



# SHAPE JOURNAL

THE WHOLE AND THE PART

THE WHOLE AND THE PART / A NEW HOLISTIC ITERATIVE METHOD / PLURALITY AND HOLISM, MATHEMATICS AND REALITY  
PHYSICAL ITERATION & ACHIEVED STABILITY / BRINGING HOLISM INTO THE METHODS OF SCIENCE / DIALECTICAL EMERGENCE

©2018 Jim Schofield  
Words Jim Schofield  
Editing & Design Mick Schofield  
Art Henry Moore

[www.e-journal.org.uk/shape](http://www.e-journal.org.uk/shape)



As well as being a scientist and philosopher, Jim Schofield has been an artist and sculptor for some 50 years. Henry Moore had a big influence on him over that time, both artistically and philosophically. Moore's work deals with abstraction, nature, materialism and seems to pose unspoken questions about Reality and Man's relationship to it. For these reasons, the sculpture of Henry Moore seems the ideal visual accompaniment to these essays.

Mick Schofield  
Editor

## The Whole and the Part

Issue 62 / November 2018

4. The Whole and the Part
6. The Hermeneutic Cycle
9. Thought for Today
10. Bringing Holism into the Methods of Science
14. Why Holist Science and Iteration?
17. A New Holistic Iterative Method
20. Plurality & Holism, Mathematics & Reality
24. Multi-variable Relations
29. Dialectical Emergence

## The Whole and the Part:

The effects of  
Pluralistic or Holistic  
approaches to  
studying Reality

by

**Jim Schofield**



Welcome to Issue 62 of the SHAPE Journal, entitled *The Whole and the Part*, a loose collection of recent papers aiming to develop a nascent Science of Holism, by looking closer at the crucial oppositions involved: Plurality and Holism, the Whole and the Part.

Let us start by confirming the differences between the two fundamental approaches.

### Plurality - the study of parts?

This stance facilitates analysis by assuming the independence of contributing factors in any complex process. This results in a belief in collections of eternal Natural Laws, summing to result in merely 'complicated' results. Such a stance allows any modifications to a situation that will reveal one or another of the factors involved, because nothing can change those factors: they are seen as eternal.

### Holism - the study of wholes?

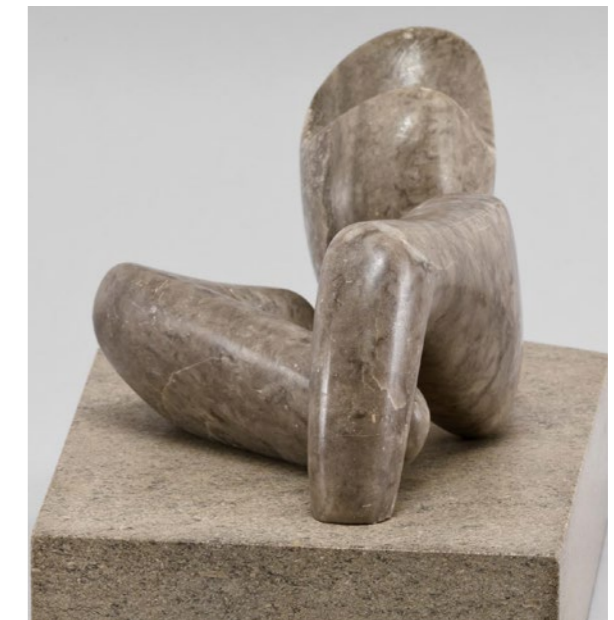
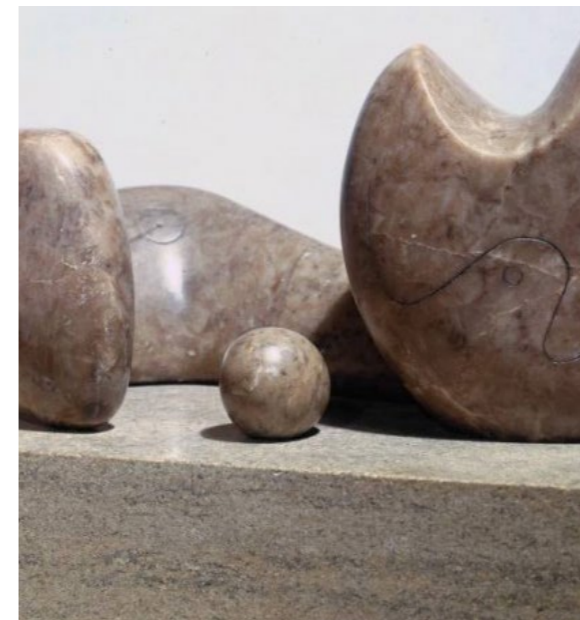
This stance insists, that to some extent at least, "Everything affects everything else!", making analysis intrinsically unreliable, for the usual pluralist simplifications will indeed modify whatever has been so revealed. It, of course, complicates the methods and interpretations involved in all investigations, and vastly multiplies what differences are possible in any complex situation.

### Stability - synthesis?

But, of course, both of these are a typical Dichotomous Pair of contradictory concepts (see Hegel's work on Dialectics), presenting opposite extremes of real situations, especially as complex mixes of simultaneous factors can, by oppositions and co-operations, often find a temporary, natural and self-maintaining *balance*, which we often misinterpret as a permanent feature of reality - indeed, as a natural Stability, which we confuse with assuming a natural Plurality.

And, as such Stabilities can be very long-lasting, naturally, and also artificially achievable and maintainable by the actions of Man, it has been possible to construct a whole discipline upon such a basis, which we now call "Science", but based *only* upon such Stabilities - man-made and natural.

Science should be renamed Pluralist Science, and opposed, where possible, by an as yet unachieved Holist Science: though individual examples of the latter have indeed been achieved - such as Darwin's Natural Selection and Stanley Miller's Primitive Environment Emulation Experiment, which produced Amino acids. Also, Yves Couder's "Walker" Experiments producing entities solely out of a Substrate and Energy, are also important contributions, but a General Holistic Science Methodology has not yet been discovered.



So, *Real Science*, which must be our objective, is still in the making! The crucial area must be in investigating the processes terminating any such Stability and establishing another *different* Stability - the so-called *Emergences*.

### Emergences

Now, detailed work upon these interludes is generally extremely difficult, and in many cases totally impossible, because they happen totally unheralded and so fast as to appear to Mankind as uninvestigate-able step changes. But they do appear at all levels of true Qualitative Changes, so the essential work was initially carried out by Karl Marx, who as a Dialectical Historian, and based mostly upon Michelet's *History of the French Revolution (1789-1815)* and Hegel's work upon Dialectics, began to study these changes in the clearly extended episodes of Social Revolutions.

To that professional historian the results were so revealing that a deeper analysis of the whole trajectory of such changes, and why-and-how they occurred, had to be prioritised. He dedicated the rest of his life to revealing the dynamics of Capitalist Economics in his major work *Das Kapital*.

But the absolutely crucial application of Dialectics to Science was never as resolutely undertaken, and it would never be, unless the methodology obviously applied in

*Das Kapital* was revealingly applied to Science too.

I say 'revealingly' because in attempting to encompass Science-in-general (a truly vast set of disciplines) in the very process, not only would Science be changed but Dialectics would too!

NOTE: This scientist struggled for years to do this, but got nowhere, until he was doing research into software for the Teaching of Dance Performance and Choreography, using Analogue Video and Digital recordings of crucial expressive movements. In spite of using the very best available techniques BOTH means seemed incapable of delivering what was needed. For the Digital was composed of *Discrete* stills (small parts of the whole movement), while the Video smeared the motion and lacked precise positional information. There just wasn't enough in either to deliver what was needed.

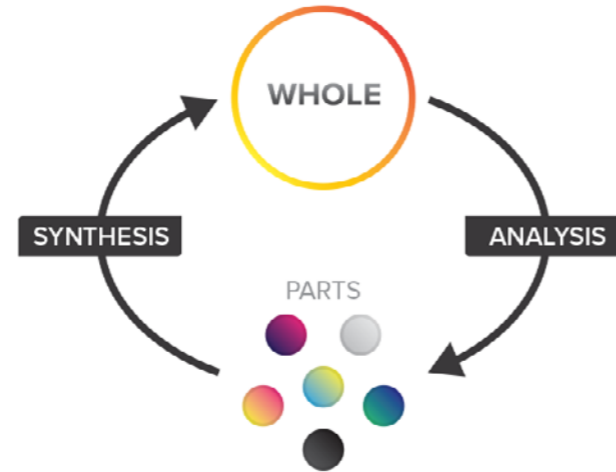
It was the classic Zeno Paradox of Continuity and Discreteness in action - the very Dichotomous pair that Hegel had addressed dialectically. And solving the presented problem empowered me to address a holistic view of change too - the Trajectory of an Emergence was completed in 2010, in *The Theory of Emergences*.

## The Hermeneutic Cycle

While this concept concerns the interpretation of *texts*, the Hermeneutic Cycle seems relevant to these scientific and philosophical considerations, too.

The idea is that we can only understand a Whole by studying its Parts, and we can only understand the Parts by looking at the Whole.

The latter part of this cyclical approach appears to be missing from Pluralist Science. Could this iterative method apply to our studies of nature too?



Diagrams are from the web:

### Reading Hermeneutically

- The hermeneutic circle refers to the circle of interpretation that is involved in the understanding of knowledge. This approach to reading acknowledges that understanding and knowledge is a **cycle** of exposure to information (texts), interpretation, then re-exposure to texts.
- Subsequent exposure to a text offers closer inspection and new insights.

A diagram of the hermeneutic circle. At the center is a small circle labeled 'the text'. Surrounding it are two larger concentric circles. The outer circle is labeled 'whole' at the top and 'parts' at the bottom. The left side of the circle is labeled 'synthesis' and the right side is labeled 'analysis'. Arrows indicate a clockwise cycle. Below this is a smaller diagram showing a cycle between 'Global inspection' and 'Deeper understanding', with 'Inspection of detail' in the middle.

For more on the hermeneutic tradition: <http://staffweb.hkbu.edu.hk/ppp/tp4/top06.html>





*Locking Piece* by Henry Moore, 1963-4

## Thought for Today

Reality is where everything real must dwell.

Ideality is the realm of Pure Forms alone:

it's content is related-to, but different-from Reality.

So, how do Reality and Ideality relate to one another?

Mathematics must dwell, as such, only within Ideality.

Ideality can contain only purely formal Reflections of Reality. The Rules of Reflection is extended beyond what can exist in Reality. So, Reality can determine some of the content of Ideality, but not all of it.

Reality only maps onto the reflections in Ideality of what exists in Reality. There is a formal hinterland in Ideality, which is impossible in Reality.

So Mathematics is not about what exists in Reality.

It relates to what is in Reality, but is not identical with it. It is about only the formal Reflections of Reality in Ideality.

Ideality is Pluralist: while Reality is Holist

So what is Sub Atomic Physics?

## Bringing Holism into the Methods of Science

### The Cul-de-sac of Pluralist Science

On initial consideration, it seems wholly impossible to apply a Holistic approach to any of the usual kinds of scientific experiments.

For, Holism insists that multiple, different-and-simultaneous factors are always present, in every single possible natural situation, and also, even more significantly that they always have the potential to affect and even transform each other. All present factors will be unavoidably subject to change, due to their determining containing-context.

But, the current lauded Scientific Method, universally employed in all experiments, makes an unacknowledged assumption that the exact opposite is true - that all the many individual relations are, each-and-every-one, totally eternal, and hence, as such, are completely unaffected by their contexts: so the usual method necessarily must involve very careful farming of the investigated situation, so that a single targeted factor alone, effectively dominates the situation, and can be extracted. But, that extracted relation will only-be-true in that precise context, and absolutely nowhere else.

Therefore, though by replication of that exact-required context, the extracted relation can be effectively used in successful applications, it cannot be used in any other contexts - it certainly isn't a universal or eternal Natural Law, and the assumption that it is, in its use in Theory, will be totally-and-misleadingly illegitimate.

And, this is, primarily, because we not only always either eliminate or steadfastly-control most factors in any given investigated situation, with the intended purpose of first isolating, but then also extracting of only a single

factor - the only one left evident in the carefully arranged-for situation. And, what is most important, is that it is always based upon the exact opposite principle to that of Holism, namely that of Plurality, so that the arranged-for single factor extracted, is then assumed to behave in exactly the same way, in *every* possible situation.

Clearly, in spite of its practical successes, Pluralist Science delivers a distorted Truth, and is increasingly wrong, when more complex theories are attempted to be developed via the also entirely pluralist methods of Formal Logic.

Let us, therefore, complete the necessary burial!

The farming of experiments always delivers a significantly simplified context. And, the following process of using the distorted data from that farmed-situation, to "fit-up" a conceived-of elsewhere General Perfect Form from the also pluralist discipline of Mathematics, also, unavoidably idealises the resultant, supposedly-defining Equation.

I'm afraid the old historical amalgam of contradictory disciplines, validated by the pragmatist tenet of - "If it works, it is right!", again steps in, to justify this wholly technological system as also "theoretically true"! That, is, most certainly, not the case.

We transform Reality to suit our needs - this doesn't help us understand it. Plurality allowed Roman Roads to be pragmatically constructed regardless of context: the landscape was fitted to the needs of the road! It did a particular job reasonably well, but did little to reveal the true nature of the landscape it traversed.



Indeed, whenever the studied ground was straightforwardly prepared, Pluralist Science could be useful. But, as the investigations of Reality delved ever deeper, the mismatches became ever more misleading.

Indeed, in modern Sub Atomic Physics, the investigations into the most dramatically-farmed contexts, such as the Large Hadron Collider, meant that Reality-as-is was replaced by a narrow Pluralist alternative that was increasingly determined by the nature of Mathematics alone! Indeed, what was studied wasn't Reality at all, but instead the World of Pure Forms alone - a strange realm I have termed Ideality.

And that is crucial! For though Ideality delivers only formal reflections of Reality, and hence contains only a small part of the richness of concrete Reality, it can easily be extended formally, well beyond the limits of concrete Reality. It can also extend its purely-formal-rules to multiple non-existent dimensions, and their surmised contents!

So, guess what? The new physicists have extended their supposedly real-world discipline to investigate the fantastic landscape of Ideality instead, and read it as an actually existing extension of Reality.

Ideality is assumed to supercede Reality.

These assertions are proved conclusively by the current state of Sub Atomic Physics today. This cannot be the place to demonstrate this in detail, but, for example, every single anomaly of the famed Double Slit Experiments, which are used to "prove" the existence of Wave/Particle Duality, has been fully explained-away physically, and a subsequent demolition of the Copenhagen Interpretation of Quantum Theory as a whole, has recently been completed.

#### Towards a Holistic Science?

So, returning to the main question posed by all of this! Can a Holistic alternative approach be developed to replace the current, and obviously failing, pluralist diversion? It can, but it certainly won't be easy!

How on earth can experimenters juggle with multiple simultaneous, mutually-affecting, and hence constantly-varying factors?

Well, surprisingly, we do it all the time, in day-to-day living, yet never in the totally controlled circumstances of Science: we make most decisions "on-the-fly" - we are, at least, partly aware of the multiple factors involved, and we decide what to do by a mixture of previous experience, along with a hopefully informed judgement of how things are most likely to work out.

The way we live is clearly holistic!

Indeed, though not as philosophically pursued in the West, such an approach does have a rich history in the East, and, one brilliant contributor to Holist thinking was certainly The Buddha. In his famous *Loka Sutta*, he describes the best way to address problems in a better way than our usual one. He considers such thinking as composed of stages, each of which is always composed of sub-steps. And his suggestion was that as soon as the sub steps in a certain stage had been completed - the thinker must *return to the start* of the current stage, and do it all again.

It is an important move: for the thinker does it all again, but in the light of the outcomes from last time around. It will not be the same! And, the Buddha inserts such recursions for every single stage.

Now, he wasn't telling us how to get the right decision in a particular problem. He was saying how to improve your decision-making *overall*. Believe it or not, you already do that, at least some of the time: the Buddha was stating how this could be developed into a method!

There is an already-existing method used by scientists, which involves such recursions, though in a somewhat different form, they are the widely used *Iterative Methods*.

Now, interestingly, apart from the usually involved pure pragmatic mathematical tricks, which deliver iterative methods for getting ever closer to a sought-for numerical solution, these same methods can also, in special cases, add value from outside the normal pluralist straight-jacket, and infer qualitative changes too. For, perhaps surprisingly, equations developed directly from holistic explanations, rather than from measured data first, can deliver surprisingly qualitative features when used iteratively.

Iterative forms of a modified Van der Pol equation used as a model for the beating of the Human Heart delivered both Fibrillations and terminal Heart Attacks, when only marginally adjusted.

And, in this extended set of papers, various attempts have been pursued to develop the usual "formal frigs", that have been around ever since Newton's Calculus, into a more consciously-holistic set of techniques.

## Why Holist Science and Iteration?

This current set of papers, mostly on the theme of Iteration, will doubtless present a very narrow view of the width and power of the Holist stance - especially that delivered within a Dialectical Materialist, or Marxist, general philosophical standpoint: not least because most of the ideas presented are still at a very early stage, and are also necessarily focussed upon an aimed-for Holist Scientific Experimental Method.

Clearly, the context for this current research, will be essential to give the full ground for the stance it represents.

The origin of this stance was established by the philosopher and historian Karl Marx, as a follower of the German idealist Hegel, due to the latter's Dialectical criticisms of Formal Reasoning, which Marx also embraced.

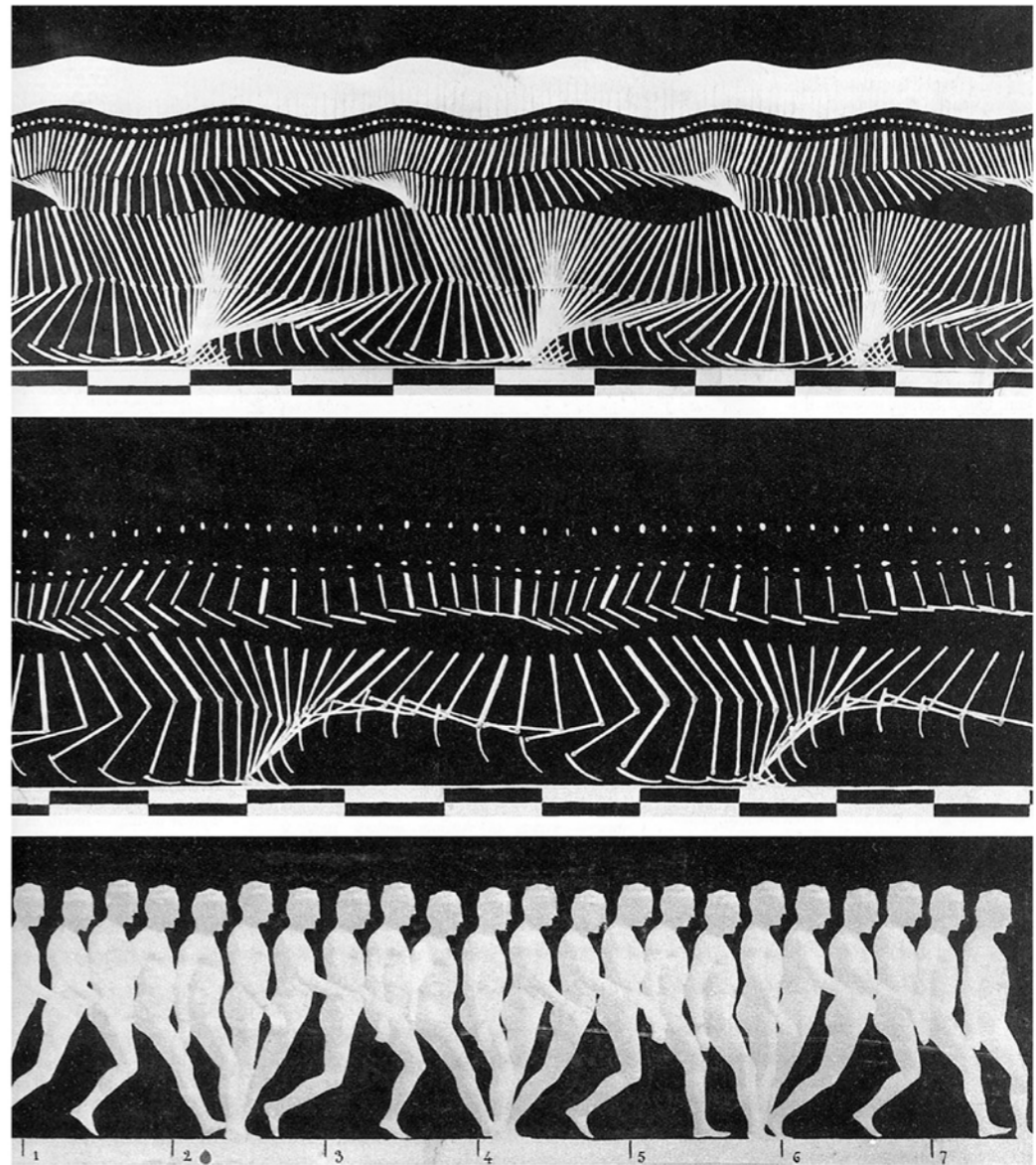
But, being a professional historian, dealing with the clearly concrete development of Human Civilisation, Marx could not but notice the evidence of the applicability of Hegel's Dialectics to the trajectories within the developments of Human Societies too. So, to unify these gains to the achievements of Mankind in disciplines like History and Science, Marx embarked upon the transfer of all of Hegel's gains to a Materialist alternative stance.

Now, that objective got underway almost 200 years ago, and has since spread worldwide as an alternative to the various other philosophical stances, and particularly politically as the stance of the most developed anti-Capitalist movement.

But, its primary and essential task of unifying with the other materialist disciplines, especially Science, has never been comprehensively addressed: and the writer of these papers, a physicist and a Marxist, undertook this task, starting 10 years ago with the launching of this journal, as the means of both tackling and disseminating this mammoth undertaking.

Though this had been a concern for this author throughout all his adult life, it was only addressed when, in 2008, he was finally able to dedicate himself, full-time to the project, and by 2018, many of the tasks began to reach worthwhile conclusions. At this point there are over 1000 papers and 120 issues of SHAPE Journal, freely available to all.

SPECIAL ISSUE 59 JUN 18 JIM SCHOFIELD



**SHAPE JOURNAL**

**ITERATION**

THE BORDERS OF IDEALITY AND BEYOND / LOGIC AND DIALECTICS / CHAOS AND STABILITY / CHAOS IN A HOLIST WORLD  
HOLISTIC ITERATIONS / AN ITERATIVE FORM DIRECT FROM DATA / A NEW ITERATIVE METHOD

For more background information on the key theme of Iteration please read [Special Issue 59](#) of SHAPE Journal. A couple of the papers presented here were published in an earlier form in this edition.





Henry Moore in his studio. The best artists seem to use a form of Holist Iteration as an investigative method.

## A New Holistic Iterative Method?

### Prelude:

What absolutely must be included here as the basis of a determined Holistic Stance, is to replace the most often assumed yet always-significantly-misleading consequences of the usually unconscious Pluralist Stance in all our methods.

And, that inevitably means removing any assumption of eternal Natural Laws, and instead, recognising the alternative of a whole set of multiple, mutually-affecting factors, which are not only changed individually by their accompanying-context, but reciprocally by also modifying that context too.

Permanently-fixed, natural laws were an historically-necessary simplification, in order to even begin to understand Reality. Clearly, Plurality was an attempt to adjust Reality to get a handle on it - to get approximate values, from a simplified law.

But now, we absolutely must adopt *new* techniques to better reflect the true interconnected nature of Reality - one of these must be Iteration.

There is a key problem in attempting, as I do, to develop an Iterative Method, from a measured data sequence alone, especially if we attempt to do it without any assumed form of model, for a relation supposedly-connecting those data points, as has always been the case in the usually-employed iteration techniques. For, without some sort of model, there seemed to be no way of reflecting the nature of the factors that cause the trajectory revealed in those data.

Now, in dealing with this situation, it is essential that several things have to be made absolutely clear about the usual iterative methods.

They always use an Ideal Form, taken directly from Mathematics, as a basis, which had then been fitted-up to those data, by multiple substitutions of them into it, to give a set of simultaneous equations, in the constants of the general form, which can then be solved. The result is still the same general Form, but persuaded-to-approximate to Reality, BUT only within-the-range from which those data were taken.

They then "re-structure" that equation geometrically-upon-a-graph into a set of iterative-forms. Now, such a re-structuring involves a major geometrical and transformative use, because, it isn't merely a manipulation of the ideal equation. It is actually the use of that formula in geometrically-finding a consequent set-of-forms - one for each variable, that can use a single-known-point, and substitute from it into these derived iterative forms to find another single point, and, thereafter, further points, with each one derived from its predecessor.

And, the iterative forms so derived never change!

Being based upon Geometry-in-Graphs, they are unavoidably pluralistic: for the separation of variables

into distinct directional dimensions, necessarily excludes any mutual influences they might have upon one another. So these iterative forms also perpetuate Plurality.

They are fixed, but their repeated-use always gives new points, but always some distance from the “known” point used, so that the action moves rapidly across the whole range of the “driving” function’s possibility space (along with the usual drift as with all such iterative techniques).

Remember, absolutely nothing new has been added to the original source equation, only-the-means-used to access the sequence of generated points, delivered one-at-a-time. And if, as I am convinced, that original formula is NOT the deliverer of the sequence, but a simplified and idealised approximation, then all its short-comings MUST inevitably be carried over into the iterative forms derived from it, and added to by the effects of iteration itself!

Now, the reader is certain to ask why do these forms sometimes deliver things closer to Reality than the original source formulae? It is indeed an important question!

But, as the only significant change, in the actual plotting, has been the zigzagging-about the whole range of that ideal function, then that, plus the iterative drift, must be what is adding something extra, which can reveal something that was not there in the original idealised equation.

But, that method can surely only be some sort of purely-pragmatic trick. It certainly isn’t here taking us ever-closer to a definitive set of actually occurring situations, but just others in similar-but-different positions, in well-scattered general areas. They are certainly not due to the real physical causes (which are never even mentioned, never mind considered, but only due to our chosen strictly formal methods).

Clearly, though pragmatically, it is also only when our purposes can be at least partially fulfilled by such frigs, that we will use them. But, if our purpose is instead to better understand WHY things behave as they do, then it can only mislead us away from that valid, and indeed, absolutely necessary intention.

Let me re-emphasize, there is the important point that current iterative methods are always pluralistic – just like the original equation from which the iterative forms were derived, it assumes the same additively-arrived-at formal “cause”! And, such will be, for the very same reasons, significantly misleading.

But no Real World phenomenon is driven by a single factor: the general situation will always include many different factors, and crucially, if a holist stance is taken, instead of a pluralist one, then these factors will all affect and, indeed, change, one another to some extent.

Absolutely no other factors are included in the usual iterative methodology – it uses only ONE. So, what should be down to the hidden mutual affects of all the other factors involved, is here due instead to a rigged-up version of the usual method.

And, here it isn’t the actual-contributions, but something-else that may deliver something “similar”.

## The Alternative

So, it is suggested that we address these problems, instead, through the use of *Recursion*, in addition to the use of real points, and absolutely none of the usual pluralist and iterative methods of the past.

With each new measurement, we start by using Difference Methods (or something similar) to reveal what powers of variables are appropriate in the most general polynomial Model. Then use our data again, but now in the usual way to find the still unknown constants of that model.

So far, this sounds like something already used in the past, but there is a significant twist! We do not stick with that form throughout.

So, instead, we now recursively do the steps all over again, including the next measurement made, and repeat the full set of processes, not only with this, but thereafter with every single new additional measurement made.

What will happen is an evolving form, changing with each new addition.

Exactly what the most general form would be, may begin with the assumption of a polynomial. But, if the evidence is against that model, we could add further non-polynomial terms. The crux of the method then becomes the comparison of a predicted location with the real measured one, and a subsequent judgement as to what changes in the adjusted general form might be required.

The original idea for this method was conceived of as the measurements being taken as the body in question was moving (as if we were the riders on a rocket in Space). But, of course, a full, extended set could be achieved, before any fitting up was attempted, and in some complex circumstances, where many dominant influences could regularly come-and-go, for then this method will come into its own.

Indeed, the processes of the method could be carried out completely after the Event, and once sufficient had been processed to get some sort of form, all subsequent positions could be associated with its own version of the form. Also, each new, as yet unprocessed position would be predicted from the current version of the form.

Studying the varying forms could tell us more about the changing-real-influences affecting an overall form, than one that is both always simplified and idealised.

## Postscript

Now, the reader must appreciate that what is being attempted here is entirely new!

First, it rejects Plurality as the current basis for such pragmatic manipulations.

Second, it is attempting to indirectly include aspects of Reality that are usually excluded.

Third, it is purposely recursive, as in the Buddhist Loka Sutta, as a means of constantly checking upon its own validity.

It will most certainly NOT be the last word in this area: it will take some time to break ourselves from “If it works, it is right!” - the credo of the farmed situations that perpetuate Pluralist Science.

## Plurality & Holism, Mathematics & Reality

Thus far, in my criticisms of Plurality, they have been concerned with the fact that it is definitely not true of the Reality-as-is that we actually inhabit. For, that is much more accurately described by Holism.

Yet, despite this major drawback, it was, originally, formally-discovered along with its greatest area of applicability, namely Mathematics, by the Ancient Greeks. And, of course, that turned out to be a truly significant and even a transforming intellectual revolution! For, exactly what it delivered, for Mankind, to use in their Thinking, was both wholly new and extremely profound.

For though, they had been using Abstraction of various kinds for many millennia, they did not know how to handle Abstractions together-as-a-related-system, and in Mathematics that sort of thing was achieved for the first time, and indeed led to it becoming the very first *intellectual* discipline.

And, though it erroneously treated all its various elements as permanently fixed, that is, in fact, perfectly true for what Mathematics actually deals with; it is certainly not always true for where it is then most commonly used - back in Reality!

Nevertheless, that is also the case for literally all the other different kinds of Abstractions too, but, over the usual short time periods usually involved, and levels of accuracy required, both they, and, to a lesser extent, Mathematics too, could indeed suffice.

And, this is because though Change is always active, or potentially so, its tempo is can be so extremely slow, that things can be mostly assumed to be unchanging.

Now, that precise feature is included under the "opposite" assumption of modern Holism, which can recognise long, persisting interludes of Stability, in which a self-maintaining balance, of multiple active elements,

keep things the same, until the balance is ultimately and unavoidably dissociated, and significant and transforming changes finally occur.

Clearly, Stability is always true in Mathematics, and can even be (quite) true in Reality, either in natural situations for limited periods, or in artificially-maintained periods as long as that is purposely arranged-for - this is the case in all man-made technologies.

Now, this all seems relatively innocuous, until the actual assumptions necessary to enable a logically useable system of formal abstractions to be created, is critically assessed. For, they always extract only the barest of abstractions from reality - turning positions into "dots of zero extension" and spatial separations into "lines of zero thickness". For, what were, thereafter, manipulated mathematically were these Abstractions, rather than the really existing real "dots and lines" of Reality.

And all of Mathematics is the same!

It is this nature that exactly what made it have the essential properties that it required, and which were also sufficient for the tasks that were then applied to those forms.

But, the facilities delivered by Mathematics were also prodigious, the whole system of processes involving both Theorems and Proofs, that enabled its subsequent power, so excited others in many different fields, so the same sort of methods, found for Maths, were exported to Reasoning in what became Formal Logic, and later to Science as well: and neither of these were legitimate disciplines to receive such transfers at all.

Nevertheless, they did allow great gains when applied to situations in which things didn't evidently change qualitatively - though in Reasoning the gains were offset, very significantly, by the built-in assumption of Plurality, because it also prohibited any Qualitative Changes from





*Upright Form: Knife Edge* by Henry Moore, 1966

ever being allowed in the concepts being used. In fact, many such changes were rejected as invalid because they appeared to be totally contradictory with what had been used previously.

For, in the 2,300 years separating the Ancient Greeks and the first trenchant critic of that crucial and fundamental error - the German Idealist Philosopher Hegel, absolutely NO *qualitative* changes were ever allowed into Logic.

Indeed, Hegel revealed that changes into what seemed to be (logically) direct opposites, were frequently at the very heart of many really-occurring qualitative changes in Reality, AND, he energetically insisted, in Reasoning too!

Hegel developed his critique from what were termed Dichotomous Pairs of contradictory concepts, via an investigation-and-correction of the premises involved in those concepts. And, his changes turned terminating impasses into forks in the reasoning, and then went further with his Interpenetration of Opposites, into developing an add-on system to include qualitative changes into Logic, a system which he termed Dialectics.

But, the biggest set of debilitating problems was accelerating apace across the now wide range of Sciences, which had also included Plurality from their initial conceptions in Ancient Greece. And, of course, when such investigations of Reality were carried out, they were certain to encounter qualitative changes, but couldn't effectively cope with them, because of the barrier of the Principle of Plurality.

So, what had been Natural Philosophy across all of Reality, was forced to split into an ever increasing number of different sciences, dissociating precisely at these seemingly unsolvable qualitative changes, and, thereafter, into ever more Specialisms, until the final crises seemed totally intractable, and major retreats began to appear everywhere.

But, the solution had been already defined, almost 180 years ago by the Hegelian historian, Karl Marx, with his wholesale transfer of Hegel's Dialectics from Idealism to Materialism, but he was never able to undertake a comprehensive investigation of the implications for Science, and that task is only now nearing completion.

## Multi-variable Relations

### How are they dealt with in Modern Physics?

Considering both the usual problems implicit when studying many-variable, real-world situations, and the classic, but fundamentally-flawed, pluralist stance taken to get around that problem, we see that we don't so much address the problem-as-is, as instead transform-it-successively by removing, or holding constant, as many factors as possible until the problem finally resolves itself into something a great deal more amenable and investigate-able.

We usually justify such an approach by calling upon the Principle of Plurality - a handy, commonsense and simplifying premise, which sees all causative factors as both separable and fixed - the world is assumed to be delivered by eternal Natural Laws, so, by such methods we are effectively aiming at a single one of those laws - "thereby revealing it and then extracting it, we explain".

You can see why I insist upon calling this process Pluralist Science, can't you? For, the assumption of separate and unchanging laws is not the only possibility! Indeed, at around the same time, historically, as the Greeks were settling upon Plurality as the best way of understanding Reality, over in India, the religious leader Buddha, had arrived at the opposite Holist stance. And if everything can potentially affect everything else, the whole Pluralist approach is rendered invalid! The rigorous tailoring of the investigated situation would change all the active factors still remaining, from how they would have functioned in the natural, untailed case, originally being addressed.

But, before addressing that enormously difficult alternative, there is still a great deal more to be made clear about our usual methods.

So, returning to the standard pluralist approach in the common situation delivered by many simultaneous causative factors, it is clear that we must repeat this whole process, for each and every one of those originally present factors. And, in each case, we will first tailor the situation to both highlight and select a different factor, and then, once again, take the situation over a given range of what we term the independent variable, while measuring the corresponding values of a single dependant variable.

The classic next step is then to match a known Pure General Form from Mathematics, and use the gathered data to transform that generality into a specific-tailored-match to that data. We say we have delivered one of the eternal Natural Laws governing one factor in that original situation. Yet, how do we make use of such extractions?

We still need a great deal more than the usual pragmatic "solution" by attempting to deliver something of the original natural situation, by dealing with the full series of two variable situations, extractable from it, and to then somehow attempt to deliver the same overall result, via the successive use of that whole series of such implementations, one after the other.

But, clearly, only if the Principle of Plurality is true, will such an approach be a reasonable route to take.

If that opposite Principle of Holism is closer to the truth, then all such pluralist methods cannot reveal what is actually going on in the complex, real world situation, and will be at best merely a set of means of arriving at "predictable" pragmatic result which may only very inaccurately resemble the real world situation we are attempting to replicate.

Indeed, a very much stronger denunciation is absolutely necessary!

For, in the current approach, any attempt to actually understand a situation has been totally jettisoned, in favour of a purely pragmatic production of something similar, and without any dependable explanatory content whatsoever.

Let us be blunt: Explanatory Science has been replaced by deliverable *Technology!*

And, in a Society where, selling something new for profit always trumps attempts to understand an interesting new situation for its own sake.

We should expect nothing else!

But, let us explore further what we actually do with our extracted pluralist Laws, and, in particular, go beyond the simple two variable equations.

Quite separate to the pragmatic applications, as above, we have Purely Formal replacements for the now abandoned Physical Explanations, that can be explored together, at length, on paper or the blackboard, and this means of unifying the individually produced "Laws" is termed "*Theory!*"

For, clearly, only if such laws are unaffected by the presence of many others, can we not be able to actually "sum" the extracted equations in some way.

After all, the belief is that we are only assuming a variation in the amounts of all those "supposedly-fixed laws" to

contribute to a single variable's value, so apart from an all-embracing quantitative Constant for each, the individual component laws themselves will be the same and can be added in as separate terms in an overall equation.

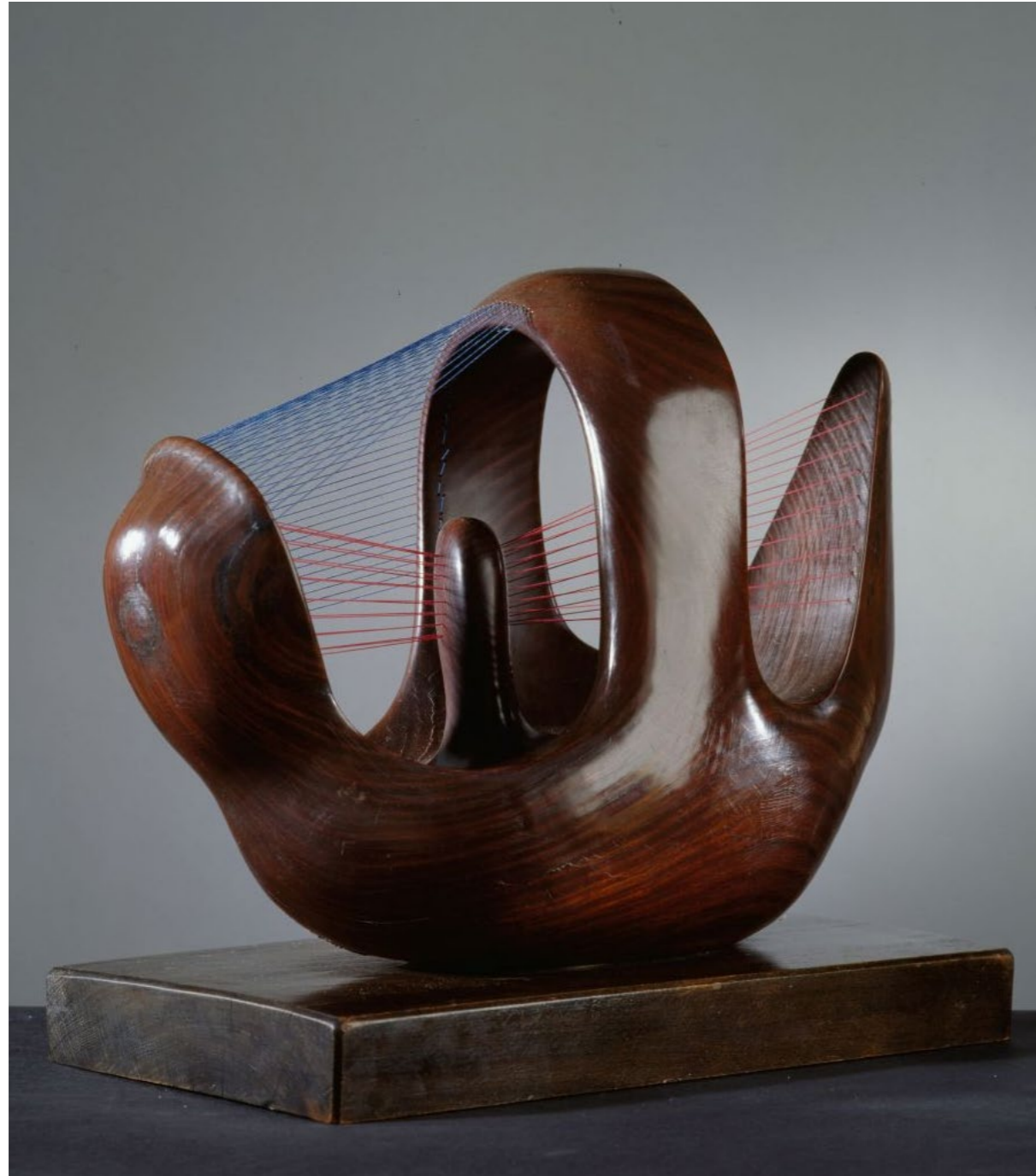
A Combined Theoretical Law composed of separate terms, each with its own quantitative Constant, is supposedly to represent the combined, real-world, original case. And, as far as possible, data are used to regularly adjust these individual-law Constants, until the overall Equation, to some assumed-to-be-adequate-extent, delivers!

But, even then, it is never applicable in all circumstances.

For, we have the problem of Singularities!

Remember, what we have constructed is a tailored trick (judged by the ancient pragmatic principle - "If it works, it is right!"): it has been carefully adjusted to deliver reasonable answers, within a given range, but it is only a purely formal construction - it includes NO real Causality. So, each and every one will only deliver within its own implicit Finite Range - outside of which it will simply blow up! And, such inevitable failures are the famous Singularities. So, the important question has to be, "Why?"

If you were an old fashioned explanatory scientist, you would have separate physical explanations for the contributions in every contributory pluralist component law, so it would be possible to suggest what variable may have changed too much and caused that component to fail. It would still have its weaknesses, however, because of the fact that the laws in the full complex natural situation will be different to the versions we have, and



are, using, here. And, in addition, it is unlikely to be a single “component law” that causes the overall failure, but instead some complex inter-relationship between the full set of varying factors in the real world complexity.

And, even if a failure or Singularity both occurs and is predicted, what form that singularity takes is unlikely to be predictable.

And, all this being the case, the whole Nature of such purely-formal “Theory”, in what passes for Real Theory in such a mathematical tradition, will at best be technologically used, and will be useless in developing any physical understanding whatsoever!

What Modern Quantum Physicists do theoretically, has relevance only in the Colliders where everything is situated: it is pragmatic to that technological environment only, for nowhere else can their “Theory” be used - for they have NO control outside of that limited domain.



## Dialectical Emergences

### The True Mechanism for all Qualitative Changes

There is an increasing mention of Emergences these days, in the academic literature within Physics.

But, though it does at first appear to be anti-Reductionist, it also reveals no clear alternative to that stance - and certainly delivers no changed philosophical bases to the premises, which historically led to such a stance.

And also, in current Quantum Physics, in several different cases, it still appears as a physically inexplicable appearance of the New. But, with no causal explanation of how such things occur, the only conclusion (as usual) is that it is some statistical flip, in a complex milieu of all-possible random circumstances or eventualities.

But, that is nowhere near good enough! It puts down all significant development to a *chance* selection from an enormous set of alternatives that deliver absolutely Everything!

No, that is NOT an explanation. As with all mentions of chance, it is a substitute for one.

Clearly, a Real Emergence can never be dealt with in that way, for it, of itself, can open doors to things that have never-occurred-before, because the necessary means were then totally unavailable, but which, entirely due to the Emergence, have dramatically now been made available, so subsequently, each innovation can finally begin to be explained in terms of its causes.

So, what actually prevented this happening before? The answer is always the past, ultimate achievement of a persisting balance of multiple processes, allowing some things to possibly occur, but at the same time, actively and totally-effectively preventing others.

Such a situation is termed a Stability!

And, it often gives the impression of being permanent - as if that is now, *and always will be*, exactly the same!

Such naturally persisting stabilities persuaded Mankind that Plurality is correct - so that all laws are fixed and unchanging, and so we can therefore assume that Stability is The Defining Norm of Reality.

It was a mistake, of course! But, what makes Stability so? Why can it persist so long? And, why does it ultimately always totally fail at some point - within an Emergence?

And finally, what exactly is an Emergence, and what constitutes its trajectory of changes?

The answers to such questions were not immediately evident, and the crude initial ideas of "Randomness", merely prevented any detailed investigation of the usually involved substantial collections of simultaneous, diverse processes, especially as the Principle of Plurality makes them totally independent of one another and unchanging.

It therefore required consideration of the opposite Principle of Holism. For, this totally changed the dynamics of such combined populations. For then, no individual process would always and incessantly perform in the very same way. And, it would also crucially require resources, occur in given natural initial abundances, and deliver consequent products, within a mix of simultaneous processes, all of which could clearly affect the selective performances of both it and all the other various processes, and even the consequent (temporary) dominances of the most aptly served processes.

Indeed, to get a handle upon such systems, this researcher had to tread a truly remarkable route via pre-Life developments, prior to the Origin of Life on Earth, and even the very different solution of problems of Access and Control in Multimedia Aids - for use in accessing recorded footage, developed for revealing the true complex creative Movements in the Teaching of Dance Performance and Choreography!

Indeed, all of this was crucial to enable him to address the necessary problems in Dialectics to be sufficiently prepared to tackle the precise kinds of problem addressed here too.

The most important area, of course, was in the dynamics of complex, multi-process, mutually-interacting systems, and their constant drive towards a "balanced Stability", wherein both conducive and competing systems of processes form relatively-constant, self-maintaining balances, usually with a clearly evident dominating-main-process, actually hiding the contributions of the other allowed and continuing lesser processes.

Indeed, such Stabilities would always appear permanent, due to the way we do experiments, but that would never naturally be the case, as every one would suffer partial undermining, but usually somehow, re-establish a similar balance.

In time, however, the challenges would become more serious, and mature into a Crisis - until finally the overall Stability would completely collapse, always involving the total dissociation of the whole system, and, apparently, heading for Total Chaos, but generally upon reaching some Nadir of Dissociation, a new sub-systems would begin to become successful, until finally a very different balanced Stability would become established instead.

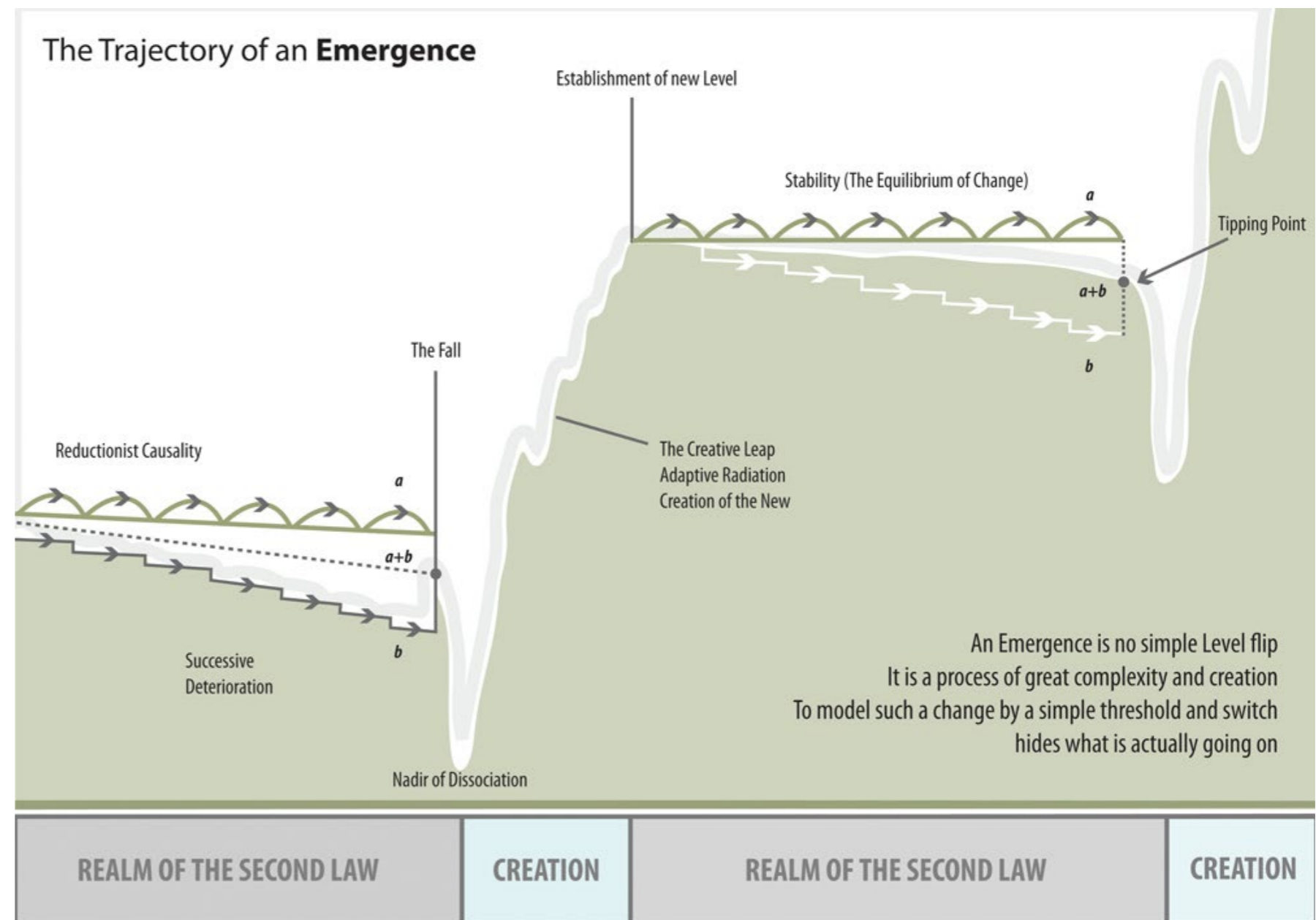
Indeed, this researcher published his *Theory of Emergences* in 2010, of which the Trajectory of an Emergence (opposite) was a key diagram.

In this theory the whole process from initial Crises to new Stability is termed an Emergence.

Clearly there is a great deal more to Emergences, than the inadequate mentions currently occurring here, which has also matured into an Alternative Theory of the Double Slit Experiments, and a comprehensive Condemnation of the Copenhagen Interpretation of Quantum Theory - all by this author.

Now, clearly, this is a major development from Hegel's purely idealist version of Dialectics, and though something similar was implicitly-built into Marx's treatment of Capitalist Economics, in his *Das Kapital*, this version is clearly transformed by its comprehensive application-to and enhancement-by its journey through Modern Sub Atomic Physics.

So, as it was for extracting from *Das Kapital*, to fully appreciate Marx's achievement, so it will also be for the wholly New Theory of Sub Atomic Physics to reveal new aspects from the first comprehensive application in the concrete Reality of Physics - for Wave/Particle Duality, Quantum Entanglement and the whole of the Copenhagen Interpretation of Quantum Theory, all totally perish by means of the new holistic approach.







**SHAPE JOURNAL**

[WWW-E-JOURNAL.ORG.UK](http://WWW-E-JOURNAL.ORG.UK)