

The background of the entire page is an abstract, dense composition of thin, vibrant lines in various colors including red, yellow, blue, green, and purple. These lines are scattered and tangled across a dark, almost black, background, creating a complex, chaotic visual texture. The lines vary in thickness and orientation, some appearing as straight streaks while others form loops or curves. The overall effect is reminiscent of a complex network or a chaotic system.

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**THE
SYSTEMS
THEORY
OF EVERYTHING**

PART 1

JIM SCHOFIELD



The Systems Theory of Everything I

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Art Director's note

The illustration in this series of issues on Jim Schofield's new Systems Theory, draws heavily on the genre of fine art known as action painting, of which Jackson Pollock was the most renowned exponent.

The reasons for this choice are more than aesthetic.

Action painting marked a sea-change in approach during the 1950s, in which process and method became more important considerations for the artist, than the final image created. The movement also saw a renewed acknowledgment of the painting's own materiality and objectness, not as an illusory depiction of some scene or person, but as a trace record of real matter, motion and time.

The approach of abstract expressionism may have been intuitive, with the artist responding to the changing canvas, but it was also often the result of a repeating schema or cyclical systematic approach to mark-making. This can be seen as an interesting analog for natural systems and their emergences, where simple repeating processes and feedback loops result in systems capable of responding to changing conditions, and can lead to seemingly impenetrable complexity - even the creation of entirely new forms of matter. These are universal phenomena that reductionist science has never been able to fully understand and explain. The Systems approach to reality attempts to address these shortcomings...

To further illustrate these parallels, action paintings are juxtaposed here with images from science - namely the Wellcome Trust's annual photography awards.

Introducing Jim Schofield's

Systems Theory

Mick Schofield

This series of issues attempts to set out the first definitive account of Jim Schofield's new Systems Approach to Science. The various papers collected here, and over the next few editions of this journal, explore the proposed theory and explain why it is such a radical departure from the current universally applied scientific method.

While working on the recent YouTube video "Taking Shape: Denis Noble and the Systems Level Approach" (2022), it arose in discussion between myself and Jim, whether or not "system" was even the right word to use for these ideas. Schofield's revised view of natural systems is certainly not the usual one. They are not "systematic", mechanistic or carefully structured in any way. They don't follow universal laws and rules. They are dynamic, contingent and emergent, containing contention and contradiction. They can be hidden, vastly complex, and sometimes seemingly chaotic from our human vantage point. Many are stable and extremely long-lasting, and are routinely misinterpreted by scientists as eternal and fundamental laws of nature. Schofield's view of systems is Holist and Materialist, arguing that the holistic understanding of how natural systems evolve and maintain themselves, is vital if we are to really appreciate how things come to be, and why they are the way they are.

There have been systems theories before. However, the scientific study of systems has historically been hamstrung by pervasive reductionism and the formalisation of entities, laws and causality. In Sociology, for example, Systems Theory was actually a conservative approach to the subject that saw society as basically functional and explicable via person-to-person interactions.

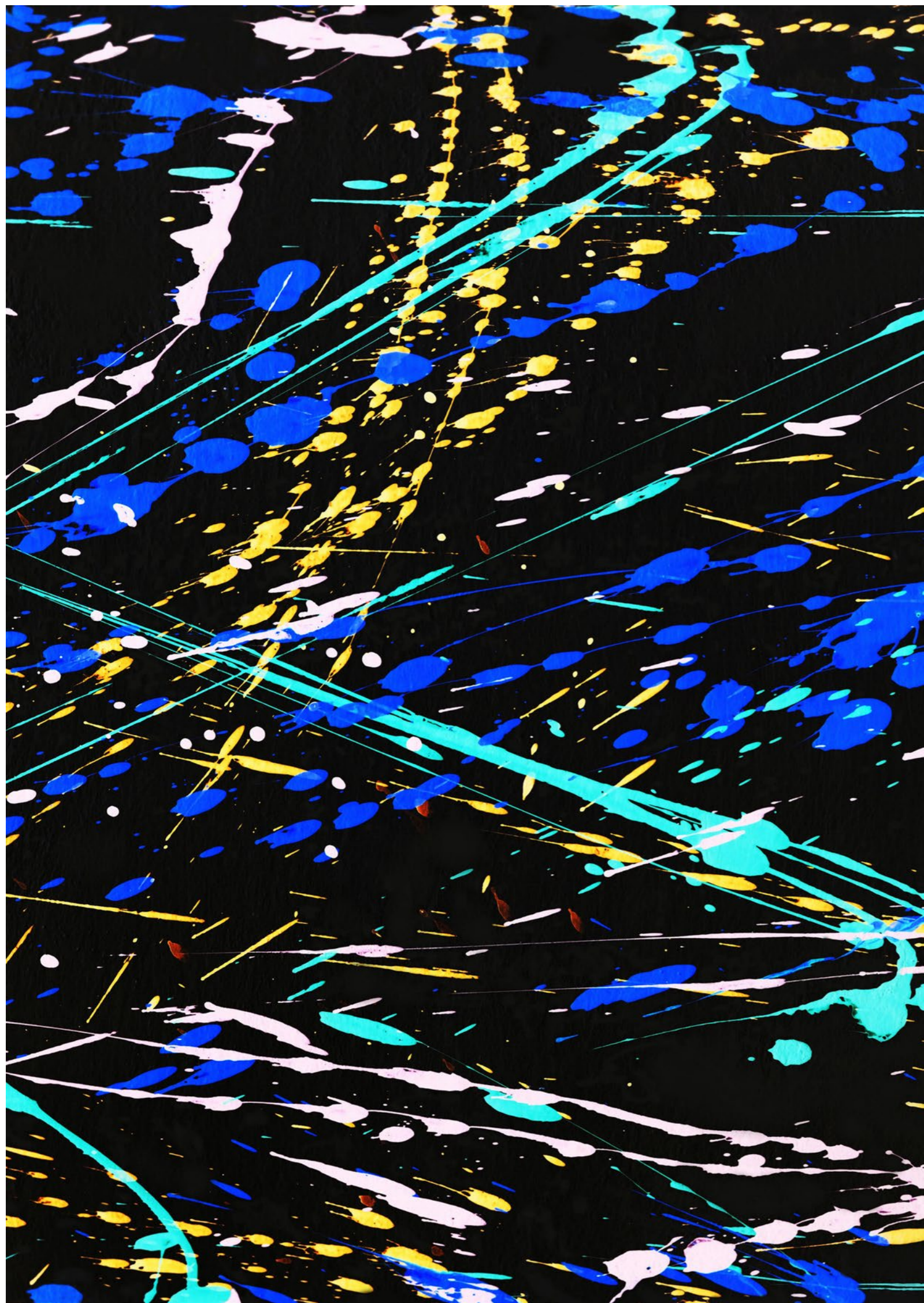
This approach was dogged by a rigid and ordered way of seeing things and was largely rejected by Marxist sociologists in the 1970s, which favoured examining conflict, change and contradiction, as the key driving forces underpinning social conditions. Similarly in systems engineering, machine logic, computer modelling and mathematics, systems are widely used but still conceived of as the complex but predictable interactions of fundamentally reducible elements and rules. This demonstrates the importance of epistemology, politics and a critique of the scientific method, in moving the study of systems forward - beyond the usual approaches, and towards one that embraces the vital roles played by interconnection, contention and hidden top-down effects.

Missing from many approaches to systems is the role that different Levels of Reality play in its composition and evolution, with causality often happening at a much higher systems level than the ones scientists currently seek data in for clues.

The Philosophy of Science must look to other disciplines for ways of dealing with such phenomena, from art to politics, from Buddhist Holism to Dialectical Materialism, the basic ingredients for a new Systems Approach already exist. But first we must look at how the usual scientific methods fail to appreciate the role dynamic natural systems play in everything that we try to study and understand.

The series begins with a look at cycles in systems, and the vital role cyclical processes play in both maintaining stability and instigating radical change.





The True and Profound Significance of Natural Cycles

Jim Schofield

A key understanding in my new Systems Approach to Science, is the importance of interrelated Natural Cycles, constantly occurring at all different Levels of Reality.

In a recent *See the Pattern* video on Youtube, Gareth Samuels hinted at this same epiphany, revealing various surprising New Cycles, occurring at literally all possible Levels of Reality, but concentrating most upon the variations in Cycles which he had extracted from Astronomy, and which he has linked to those within Historical Ideas in Astrology.

As usual, it must be said, he attempts No Causal Explanations of these fascinating observations, for, as always, he puts his sole trust entirely in revealing ever more accurate Quantitative Measurements, which he seems-to-believe will entirely alone, result in our Understanding of the actually causing interactions.

But, it is, I'm afraid, just another example of "the data will reveal all" stance of the "Engineers". I'm also fully aware, that it is in fact, a wholly mistaken and misleading approach, in all such investigations (even those purporting to be justifiably scientific). For, that has led inevitably, over the last two and a half millennia, to the error of endowing all Explanatory Truth solely to Quantitative Data, and their relationships embodied in Mathematical Relationships alone.

Now, this has to be wholly inadequate, as such relationships only appear, and are employed, entirely as exclusively Fixed Laws, which are certainly NOT what can explain the vast majority of Reality-as-is, particularly its evolution over time...

Unfortunately for Samuels, "Seeing the Pattern", is not enough! A "pattern" can only ever be an abstraction and a fixed simplification.

For, what is missing in such a mechanistic approach, amounts to two major and misleading oversights. First, there are always many such Effects both present and acting simultaneously in a given natural System, AND secondly, they can also definitely affect one another, and as such, affect any overall outcome.

The reductionist assumption that such processes are somehow independent, extractable and merely SUM together to create the whole, with only the measurable *amounts* changing, is certainly wrong! For, mutually-affecting processes can effectively flip the current Dominant Effect of a System, to a vastly different alternative (as in an "If / Then Clause" in a computer Program). And, when they are also diametrically opposite Effects, they can even totally cancel each other out. And when the processes involved also constitute integral parts of Chains or Cycles of such processes, they can, and indeed sometimes do, cause a total cancellation - terminating the entire System.

Clearly, the unacknowledged assumptions of simple summations can lead to massive gaps in our scientific knowledge. Particularly when that is coupled with the way that we encapsulate all such interactions solely in terms of Individual Components, brought together in general Equations, as if, every single Component of such a System is naturally lined-up ready-and-waiting for its turn, in a natural sequence.

Now, such a simplification can be nothing like the actual ways real interactions and reactions take place in such multiply-involved natural situations, and even competitive random-mixes of many possibilities, all attempting to happen at once. The consequently Ideal Mathematical Equations, as we reduce such situations to, must be a very long way from what actually occurs! Indeed, so much so, that they NEVER, as a Full Set, actually deliver what happens, but only an idealised and totally separated version of just an abstracted part of what really occurs in nature.

The Real Situations, outside of the rigidly-controlled experiments we rely on for most data, include things that don't even occur in those Equations, and which can actually exclude other results that indeed do!

Any straight-forward study of any natural phenomenon, undertaken exclusively via such idealised Equations, does NOT deliver everything that actually occurs as part of it: so that the accepted methods, employed-universally in Science, always fail to fully replicate the richness of natural situations. Indeed, it has become the norm, both in investigations and in production, to so radically restrict situations as to make them conform to our prior assumptions: but, of course, they, therefore, NEVER reflect Reality-as-is, and hence the Real relationships all around us!

Now, there are approaches that attempt to deliver all that occurs: but they involve an absolutely essential and Developed Theory, to interpret what evidence they have, correctly! For, Theory attempts to *explain* phenomena in terms of Causes and Effects: due to known properties from the Real World, so the artificial separations of the ideal Equations DO NOT happen as they are predicted to, within those Idealised Equations.

Indeed, long before the anomalies in Physics addressed by Samuels, there have always been others, which are never explained, but are just added-in (because they certainly do occur) without any explanation or modification due to Context.

Indeed, it was these increasingly evident, yet unexplained features that deliver the reasons for the final effects, that became the supposedly clinching arguments, for the triumph of Positivism, in the early 20th century, commenced initially by Poincare and Mach.

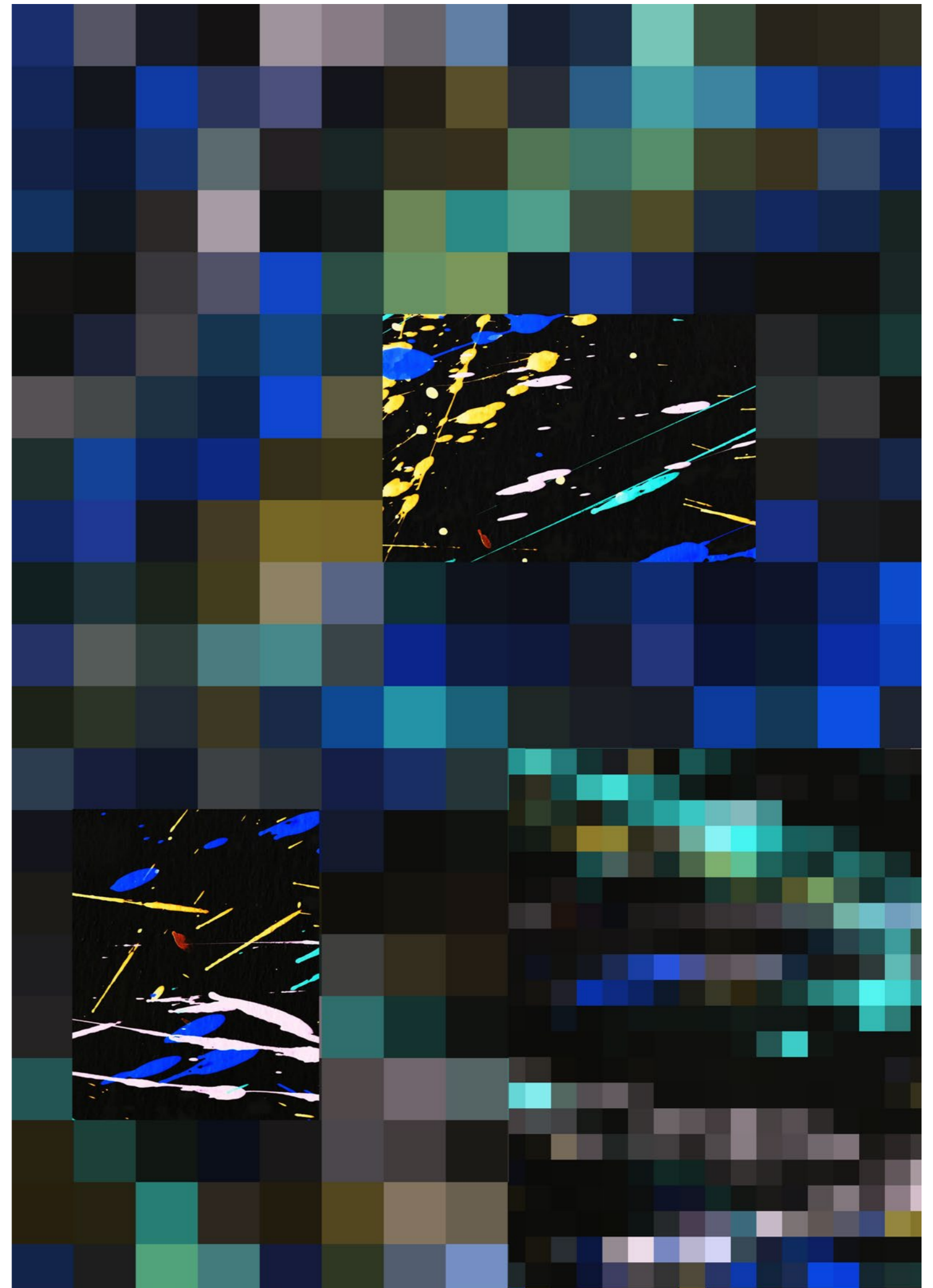
But, long before the major changes in representing the seemingly-revealed Laws, the actual experimenters-and-deliverers had long been severely restricting-and-maintaining absolutely all involved Contexts, so that the very same situations and consequent outcomes were always assured, and could therefore be relied upon, also in using the results within Production in the exact same Contexts. The same restricted conditions were always required for both!

And, of course, the "Tail" of such-well-established Practice, also wagged the "Dog" of representation, and the consequent restrictions DID indeed enable the simplified way of representing what was going on within wholly Fixed Laws - as it was precisely those very restrictions that distorted the actual Natural Laws in the first place - into what I term "Pluralist Laws". Meanwhile Reality-as-is, outside of our technologies, remains steadfastly Holistic - the opposite of Pluralistic. Reality's Holism is always clearly demonstrated by long-term and wholly-unrestricted Developments, in particular with both Life and Evolution.

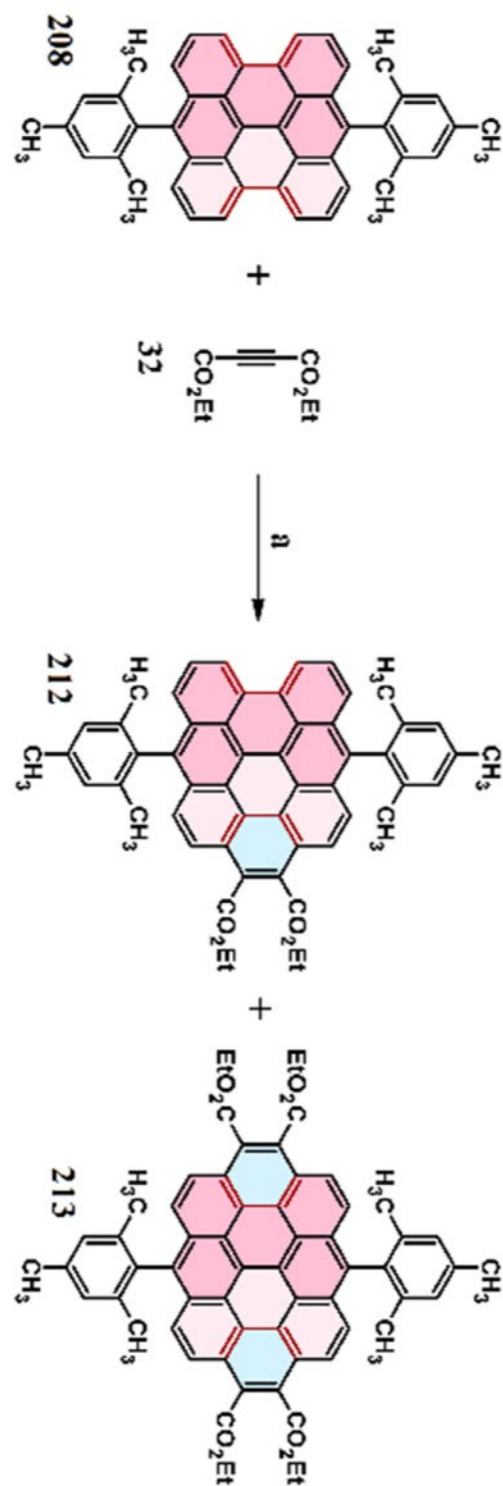
Now for the Evolution of *Science*, such a tight-and-closed System was, in its day, a remarkable achievement, not only for its evident consistency, but indeed for its prodigious technological successes! For, though it DID NOT reflect Reality-as-is, it did deliver working situations, even if necessarily divided into multiple differently controlled stages. With technology we built a parallel Reality we could control.

But, of course, the necessary artificial conditions for this could NOT be both established-and-maintained absolutely Everywhere! Only a network of entirely non-mutually-connected-sequences were ever possible! For, after each such process, the work would have to be physically transferred to the next ideal setting: so such a System could never, overall, tackle everything within Reality-as-is : for in spite of the technological success, absolutely NO Explanations linking all the necessary steps is ever possible with this Approach. Indeed, any overview of what is established, cannot but reveal just how much is never included!

And, of course, outside of mere productive imperatives, there is truly vast amounts that need to be understood, in order to develop Explanatory Overall Theory, without which absolutely no Real Understanding is ever really possible!



The True and Profound Significance of Natural Cycles II



Now, this clearly being the case, let us see what the “Experts” in our Universities do to educate our scientists.

They simplify the real multifarious-and-complex situations of Reality, to match their extracted constrained relations, by addressing only Single Molecules, which they purely-formerly relate (regardless of Context) to match their productive extractions in experiments within wholly NON NATURAL circumstances.

This, they have successfully done! So that their Simplified Equations do mostly address, their productive Processes. But, neither of these get anywhere near matching Reality-as-is. Indeed, they constitute a severely reduced-and-distorted Sub-World, well-within, but wholly different-to, the all embracing Reality.

And, most damaging of all, No Real Theory of that Reality as-yet exists within Mankind’s ideas, and instead, only those relations extracted from carefully limited-and-maintained Sub Divisions are wrongly regarded as “Reality”- for such are limited-exclusively to only those relations rigidly conforming to Mathematical Rationality, and therefore only delivering Fixed Laws!

And these, of course, DO NOT reflect the “Laws” of Reality-as-is, which must be entirely Holistic! And these alone, allow the Really Existing Laws related to the Systems of such multiple simultaneous Laws - AND their consequent adjustments within Chains and Cycles - to give us ultimate developments into the Wholly New...

Systems Theory has been sketched out before in this journal, but it is now necessary to begin a much fuller and deeper effort, by a much more detailed and revealing account - as I am absolutely certain that the now essential and coming Theoretical Revolution, is crucial for literally all of The Sciences, and consequently, thereafter, for all subsequent Thinking in general too.

And it CANNOT be the usually-applied narrowing and simplifying type of adjustments-and-omissions, as has always been applied heretofore, OR even one based upon some singular new discovery - BUT, instead, a wholly New Approach, based upon a valid appreciation of, and a required correction to, the actual Trajectory of Human Thinking thus far!

Because it was, when it happened, and, for the Very First Time - only within Mankind - that we saw this wholly New Development in Reality. And, that Trajectory just had to be determined by Man’s then-current extremely-precarious state - endowed ONLY with this wholly new, though, as yet, totally undeveloped ability - to attempt to imperatively conceive of New Ways to even survive, and, at that stage, certainly NOT at all to prosper, as their conditions of Life had varied dramatically, with a truly Major Climate Change! For, in spite of their obvious physical inadequacies, Human Beings did already exceed their opponents, if only marginally, in their evident Ability to *Think*. And this, remarkably, also led to physical changes, more or less incidentally, due to their choices of where to live, so that, in time, it also gave them another important set of advantages, including the ability to travel vast distances and create tools - features that then changed the entire world.

It was, by no means, a conscious development! Indeed, it was never an intended feature, but a physical consequence of how they had to pursue their prey at the time, along with what New Things they could do to them, when successfully caught-up-and-killed them! For, in addition, their intelligence had also enabled them to conquer-and-safely-maintain *Fire!*

And that intelligence enabled them to adopt remarkable hunting techniques, never based upon speed, but upon skilful tracking and steady pursuing, over long periods, of the swift but very short-winded food sources! And again, unintentionally, these methods led to significant changes in human’s bodies: they lost their furry coverings, had developed the ability to sweat, which kept their body temperature down, along with other changes, and most significant of all - they developed a remarkable physical resilience, so they could out-run their prey - to drive them to their consequent total exhaustion, so their pursuers could then easily kill them!

For the first time, the shortness of all individual human lifetimes, along with the changes in their offspring, brought about also by many very much later, cultural effects, via Training and Education, began to accelerate evolutionary development at a remarkable rate.

NOTE: My own paternal Grandmother could neither read-nor-write, yet I achieved a Professorial Level Post in a College of London University, after posts in Universities in three different countries -- so such rapid developments still continue!

These kinds of developments continued to be added to, but the last totally-transforming Revolution in Human Thinking was, in fact, the Greek Intellectual Revolution in the 5th century BC - which remarkably still greatly underpins what we do in the Sciences to this day.

And, that series of related gains was only possible, by means of a whole set of mutually-supportive-assumptions, that apparently, but mistakenly, removed the contradictions between the well-established, pragmatic approaches of the “artisans”, who successfully made many implements and structures, such as functional carts and boats, all based upon the simple principle “If it works, it is right!” AND the achievements of the Greek Philosophers in soundly establishing Mathematical Rationality, and hence both Euclidian Geometry and the Logical Consistency of All of Science - BUT ONLY, formally - that is - treating Mathematics as a Set of Forms, rather than a *description* of Elements of Reality-as-is, which accordingly made all the Laws involved Permanently Fixed! And, of course, that is NEVER true of Reality-as-is. As, otherwise, Real Qualitative Developments involving the Wholly New, could never emerge: and Life and Evolution would be impossible!

Now, the above alternative introduction to this series, was considered a necessary foundation before re-embarking upon an investigation of the true Nature of Reality-as-is, which in all the usual attempts at explaining things has been extensively ignored. So, let us commence with a systematic attempt to correct those wholly wrong and misleading assumptions, and consequent “Supposed Explanations” of what is actually really going on.

First and foremost, the supposed extractions from Reality-as-is that are always made: they must be condemned out-right: for ONLY SOME of the elements present are *selected out*, and such a move ignores what has been left behind.

The basis for believing that such a selection will simplify the revelation of interactions involving that very limited subset, is never delivered for Reality-as-is, and the reason is that for literally millennia Mankind has always intervened in specially extracted, and maintained-as-such, areas, wherein such required extractions were entirely valid, so as long as those required restrictions were maintained, any conclusions arrived at solely from that subset would be both valid and useable there.

Indeed, the whole basis of Science had, ever since, been addressed that way, and indeed successfully, for many, many years. But, such artificial conditions are not always possible, so, still, the majority of Natural Changes, will only be occurring within Reality-as-is - by which I mean the Universe beyond our direct control.

Indeed, the controlled situations ONLY apply to certain achievable limited conditions, AND particular externally conceived-of and applied objectives. There is NO Single Restriction appropriate for all possible required interactions. Indeed, even the simplest of productions requires a Whole Series of very different-and-maintained Contexts, to be sequentially used in any Successful Production.

And, this is because Reality-as-is cannot, as such, ever succumb to such processes in their Natural States: the situation just has to be divided into, and then maintained, as, a whole series of much simpler and rigidly-controlled episodes, to ever be amenable to our primary approaches:

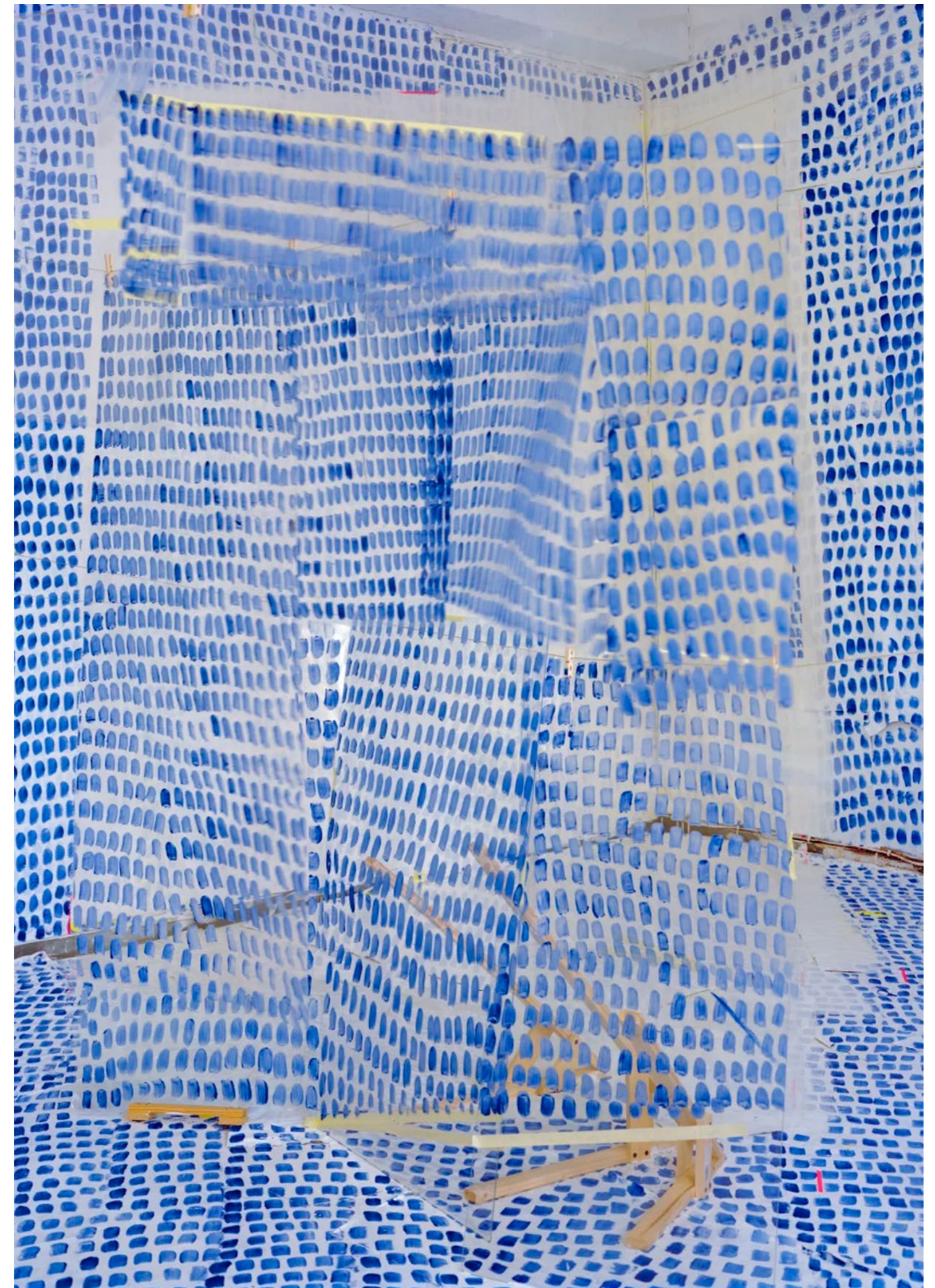
Analysis,
Prediction,
Intervention,
and Use!

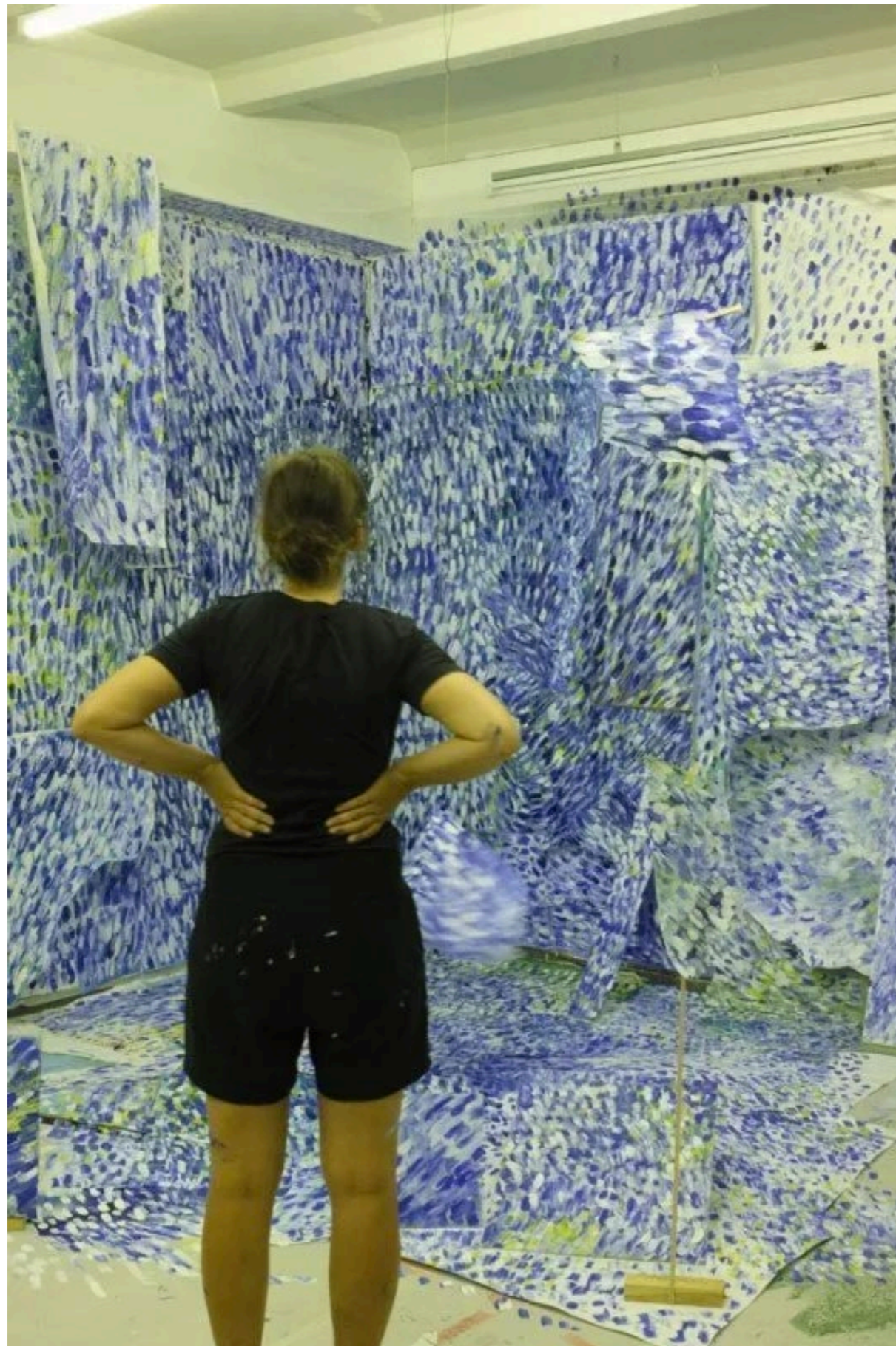
And the reasons for this are never established and thought about! So what are they?

The way we were forced to conceive of Reality, was laid down millennia ago, because the Natural Situation AS IS will never allow any such process to be inflicted upon it, without radically altering it first and transforming it into something else! So artisans of those times learned to radically change a context until their intervention would work. They effectively held Reality still!

But, such control would only work for a single intervention: so they had to re-control things differently, for each-and-every step - so they were NEVER working with Reality-as-is, but with a series of very different situations, each of which allowed a single change only. But, of course, they were always working with different situations - even with a single initial intention.

They, therefore, got a Pragmatic result - OK in Production, BUT totally useless in revealing how things happened naturally in Reality-as-is. And hence, such pragmatism would be useless in revealing how Natural





Changes - and even Natural Stabilities, as we shall see - are normally established, without the extra stabilizing interventions required of Man!

And, it is worth reiterating again that this was the basic method employed throughout All of The Sciences - and by definition this wasn't really Science at all - what we were doing most of the time was *Technology*.

So how should we approach *Science*?

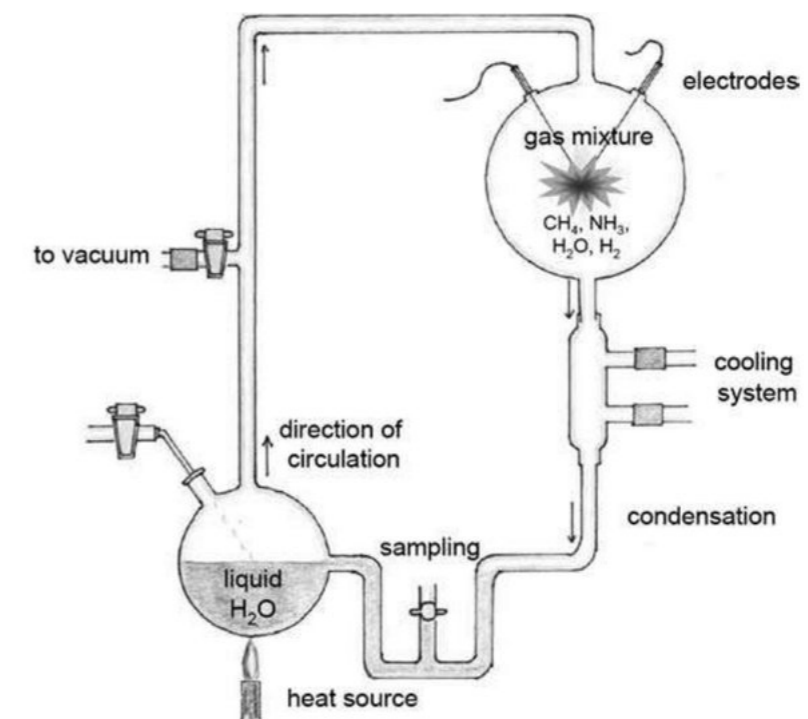
Many years ago, when confronted with the failures of Stanley Miller's remarkable experiment concerning The Origin of Life on Earth, I embarked upon an attempt to correct his methods. For, after all, his revelation of the origin of Amino Acids was still highly significant!

I attempted to make a New Analysis of all that would be simultaneously happening within Reality-as-is, in the Natural Situations occurring then: and I realised that the various ways we have were determined exclusively by the Pragmatic Means of the Artisans, whereas Reality would

be much more "chaotic", with many many different things all happening simultaneously, and in both Chains and Cycles, all jostling-for their next required stage in each of their own various overall, multi-stage Processes!

In other words, our idealised way of representing and manipulating such processes was never as simple as we always made it. The standard Scientific approach, even that taken by Miller, meant that we always missed a lot of the subtlety, complexity and hidden processes necessary for evolution and development of new Systems to occur.

So, perhaps, we have finally established a sound basis for coherently addressing *The Systems Approach* in the next paper...



The True and Profound Significance of Natural Cycles III

The Systems Approach

The time has finally arrived, to systematically establish the foundation of what I have called *The Systems Approach* to Science.

Studying Natural Systems, holistically, and as we find them, is essential in re-addressing Reality-as-is, rather than the usual approach, of first establishing a severely limited and cut-down version of that assumed context - yet always rigidly defined by what basically keeps that context exactly-the-same, and does so by mimimising, or even eliminating, most of the active elements usually present in unfettered Reality, so that only those imposed-by-the-observer, would be allowed, and, hence, the consequent effects still produced, would be limited solely to those alone.

It amounted to Science NEVER addressing true Reality-as-is - the prior Natural State, as that would not only include all sorts of hidden active-elements, but also many different, and even contending ones too! It was historically, essentially, the requirements of the Artisan, and his purposes, that were necessarily paramount - for only by such means, could intended changes ever be implemented-as-intended, and no others!

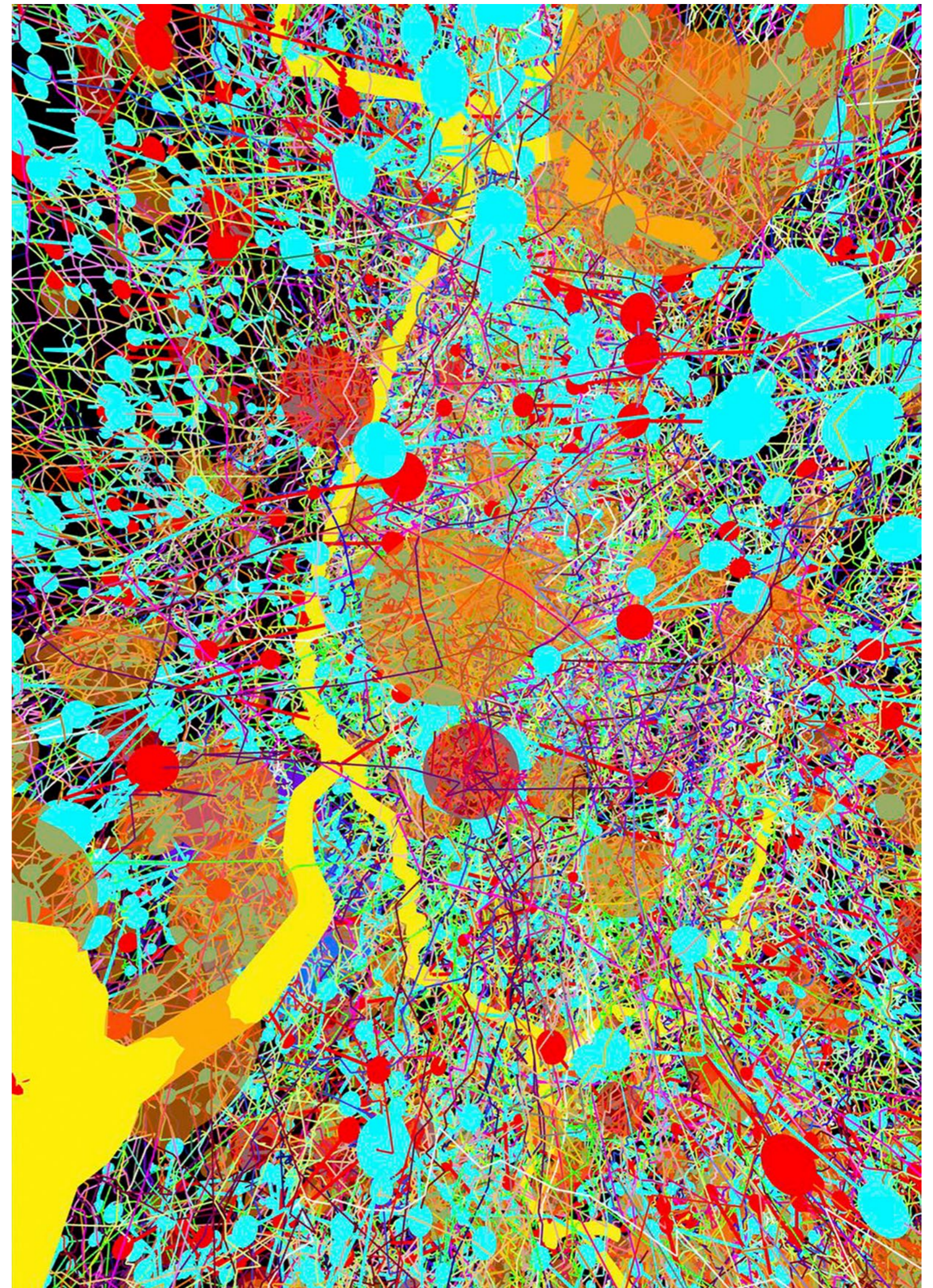
It was generally seen, by literally everybody, as a necessary-revealing requirement, suppressing all other unwanted variables and effects to allow only intended ones to act alone.

Now, if on the other hand, we also need to actually "Understand" The Real, Natural World - both as it is now, and how it has developed to reach this present State, AND, to, thereafter, further develop from now onwards: we simply must begin investigating Reality-as-is!

And, once outside the meagre influences of Man, such as in the Cosmos-at-Large, absolutely everything will be down to a totally un-edited Reality-as-is! So, clearly, all Basic, Generally-Applicable Theories MUST be exclusively-based upon Reality-as-is too - for Universe-wide, that is its Real Content! And, though we can have "useable systems" based upon Reality-as-controlled-by-us, it will never answer the more fundamental questions about our World and the Universe that contains it! Or, even address our self-inflicted Crises here at home, such as those now besetting us on all sides, whether in the changing climate of Earth or the failing economic systems of Human Society. We must KNOW how we have distorted Reality-as-is within our own realm, and what to do to avoid planet-wide potential calamities!

Of course, directly opposite to the usual requirements imposed upon Reality-as-is, for ease of all human interventions, are the requirements identified above, that will unavoidably need the fullest possible original content, indeed, to deliver the actual Source Reality-as-is - representing The Wholly Unmodified Natural World. So, we need, to accurately describe, exactly what occurs in that original state, and, therefore, enable it to ultimately deliver the whole range of actually required contents, that will alone then be simultaneously initially present, and hence absolutely crucial in determining all its potential-natural-possibilities of Developments, and deliver all possible potentials for selective reduction, or vital revelations too!

And, these will be nothing like the usually required, and drastically reduced contents required in most Man-devised situations and objectives.



Let us, then, alternatively begin to describe their real full-and-original natures - and, consequently, their actually possible forms: for even in other crucial, Mankind-required-situations, indeed those where they will certainly start as true examples of Reality-as-is, and hence have to be radically altered to fit their now-required-state! The question is, "Can that transition always and ever be easily, straight-forwardly and accurately attained?"

A given context in Reality-as-is will have to contain the contents required for any particular limited aimed-for Objective Content, and that will occur as individual Molecules. But, as distinct from the usually-considered contents, they will NEVER be there alone! Indeed, along with many multiples of the required molecules, there will also be multiples of many others, possibly necessary for use in other quite different yet simultaneous interactions.

And, the whole complex mix will all be milling around seeking their own currently-required partners. Indeed, many different processes, all in various different states, will be involved simultaneously. Nevertheless, some processes won't have even started yet, while others will already have moved on to further stages. Countless things will be happening at once!

Now, in such a complex melee, some molecules might be required in two different processes - to be used within quite unconnected reactions - and they might, at some stage, be mutually-required by both simultaneously. And, the overall results of this, and maybe other contentions too, will be that not all sequences will be equally-served, and once we are aware these actually-existing problems, can significantly produce major Systems Effects!

Indeed, the most important of these occur in Necessary Sequences of Reactions, that we call Chains! And, this is because literally no single reaction happens in isolation: for each produces a given product, enabling it to then be involved in another quite different process - so that the available possibilities change with each-and-every reaction, and the significant ones will often recur - forming further Chains.

And, occasionally, the output from one reaction in a Chain - turns out to be exactly what was required to

initiate the whole Chain in the first place - and so, it links directly to such a Process to turn it into a Repeating Cycle!

And, therefore, these turn out to be far more resilient-and-persistent simpler Chains: and, indeed, become absolutely essential in All Life Processes!

Now, there are many other hidden effects, which also significantly happen in complex Natural Systems (particularly within Life). For, simultaneous processes can also actually compete with one another: and, in those circumstances, the most numerous quantitatively will always Dominate a given Natural Context - and hence drown-out the effects of current rivals! And, if a pair of rivals produce diametric-opposites, ONLY the Dominant one will survive: no sign of the other will remain un-cancelled. And, if there are exactly equal numbers of each - then NEITHER will be evident: the processes will have cancelled each other out!

Now, consider this important latter case when both processes exist within Chains or Cycles, for then both sequences will be prematurely terminated, and the relative weights of their combined overall contributions will change, and perhaps switch over the Dominances involved, and precipitate the alternative Effect.

[It, for the first time, gives a causal explanation to the action of the full range of "if-then" clauses in computer simulations - including not only the common "if" and "else"! effects, but also the much rarer "neither" effect too]

Crucially these are *Systems* Effects: and they are NOT revealed by the usual truncated way we formulate reactions. Indeed, that way diverges significantly from delivering important aspects of The Truth. The Systems Approach is about trying to correct this.

And, it strongly echoes the Systems Findings of Denis Noble in his last two books upon the importance of such Systems Effects in Biology!

Why do we need a Systems Approach?

The development of Euclidian Geometry in Ancient Greece, as a complete, concise and comprehensive definition, marked the very first useable idea of an Applicable Logic, and thereafter, this was perfectly soundly applied to the rest of Mathematics, establishing what was correctly called Mathematical Rationality. BUT, this was also then incorrectly applied to other fields, including all the nascent Sciences, and thereby led Mankind increasingly astray, for the next two and a half Millennia, in all those important areas!

For Mathematical Rationality is only applicable to Man-devised Forms, and NOT to Reality-as-is, for though Mathematics can quite legitimately have Fixed Laws, Reality-as-is cannot, for everything does indeed develop, and Reality can even create the Wholly New, involving both Life itself, and its subsequent Evolution. Fixed Laws cannot explain this, or even apply here.

Indeed, this is best explained by the role of Forms within Language, wherein it would be useless without its identified Forms always having to mean the very same thing! It is both a necessity and a restriction upon the wondrous facility of Language! But, Any Such Legitimate Rationality, always has a great attraction for Mankind - as it allows use of an Associated Logic, in which it is legitimate to Reason-out the solution to problems entirely-within-the-head, without any direct recourse to messy Reality-as-is - which, by using Man's agile brain, can find solutions quickly-and-easily!

And this requirement is certainly wholly present, for Mathematics, BUT, just as certainly, NOT available for Reality-as-is: so, it can NEVER be applicable in any of The Sciences. Yet, it has, illegitimately, taken-over them all! This severely limits what Science can now explain.

When I was at Grammar School, in Manchester, England, many decades ago, I was adept at Mathematics, as such, but I, along with all my teachers, exclusively, and gratefully used *Causality* for all Explanations within Physics! But, in spite of those being absolutely correct, there were always discovered Laws, that could NOT be adequately explained by Causality.

Such Laws were only found by Experiment, but were at that stage impossible to explain rationally! This difficulty had a major Effect upon all the Sciences, because they needed to be reliably-used by the increasing number of competent Artisans, and they had been successfully using such Fixed Laws for a very long time! How had this been possible? They didn't change the Laws: they *changed* Reality!

They became adept at using unchanging materials, or alternatively, by rigidly controlling contexts, so that Fixed Laws could be validly used. This was OK in Production, but useless in Explanation of the Natural World. These moves had restricted Science into Technology! Its practitioners were not Scientists, but Artisans!

So, for literally millenia, studies of Reality were limited to Observations and Experiments within rigidly-controlled environments, and Explanatory Science did not yet exist! But, of course, adequate explanations were patchy, to say the least, and real Understanding was not yet firmly established: while Technology surged ahead, Science, and indeed General Understanding, was increasingly inadequate.

Now, a great deal more has been, and still remains to be said, about this distortion of Science: but its Universal Establishment has to work, in its one-to-one matching between its technological distortions and its Mathematical representations (at least most of the time). For both Mathematics, and technological experiences within Science, produce the same Fixed Laws! That, of course was due to the severely restricted environments, which delivered the very same sort of Fixed Rationality as did Mathematics! That clinched it, as far as Mankind was concerned, but it did not reflect the real Truth of Reality-as-is.

Now, in contrast, the reader may well already be guessing that the missing truths could perhaps finally be validly explained by a thorough Development of The Systems Approach! The assessment of what they call Science, is Correct but Insufficient! It is woefully incomplete.



The True and Profound Significance of Natural Cycles IV

Beyond Marx and Darwin

Let us continue with the necessary description of The Systems Approach, taking us beyond the initial measures dealt with thus far. For, it must by now be clearly evident to the reader, that many important aspects of Reality-as-is, are not yet included in the usually assumed version of events, dominated by Mathematical Rationality, yet also ignoring its prior physically existing Systems, where it is, in fact, composed of both multiple and simultaneously-different - even contending components - that are always greatly simplified in their representations in Science, in order to to facilitate further, wholly-formal "developments".

Yet, Actual Reality is a much much richer and, indeed, a vastly more complex Meta-System, so that many more of its features are both initially, and, thereafter, even more significantly active, as the true Complication of the multiple, relatively-independent, yet, nevertheless, further complicating, as ever more significant features are gradually revealed! The usual "Lego" analogy of understating the world via its building blocks, never suffices, even though it is, indeed, initially helpful, as Causality is not always Bottom-Up, but occasionally, and importantly, Top Down as well! For, though it does indeed simplify things to leave Life out of the Basic Scientific Account: it must, most definitely, be included there, and as Denis Noble of Oxford University has extensively demonstrated, the usual simplifications do indeed HIDE extremely significant features of Real Development!

[Though, I am not competent to extensively deal with this specialism, Noble certainly is, and has independently come up with a detailed description of his version of The Systems Approach, in his excellent work in Biology.]

But let us start here, by defining the full scope of a possible The Systems Approach, to then define the enormous range involved!

The first inklings of a wholly new approach were originally realised by the philosopher and historian Karl Marx, not only in his subscription to Hegel's Dialectics, but also, in his attempts to explain the evident and important Social Revolutions, which always resulted in features of society that were Wholly New, and hence totally impossible to predict before their First Emergences.

Alongside Revolution, and actually more difficult to explain than that, were the often very long periods of apparently "Permanent" Stability, which, somewhat later, were also presented to Charles Darwin, in his conception of the same kinds of "stabilities" in Nature - the stable interludes between, once again, the appearances of The Wholly New.

The problem was always those Stabilities: what actually maintained them over such vast periods of Time, and why did they then self-destruct after that longevity? Those questions were wholly inexplicable, within the usually applied means available in The Sciences: but they were certainly the main block to further explanations of Reality. Indeed, even in Biology, with Stanley Miller's Experiment, where he was finally forced to abandon his investigation, he couldn't cope with the diverse developments necessary to tackle the consequent problems.

Now, all these grindings-to-a-halt, did, indeed, involve many, often contending components, which we weren't yet equipped to discern, nevermind cope with!

But The Systems Approach slowly emerged to be able to address all these cases - to at least identify where the problems lay - and then perhaps ultimately solve them!

The Key, which seems as always to be relevant, will usually be found at the Very Highest Levels of Reality, which is also where The Wholly New mostly appears, at least at our point in the history of the Universe - and creates its Newly-Existing and Controlling Features, though also, over time, somewhat contradictingly, seemingly-outweighed by its also produced, long-lasting Stabilities, which appear to short-life span human beings to be frequently wholly permanent.

The reasons for both of these extremes, is located in the situation's overall Complexity, that was, as always, the result of many different, but also contending and mutually-supporting Processes. For though we usually find many of the easier answers by drastically limiting and even simplifying within such complex groupings, the really important resolutions along with the significant creations of the Wholly New, definitely occur only when "Complexity finds its own Balances", and the forming of wholly New Levels - along with their own Laws, and even surprising "Downwards Causalities"

Now, exactly how they find these Balances, is a profoundly different and as yet mysterious process: for these are never just the Static Balances (such as those of balanced-pairs), but, on the contrary, they always deliver "Active constantly-re-adjusting Balances" - always both temporarily slipping off-balance, but then, somehow, correcting the situation, to then return it to its now natural, maintained state!

Now, we already know, from prior use of The Systems Approach that the answers we are seeking, reside within only the Systems actual Nature of many Complex, and multi-process situations, as distinct from the usual Causal Connections. We will find the answers in the very different, mutual-yet-indirect-effects - acting between seemingly wholly-independent, but merely simultaneously-acting Processes! And, the simplest influence will be, whether such Processes, though causally-unrelated, may well be either contending or supporting in their effects upon consequent outcomes.

The simplest case being the one where wholly independent processes, nevertheless produce Outcomes, which are Diametrically Opposite: for these will cancel-

each-other-out, if of exactly-equal-magnitude: but in all other cases will always leave just one of them, that will be both Dominant-and-clearly-Evident.

And, a quite different Systems Effect could be in how such a Complexity of many processes, will Change, in Nature, over time - for all other present processes, without any mutual effects with the rest of the set, will NOT persist as such for long, while only those that can deliver the necessary means, in order to participate in a continuing Overall Balance will necessarily survive.

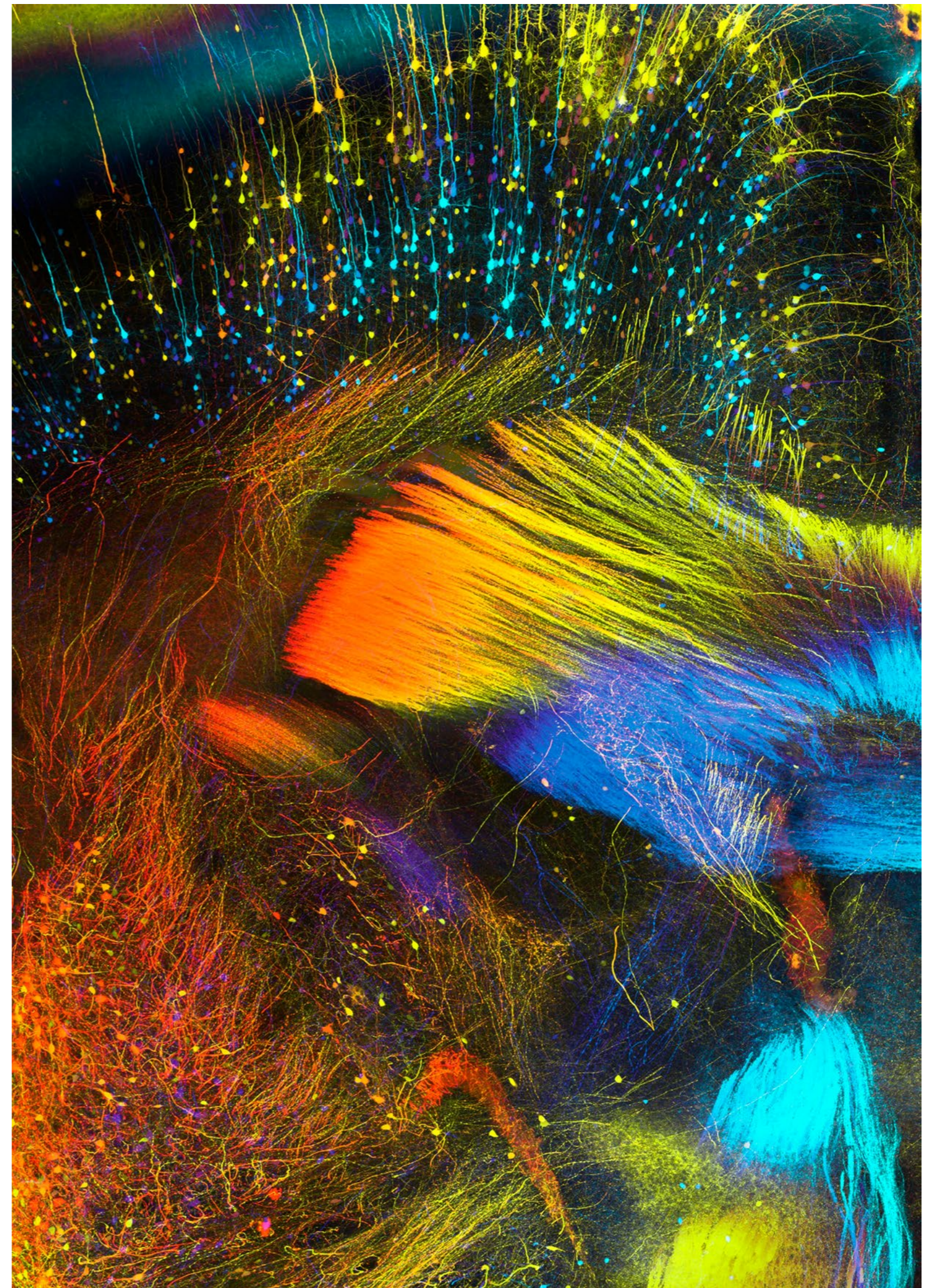
The achieved Natural Balance is therefore selected for by only keeping the processes that enable its continuing existence, while all others, with no such role, could indeed be lost from the set! [Now, this account is descriptive rather than explanatory: but, nevertheless, it does infer an as yet unrevealed relationship, relating the contents of such sets, or, maybe, instead, the inter-relationships of the whole containing set, with other such sets, occurring at an even Higher Systems Level]

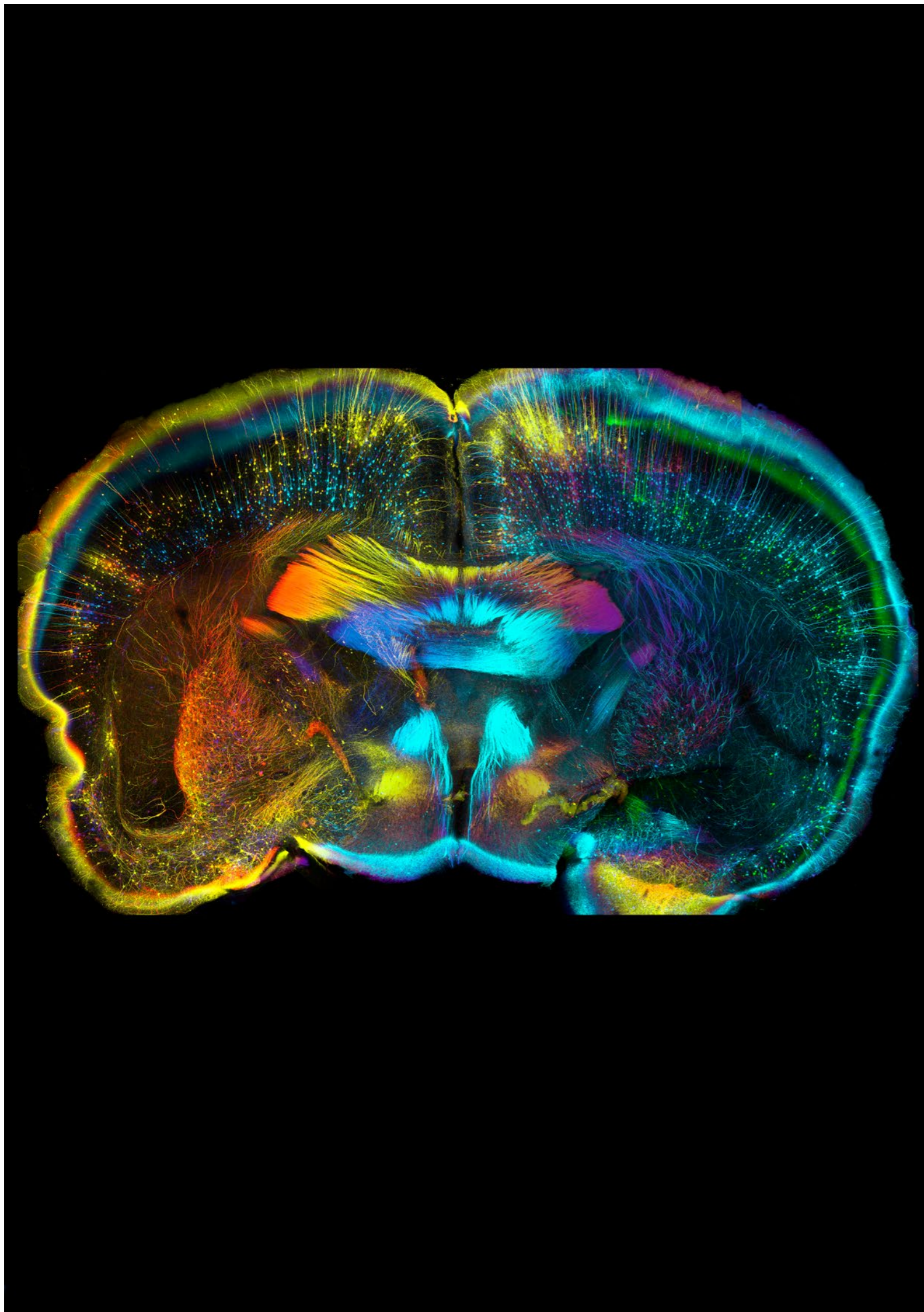
Now, these System Effects are NOT of the basic Causal Kind, which are due to actual relationships between the substances within the kinds of molecules (essentially chemical in nature), while these newly-found ones are to do with purely Systems relationships!

Now perhaps we should pause for a moment. to additionally consider the possible Proliferation of Levels - Absolutely All of which exist well beyond our current investigative interventions, as in the truly vast Cosmos! For, in the studies of the Heavens, which were perhaps the oldest scientific considerations of Mankind, there are surprisingly Common and wide-ranging Relationships. Though, of course, they are often drowned-out by the much greater influences of more Local and well-known ones.

So, returning-back to those we are now finally revealing, very much closer to home, let us re-iterate what we have discovered about Chains and Cycles of Processes, and their significant Systems Effects!

All Proceses require Resources to act upon, and deliver various Outcomes: and, for anything to happen, due to these important components, Outcomes must become Resources for consequent Processes, ultimately producing Whole Chains of such Processes, and ultimately if the single final Outcome turns out to be exactly what was the





process's necessary Original Resource, we will naturally get a Constantly Repeatable Cycle, which will be more resilient-and-persistent than a terminating Chain.

Indeed, Life itself is built around prolific collections of such Cycles.

Now, both Chains and Cycles involve both other inputs and other outputs, in addition to the definitive Primary Resources and Final Outputs: and they will also involve subsidiary lateral inputs, as well as subsidiary consequent lateral outputs, which, in Life perform secondary linkages to other necessary sequences.

Indeed, within any Living Form, it is clear that a hierarchical system of such related sub-systems, together, deliver each individual Lifeform: and beyond that, there has to be yet another Hierarchy, this time of related Systems that make each and every Lifeform together deliver the Ecosystem, and even the overall System we call Life!

Indeed, it is becoming increasingly clear that all the processes we together call Life, could never even exist, without the features being revealed in this Systems Approach: for, the complication, flexibility and literally vast potential of Systems of Chains and Cycles and these interconnecting Networks alone, make possible not only the rich structures - delivering an individual Lifeform, BUT also, and vitally, all those relations above that Level, including Language, Intelligence, and Societies, as well as Planet-wide Materials and Economic relations, without which absolutely none of it could have become established or been maintained.

Revolution and Stability

The Philosophical Diagram opposite was created several decades ago by the writer of this paper, initially as a visual description of Karl Marx's ideas on the processes and trajectory involved in both Social Revolutions, and their interregnums - the often long-lasting Interludes of comparative Stability.

But, it also went a little further, in extending these observations to Emergence in general, but also describing the important Trajectories of Failed Crises always involved in Emergence, BUT always without indicating any actual causes of how they usually terminated. While a similar idea was also repeatedly-included, in the Intervening Periods of Stability, always happening between Revolutionary Emergences - though modified throughout into an almost constant sequence of limited and always failed crises, which though still ultimately maintaining-the-Stability, also always inferred that it was composed of incessant, yet necessarily-failing processes.

Clearly, I was already adding something of my own to Karl Marx's original conceptions, BUT still just as wholly unexplained, and also as vitally implicit as the usually prior Form of Incessant minor Crises! For, I'm afraid, that I too followed in the usual error of adding more descriptive details, without ever resorting to a revealing Explanation!

So, it is now very clear that such a diagram as this, urgently requires a full and detailed Causal Explanation. And as just such updates always also inevitably add new things, that will not only change the Diagram eventually, but also, and crucially, address important things that cannot be illustratively included in such an image. As they will be NOT directly visible, they will require an

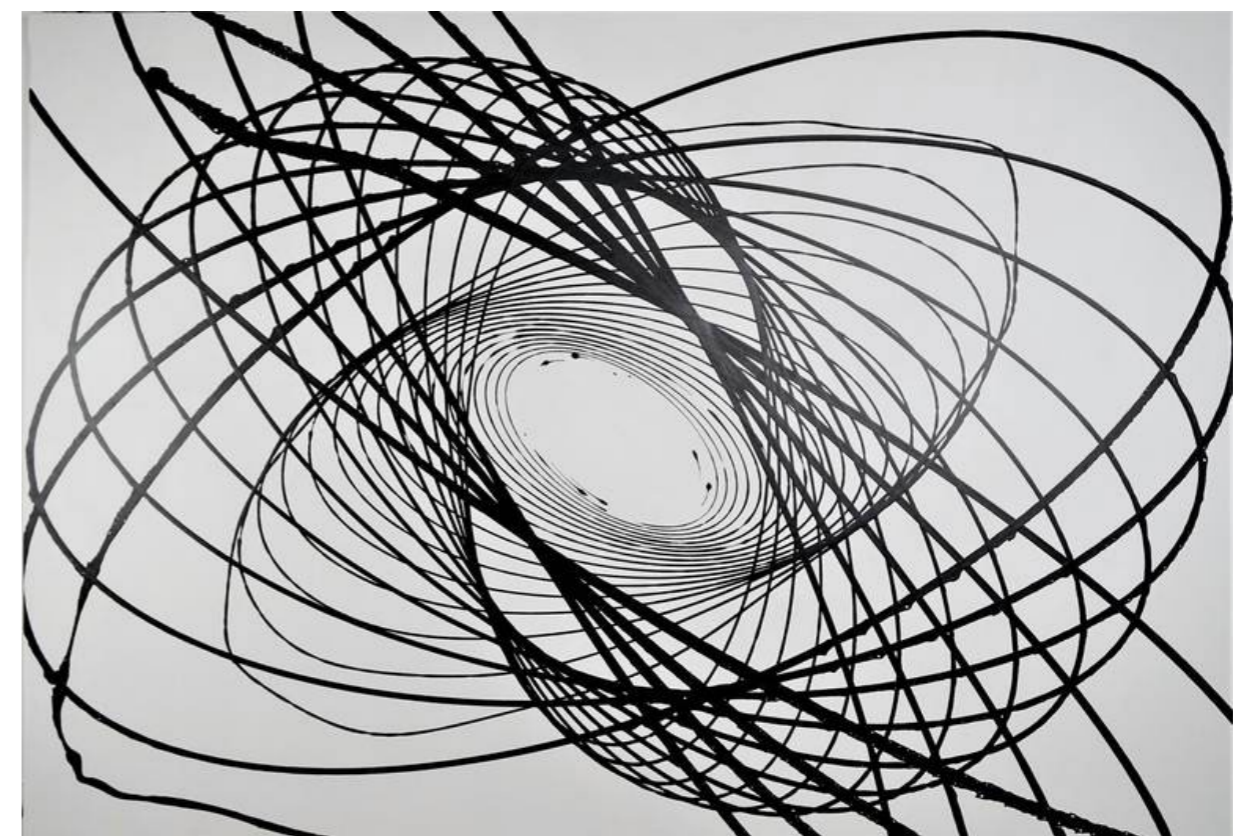
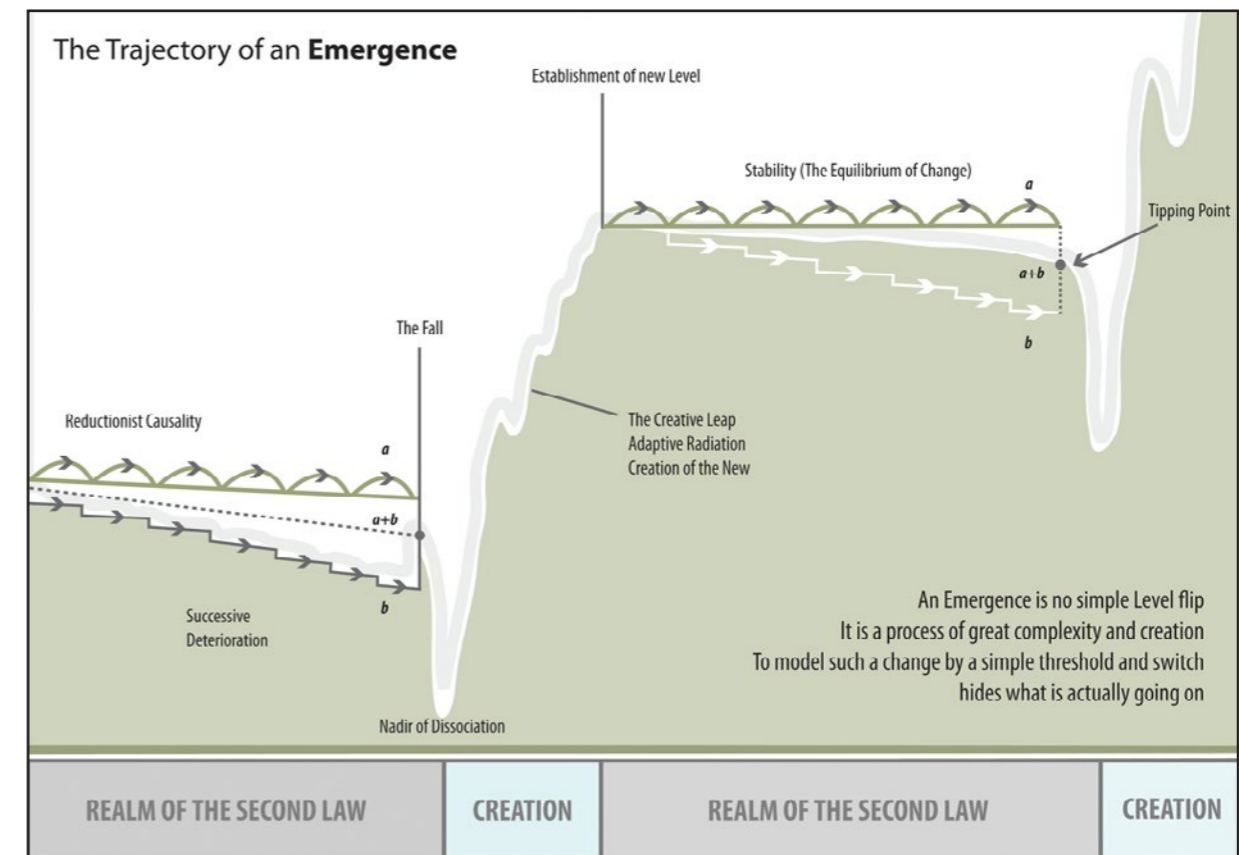
absolutely essential Accompanying Narrative!

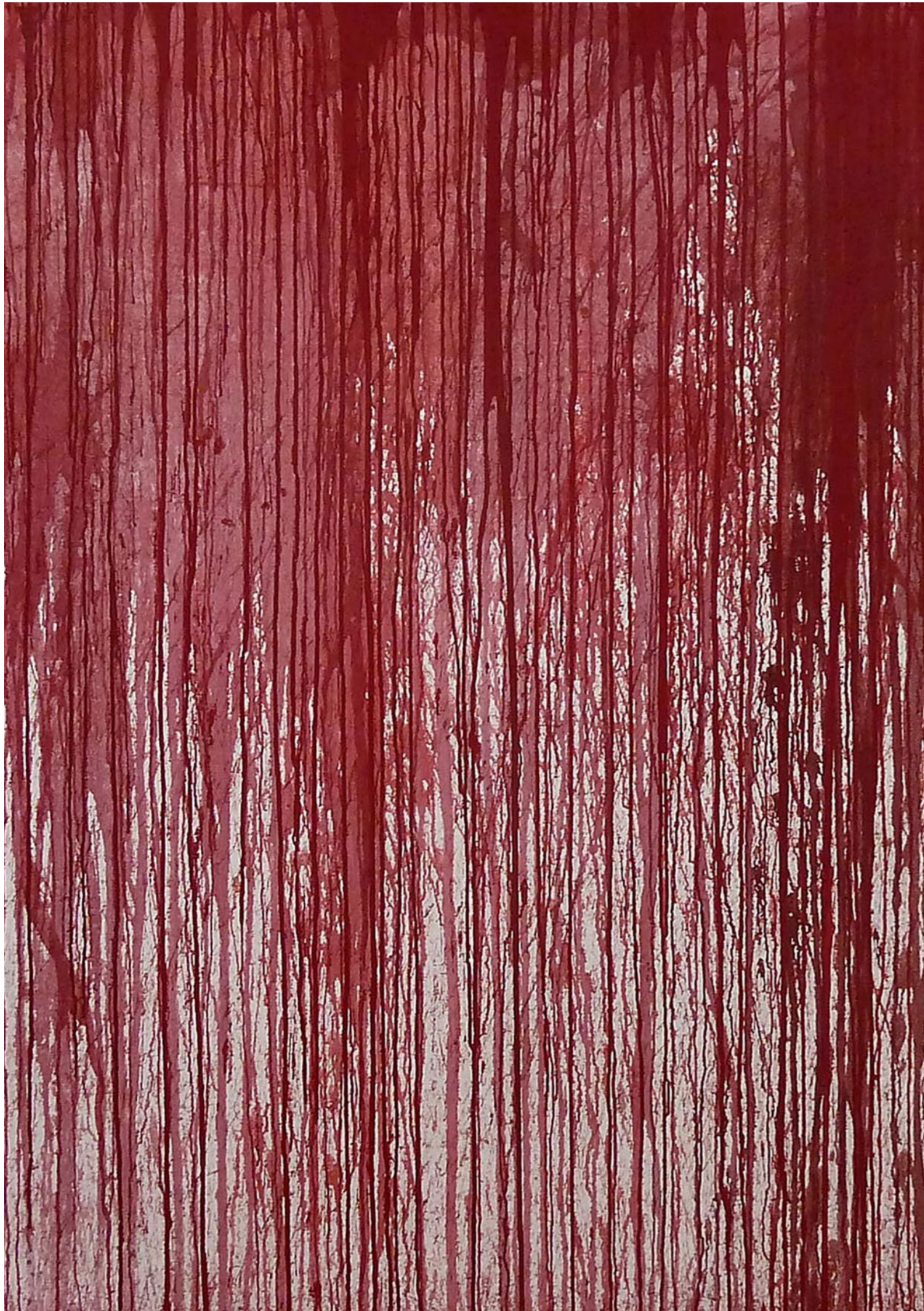
Now, for an extremely long time I was unable to develop any satisfactory explanations for those perplexingly long periods of Stability, but the recent theoretical turn to The Systems Approach, though only slowly, and very selectively to begin with, has gradually been able to deliver some partial Explanations - particularly of the Trajectory of a Single Isolated Crisis.

Recently, the problem of Long Term Stabilities in Natural Systems has finally become addressable: though of course, still initially seen (and illustrated) as an incessant stream of many very short-term and inevitable failures (without any specific Explanations at all) - but it has finally succumbed to a New-and-Necessary Approach - now involving Balances of Key Contending Contributions.

Systems are not only always and regularly slipping out of one given balance, but just as easily slipping immediately into another quite-different short-term balance, BUT one that never precipitates into the necessary overall cataclysmic collapse that happens in a Revolution, where the involved strong connections always cause unavoidable failures, one after the other, to ultimately bring the Whole System to An End!

For, instead, the absolutely crucial elements in the Overall Stability are never profoundly affected - the individual failures being relatively independent of one another, and only trivially involved in the maintenance of the wider System. So in affect, NO precarious House of Cards is involved, but delivers only a minor internal shuffling of the deck - and so the Overall Stability survives.





Indeed, such a Form of Stability is self-selected by Reality-as-is, which, via trial-and-error, finds the mix and proportions of Processes that are all kept within the necessary limits, a situation that still allows constant variation, but within an arrangement which won't precipitate the collapse of the Overall System.

Left to itself, this is the normal persisting solution in Society. But, either multiple Natural calamities or self-caused-and-mounting Crises, due to the dominant Ruling Classes in any such Social System, will unavoidably skew the Variation into precipitous and damaging Changes, which when occurring upon several different fronts simultaneously, can and do push the Whole System into unavoidable General Collapse!

This is exactly what happened with the First and Second World Wars, and arguably it is what is happening again NOW, and this time it is very likely to precipitate the threatened disaster. And it isn't just the Global Climate Catastrophe: important Social Support Systems like the NHS are close to Collapse too. Most of what was taken into Public Hands is now Privatised and is vulnerable to instabilities in markets. And Global Pandemics such as COVID cannot be tamed from the top down. War has returned to previously stable parts of the world such as Europe...

Do you really think Revolutions are precipitated by revolutionaries? Of course not! And never by those who claim that purpose! The real job of Revolutionaries is to EXPLAIN them - understand what is happening and intervene with Real Solutions for the people.

Conclusion:

The interpretation of Descriptive Diagrams, as appeared at the head of this paper is usually significantly misdirected by the usual Rationality (or Logic) used in such associated explanations, for the absolutely essential Systems Approach, which has only recently been discovered, revealed and applied, is literally NEVER employed in such interpretations, while it is in fact the only approach that can do so correctly.

Thus, in spite of something being an accurate description, it is always wrongly applied, and consequently cannot remedy the ills that are generally believed to be its contained message, and thereby always misleadingly, and indeed wrongly, explained.

Indeed, the above case delivers an example of how mere description is never enough, for the usual assumption that it is, and the genuine explanations from it though seemingly obvious, are always wrong.

Real Understanding requires Real Explanations.

Now, the standard given solution of suggesting reference to the appropriate branch of Science, is I'm afraid, NEVER the answer in such cases, as all the Sciences are now subjugated to Mathematical Rationality, which, following Mathematics itself, is entirely Pluralist, and hence can only be limited to formalised and Fixed Laws, which is never the case in Reality-as-is.

The most important weakness in the Pluralist Approach to Science, is that it NEVER allows Natural Development or Emergence. These disciplines have been effectively "castrated" by Plurality, and vast and vital areas of Developing Truth are NEVER allowed to be explained!

Now, of course, this limitation never applies to Production - the real Overall System that dominates us - as such situations are always limited in the exact same way physically, as Plurality is limited theoretically.

Contention and Cycles within Evolving Systems

The appearance of CYCLES in sequences of Processes allowed the constant repetition of the involved set, a very large number of times - perhaps in seeming perpetuity from our vantage point. And as they are also a member of a simultaneous number of such Systems, existing also in a stacked hierarchy of Levels, this would help contribute to maintaining long-persisting Overall Stabilities, due to a finally-arrived-at Overall Balance - delivered by Multiple Contentions, and, hence, thereafter repeat them "almost-endlessly", as an element in an actively maintained Complex of Systems of Contending Processes.

But, such a situation can also be maintained, by using many different contentions, and even occurring within various different Processes - and as long as they perform the very same function, within the overall Collection, that role will NOT be affected. And, such substitutions within the described melee of components could then even take a different amount of time, and even slightly vary the elements involved, as long as it continued to play that same necessary role.

The Overall System could vary substantially in its contents, as long as its larger role was unchanged! It could, indeed, successively drift over many iterations - performing things quicker, or alternatively, if requiring less energy, it could perhaps do it ultimately by merely changing the amount of its overall contribution.

In this way Actual Development could indeed also occur, as a result of such changes!

In particular the relative abundances of certain components, could vary enough to cause a significant flip elsewhere in the Overall System, and thereby cause an important change in the Overall System Effects!

For, as minor changes could occur, and accumulate over many repeats of a CYCLE, while still effectively maintaining its necessary function: SO a new situation could be reached, where the changes finally totally undermine its key balancing role, and the necessary Stability might well be lost, while new substitutions, coming from the Containing Melee, could re-establish a New Balance - but then, usually a different one. In this way Overall Stability might be maintained, but with a significant change happening beneath it.

The famous "If / Then" Clause used successfully in Computer Simulation is thus finally physically-explained: BUT, this can only ever at the Systems Level!

Now, these Processes, and, indeed, sets of them, in all persisting Systems, (particularly those within Balanced CYCLES), go a great deal further in situations composed of Multiple Levels, both locally, globally and even universally: the most significant at all Levels being naturally entirely self-establishing of their own Balanced Stabilities, and hence appearing to be "Permanent Features" of Reality - though they never actually are!

The very nature of Planet Earth, imposes its own patterns, due to its orbit around the Sun, the tilt upon its axis, as well as its constant rotation, with its consequent alternating Night-and-Day: ALL imposing their own physical cycles upon Global Systems of Processes.

This stable repetition of conditions helps drive the Natural Systems, converted from CHAINS into CYCLES. And, of course, the internal physical mechanisms of the Planet itself, involving the movements of Tectonic Plates, causing violent Volcanic Eruptions, along also with varying Birkeland Currents of Plasma from-and-to The Sun: ALL compounding the unevenness of what we usually assume to be permanent Natural Processes, delivering, for example, Four separate, variable-speed Jet Streams caused by other Flows, yet subsequently actually directing them too.

So, for us to so often "find" so many apparent constancies literally Everywhere in Nature, it is therefore clear that the organising of these major Systems, and in a natural basically Single Direction, constantly re-establishes an Order out of Chaos - perhaps, as a series of natural switches to processes and Systems requiring Less Energy: but, nevertheless, constantly afflicted by Events that do the precise opposite.

Finally, it should be emphasized that the Overall System, defined here as a special case: is, indeed, no such thing! It is quite definitely, a version of a Generally True State of All Things, happening Everywhere and at Every Single Level of Reality-as-is!

Indeed, something very like the above description, is, in fact, the only way that such seemingly-permanent, yet actually temporary Stable Systems, could ever be established and maintained!

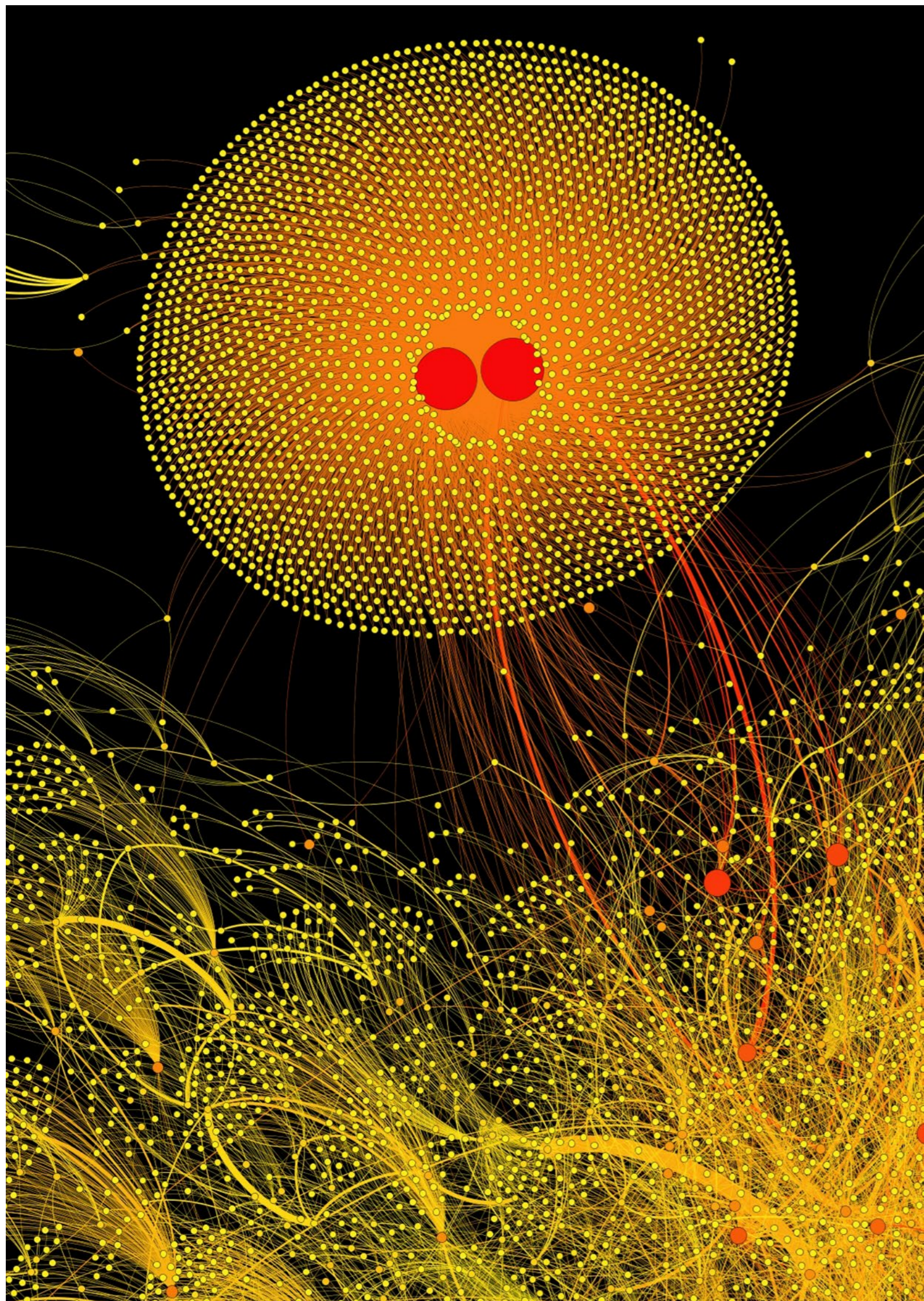
AND, also at times negated, both in rapidly naturally evolving Systems: yet, also, though rarely, suffering both Cataclysmic Collapse AND Remarkable Revolutionary Developments - such as the original Origin of Life.

Literally nothing else, as a self-moving Complex of Systems, could ever do it!

And, clearly, as now is the case, NO entirely uncoordinated Global System of personal Greed, could ever gainstay its inevitable Cataclysmic Calamity, as the only possible outcome.

Capitalism could never do it! The internal contradictions are constantly emerging and new stable mixes of processes sought to preserve the Overall System, in the interests of those who benefit most from its preservation. This constant fight against instability can't go on forever.

Once Calamity does strike, a new more stable System will have to Emerge, or Chaos will be the final outcome.



Mathematics and Both-Ways Causality

On thinking about Biology, and the notion of Both-Ways Causality, in particular the version contained in Denis Noble's *The Music of Life*, in which he makes his own claims for a version of The Systems Approach to Science (which I largely subscribe to) - I noticed that he sees it as though both directions seem to arrive with very similar Causal Conclusions. Contrastingly, in my own findings, we finally arrive at very different conclusions, and indeed they must involve wholly different basic Methods, for the two directions.

For my research started in a very different area, and much lower Level of Reality - Sub Atomic Physics - but from a philosophical position which rejected Mathematics-based Theories as unretrievably erroneous. This is because they are all based upon a strict Mathematical Rationality, with its always Exclusively Fixed Laws, valid only within that Wholly Pluralist Ideality: whereas Reality-as-is can never fit into such a fundamentally restricted Context - demanding instead, a much wider Holist Understanding.

Consequently, Mathematics is far too limited to encompass many important aspects of Reality-as-is, and hence means that all supposedly adequate explanations will be Exclusively-Limited Metaphors, of the cases he supposes he has correctly-defined.

So while Noble's Systems Approach is sound, his interpretations of Downwards Causality, simply must be just such limited Metaphors, and hence his wider explanation cannot be valid! And, the reason for my insistence upon this stance is supported by Noble's own Explanation of the inadequate role of Metaphors in that same book: along with my insisted-upon, completely

Holistic Explanation of the "Apparent Downwards Causality", in terms of a mixture of Upwards Causality, gradually totally changing the resulting Context, to finally give that false Top-Down Appearance!

And, to fill in the obvious gaps in my own initial alternative, I had to very slowly reveal a whole catalogue of Bottom-Up changes, over many necessary series of iterations to finally transform the structure to give exactly what the very same apportionment that a "Top Down Causality" would deliver.

This Conclusion is not limited to this case alone, however: it is considered to be generally applicable, as is seen when investigations proceed into the immediately evident attempts at Explanation: over very short time periods, and also for apparently simplified forms, which can be (and indeed are) there settled into, as initial incorrect explanations.

But, ever more detail and study over extended periods of time, regularly dissociate most things into a series of only-temporarily-true-approximations, and only much later, and with extended study, do the natural variabilities become ever more apparent.

Indeed, though generally not immediately evident, almost Everything is involved in a slow series of similar changes, which at some point will result in dramatic conversions - as we see in Emergence Theory.

And Reality-as-is also gradually reveals some of its very extensive Hierarchy of Different Levels of existence - many of which have long been beyond our Abilities-and-Reach to adequately investigate: YET, very slowly, even

they are gradually extended too.

But, of course, many are still well beyond our current reach, and even those that are more easily investigated, are made radically easier to Understand and Control, when limited to maintained-as-fixed situations.

And, it is precisely there, in so-called Science and its Experimentation, that the vast bulk of both investigations and Manufactures of desired Products are limited in that way! The very first Intellectual Discipline of Mathematics was correctly limited (as was its Contexts) to being entirely Pluralist: that is involving only Fixed Relations: so the same restrictions imposed upon scientific investigation AND Production drew those into the same artificially restricted World!

Consequently, only very rarely do any of the Sciences depart from a wholly Pluralistic approach to Reality, and the recent turn to what is termed The Systems Approach, has been, as yet, both halting and limited: theorists like Denis Noble are certainly only the beginning.

Now, this historical aberration has not only been very badly served by Mathematics, which from the outset was correctly Pluralistic: but has, in addition, delivered a vast complex of developments, which are made just as inflexibly Pluralistic. This approach can-and-does deliver many sophisticated developments, which wrongly appear to get-around their congenital limitations.

The Classic case, based upon Probability Theory is, of course the Quantum re-writing of Sub Atomic Physics.

For, as with many others of this ilk, it can be massaged to “look like” a legitimate Holist Theory: while actually being no such thing!

And, for this falsehood we can blame Henri Poinare and Ernt Mach, who early in the 20th century, convinced their colleagues of the legitimacy of Positivism (which they called Empirio Criticism, at the time) in which experimentally established relations were given the same weight as Causal Explanations, and thereby “made” Mathematics as legitimate as Causality.

But it is no such thing!

As ever more complicated Mathematics became involved - and of course, the conclusions would indeed be right, if used in the right Context - it would invalidly be smuggled-in, as being as reliable as Causality, and so it was: BUT never as *Causes!*

And, of course, with tremendous pressure from the scientific consensus, Denis Noble was also driven to conquer and apply a whole galaxy of sophisticated Mathematics to his Holist ideas - and though he did so, he was constantly also regularly being confronted with features that did not fit that paradigm, and he was driven in these cases to further develop a necessary Systems Approach. YET this moved forward only in his conviction that Causality could be Top-Down as well as Bottom-up: and he seemed to be unaware of the unavoidable Plurality of absolutely all Mathematical approaches.

Noble wasn't yet a thorough-going Holist, and did not know to generally limit Mathematics to only the strictly Pluralist Contexts where it could legitimately be used.

And as I have already insisted, without that adjustment, the Effects encountered could be very easily misinterpreted.



The background of the entire page is a dense, chaotic web of thin, brightly colored lines in various colors including red, yellow, blue, green, purple, and orange. These lines are scattered across a dark, almost black, background, creating a complex, abstract pattern that resembles tangled threads or a complex network. The lines vary in thickness and orientation, some being straight and others curved, creating a sense of movement and depth.

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