

Diagrammatic Emergence

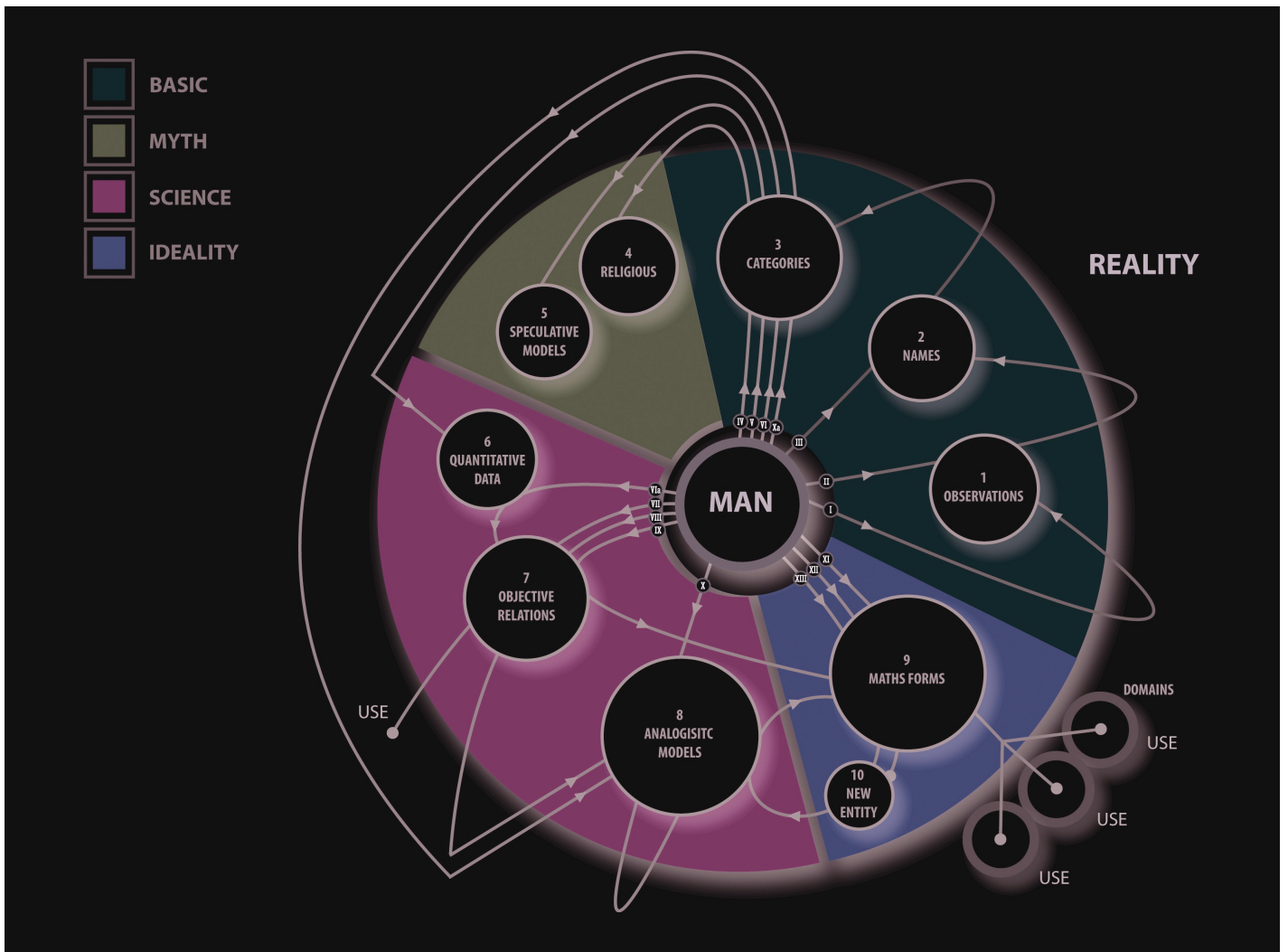
In re-reading all my stuff on Nobel Laureate Laughlin and the topic of Emergence, it becomes very clear that my words-only descriptions do not suffice to deliver all my intended objectives

As was also the case with my problems when dealing with the Processes and Productions of Abstraction, perhaps the answer will be to once again attempt a diagrammatic description to reveal the maximum, and even also perhaps the next and future steps in explaining this difficult and unusual area.

Indeed, it may indeed be necessary to actually **invent** a wholly new form of diagram, which would reveal the inner transforming sequences involved in the Emergence Event via a series of clear diagrams.

For with my researches into Abstraction it was found to be essential to find a way to represent all of **Reality**, **Man-as-Agent**, the **Activities** and the **Results** of Abstraction – the sum-total of Processes of abstraction, and their resulting Products in a single intuitively revealing figure.

The form of that final version of this diagram was entirely new, and delivered a simple means of seeing the implications of particular processes – their virtues and their pitfalls without confusion. The successful completion of that difficult task encourages me to attempt to try once again with Emergence. Diagrams don't solve problems, but they can certainly *reveal* them!



The Processes and Productions of Abstraction

Such a diagram will, of course, be retrospective, attempting to include all possible information from past Emergences and displaying them in the most revealing way possible. But, perhaps such an undertaking would

also lead to the clearly evident qualitative characterisation of all the key and defining elements involved, both as causal factors, and as participating elements.

To attempt such in the area of Emergence in general is, of course, a very tall order – of that I am well aware, but, nevertheless, it simply must be tackled.

The last essay on Laughlin, *The Topology of Reality*, attempted to bring in **possibility spaces** to clarify the dominant features of an Emergence, and this was certainly a start, but *only* a start.

The difficult part in this more ambitious undertaking will be in designing forms that will adequately contrast pre-emergence, stable, situations with the actual Emergent Overturns themselves. There will have to be a way of delivering in the Diagram (or diagrams) the number and sort of possibilities before and after the overturn, and these must somehow display what seems in words to be wholly contradictory.

Let us therefore take a quick look at the Overturn as a table of words alone.

Stage	Stability	Changes?	Potentials	Behaviour
BEFORE	Stable	Quantitative change within level	Enormous possibilities with most of almost zero probability	Self maintaining
DURING	Unstable	Qualitative changes	Dynamic, transforming, evolving and temporary	Transitory
AFTER	Stable	Quantitative change within level	Narrower possibilities making many of what were “impossible” now more probable	Self maintaining

As can be seen from the above chart, this is not going to be easy. As stated above, there seems to be very little of importance revealed – yet these changes are amongst the most profound in the history of the Universe.

The BEFORE and AFTER phases do **not** seem to be significantly different to one another. The only clue to significant change occurs in the **Potentials** column. Yet even here the information is cryptic rather than revealing. The most misleading fact is in the two seemingly contradictory outcomes in possible developments.

Whereas, prior to the changeover, enormous numbers of things were possible, but so unlikely as to never actually occur, in the situation after the change over the number of possibilities was greatly reduced, yet these were now very much more likely, and not just because of the reduction in possibilities: somehow a sort of direction had been imposed which had this remarkable effect.

Thus, we have restrictions which make certain things much more likely, and it is in these new possibilities that significant *new* qualities reside.

As with all such attempted general descriptions, the best illustration is to immediately refer the reader to the most profound Emergence of all – the **Origin of Life on Earth**.

When we consider this event, the above, seemingly woolly words, begin to make more sense.

Consider the potentialities *before* the Emergence of Life, and compare them to those *after* that revolutionary event!

Of course, the above has all the drawbacks of a retrospective definition. It is always very easy, in retrospect, to earmark the significant possibilities that transformed a situation, but we are attempting to *generalise* these wondrous processes, and this means going beyond the known cases.

Identifying, before the event, the “crucially determining” sorts of possibilities is NOT easy.

There is, in our categorisations above, no way of determining which are probable and conservative, and which are possible and revolutionary.

Whatever form of diagram is chosen, without the definition of critical entities nothing can be delivered.

It was exactly the same in our diagram about *The Processes and Productions of Abstraction*.

Only after the elements involved, the sequence of stages and the nature of all of these was known was any revealing diagram possible.

It will be clear to the reader that it is the DURING stage that must be analysed in great detail. The current row of “vague & fruitful” descriptive adjectives in the table above *must* be replaced by Processes and Productions and their dynamic relationships.

As with my colleague **Jagan Gomatom** work on the *Toroidal Scroll Forms in Liquid Reaction Fronts*, and with the stable cases both before and after, that did not reveal the significant content.

The nitty gritty then was *only* to be found in the dynamical processes of change.

“*Stir well and wait until equilibrium was established and only then take your measurements*”, may well have been good advice when any data collected during the change would only confuse. But, with Jagan’s work and the general problems of Emergence, the *change* is the thing!

Let us begin to think about the Changes involved.

Impossible Possibilities and Likely Probabilities

When studying the elements and processes prior to the emergence of Life, there could, with great difficulty, be discerned certain possibilities which could lead to amazing new things happening.

But the likelihoods of them occurring were vanishingly small. The closest description to the truth of their actually happening could best be stated as, “*They are Impossible. They will never happen*”. Yet, by some sequence of processes **they do indeed happen**.

The questions must be about why they persist and become established into a new Level. And also, very importantly, exactly HOW do the balances of probabilities change so dramatically?

It can only be in the Context-Transforming nature of the crucial processes of Emergence.

The Environment must be changed and, in so doing, transform the likelihood of events happening profoundly. We have to identify processes which run-away to take over the composition of the surrounding context. These must be, in some way positive feedback situations, but must also be self maintaining.

Almost impossible outcomes are significantly changed into probable outcomes by the processes of emergent Change, and these must be somehow actively encouraged to persist rather than be mere passing interludes. This survival and growth changes the context and hence overturns the pre Emergence possibilities dramatically. Indeed, all probabilities are changed, and this makes further change ever more likely. Richer possible futures begin to be more likely and precipitate other Emergences, increasing the acceleration of change and the vast expansion of probable outcomes.

Emergent Change is indeed Revolutionary Change.

Now the trajectory of the actual interim changes, as distinct from the ultimately stable result, is both complex and unstable. As you can imagine, generalising this will be an incredibly difficult task.

Hegel started the task with his extractions variously and subsequently labelled as:-

Thesis-Antithesis-Synthesis

Contradiction as the Motive Force

Overcoming, yet Maintaining

Limiting, yet Opening Doors

Extremes Meet

.....and many others

But his work was 200 years ago, and apart from a few laudable exceptions, most of his “disciples” emasculated his contributions and turned them into dead cliché-like forms - things that could be retrospectively “fitted” onto rapidly changing situations, but which, instead of revealing significant content and forces for change, simply buried what was happening under dead labels and inaccurate descriptions.

The Russian revolutionary Trotsky encapsulated the actual content of real analysis of such emerging change with his term “The Art of Insurrection” – no automatism there! The revolutionary had to be tuned to recognise dynamic features as they emerged and grasp their significance, so as to correctly predict the ensuing possibilities.

The statement “*A week is a long time in politics*” gets accelerated to breathtaking proportions in Emergences and Revolutions. The activist has to discern, understand and act in accordance with a rapidly developing complex overturn.

In the same way, applying Hegel’s discoveries retrospectively as a system of labelling is essentially useless. Not only must the stages in Emergence be identified, but also the variability and the dynamic of these must be appreciated. A real reapplication **MUST** be always be a process of discovery and **not** a dead labelling.

Apart from a very few, almost nobody has carried Hegel’s work forward, and certainly no one since Lenin and Trotsky. Modern philosophers of whatever persuasion seem to understanding nothing of such processes.

So, Let us Begin

Let us kick about a few diagrammatic ideas (most will, as usual, be rubbish, but hopefully we will arrive at appropriate forms as we did for Abstraction.

The hardest thing to indicate in our diagrams will be what could be called “height”.

It is not a happy term, because though it is to do with the “height” of level of organisation, it is also more than this simple appellation. This is because Emergent Levels open up totally new, never before in existence processes and entities, which go on to transform what could be called the context or background in significant ways. In changing these areas, “height” is **not** the ideal label. I suppose we could describe it in the following way. Our “height” indicates the opposite of the 2nd Law of Thermodynamics, which asserts that Nature inevitably moves from Order to Chaos – that is the winding down to “noise” and oblivion.

So, “height” in our context is a measure of the increase in Order of a special kind. It is not mere complication. Neither can we use the term Complexity because of its various technical and everyday meanings.

Is Life merely more-complicated non-living matter?

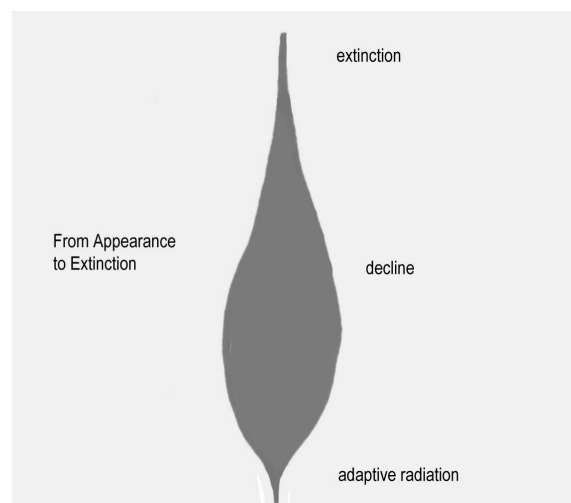
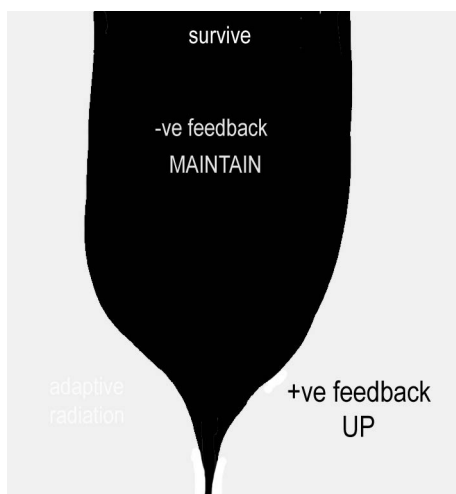
It is not! So we are trying to put a label on this aspect of Higher Order – so we call it “height”

Hopefully, when I use this term later on it will be clear exactly what I mean by it.

Let us return to the Context or Background within which our Emergence occurs.

These things are not left unchanged by Emergence. Indeed, you could call the inevitable transformation of the context by Emergence one of its most important features.

What happens is that the possibilities within the context are greatly transformed. They are limited by a positive feedback process, which accelerates the main contained processes, and by the exclusion of most possibilities in the context.

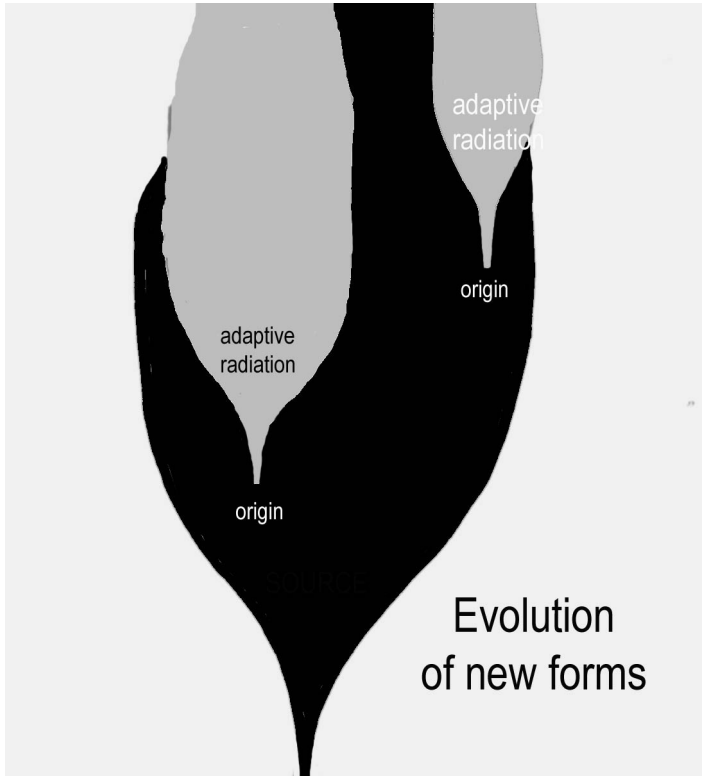


The context becomes a different place, with a significant change in what can happen, AND in the probabilities of the now strictly limited set of possibilities.

In addition, negative feedback, self-maintaining processes are established, which prevent the new situation subsiding and reverting to the previous conditions.

George Gaylord Simpson's wonderful evolutionary diagrams come immediately to mind, and could deliver part of the answer for our Emergence Diagrams.

These diagrams were part of Simpson's descriptions of the processes of Evolution. In particular, he was able to illustrate the increase in variability from origin, through Adaptive Radiation and maintenance, right through to Decline and Extinction. These could be repeated to illustrate the evolution of new forms of various kinds from a common stock as shown on the next page.



The terms positive and negative feedback, though appropriate, hide the substance of what is going on. Stated as two different types of process they don't get related to one another. My studies elsewhere (my papers from early 2006 stimulated by an essay by my son, Mick Schofield) on feedback showed that both these can involve the same contained sub processes, but these are always constrained by resources and context, which may change as a result of the processes themselves. There is a trajectory where, for example, positive feedback will never be permanent. It will subside and become stabilised into a sort of level of activity where change is minimal. It can, and always is, transformed into something like stability: it becomes negative feedback! Such trajectories of change are not overt in the labels positive and negative feedback. So, they must be used with an awareness of their inherent dynamics.

