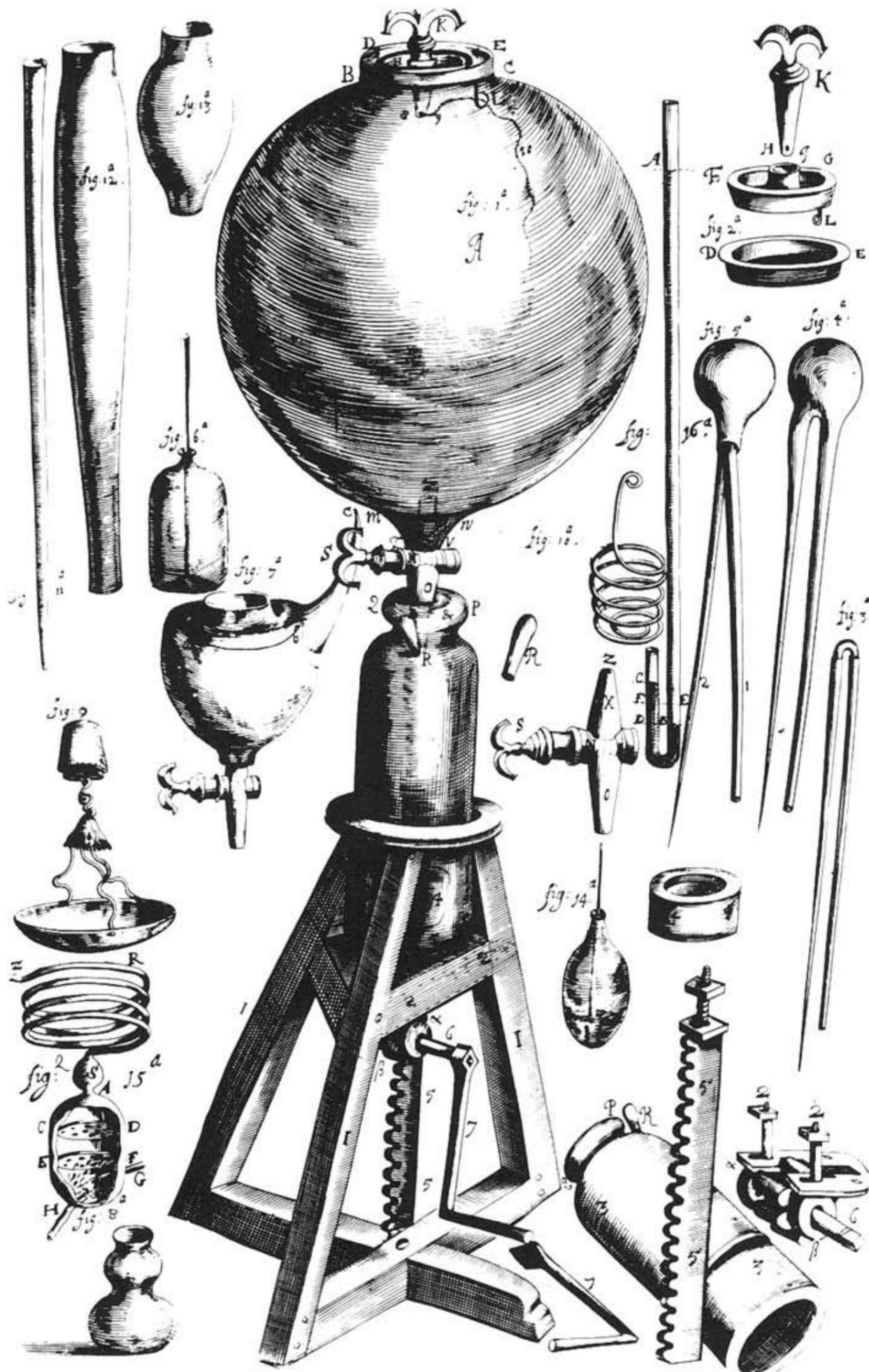
It was good because we could deal with such formal relations or Forms in total isolation from their contexts. We could study these Forms in their own terms as **Mathematics**. But, we also began to treat them as being the *driving essences* of Reality – we **forgot** the importance of Context!

Now, this would soon have been picked up by those who had to use these equations: *they* could never forget context.

But, mathematicians and scientific theorists could, and did, **forget!**

They employed the assumption of **Plurality** – that all such extractions were entirely *separable*: they would always be exactly the same whether within a mix or isolated as in our experiments, and with this as our justification, we could treat these eternal/formal relations as essential and use them as such in our explanations.

Of course, all such relations were merely quantitative and did not explain things when qualitative changes were happening everywhere, and hence could never be applied in such situations successfully. We could get away with them in stable situations and with isolation and Domain construction, but when things were being overturned and *becoming* something else they were useless, because Plurality is WRONG! Indeed, complex situations are not delivered by a mix of separable eternal essences or laws, but, on the contrary, it is Reality in complex and mutually affecting situations that MAKES the laws. The assumption, now universally believed, that basic laws make Reality what it is, is profoundly mistaken. And the proof is crystal clear within an Emergence, where new laws appear from the very first time, and can never be reduced to those at a simpler Level.



## What Produces What? (Can we Reduce Laws to Final basic Elements?)

What exactly is an Extracted Law of Nature?

The usual assumption is that, due to the specially designed and highly controlled conditions in which the extraction is made, we must have removed all extraneous and blurring additional factors, so that we can finally reveal a singular, contributing essence.

But, how can this possibly be true?

Certainly, there are situations that occur, entirely naturally, (without any intervention by ourselves, and yet display clear extractable laws.

Could it be that the same is true in all circumstances, but, more often than not, blurred by multiple, simultaneously-acting laws, which make the individual contributions hard, if not impossible, to see?

And are those especially clear cases chance exceptions, wherein multiple contributions are not present, and the fundamental laws are acting alone, and are hence easy to both see and extract?

But, the historical development of Science proves otherwise!

In the Gas Laws, the first extracted version was

**PV = constant** - (*Boyles Law* – relating the Pressure and Volume of a contained measure of gas). But, that version involved special constraints, and when these were breached (by what is called adiabatic expansion) the law was transformed into

**PV<sup>γ</sup> = constant** - and this wasn't the final form either.

In other circumstances where the Temperature was included as a contributor, the law became

**PV/T = constant.**

The laws were different with different conditions, and NOT merely by the arithmetical addition of lower laws – indeed, the laws were the **result** of the given circumstances.

Reality is not produced by the summing of essential, yet disembodied, laws.

On the contrary, Laws are products of integrated, and most definitely concrete, Reality.

Basic essences as such do not exist! They are *idealist* myths!

Indeed, it has to be asked – “Can you ever terminate the generally believed process that NO Law is eternal and essential, but *always* a product of mutually determining sets of lower contributory factors?”

And when the simplistic concept of a law is shown to be clearly inadequate, it is usually replaced by a reductionist alternative, which agrees on laws *secondary* nature, but then assumes an “infinite regress” of causes, ultimately terminated(?) by a final set of unchanging elements and laws at a bottommost level.

But, needless to say, this Final Set, though searched for with ever-bigger “atom-smashers”, has never been delivered. (And it seems reasonable to suppose that rather than revealing ever more basic entities, these experiments are actually *creating* them).

Indeed, the evidence is overwhelming that this assumption of Reductionism can only be applied “locally” – that is *within a given Stability*, for rather than a continuous sequence all the way down to final elements, such a multiply-applied set of analyses *always* hits an unbridgeable cataclysmic Event (an **Emergence**) where Reductionism fails completely.

And such natural revolutions are encountered time-after-time as the analysis is restarted and continued.

Clearly, all our most dearly held, basic assumptions are wrong!

But, of course, that doesn't mean, “*Give up now, you'll never do it!*”

It does mean, however, that we must replace our current ideas with something better.

Modern Science has reached the final limits of these primitive first approximations to the nature of causes, and the trick of merely labelling everything after a particular Emergence as a New Science, and thereafter limiting all research to within those confines. They just have to go!

But, certainly NOT by any “rationalised bridges” across the gaps.

Instead, we must begin to study these remarkable periods of transition – the **Emergences**, to establish an overall Science of Qualitative Change - Hegel’s 200 year-old objective must again be addressed. For without such studies Science will otherwise increasingly hit more and more such barriers due to its now defunct current assumptions.

