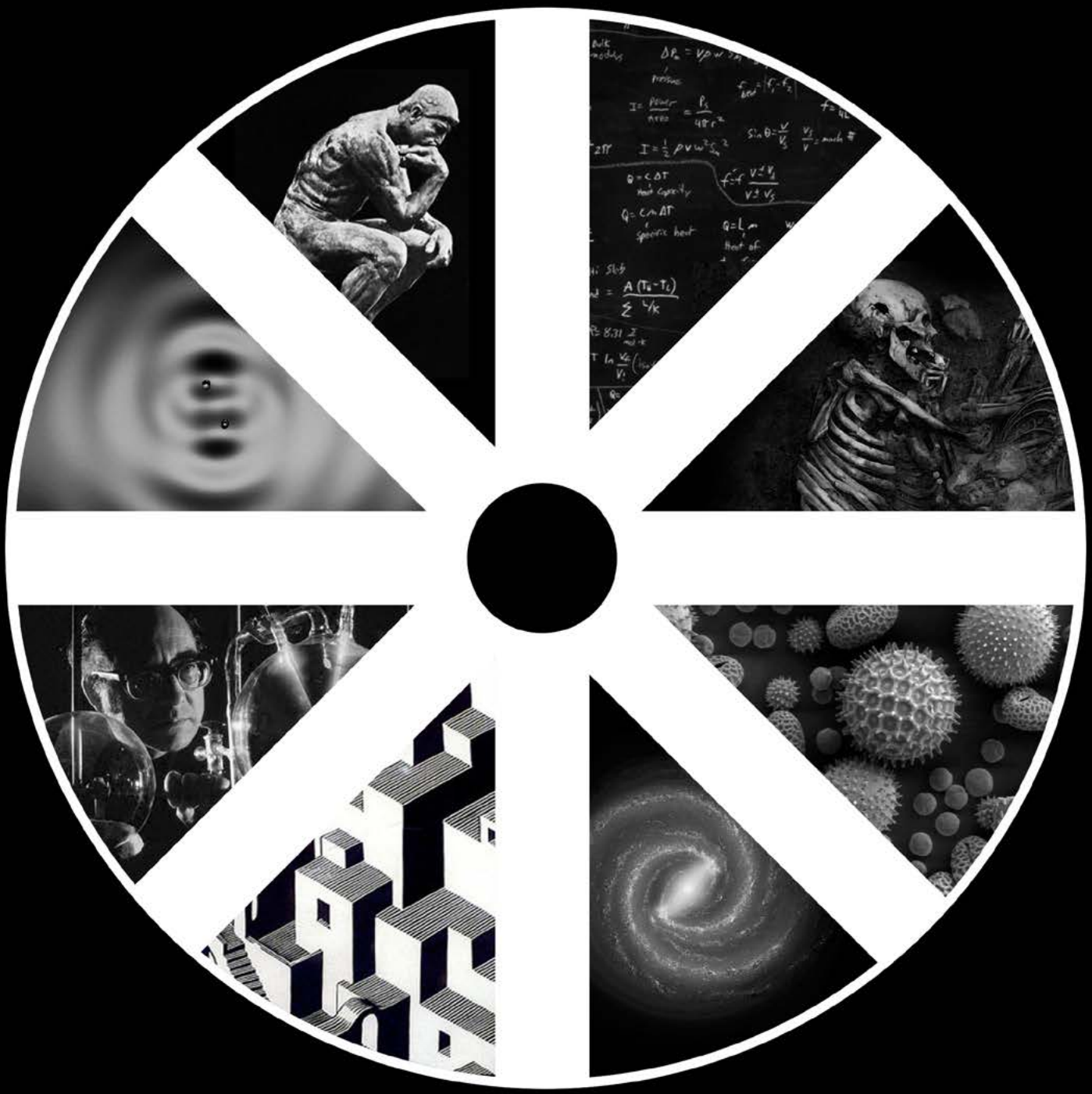
SPECIAL ISSUE 24 DEC 13 JIM SCHOFIELD



SHAPEJOURNAL

THE HOLIST REVOLUTION: A MULTI-DISCIPLINE APPROACH

PHILOSOPHY / POLITICS / PHYSICS / ARCHAEOLOGY / EVOLUTION
COSMOLOGY / MATHEMATICS / EXPERIMENTAL METHOD

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Special Issue 24

The Holist Revolution:
A Multi-Discipline Approach

Introduction
The Holist Revolution: A Multi-Discipline Approach

Welcome to the 24th Special Issue of the **SHAPE Journal**.

This collection of papers might be the most siginifcant contribution in the work towards a holist approach to all the sciences. It advances what Hegel set as his primary goal, which was to develop a 'Logic of Change' to take over where Formal Logic had always failed - during interludes of significant *qualitative* change.

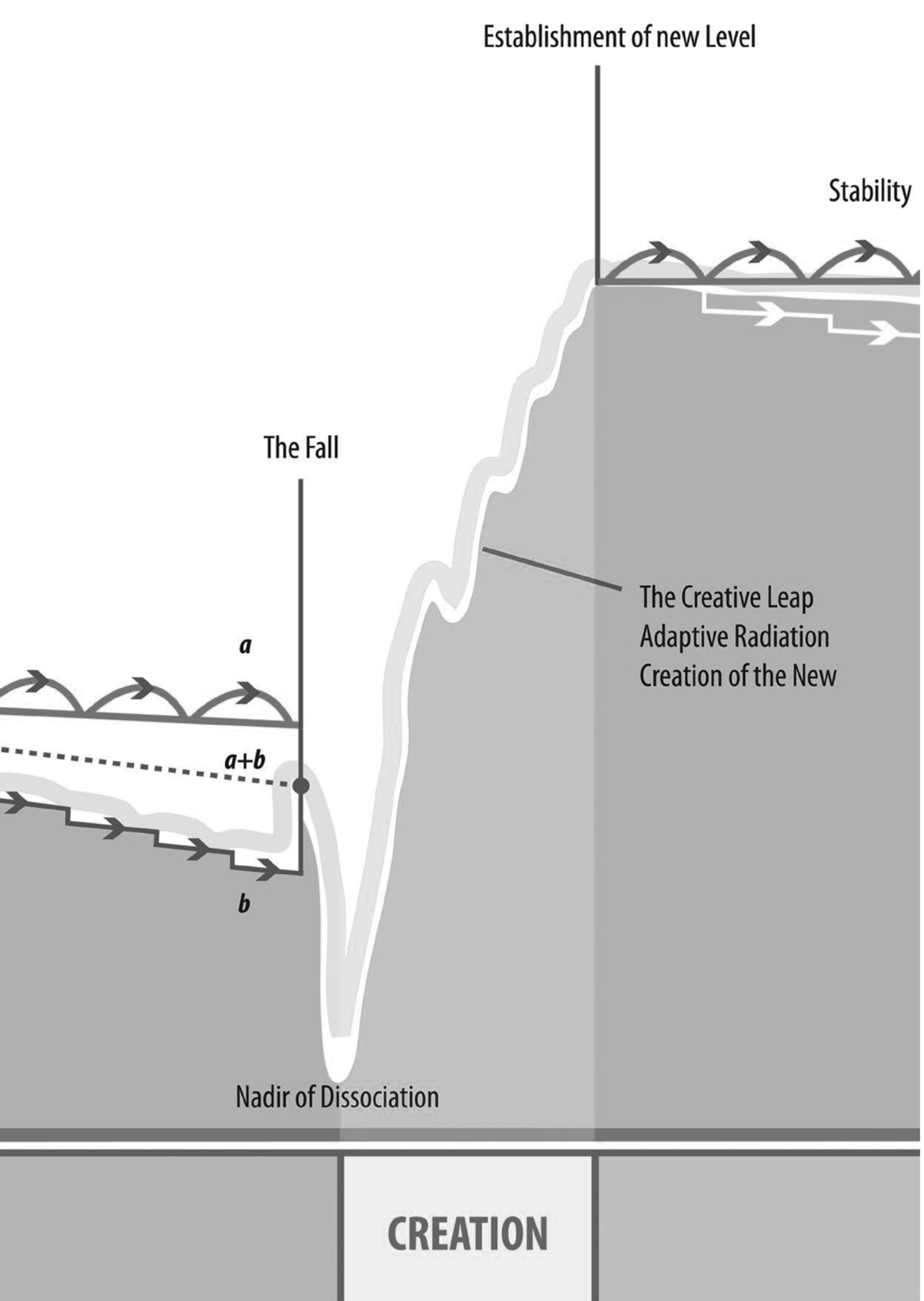
Even 200 years ago Hegel had identified crises in many disciplines where the prior assumptions and principles on which they were based, had run out of steam, and were beginning to come apart at the seams. He, in particular, recognised the appearance of what he termed Dichotomous Pairs - which were principles that though effective in certain areas, were in fact, mutually contradictory, and could therefore never be unified into a single principle covering both. Indeed, though crises may be considered to be typically of short duration, Hegel realised that such situations could persist for very long periods. Man learned to switch between the Dichotomous Pairs to use whichever principle worked in a given situation.

Hegel argued that by such methods, real understanding had been brought to a halt, and that any solution gained by such switching was merely pragmatic and needed to be transcended. He insisted they should be addressed with a view to revealing, criticising and ultimately replacing the assumptions on which they were based, resolving the impasse to a new level.

This was Dialectical Reasoning, and the transcending to a new level was termed an Emergence.

The papers in this issue attempt to outline these methods in eight different disciplines, occasionally being profound enough to demolish the older methods of analysis and attempted understanding, for a more comprehensive approach that covers not only periods of stability, but crucially, the transforming interludes that we term Emergences.

Jim Schofield Dec 2013



Philosophy:

The Third Law

Papers 1 & 2

In considering what is actually happening during an Emergence, we arrived at a counter-law to the Second Law of Thermodynamics. In contrast to its drive to disorder, the new opposing Law seemed to embody a drive to order. Now these are clearly total opposites, and initially it is hard to see how they could both arise from the same ground. How could they ever be true simultaneously?

Now, these are quite reasonable complaints, but we must see that they are viewed from the basis of certain assumptions that we have about the nature of Reality. Elsewhere (and even here when relevant) I have contrasted Holism with the currently consensus Plurality position in Science – which is Plurality. And now from that standpoint, such contradictory Laws would certainly run entirely counter to its "banker" Reductionism.

But even if we abandon that position and assume that all of us are committed to seeing the World as a definitely holist situation, we can still be unclear as to what that means, and two opposite Laws from the same situation still seem totally untenable.

There are many ways of constructing Holism, and apart from the simplest, which merely sees everything affecting everything else, there are a whole group of possibly important riders! One assumption sees all processes as of equal weights so that the obvious result is either that they cancel each other out, or alternatively that they lead to a kind of permanent total randomness.

Now, Holism as it certainly exists in Reality at large is not so easily encapsulated. Yet understanding is still possible in a holistic World, and that is because all contributing factors are NOT of equal weight: they don't either entirely cancel out or result in evenly-directed, random motions and effects. On the contrary, in all carefully studied real-world cases, dominances do emerge, and all other contributions make decidedly minor contributions. They have been knocked into the long grass by strongly growing major processes., and though still present and indeed active, they are NOT evident or even seemingly significant.

Such Holism, at first glance, looks exactly how we would expect a pluralist World to look. Put a wall round a piece of it, and we can, and do, treat it as entirely pluralistic.

But that is not its true nature. Instead of some multi-process, all-directions, all-effects, and simultaneously-acting system, we have to see it as a self-moving, self-maintaining and self-developing system. And that is very different! It is not re-mix but creation that characterises this Nature.

Reality seen this way is produced by itself and is also its own ground!

In changing itself, it changes the conditions for what comes next, and though the idea of everything affecting everything else is basically true, it is never a mere summation of equal contributions. Certain features always become relatively dominant, and give a given phase its current character, but even then the under-layer of less dominant processes is still chugging away and can, and in time always will, become challenging to the overall, and currently dominant, status quo.

Now, when such a temporarily stable system is first established, it is nothing like a process totally governed by a single Law or equation. Each and every stabilising victory is mutually determined by the full mix of contributions, and the controlling possibilities of the various dominant strands. All these characterise the solution – for now!

And, even within a currently "stable" system, there are constantly opposing processes still happening, and what occurs is some sort of new mix of the dominant and the minor opposing forces, so simple laws DO NOT precisely predict, as in a pluralist system. The opposing forces qualify and change the new stability, even if the same dominances continue to rule the roost. (We use summations and averages to reveal the dominant relations).

And, as you will already have guessed, no particular stability is anything but temporary, and in time the stable state will be first undermined, and then certainly completely overturned. There are NO permanent equilibriums, because Change is incessant!

To get a handle on such a holistic system, we have to think in terms of both these Phases - Stability, (when the Level persists) and then Emergence (when the Level is overthrown).

Holism within a single permanent Level is NOT what happens in Reality.

Multiple factors all affecting and even opposing one another are present, but they are not of equal weight. This makes Reality (even within a given Level) a continually moving target, changing all the time as it moves. And as such a system, it will contain bottom up causalities, but also top down causalities. It is NOT a set of uniformly-distributed, purely random features at all.

Indeed, it is also very uneven from place to place and thus develops what can only be called partially self-produced localities. The nature of their dependence on the overall system is vital for what then ensues, and if such localities begin to increasingly undermine the overall stability and dominances, a revolution can be precipitated!

So, such a system has localities and dominances, which can and do both grow and decline. But, in a holistic system, ideas like sequential Reductionism don't fit at all well. Indeed, perhaps the most difficult part of Reality's holism is that nothing is eternal, or even constant. It re-makes itself continually, sometimes in minor increments, and occasionally in cataclysms. And what in one period and one locality can be clearly dominant and providing the ground for everything else there, it will in time only decline to be much less dominant, and will actually finally cease to exist!

Now, there is a widely favoured version of holism, which has everything always present, and merely changing in the significance (magnitude) of their diverse contributions.
With this version, nothing actually dies! Everything always survives but can be so vestigial as to be totally invisible. But, it is still around, and is always available to play a very different role in a later Phase. And this idea is clearly conceptually very easy!

The evident constantly rolling change can at certain times merely promote once unknown processes into prominence. They may seem to come magically from nowhere. But, with this view they were always present, and merely come to the fore at the expense of others, which themselves decline and even seem to vanish, but have merely slipped into vestigial invisibility. You can see the advantages of such a conception! Indeed, in one form or another, it is always being promoted, mainly because it torpedoes you ever having to explain the creation of the entirely new. For everything has always been present!

NOTE: I am reminded of Lenin's jibing of what he called the "Worm's Eye View" of Wundt, who definitely subscribed to this position, even when considering Consciousness
For all you have to justify with such a standpoint is promotion and demotion. But it is indeed a get-out, and untenable for those attempting to actually understand anything.

So, with this preamble out of the way, let us tackle our two contradictory Laws! For they then, in our version of Holism, become products of different conditions at different times and/or in different places!

The Second Law is active in relatively stable circumstances. It is the effect of counter-posing processes that are initially completely swamped by those that together constitute the stability of the current Level. These dominant factors tend to suppress all change, whether destructive or progressive. They are conservative, but, as well as maintaining a coherent system, they are still continually changing. The dominant system does not wholly suppress all opposing processes, and these can build up until they can pass a crucial tipping point, and thereafter precipitate a complete collapse of the system of stability. If only the Second Law was present with nothing to oppose it, then the result could be nothing but totally random chaos.

But we must remember that the Level dominances not only actually enabled the current Level at its birth, and policed its maintenance against dissolution, but also opposed all kinds of change. And this latter feature meant that any NEW possible laws were also stopped from growing in contribution.

With the demise of the system, however, any constructive, organising, or progressive possibilities are also no longer suppressed, and in various localities conducive pairs, or even sets, of processes can begin to proliferate at the expense of mutually contending alternatives. This development is surely one towards increasing order, but can only happen when the dominant, anti-change constraints are no longer in charge.

So, the Second Law had changed the situation to one in which a drive to order becomes possible. It had produced the ground for its opposite!

Now, we could treat such situations in a very pragmatic way! We could, once more, merely (and crudely) switch modes and change the laws we apply (indeed, exactly as they do in computer simulations), but that would merely be a pragmatic frig. We know when to switch (when a threshold is passed). We know what to switch to, and even how to apply the new law, but we do not know why!

What initially enabled the Second Law was precisely the crystallisation of a self-maintaining, new Level with its own dominances.

The ball keeps rolling, and any newly emerging embryo systems of such stability will be counter-posed by a re-energising of the Second Law, until it once again subsides, having done its job, and a new creative drive again commences. The system thus oscillates under the alternate actions of the two laws.

But, it doesn't do so for ever! Indeed, the ladder upwards of successive new sub-systems of relative stability are merely possibilities, and most will not be up to the job of establishing and maintaining a New Level. They will be defeated by an immediately resurgent Second Law.

But, after each oscillation, the recurring effect of the Second Law becomes less able to undo all that had been constructed, and the next upward drive quickly reasserts itself and takes things further. The effects of these two opposing Laws finally begin to cancel each other out and the amplitude of the oscillations gets smaller until they cease altogether leaving a new and persisting Level of significant, thoughrelative, stability.

So, let us attempt to address this decreasing (let us say damped) oscillation of the two alternating and opposing laws, and explain why it doesn't just oscillate with equal amplitudes for ever.

There must be a THIRD LAW involved!

Without it the quite evident sequence of higher and higher Levels could not happen.

In effect, this law allows the creationist side to win for a longer period in each oscillation, and thus establish a new and definitely higher Level than from where this Emergence started. Some ideas as to what is occurring have been outlined above.
What do you think?

NOTE: Hofstadter, and many others, are always talking about meta-this or meta-that, and what they are referring to is quite legitimate. Languages used to describe languages in general, would be termed meta-languages, while Hegel's "Thinking about Thinking" might well be termed meta-thinking (if he didn't define Philosophy that way).

What they had realised was that these were more than merely categories, and do, in fact reflect a layering in Reality, as well as our way of dealing with it.

The discussions in this paper , though still very elementary, also recognise hierarchies of laws, which only become possible by the emergence of higher Levels. And, crucially, many of these laws are top-down! The rigidly pluralist position can only see bottom-up causality, which explains why its adherents are constantly driven downwards to more and more basic entities and laws, until they must hit the bottommost rung.

They have to have fundamental entities and immutable, basic laws on which EVERYTHING is based.

A holist perspective brings in what was, and is, impossible via Plurality. It realises that the whole Process is inter-related in all directions, and it rejects straight-through Reductionism as an invention when applied to everything and all Levels.

Only Holism sees the Emergence of the entirely New, and also sees how the new higher Levels can affect those which are lower.

There can be NO Control in a totally pluralist World – only a determinist and complicating explanation for anything.

Control implies top-down, and it allows stabilities to establish themselves.

With Plurality Stability is a principle! With Holism it is a consequence!

For more information about these theories please read our first Special Issue entitled **The Theory of Emergence**

Politics into Physics:

Resolving The Dichotomy
Crisis in Physics

When the philosopher Hegel identified the inevitable crises that occurred in all development, and of course, most importantly for him, in the development of Human Thought, he realised that the fundamental bases of each and every current stage would ultimately display their inherent shortcomings, but, perhaps surprisingly, in pairs of contradictory concepts, which no matter how they were manipulated, could not be rationally reduced to a single common and resolving conception.

For any current stability, based upon such assumed or implied concepts had run its course, and was now ever more clearly revealing the limits of possible development, which then always became focussed into two totally contradictory ideas, that could certainly not both be true!

Yet, each side of such a dichotomy could still be used effectively in certain limited circumstances: they just could not be unified!

Such contradictory pairs were the basis for Dialectics – for their remaining efficacies showed that each certainly contained a worthwhile measure of Objective Content within it, but their irreducibility also showed the real inadequacies of both!

Hence, to actually embrace the Dichotomy, and follow each side down as far as possible, was the only technique (in human thought) to deliver any chance of arriving at a transcendent resolution. Yet, even such a method would not automatically guarantee such transcendent results.

Indeed, in taking such a route, the initial signs would not be encouraging. For, the crisis would at first deepen, and pull ever more ideas into the whirlpool down towards Chaos! So, initially, to follow such a road seemed only to be heading into a much more general and irresolvable mess – indeed, a wholesale collapse of all assumptions seemed the most likely outcome.

But, that turned out to be NOT the only possible outcome! To have the confidence, to challenge our own revealed assumptions, turns out to be the only way to ever transcend an impasse. The method would pinpoint these assumptions and thus suggest a reappraisal of their validity. And, thus require some kind of replacement.

Now, if the problem were based upon more than one assumption then the solution would only start to become evident, as the incorrect assumptions were removed and replaced by better ones. Then, the once irresolvable impasses would begin to melt away and a genuine ascent to a higher level could finally resolve things. But it has to be realised that such impasses and dichotomous pairs of contradictory concepts will *always* arise if the underlying assumptions are inadequate. Such repeat crises don't happen immediately, but they will always be unavoidable at some point, and to transcend each, the same sort of investigation would have to be repeated to overcome each halt in development.

Now, of course, Hegel had decided upon the inadequacies of Formal Logic long before, and had therefore concentrated upon Qualitative Change as the necessary basis for a new and better Logic of Change, and the only area where he felt that he could find, study, reveal and finally transcend the barriers to a correct understanding was in Human Thinking So, he had set himself upon studying just how Thought could be, and indeed was, able to transcend Formal Logic, and deliver ideas that were new! It was a brave route to take. And those who should have been his closest allies – the scientists, turned out to be his most critical opponents. "Studying your own thinking could not be objective!", was their agreed position. It would be too subjective to reveal anything really independent of the thinker's own prejudices was their criticism. But, of course, their confidence, that their own insistent recourse to concrete evidence via experiment, still did not stop their own prejudices from diverting their interpretations of the observed evidence. You could see their point!

Though, because of the misinterpretations, they were wrong about Hegel. For he was a mighty-thinker, and fiercely objective to a fault! In spite of the real difficulties, he began to reveal important features of how Mankind's thinking actually developed, how it encountered innumerable impasses, and how it could, indeed, transcend its own limitations by unflaggingly addressing dichotomies.

But, of course, the scientists' criticisms did have some validity. For Hegel, as distinct from his scientific critics, was not a materialist, but an idealist, and even his brilliant revelations had their own limitations.

He ended up with the *Absolute Idea*, as the crucial essence of all thinking processes. Indeed, totally disembodied Thought became the "motive force" for everything!

It was no surprise, therefore, that his best disciples – the Young Hegelians, broke with their Master, and attempted to transplant his Dialectics from Idealism into Materialism. The group was led by Karl Marx, and the resulting, very different, philosophic tendency became known as Marxism.

For Marx realised that what Hegel had revealed about developments in Human Thought, would also be the case for all forms of development – in History, Economics and crucially in Social Developments too. For the French Revolution had not long ago transformed France and even threatened to do the same for the whole of Europe. Mankind was certainly at a crucial juncture in its Social Development. For as well as Hegel in Philosophy, there was Michelet in History, with his History of the French Revolution. , and the English economists analysing the bases of Value in Capitalism, and last but by no means least, there was Science – or more accurately the Sciences, for they were proliferating at a great rate, and pointing in many different directions.

Clearly, the trajectory of development in all things had started to be revealed by Hegel's genius. And, of course, his identified, inevitable impasses and crises were vital to enable the addressing of the crucial flaws inherent in all current assumptions. How, actually, did they occur, and how were they transcended?

Marx realised that the clearest and most accessible phenomena, which would not have the inherent subjectivity of Human Thinking, would be revealed in actual Social Revolutions. The possibility of the exact opposite to the evident proliferation of specialisms could be found in the common nature of the trajectories of their developments, and some such features could be found that were universally applicable. The dream that was featured in Herman Hesse's book *The Glass Bead Game* was, to some extent at least, going to be possible, NOT, as was usually expected in generally applicable Forms, but in Developmental Trajectories – not the same things at all!

But, this current paper was demanded, because, it was also evident, that every single such transcendence (now termed Emergences) were always only temporary.

But, this did not mean that it was "only for a time", followed by a slip back to the prior stable state. For something significant had occurred: a Revolution had promoted the situation into a new and higher stability, with a different and richer range of possibilities. Nevertheless, it would never be the final step!

Each and every such progressive and transforming leap would always be compromised, and, at some future point, inevitably run out of developmental possibilities.

And, therefore, the struggle for Absolute Truth in anything was unavoidably never-ending. And, this was because qualitative developments, in themselves, and especially the crucial Emergences, always changed the game! In themselves, they actually created new circumstances: all gains would be in terms of current potentialities, and they would change with real transforming developments.

In the past, during revolutionary crises in Russia, Leon Trotsky insisted that the necessity would always be for what he called Permanent Revolution. There could be NO final promised land! Advances would be made, but developments would always be constrained, and perhaps the most surprising of these would always be the *policeman processes* that had turned out to be essential in guaranteeing the completion of the Revolution into a required maintainable stability, but would thereafter defend that gain by opposing all further changes in whatever direction.

NOTE: Of course Social Revolutions were henceforth, different to all past Emergences, because they involved thinking and acting participants: any non-living Emergence would be stupendous but normally inevitable, but a local Social Revolution would always still exist in a world that was not only different to it, but also hostile to it, and intent upon reversing the gains made. There could be no permanent, and always ongoing, guarantee of continuing stability: further developmental crises and Revolutions would still happen as each current stability began to dissociate. [Indeed, because of conscious and powerful intervention, even Counter Revolution was possible]

Now, of course, the most significant developments in these ideas were in social matters, and Marxism became synonymous with revolutionary socialists fighting to end Capitalism. But, even that concentration was bound to limit the power of their thinking.

To continue to make significant progress, there were many areas of Reality, which had been by-passed by the realisation of the significance of these ideas in social change, and these could not continue to be ignored if the discoveries of Hegel and Marx were to be developed further. They simply had to be applied in ALL spheres of development. And, THE most outstandingly important had to be Science!

In spite of the materialist basis of Science, it had been a product of a society that delivered all the other disciplines and specialisms too. So, apart from its Materialism, it was just as compromised as all other thinking, due to its basic assumptions. And what potential was made possible by its sounder philosophical stance, was, at the same time, limited by its subscription to banker techniques, such as Formal Logic (from the Greeks), with its covertly idealistic essence – Mathematics, compounded by the Industrial Revolution, that radically transformed most of Science into pragmatic *Technology*. The pressure for "Useful Science" far outweighed that for a "Science for the universal understanding of "Reality"

And even from the very birth of Modern Science, there had been a crucial dichotomy at its heart – the Dichotomous Pair of Science and Mathematics!

Though seemingly close allies, they were, in fact, a typical example of an incompatible Dichotomous Pair. For Mathematics is not materialist: it is idealist! And in classic phenomena, the two arms of that dichotomy were both retained in use as essential alternatives. For each could contribute valuable things for that society at that time.

You just switched between them when necessary. You ignored their contradictions for their efficacy in delivering very useful solutions.

Perhaps surprisingly, Mathematics, in being able to fit known Forms to phenomena, enabled both prediction and pragmatic use. Whereas Science was infinitely better at delivering meaningful explanations of why things behaved as they did.

The masters of this amalgam, knew exactly when to switch and why!

But, it just couldn't last!

The holding on to both was bound, in the end, to precipitate a monumental crisis, and that is precisely what occurred in the most basic and fundamental of the sciences – Physics. And it began in a seemingly innocuous place – the everyday conception of what was termed Black Body Radiation.

All the conceptions involved, which were never questioned, saw energy as a continuously variable thing, but in this case, the only solution that fitted all the gathered data was if that energy came in descrete gobbets – or quanta. While many other situations could only be explained if the energy was continuously variable.

We had yet another Descreteness and Continuity dichotomy (as Zeno had clearly revealed 2,500 years ago when applied to movement) but now it had becomes a Wave/Particle Duality, and it could not be resolved using the current philosophical standpoints.

A compromise was suggested, which put Equations as the only reliable truths, and explanatory Science was, therefore, terminated.

A counter-revolution had occurred in the citadel of objective studies, and been victorious! The somewhat different task was not a normal Emergence, but a negation on two different fronts.

First, in defeating the Copenhagen Establishment, and second, in correcting, indeed transcending, the flawed assumptions and principles of pre-Copenhagen Science – to in fact complete what that phase in Science was unable to even attempt.

Archaeology:

Impasses in Archaeology: Göbekli Tepe
A Critique of Philosophy & Method

On reading *Civilisation's True Dawn* – an article in **New Scientist (2937)** by David Robinson, it was clear from the outset that the almost 75 year old conceptions of V. Gordon Childe (a Marxist Archaeologist) were to be extensively debunked as the previously accepted wisdom in Archaeology, right up until these current discoveries in the Middle East.

Clearly, his idea of an economic base supporting a cultural superstructure, though it had made sense for all that time, must now be replaced with "something cultural" as the real motive force, though what might have caused cultural developments was not made clear.

The rejected thesis attributed to Childe, that it was the absolutely crucial Neolithic Revolution, which had led to the vast flowering of cultural developments, did not fit in with the trends in ideology within our current economic crisis at all. Rather than some other developments making possible the cultural advances, it has become more attractive to turn this right around, and have the cultural developments supposedly coming first.

At first glance, such an inversion appears to be a retreat, so you wonder how it has grown in its constituency over recent years, for though new sites, not fitting in with the old chronology have certainly been discovered and investigated, the wholesale rejection of the determining role of the economic changes seems altogether too drastic to be reasonable. For then, the changes in ideas have no basis in anything other than that the thoughts in people's heads.

Yet, the preceding Palaeolithic (Old Stone Age) involving basically a hunter/gatherer economy had lasted for about 180,000 years without significant economic or cultural changes being evident, and then, caused by some new thoughts alone, around only 10,000 years ago, both the Neolithic Revolution and the beginnings of civilisation occurred almost at the same time. To have the cultural things coming out of nowhere in a still hunter/gatherer environment seems inexplicable, while the possibility of cultural changes brought about by a massive Revolution in the very means of existence of Mankind seems highly probable.

To make such a enormous switch on causality would surely require a great deal more than some dramatic findings that definitely preceded economic changes being found, in certain particular areas, which then proliferated throughout the whole World and "caused" the Neolithic Revolution.

But crucially, even under a hunter/gatherer social system, there had been interludes that went beyond the usual limitations of that economic set up. But, they were unusually advantageous circumstances that allowed the old means of subsistence to be sufficient without having to be constantly on the move.

The situation in Southern France, where migrating herds could be counted on to travel up and down the same valley as the seasons changed, had certainly delivered the most wonderful hunting AND the most beautiful art in history up to that time. But, as soon as those circumstances vanished, so did most of the higher cultural features too.

The whole point about Childe's suggestion was that, via the gains of the Neolithic Revolution, human beings stayed put, and could produce a great deal more than they ever could as hunter/gatherers. The sizes of local groups increased tremendously and specialists could be supported by the surpluses possible.

These new inversions are simply not sufficiently grounded to dump the older theory. Indeed, it is surprising that such a thesis could even be considered as possibly correct.

But, also from another important point of view, this remarkable re-evaluation for any 75 year old theory should by now have an increasing number of sites and evidence to reveal what actually happened as more complex than it was possible to conceive of on the old evidence, and straightforward theory.

We should expect reviews and updates, or even complete overthrows, of past theories. It should never be seen as the old definers of the past theory as simply being wrong!

Whatever conceptions we construct to make sense out of revealed facts, will naturally be limited by the range and depth of those facts. New data will inevitably and correctly challenge older theories.

But, the simple inversion suggested in this article is not the kind of thing that is required. It is a step backwards!

And, perhaps, even more important, the assumption of a linear series of causes and consequences will also prove to be too simplistic. For with such an approach, we leave out recursion and cross-fertilisation of ideas, which will certainly make significant changes variable over different areas.

A hunter/gatherer group, coming across a primitive farming group, would certainly make them think, and they would carry on their usual treks with the seasons, with a ”seed” definitely planted in their heads as to an alternative mode of existing. [They might even, in dire straights, return to the farming community to steal its stored reserves – killing-to-live, indeed. And such a mode of life could be very lucrative, and give the appearance of civilisation, by what it has achieved by such means.] They would certainly do their gathering with a new perspective – looking at seeds as plant-able as well as eatable. And the hunter would be thinking how he could corral some of his prey animals to have them always available. Indeed, there is a substantial body of evidence of wandering peoples making use of their hunting skills into warring skills, and taking what they need from the better off farming communities.
And, thus the effects of the first phase of the Neolithic Revolution would be evident, even in communities that were not yet farming and herding.

The conclusions made in this article are too linear: they take no account whatsoever of the Trajectory of a Revolution.
And, this linear way of formulating causes and effects is even more pronounced in other disciplines, in particular in the Sciences, for example.

Indeed, the whole histories of developments, in all sorts of different spheres, can be misled by such simplistic linear reasoning. It comes from an assumption that changes are incremental, and that when a crucial point is reached and passed, everything thereafter is consistent with the new situation. Such individual events don’t create the entirely new, by themselves. In fact they will usually cause a crisis, or even a series of them, and it is only when all these have come together as a surviving and better system that the new can be said to have arrived.

So, when we take just these two dynamical variations into account, we should expect inconsistent data to be revealed in the tiny number of new, revealing sites. You shouldn’t “throw the baby out with the bathwater” when assessing what is going on in a revolutionary interlude, in different places at the same times. But, when you see titles such as, “Why Newton was wrong!” or “Einstein’s major error!”, you see quite a different process going on. This seems to be a need to blame past contributors for not getting things absolutely correct!

Forgive me, but isn’t that rather stupid? Will not absolutely each and every past theory, in the end, display inadequacies? Of course, they will!

Blaming past geniuses for not knowing what we know now is surely infantile. They couldn’t possibly know, and their intelligent rationalisations based upon insufficient evidence would certainly be the best they could possibly do. And, the only reasonable judgement, of their contributions, should not be measured against what-we-know-now, but what was believed to be the case before their contribution. Did the new theory contribute more Objective Content than resided in the immediately prior theories? For if they did, the contribution would indeed be valid: and could in particular cases still be works of genius!

So, apart from corrections and improvements due to new evidence, you also have the need to debunk past contributions that don’t fit in with the ideas of politically motivated groups today.

Now, to attempt to establish a correct approach to evidence and past theories, we have to be clear on what it was in those theories that established them as the thereafter-prevailing consensus.

It was certainly not Absolute Truth!

For Mankind cannot alight upon such things - ever!

Man can only formulate theories that attempt to maximise Objective Content, and that is a very different thing. Aspects or Parts of Reality can indeed be glimpsed, and via carefully designed and implemented experiments, some of these can be shown to approach the actual situation – at least in the given circumstances. We say that Man has first discerned, then by control of a limited environment, displayed, and then extracted these important partial truths. Thereafter, he has also managed to abstract certain measured quantitative data from his experiments into formal equations, that, as long as the same conditions are replicated as were used in their extraction from Reality, can be used successfully to predict, and hence in more complex sequences to also produce.

[Notice that these are conditional, and limited to particular defined contexts: they are never absolute!]

Once understood, the common attitude of a defence of past theories seems to be entirely sound! Whereas, the imperative of demolishing great achievements of past researchers seems to be infantile. You don’t just dump past good theories, you must *transcend* them!

The real tasks of scientists must be either to extend, improve or replace all our theories, by doing experiments, first in related areas, and then in ever more distant contexts. Science becomes the incessant process of advancing our understanding: forever increasing our Objective Content, wherever and whenever we can.

Yet, it must be admitted that explaining it in that way misleadingly sounds as though it is entirely incremental. It sounds as if theoretical developments are linearly improved step-by-step. But, that is certainly not always the case.Sometimes, our past conceptions become a barrier to any sort of improvements. A seemingly impassable barrier is arrived at!

Though the past theories causing the cul de sac did involve Objective Content, our resulting, general and underlying view was mistaken, and actually stopped us pushing such ideas any further. Our assumptions ran out of potential: in the new circumstances they were just wrong! To proceed any further a thoroughgoing reassessment of the involved basic assumptions and even principles extracted from past data and past theories became absolutely essential, as they had reached their ultimate limits of efficacy.

Now, it turns out to be fascinating what inevitably happens at such junctures. Hegel realised that we do construct principles out of our conceptions, and these too also contain real Objective Content, but they are also unavoidably limited. And the classic situation, as the crisis looms, is for two different, indeed diametrically contradicting principles to arise, which can be used successfully as alternatives in various different situations.

If idea A fails, we use idea B. Do you want an example, for they are certainly many of them?

The oldest and classic case is Descreteness and Continuity. As Zeno discovered over 2,500 years ago, Mankind in its conceptions of movement employed both of these principles. Yet they were in direct contradiction to one another, but were still used extensively - if one failed, they just pragmatically switched to the other, and for the most part got away with it. Zeno’s Paradoxes were a successful attempt to reveal exactly what was inconsistently been done with these alternative principles. And, in modern Sub Atomic Physics there are the two opposing concepts of Waves and Particles – again another of these Dichotomous (yet complementary) Pairs.

Now, Hegel was clear - the development of understanding only really moves forward when such complementary Dichotomous Pairs are revealed, and then transcended. For both sides of such a pair are always equally inadequate. In spite of having different, yet real, Objective Content, in the two alternatives, they were both “basic” principles. To get beyond them both involved destroying and explaining both, in terms of a higher, rather than a lower, level of Reality. And, it must also be emphasized that this transcending is never merely a puzzle to be cracked at the current level at which they actually appear. The usual way of thinking about such things leads inexorably to contradictions: the required changes are absolutely fundamental, not only in human thought, but also in all general processes of development.

What always seem to be uncrackable crises will appear, and either a revolutionary transformation occurs, or things grind to a total developmental halt: significant qualitative changes completely cease.

In thinking then, we learn to live with the contradictory pair, and thereafter pragmatically switch between them as required. Further developments upon that front are no longer possible, until that dichotomy has been somehow transcended. Developments can continue elsewhere, but not anywhere dependant upon what reveals itself in that dichotomy.

And, in general developments, a revolution occurs leading initially to what seems to be a total breakdown, but which ultimately resolves into a major qualitative series of changes, at a wholly new level Though, alternatively, stagnation sets in, and what can only be called a Dark Age takes over, and real progress halts.

NOTE: Recently in another TV programme concerning the period immediately following the end of the Roman occupation of Britain, the assembled experts on Anglo Saxon Britain all agreed to the usual characterisation of that period, as a Dark Age was “completely wrong”. And to prove their point, they pointed to the assembled wealth of the new chiefs and Kings, while simultaneously bemoaning the almost total lack of sufficient dwelling sites, pottery and many other products that were abundant in the preceding Roman Period. It was, indeed, a Dark Age, and society had to in the end find a wholly new path to a following period of significant development.

Indeed, these crises are so important that Hegel had a word for the interludes of significant qualitative changes: he called them Emergences.

And these turn out to be very complex interludes – absolutely NOT susceptible to the Formal Logic of most methods of analysis.

The actual trajectories of such Events show how very different they are from ordinary relation-governed quantitative changes.

For, the characteristic of the ripening of the inadequacy of assumptions in concrete stabilities is not merely a continuing crisis, but also a cataclysmic dissociation of the currently stable situation: the prognosis is for a descent into total chaos, and, indeed, that certainly constitutes the initial phase of the overall process. But, it can and does actually turn around! Not, it must be pointed out, to some predictable future at all, but first to a competing set of possible-stabilities, which grow and then decline

as different ones temporarily come into prominence. Yet, in the end, inevitably, one of these swamps all the others and matures into a new, very different stability, on bases that could never have been logically derived from what came before. For too much of the Old had perished, and too much that was wholly new had come into prominence. A Revolution will have occurred!

Now, the reader might well wonder why we have strayed so far from Göbekli Tepe!

But, remember, these crises occur in our thinking too, and the discovery of what appears to be the first signs of human civilisation before the Neolithic Revolution seemed to torpedo the old formula explaining how these things had occurred.

Clearly, the crucial crisis of the hunter/gatherer economic system of human societies was running out of the necessary wherewithall to continue. In fact the amazingly swift spread of homo sapiens across literally the whole accessible Earth, was due entirely to the need to constantly move to new, as yet untapped areas, to be able to maintain the same level of sustenance. Without almost continuous mobility the increasingly numerous hunter/gatherer families or groups would certainly perish. Yet Mankind was also a remarkable animal, and its intelligence kept its members well fed and relatively healthy, so that numbers were also growing at an unprecedented rate, while resources were certainly not.

So, the changes amounted to a major crisis, and a collapse of the old system as a viable means of supporting that growing population. The classic descent into chaos began to establish itself, and as the old ways had to be abandoned, the seeming demise, turned into a variety of new alternative means, and embryo new forms began to appear, though most would not succeed.

In conducive circumstances some of these would deliver a great deal more than had been possible within the old social and economic system. And a variety of different alternative proto-societies arose where they found the resources that such a system needed.

An Emergent Interlude had passed through crisis into variety, and thence to a new stability. Only then was the Neolithic Revolution complete!

The conducive area seemed to be around what is now called the Levant and southern Anatolia, and a number of these alternative societies, each on a small scale and with varying success began to arise.

Notice that many of these must have came and went without seemingly leaving their gains for us to trace through consequent following forms. But they certainly must have happened.

But, what are our present-day theorists making of the new sites and surprising data? First, they condemn the Marxist archaeologist V. Gordon Childe for “Economism”, and second, they strive to make cultural changes come first. The transformation of Palaeolithic and Mesolithic communities into Neolithic societies, they put down to unconnected, and certainly in no way economically determined, religious and cultural developments, and therefore conclude that it was these latter that “caused” the revolution that included agriculture, animal husbandry, pottery, weaving, baking, brewing etc. etc. etc. Are they right? Of course they aren’t!

They are making the classic idealist mistake of putting down all significant developments to *ideas*, rather than the other way round. They are weaving in a simple explanation through a gigantic Revolution. They are still enmeshed in old forms of thinking, and their unavoidable Contradictory Pair is Economy and Social Forms. It is the old Superstructure and the Base discussion, which is yet another Dichotomous Pair, when the actual real relationship between the two is not understood. They doubtless will continue to switch to and fro between these conceptions when explanations via the alternative fail.

Clearly, these important new discoveries are in no way carrying them through the crisis, which they evidently precipitated, and the inadequacies of their analytical methods.

It is sad, because these are very important discoveries and were happening in the midst of a vital Emergent Episode in Mankind’s development.

The Neolithic Revolution was THE most important transformation in the whole history of Homo sapiens (and not just a good idea).

Evolution:

The End of Incrementalist Evolution?

Review: Accidental Origins (New Scientist 2751)

Yet another article has appeared but this time adding a rather different gloss to the usual consensus interpretation of Natural Selection, but instead of the usual cashing in on a world celebrated anniversary, this one does add something of real value. In Accidental Change just released in the recent New Scientist (2751), reporter Bob Holmes introduces us to **Mark Pagel,** who along with his colleagues, has uncovered a fatal flaw in the assumption of large numbers of very small, incremental steps which alone are supposed to deliver the crucial process of species change via Natural Selection. Though many others have questioned this tenet of Natural Selection, Pagel is different because he uses the same standpoint and methodology as his opponents to demolish their position. He uses a mathematical analysis of data derived from available evolutionary sequences to show that they could not have happened in the assumed way. But importantly, the significance of his results also, in fact, reaches well beyond Natural Selection to a whole range of "theories" based on the same sort of assumptions throughout present day Science, and so his contribution is significant for Science in general. He reveals a significant hole in this form of explanation by showing that the concrete results do NOT have the actual "shape" that would be unavoidable from large numbers of small steps. Indeed, he goes onto demonstrate that the nearest idea that matches the analysis, is that species change is caused by a single accidental event rather than the assumed gradualist drift.

But, taking a step away from the individual problem Pagel addresses, we must more generally separate out quantitative derivation of formulae and its ability to accurately predict, from the usually following explanatory theory.

Most scientists today feel that the initial stage is actually the "real nitty-gritty", and the explanatory phase is merely some sort of rationalisation. Once a means of prediction is in their hands, the scientific process is presumed to be "complete", and all sorts of questionable rationalisations are considered sufficient for the final "window-dressing", explanatory phase.

Returning to Pagel's work, it is clear he has totally undermined this overall approach, at the same time as his contributions to Evolution.

ALL other similar rationalisations in many other important areas of modern science must also be seen as subject to the same criticisms. The premise of vast interludes of time, and innumerable increments to totally alone produce all possible states can be demolished by such research as that delivered by Pagel. The flawed methodology is not a no-brainer, which everyone is bound to accept.

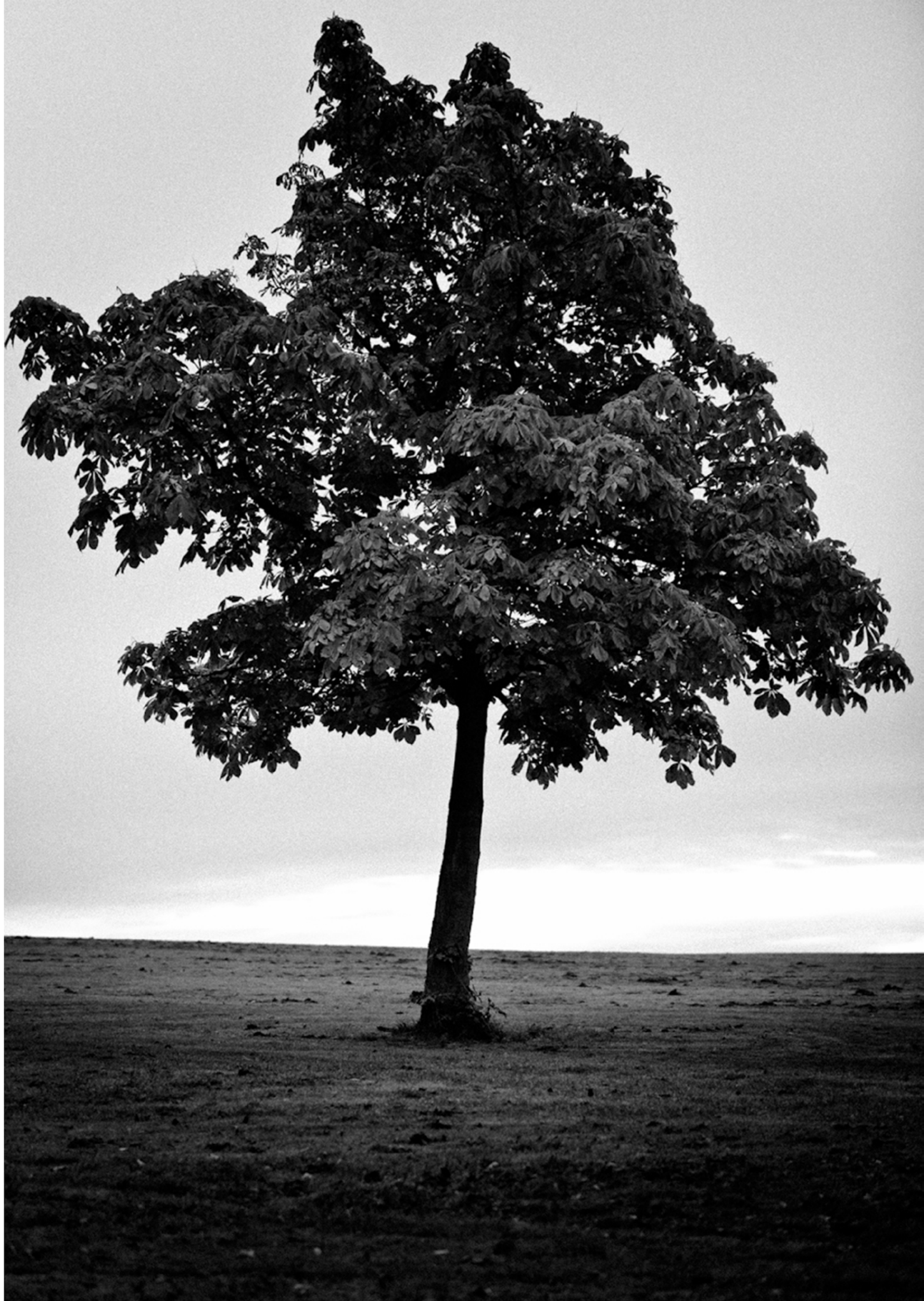
Indeed, many other scientists, including myself, have long disputed such forms of "explanation", but our position has not been accepted as most cases were always completely beyond either experimental demolition or confirmation. Pagel's method changes this seemingly permanent impasse, and such assumptions can be tested with certainty.

Consider all the accepted methods, particularly in computer simulations, where, based upon "placeholder" theories, of the kind demolished here, involve similar thresholds, beyond which it is assumed that a new situation has been established (by incremental changes?), and new formulae can be employed. Such methods are now clearly revealed as cases with sufficient evidence for reliable data, yet having NO real Theory, and which therefore require invented, incremental-type placeholders which cannot be validated in the usual ways.

Mark Pagel (University of Reading) attempted to "quantify" species change by considering the effects of both random, incremental events and the time-gaps between adjacent species in an evident evolutionary sequence, BUT he came up with the result that the usual assumptions were inconsistent with the investigated data, and in considering a whole range of alternatives, the one that stood out as vastly more in tune with the data, was that only the emergence of a new species by a Single Accidental Event would do.

Now, as a scientist who cringes at the usual purely mathematical foundations for "theories" in much of modern science, I was primed to disagree with Pagel. But I was mistaken. He was using the science of Pure Form (Mathematics) as it should be used – to assess the formal implications of a methodology. His conclusions are formally unassailable!

But nevertheless, for my kind of Science, his revelations are only the beginning of absolutely necessary consequent



scientific investigations. The criticised basic assumptions seem to be:-

1. That totally random and undirected accidents occur over vast periods of time, from which Natural Selection picks out only the most advantageous for continued survival.

2. And, that such increments can then gradually build up until a threshold is reached, beyond which a wholly new species (NOT a mere race or breed) is created.

The expression, "You cannot see the Wood for the Trees!" comes immediately to mind.

A single isolated tree in an open space is a very different thing to one existing in established and continuing Woodland.

The latter is part of a system working at a different level from the single tree. Component individual trees are different by being surrounded by other trees. In established Woodland, the growth patterns are very different, and the Wood affords a measure of protection too, while the involved ecological system is much richer there, so that all sorts of symbiotic and parasitic and even inter species advantages can establish themselves. The question has to be asked, "Could the system of the Wood be determined solely by knowing about the properties of an individual, solitary tree?" And, of course, the same must also be true for other species of organisms. We cannot reduce their development and crucial change to incremental and undirected accident over vast periods of time.

Pagel's work demolishes the usual placeholders, but the actual causal features of species-change are still requiring answers, which will NOT be solely formal, but will tackle exactly how such changes can occur; what is the biological content of species change? What significant qualitative events can deliver such innovation?

Now, to address this question, we must start by admitting that step-by-step selection does indeed take place, and can transform a species into a different Form – but that does NOT mean a switch to a new species: a Great Dane and a Chihuahua are still both just Dogs! This mechanism explains breeds but NOT speciation! Something else must happen to result in what we correctly term a New Species: something which is NOT gradual and incremental, but immediate, qualitative & significant!

Now Pagel et al draw the conclusion that a single accidental event must be the cause, but that merely precipitates even bigger questions. What sort of single change could produce a new species at a single stroke? It must, surely, be impossible when seen as a single accidental mutation! We must replace both Pagel's and the usual interpretation of such an "event" with something of an entirely different order.

The Change must be brought about by a short but "revolutionary" Event, and such, of course, do indeed exist, and we have come to call them Emergences.

These cannot ONLY involve a single piece of genetic damage, which, by pure chance, causes sufficient changes to produce a wholly new and viable species. It must be some sort of general "system" change in which, in a relatively short period of time, via both avalanches of dissociation and swift erections of "the new", produce, over a series of contained, see-sawing crises, a new synthesis, which is both viable and persists!

Now, such Events are not unknown! The greatest example of such occurrences must include the very first Star, then, much later, the Origin of Life itself, not to mention subsequent significant revolutions, such as those involving the birth of Consciousness, and that of Thinking too. Finally, such processes must even apply to Social Revolutions.

But such are not usually seriously addressed in academic circles. They are considered to be too much driven by ideological assumptions and indeed are often entirely discounted. But their reality is unanswerable by such purely prejudicial reasons for dismissal.

The absolutely Key example of such a kind of revolutionary Event must be the Origin of Life on Earth from purely inanimate matter. And no-one could possibly put that down to a single accidental event, could they?

To respond to Pagel et al's criticisms can only be addressed by a serious, scientific study of Emergences – the crucial, and indeed only, single events of qualitative change. Now, though these have NOT been pursued scientifically to any great degree to date, they have been available throughout history via fragmentary observations, artistic creations and persisting myths.

Around 2,500 years ago, two opposing, world-view conceptions were outlined almost simultaneously. These were Plurality and Holism. The former, concerned with seeing everything in terms of Wholes and their constituent Parts, was established in Ancient Greece, while the latter was formulated as a world view and guide to living for human beings by the Buddha – as "everything affects everything else" and "all is change" Nothing persists!"

Thereafter, throughout the intervening period right up to the present day, many holistic gems were uncovered and delivered in sayings, stories, and many works of art, but it was not until Hegel (around 1800) that an attempt was made to formulise the study of Qualitative Change via his attempt to construct a "logic" of Change with his book The Science of Logic. His main disciples, the Young Hegelians dramatically switched sides, not only abandoning Idealism for Materialism, but also by concentrating to a great extent on Social Change as their main purpose. Marx and his followers could not be stomached by the conservative occupiers of High Academia, and any serious research into Emergences and Qualitative Change was effectively deemed insupportable.

But, the wheel has turned full circle since that time, and Science is now constantly coming up against the contradictions inevitable from maintaining an entirely pluralist standpoint in a clearly holistic World. [The most significant and ever continuing crisis debilitating Modern Sub Atomic Physics is perhaps the clearest example, but many other cases with the same causes abound in many diverse areas of study]

Even from the very heart of Academia, scientists such as Murray Gell-Man have proposed the task of addressing Emergences, and the famed Santa Fe Institute was established with that as its main purpose. But, even the giants involved there could not negate what they and their predecessors had constructed over the last century, and their unbreakable marriage to Plurality has made any real progress impossible, and the purpose of the Institute has now shrunk into investigating yet another branch of Mathematics ONLY! Such philosophically unsound bases, and purely maths-led "theorising" is incapable of addressing this crucial area, and the contributions from Santa Fe have been decidedly poor.

AS scientific method and explanation is increasingly replaced by pure Form equations, applicable only in pluralist-demanded Domains, these researchers find themselves incapable of transcending the contradictions they encounter on all sides, such that they are now major "tenets" for their position and are worn as badges of honour and superiority over the rest of uncomprehending humanity. So, like Pagel, they find flaws, but can only replace them with other flaws, dictated by their increasingly redundant methodologies and world views.

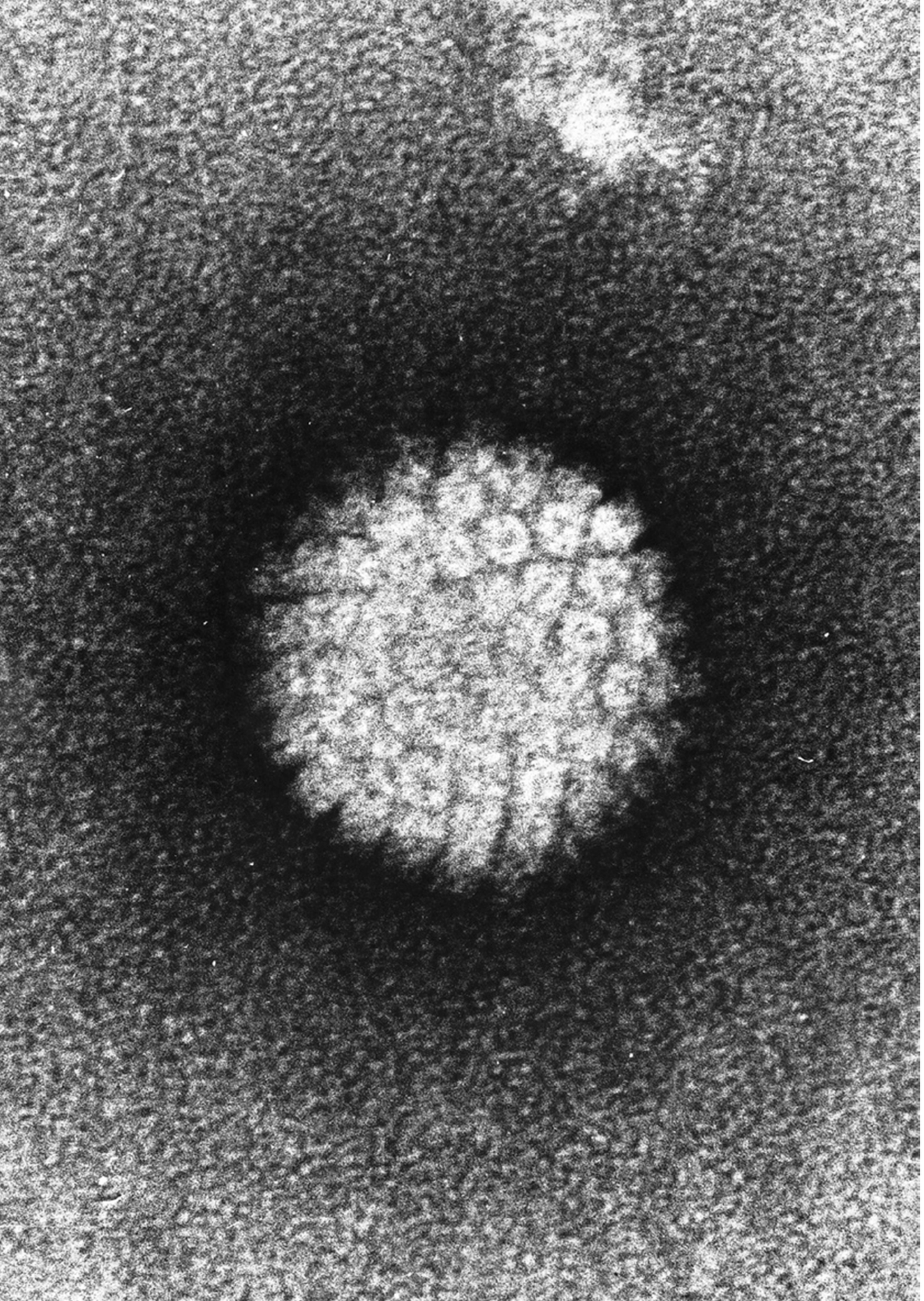
The errors, though, frequently switch to the opposite end of the spectrum and the "containing Wood" may well be recognised, but only as a summation of isolated trees producing overall and average collective features with matching probabilities. Instead of real understanding and explanation, almost arbitrary quantifiable features are monitored for a dependable, recurring Value (at Transition), so that when it is surpassed, new laws are brought into play to replace those possible before the threshold.

Clearly the passing of the value at the threshold does NOT cause the change over, but is merely yet another symptom of the process which really does bring about the changes. AND these are not a simple switch but a kind of system revolution, involving significant dissociations and re-associations – more of an Emergence indeed, than a single accidental event.

No real answers will be produced without a major renovation of the by-now ubiquitous pluralist and maths-led methodology, and the general acceptance of such apposition is clearly proved by the very language of almost all scientists. They talk of natural laws determining the nature and evolution of Reality, which is clearly an abandonment of Materialism. How can a disembodied formalism produce and then drive Reality? That is naked Idealism! Laws are produced BY Reality, which changes and evolves, so that new laws appear at each new emerging Level. The revolution of the Origin of Life on Earth generated via concrete Reality, a whole new world of laws – subsequently gathered together by Mankind as Biology! Were there any eternal biological laws "before Life"?
Of course there wasn't!

Now, this short paper is not mere kite-flying. The author – a physicist/mathematician, philosopher and teacher of 50 years experience, has been writing on these very matters for over 10 years and has, in the last 12 months, described his conception of the Inner Trajectory of an Emergence, as the first step to a world-wide investigation into scientific method and the necessary formulation of an holistic alternative.

Such a purpose has already produced a reformulation of Miller's brilliant and holistic experiment into the Origin of Life. And this would itself begin to define a whole new approach to such questions, and lay the foundations for a Holistic Science.



The Single Transforming Event

Pagel's research has proved that speciation must be a single event, and not merely the accumulation of many contributory and purely quantitative changes, but that doesn't say everything that must be involved. Indeed, the inference is that a series of such changes finally culminate in such a completing transforming event, but that seems also to have been proved to be mistaken by his work. For it merely again infers that the new species is merely the sum of those directional changes, which finally and crucially adjust into something entirely different.

In fact separate and very different research into Emergences in general (by the author of this paper) shows that the exact opposite is very much nearer to the truth.

The changes that are immediately evident may well be how we recognise the species, but they alone are totally insufficient to precipitate an event which effectively re-organises the old into something entirely New! In a holist world Quantity into Quality is a myth!

For, it turns out that the most significant contributions to the speciation event are undoubtedly deleterious and undermining of the prior and aptly defended "stable systems" which characterise as the prior species. They effectively dismantle the self-maintaining factors of the old species. The inexorable march of the Second Law of Thermodynamics-type changes cause the initial stage of the event, which finally amount to a total collapse of the old stabilities, and which also seem to promise at first sight a result of total dissolution and chaos. The old species had been rigorously maintained as a system, and its defensive and self-maintaining mechanisms would then allow of NO significant, qualitative changes at all. Stability is a necessarily conservative state! And to see a new, separate species, with its own (and different) defining characteristics, required such a catastrophe to give such a new system to have any chance at all of arising.

According to the Theory of Emergences, in all major qualitative changes (and speciation surely, has to be such) the actual Emergence must initially be a destructive cataclysm. Now, if this is the case, the question inevitably arises, "When and how does the catastrophe and subsequent constructive revolution take place?" It seems impossible!

It cannot occur in the new phenotype living entity, for that does not yet exist – we only have mutated genetic material! While such a directed upheaval within the genetic materials also seems totally incredible too. What on earth would direct the emergence of a wholly coherent and new template for a yet-to-exist new living organism?

These are very big questions, and I cannot pretend that I can conceive of the answers as yet. But, as always, the final arbiter MUST be Reality itself, and so there has to be an answer. What is clear is that all the possibilities inherent in such a cataclysmic change do exist, but what selects them and to what ends?

Let us admit our ignorance, as all scientists must do when presented with new, indisputable, yet inexplicable situations, and attempt to find the beginnings of an answer in the indubitable features of the genetic material itself.

Most genes are in fact wholly (and permanently?) inactive! They are "permanently" "switched off"! Why are they there, and what tied them up and parked them as non-runners in the role of genetic determinations? Something must have purposely done this and for "local" and indisputable reasons. A process must have occurred which limited the active genes to a different and coherent sub-set.

[NOTE: Frank Ryan's article **I, Virus** in New Scientist mentions that only 1.5% of the genetic material fits the requirements. All the others, which were damagingly contending, would need to be disabled.]

Now, elsewhere, I have tried to address the many conundrums of genetic damage – mutations, by suggesting a built-in "Accident and Repair System", which dealt with the totally unpredictable "random damage" mutations in order to maintain, as far as possible, the integrity of the prior genetic material, and whose most obvious job would be to disable clearly non-fitting new genes. Notice that such a system could not have any criteria to do with the effects on the phenotype, when developed from the given legal set of genetic material. The system couldn't know that, and its necessary criteria would only be wholly meaningful within that World of genetic material.

BUT, as the previous genetic material was viable and obviously had produced phenotypes to get to where we are, and have the best model for a new set of genes MUST be the old set of genes. The "policemen" of the genetic material must only allow changes, which, according to some criteria, keep any new mix "close" to the current model. What else could there be?

The criteria must be to judge whether what was available made up a mutually conducive set of elements based on the previous set.

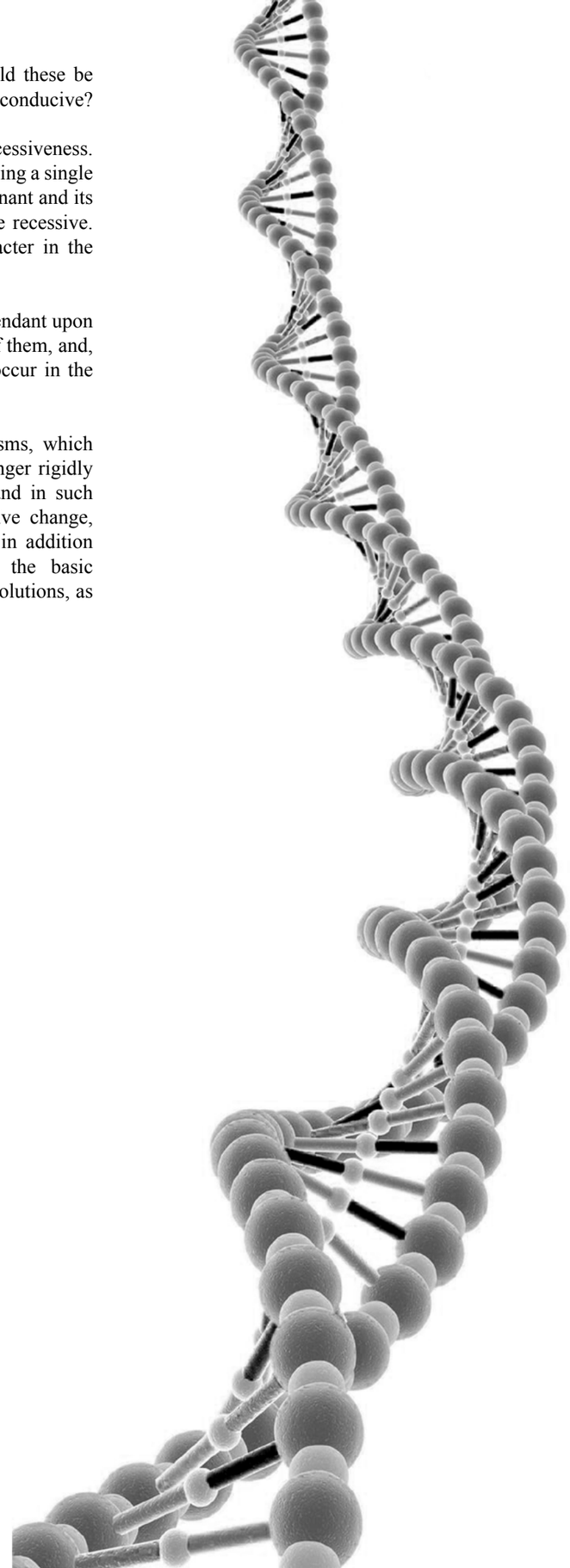
Note also what must happen in fertilisation! The haploid contributions from both parents come together to form the diploid final genetic material, and the two contributions

could have very different histories. How could these be deemed to be conducive, or possibly made to be conducive?

It seems to be connected with dominance and recessiveness. In any pair, when both are involved in determining a single particular feature, the norm is that one is dominant and its partner from the other parent is deemed to be recessive. And the dominant one determines that character in the phenotype.

[On the other hand, some features are not dependant upon a single pair, but on a sub-system of several of them, and, in spite of dominance, mixed characters do occur in the offspring.]

What I am searching for here, are mechanisms, which function in crises, where prior systems no longer rigidly determine what is allowed and what isn't, and in such a situation, there is a possibility of qualitative change, and wholly new features emerging. Clearly, in addition to Mendel's genetic theory, which forms the basic mechanisms, there must also be crises and resolutions, as in all Emergences.



On The Origin of Species
A Modification to Pagel's Excellent Contribution

When Mark Pagel announced after his detailed study of enormous quantities of measurements taken from fossils, that the Origin of entirely New Species could not have taken place gradually over many generations, but must have occurred in a Single Transforming Event, he put the cat among the pigeons for Evolutionary theorists. For, he did two transforming things to what had always been the accepted wisdom of Darwin and Wallace's Origin of Species.

First, he demolished the universally accepted theory that all new species had occurred by the accumulation of mutations to the genetic material of individuals over many generations, which were then passed on, and added to by other mutations until a certain number of the old species had moved too far to continue to interbreed with their unchanged relatives, and a new species had been born. Instead of a single species this process would generally result in two, which thereafter would continue along their own quite separate paths of development.

Pagel's contribution made Species Change an Emergent Event, but it also generated a whole series of theoretical difficulties that had not been there with the now superceded theory. For, a new species is characterised by its inability to reproduce with members of a different species, even if very closely related to it. There would be either no successful offspring, or it would be unable to reproduce, as it wouldn't have a compatible partner to reproduce with.

So, absolutely nothing like a new species could have happened, unless the mutation had occurred within its genetic material. For, a change to any other cell would not be passed on. Even then, the newly mutated individual would still have to be able to interbreed, with at least some of the local population of what were still, at this point, this individual's species. Otherwise, our new version, no matter how well it was adapted to its environmental conditions, would NOT be able to successfully reproduce. It would finally die without issue! The new species would die out with the final demise of its first, and only, member.

Now, clearly, it matters greatly how the whole set of processes that occur in the preparation of genetic materials for contribution to potential new offspring are carried out. The mutation of genes, governing less vital characteristics, must happen all the time without it causing the creation of new species.

So, exactly what these reproduction processes are will be crucial here.

Would the damage be in crucial areas that governed reproduction? What is more, with this necessary kind of mutation, there could be little or no competition leading to greater successful reproduction over generations, as no sexual relations could produce viable offspring. Natural Selection could not get started!

Now, in contrast to Pagel's new thesis, the old incrementalist theory would indeed allow continuing reproduction, for no single event (or mutation) would mark the birth of a new species. It would be a simple divergence beyond a threshold, and hence, the processes of Natural Selection would be the crucial factors. And, by the usual processes, a subset of a given species could together drift so far away from the separated parent group, that a point would be reached when interbreeding between, the old and new species would be impossible. But, Pagel's results ended that idea. A single transforming Event meant that it occurred to a single individual via a single mutation.

We seem to have a major contradiction here, unless Pagel's Theory can be extended somewhat. Clearly Species Adaption and Species Change are different mechanisms: one does not lead inexorably to the other (even gradually). Adaption will produce different races of the same Species, and they could be genetically moved great distances from the usual apparent appearances of the individual members.

Species Change must surely be a separate process, not only affecting genes in the genetic material, BUT precisely in those factors governing Reproduction and/or Development. Anything in the chain from the original essential merging of haploid genetic materials into a new individual's own genetic code, or in any crucial part of the subsequently controlled development, would be necessary.

So, what would this single, Species Change Event entail?

When a species changes one or more of its genes, and as long as it can successfully reproduce with other, unchanged members of the "same" species. Two things would characterise the new version of the organism. First, it would still be able to reproduce, successfully, with its own, local population of the same species. And second, it would still be able to reproduce with other members of the same species that have developed differently, perhaps elsewhere.

So, we are not yet talking about Species Change but the development of different Races of the same species.

For example, all human beings on Earth are homo sapiens, but, via mutations and Natural Selection have "locally" developed into many different races, with different characteristics.

Now, the problem is, if a single individual suffers a mutation within the appropriate, genetic material prepared for contributing to a new individual, several things can happen.

First, the damage may well be sufficient to make the successful coming together of these genetic materials with those of another individual impossible, and hence the fertilisation of the egg will fail, and it may be immediately naturally aborted. Or, alternatively, the egg could still come through its gestation period and birth, but would be unable to successfully reproduce itself with "normal" partners in that species. Even if the newly produced individual turned out to be completely viable as an adult phenotype, its genes might make it impossible to reproduce with members of what was its "own" species. For, as already mentioned, the soundest definition of a new species is that it can only successfully reproduce with others sufficiently like itself – that is of the *same* species!

So in this case, no new offspring would ever be possible. The viable new species of only one individual – the first of its type, will also be the last! It will die out only ever having had a single member!

Now, this seems to invalidate Pagel's findings. But, he is adamant: the statistical analyses show quite clearly, and in all the cases where there was sufficient data available, that Species Change was indeed a Single Transforming Event,

So, how could this be? We have a classic contradiction, where two things both seem true and yet appear to be totally incompatible!

The problem changes into a different question – into one where we have to still get a new strand of organisms initiated by a Single Transforming Event in a single individual's genetic material, which will show itself in a single affected offspring, so how can this still work?

One way would be if the damage was not to the genetic material prepared for a single egg or sperm, but in the "producing mechanism for genetic material: the replication of genetic material to put into the eggs or sperms, the damage could be in the parent rather than the potential offspring, and all subsequent genetic materials would have the same change. Clearly, this would mean that though these offspring would be incompatible with all others in their parent species, they would certainly be compatible with each other. Sibling intercourse could produce viable offspring.

And, the more it is investigated, there appear to be other possibilities for a new and surviving species to stem from a single transforming event.

The most obvious case, and also the most unlikely one, would be for the exact same mutation to occur in more than one individual within a local sexually accessible group. And, for the offspring of these separate events to attempt to reproduce to get the new species started. And they would also have to compete successfully with their old species to get established, or also change their chosen mode or place of living to ensure their success.

Now, there are, indeed, several others!

Two different mutations, in two local individuals of the opposite sex, which nevertheless kept them compatible for reproduction purposes, would also allow the propagation process to start.

Clearly, we can theoretically devise scenarios where a new species would get beyond one, first and last, member, but just how unlikely would they turn out to be?

But clearly, before we speculate further, we must address the key question, "What actually causes mutations?" If it is entirely random, accidental damage caused by cosmic rays, then the above ideas of species change are unlikely to be correct. Only if some external agent could, more or less, simultaneously inflict the exact same damage (or genetic change) upon more than a single individual within a mutually accessible group, could the theory deliver! It would have to be something like a local shower of mostly identical agents guaranteed to damage more than one individual and in the very same way. This may be possible, but it is certainly extremely unlikely.

Another vector, which may have a much better chance of delivering the exact same change to genetic material in many individuals in a local group, could be via viral action. The fact that a virus is a life form limits its interactions to a small range of processes in the genetic materials of other host organisms. Indeed, there is increasing evidence (See Ryan's excellent article in New Scientist with the title I, Virus!) that viruses have played an important role in past invasions by them into higher order multicellular organisms, which together have become permanent new, joint systems.

In many ways this seems the most likely as it is not random, but local and purposive, and with regular changes to the viruses themselves, yet a constant imperative in their actions to succeed and reproduce within other host organisms, it could be what we are looking for.

Yet, of course, it could happen to more than one individual within a species at about the same time: it could happen again and elsewhere. So, something else in this potential solution would have to make the precisely the same changes very unlikely in other circumstances.

Finally, we have the phenomenon of Switches – genes that switch other genes on and off! If a change occurred but did not affect reproduction because it was never turned on (indeed turning off damaged gene's may well be the first line of defence for organisms suffering such damage), and hence would have no effect. And such hidden changes may well be a way in which Pagel's theory could be proved to be correct. If another gene change, in that same organism could cause the old damaged gene to be switched on, the necessary single event could then become active. As initially the original gene would never be active, it could without any disasters be propagated to a sub population of the species, but NOT to everyone. Yet the second gene damage could initially have been in an individual without the first damage, so it also could be propagated far and near. The conjunctions of the two in the same individuals would then be likely, and the interbreeding between such individuals could build the species.

What can be assumed as definite is that a situation would soon appear in which only reproduction with genetically similar organisms would be successful, and interbreeding with even closely related organisms would always fail.
How could this work?

A bigger snout or blond hair couldn't do it; of course, the gene mutation would have to change either the union of genetic material, or the development of the embryo in some damaging way, so that the attempted development would fail dramatically. The changes that caused the Species Change would NOT be those that made the organism better in a competitive sense. That would be caused by other mutations that allowed the organism to compete better. It is impossible for them to be that same mutation! We must not mix up mutations to benefit the organism in a competitive sense, with mutations that change significantly reproduction itself, or the development of the embryo.

Only the latter would cause Speciation, and then not until none of the old replaced genes remained, would the species be established. It would be a single event à la Pagel, but it wouldn't be effective, as a species split immediately a single successful reproduction had occurred.

So, without the reproductive development genes being mutated, the species could not become a different one. Like dogs, for example, they could change in all sorts of other ways, so that they would look entirely different, and display very different abilities, but they would still be Dogs. Of course, we associate the two kinds of genetic mutation together, because the more competitive changes would soon dominate the population and when that population also had the mutation prohibiting reproduction with only those NOT carrying the same reproductive changes, we would naturally associate he Species Change with the gene that gave competitive advantage, but we would be incorrect!

It is a classic example of Association, and not Causality. One gene caused the origin of a new species, while it was another one that won the competitive battle.

Cosmology:

Conceptual Ripples in Thinking
And the Fabric of Spacetime

To actually have ripples in Spacetime – the einsteinian "fabric" of the Universe, it has to consist of something that can be set into a communicatable oscillation - but what?

For, if it isn't something material, then the idea of it becomes immediately meaningless, We must not forget that we use abstraction to both separate and simplify from a complex Reality, as a means to gradually beginning to understand it. It was a remarkable development, but within it there is also the possibility of a major consequent error. For, we can mistake our abstraction for the real thing, or, even more dangerous, treat is the actual motive force behind why Reality behaves as it does.

By its very nature, abstraction both reveals something objective and simplifies, and in so doing it undoubtedly modifies what we consider to be the case in Reality-as-is.

Space itself was conceived of to impose some sort divisions, in all directions, of the place where things were happening, thus making all three dimensions susceptible to measurement. The supposed emptiness of real Space was given a 3D net of reference points superimposed upon it. But, of course, it was, and still is, impossible to relate such a matrix to an objective Origin Point. Indeed, we not only stick our origin point in the most convenient place, but we also insist that wherever it was put, to deliver space-distances, would be subject to exactly the same laws, with reference to that origin and system of space, and, in addition, whether it was stationary or moving.

We would not even have to know about its behaviour – it could do anything as long as all our measurements were kept in reference to that centre, and its infinite net of spatial references. The laws we extract would be the same wherever we placed our origin, and even on a fast moving train, our measurements of other movements within that train, would be subject to the same laws as if everything was acting with reference to s stationary situation, such as if the train was stopped.

NOTE: This particular aspect of Space tells us that we are assuming it as wholly insubstantial, for moving matter has properties that vary with movement,

To state that the laws that exist for anything happening within that Space to be independent of what it (space) is doing, shows what it is whatever we are extracting as laws cannot be Matter-based. They must be only about pattern as seen from our chosen disembodied reference system – indeed, only about Form – something, which is independent of Matter as such, and encapsulates only disembodied patterns. It could only be arbitrary – that is "not absolute" For, everything is considered only with respect to this reference framework, without any knowledge of a contribution by the reference system's own movement.

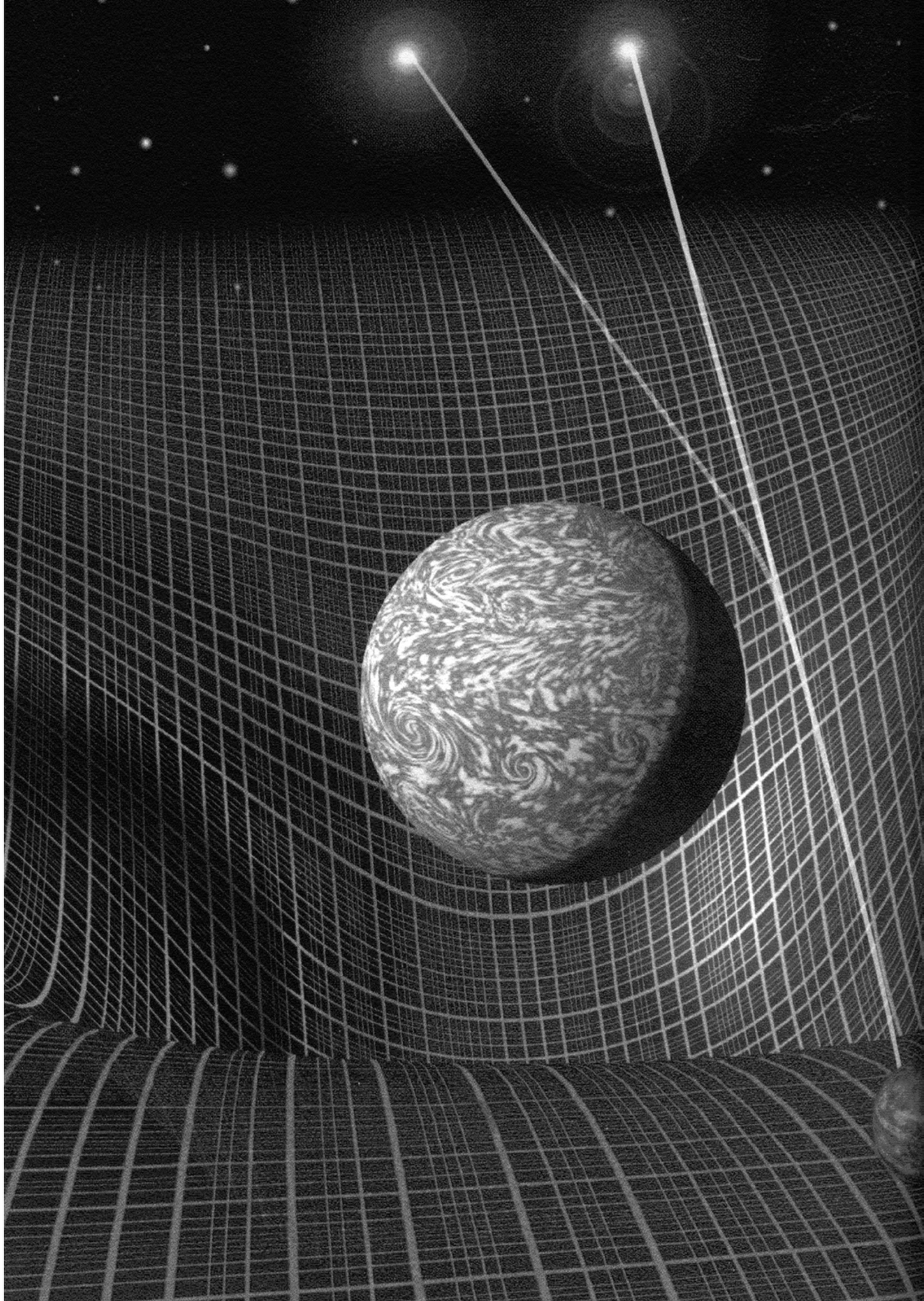
We actually treat it as being totally stationary – hanging there undisturbed by, and undisturbing of, what concretely occurs and changes. It is a man-made inclusion! And reveals exactly what Objective Content actually is: it has objectivity, but isn't the whole truth.

Now, Time is somewhat similar, and, as we cannot see all things, wherever they are, simultaneously, we have again to position our Time Origin at some convenient place, from which we can evaluate the times of preceding and following Events.

Yet, in the case of Time, there has arisen what seems to be a "real" Origin. It has been calculated as about 14 billion years ago, as the place from which all of Space was created and expanded, to give us what we have now. And, of course, if our assumptions and calculations are correct, this gives us a "real objective" origin for Time (unless, of course, the Big Bang was not the start of everything).

Nevertheless, talk of "fabric" of the Universe and ripples within it, are meaningless unless that fabric is, or contains, something variable, but notice – not very variable. Indeed, for the most part, it seems to be remarkably constant, and only in exceptional circumstances can it be made to "bodily oscillate", and even then, spread so far and wide that the ripples (presumably representing a finite amount of energy) – having been shared over enormous volumes of this "fabric".

NOTE: As usual in the description and explanation of such things, the account invariably slips into the usual assumptions, and what is talked about is hard to conceive



of as anything other than some kind of elastic medium – where the substance of the fabric itself is varying.

So, in considering Reality, Mankind has no choice, whatsoever, but to simplify and abstract from Reality and into things that are handle-able within Mankind's current knowledge and understanding. Indeed, like everything else, Mankind needed an inert, measurable Space against which to consider actions "within it", and this essential Abstraction with its practical purpose, did not, in any way, address what a "fabric" of Space might consist of, and what its physical properties might be. It was clearly simpler to not consider that yet! We would necessarily concentrate upon particular, "extractable" events, happening within an inert, but measurable, Space, to attempt to understand such events separately.

Indeed, the processes of abstraction were a crucial achievement! But, what we do by such a process, and what we then have in our hands (and, of course, in our heads) has to be understood for what it is. It is never Objective Reality! It is, at best, an aspect, view or part of Reality, artificially removed from its necessary (and determining) context, which usefully contains at least some Objective Content – indeed sufficient for us to make use of it either concretely –in producing things, or conceptually – in getting an improved grasp of the way things are. When we, as we often do, transform our useful abstraction into a "real piece of Reality" itself, then we have stepped off a pragmatic rationalisation, into a falsely conceived-of Absolute Truth. And we can only go DOWN from there! [Or, at the very best build up an ever-increasing collection of particular extracted and abstracted rationalisations taken from a real, complex and integrated Whole.

What our cosmologists and physicists are doing currently is precisely such a false and misleading path. What was originally extracted as a step towards Truth, and would always be inadequate in the long run, has been transformed into a series of totally dependable pieces of Absolute Truth. "The abstracted tail is wagging the real dog!" Form is considered primary to Content! And hence, we are no longer seeking Objective Reality, but actually elaborating our unavoidably incorrect view of it, as if it is already composed of the essential, determining drivers of concrete Reality, in the form of equations. But, of course, it isn't!

We do indeed study Reality, but always, repeat always, find it impossible to cope with as it actually is: so we successively modify our area of study to increasingly deliver, as clearly as possible, some fairly dominant aspects, which we can isolate, extract and formulate into what we term a Law! And, to give such a Law a universal and an eternal validity in our increasing panoply of such Laws, we insist upon a crucial Principle, which seems to justify our methodology.

It is the Principle or Plurality, which states that such extracted Laws are indeed separable: they can be so extracted without changing them! They are independent of context!

Now, if this were true, then our extractions would be totally valid, and we can see Reality as merely the sum of such separable laws. The proof that this Principle underlies ALL our conceptions is demonstrated by the way we construct Simulations (and even Emulations). For we construct them by having our extracted laws running simultaneously as separately acting, sum-able factors, and observing the results. They DO NOT change one another, they only add to one another: that is the error!

And, if we are honest, we know it is true, for we always include overriding super-laws, which are wholly and unashamedly pragmatic. They identify parameter values, which, if exceeded, trigger a switch from one law to its replacement by another. No reasons are involved in the simulation: the switches are based upon evidence, but involve no determinist law – just a fix. It is totally evidential! "When this parameter exceeds this threshold, we must switch from Law A to Law B!"

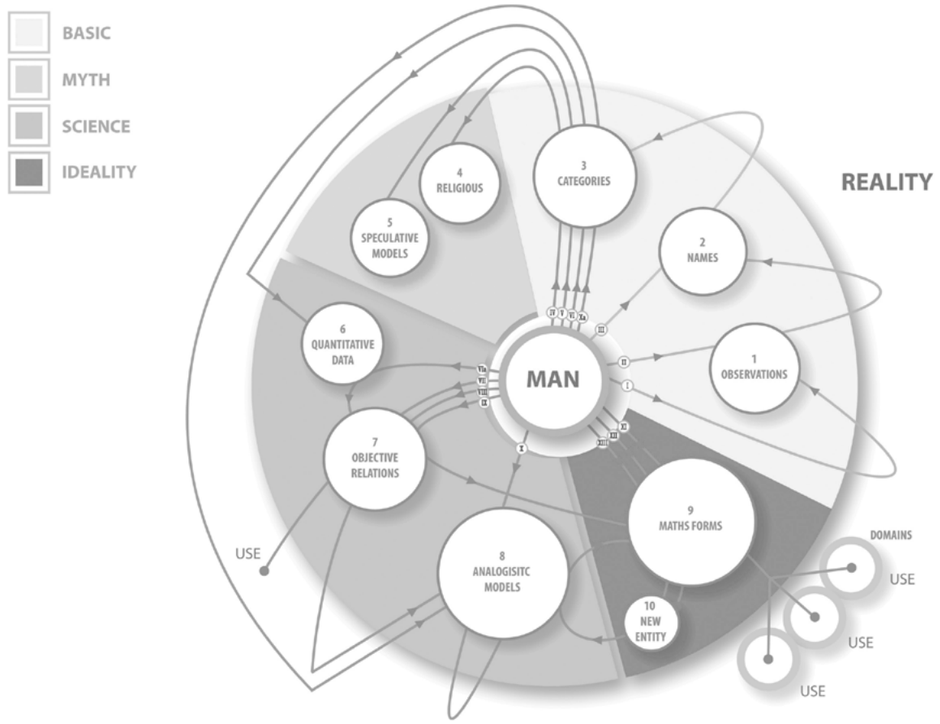
Such admitted "frigs" make it abundantly clear that Plurality is false, but we stick to it like glue, with an increasing number of such threshold–driven switches as evidence increases.

NOTE: It is important that the new evidence does NOT lead to a new law, but merely as a frig to substitute another in its place.

Now, this paper does not, of course, stand alone as a separable truth to be added into many other similar points. It has consequences in determining the nature of Empty Space. But, crucially, that cannot be completed merely by the arguments dealt with here. But, this contribution will change the other discoveries and extractions made in concrete experiment and measurements, and must, at least, kick out the "useful gaps" methodology now rampant.

Mathematics:

An Idealist Science
Or a Type of Formalist Reasoning?



Now, in any review of principles in Science, the most crucial area must occur in a discipline that is not actually a science in the usual sense at all, but which, nevertheless, is an important formal means both of representing certain discovered relationships, and also provides a technique by means of which consistency can be tested, and any results gained in an actual science being then used both used effectively and reliably. It is easy to see why this discipline is usually itself considered to be part of the full panoply of sciences. Nevertheless, it is, more correct to couple the discipline with Formal Logic, which plays a very similar though usually a non-quantitative role in all the sciences too.

What is even more important, is that it that this discipline actually preceded all the undoubtedly scientific disciplines, as Mankind's earliest system of ideas about Form. And it very quickly grew into a very powerful system of dealing with certain crucial kinds of abstraction essential in what later became the Sciences. It was, of course, Mathematics!

So, it should not surprise us that Mankind, whose primary talent was the intelligence that was developed in that species above all others, and hence the ability of humans to think, should have made its early and crucially important developments in Thinking itself. And, for millennia, this cerebral discipline has been so central to studies of Reality that it too has been labelled as a science itself, as well as being alternatively hailed as the key Handmaiden of the Sciences. Clearly, its role has been so intimately connected with Science as to render its true nature ambiguously.

But, it certainly isn't a Science! For it has identified a very different route in dealing with extracted data of various kinds, which ignores Content and Cause for Form alone. Indeed, research some years ago into the **Processes and Productions of Abstraction** (diagram above), identified very clearly the diversion from Reality into a Form-Only alternative ground termed *Ideality*.

Mathematics is the study of disembodied Form in its own terms alone!

So, clearly we must answer the question, “What is Form?” It is the shape or pattern that things take up or display. It is an alternative approach to Reality, because it involved the first extractions from Reality, and the first methodology that revealed the universal in things.

The same patterns recurred all over the place, and by concentrating exclusively upon such things, a Common Set of manipulative and presentation techniques could be usefully applied to many different things and phenomena. The most important was the recognition of calculable patterns that could be used (in ideal circumstances) to predict, “what will happen next”.

Indeed, the methods were so brilliantly developed that concise, algebraic equations could represent whole ranges of possible values in consequent outcomes.

And, such remarkable facilities led, via a small, but crucial, philosophic step, to the conception that these happenings could be conceived of as having been directly driven by these Forms.

It was thus that Mathematics’ idealist stance was established, which turned description into cause via a Driving Law! And, it wasn’t dreamers who flocked to this position, but able reasoning thinkers and pragmatic doers

They soon became proficient in that discipline, both in calculations, predictions and even in the “making-of-things” It was invaluable in what we were later to call Technology.

Indeed, hardly a single committed scientist exists who wasn’t first a dedicated mathematician.

Its original power in ancient Greece was in its universality and efficacy, which assumed an almost magical (or religious) aura as the “intentions of the Gods”. And, there can be no doubt that such a conception made it the centre of attention for many Greek thinkers, who believed that abstracted Forms were the determining essences of Reality, as designed by the Gods.

But, though it seemed inseparable from an also growing scientific attitude, which asked the key question, “Why?”, in addition to the descriptive answers of Mathematics, the two approaches were clearly philosophically very different.

For Science looked for causes in Reality itself: it unavoidably became increasingly materialist, while Mathematics was committed to the Forms being the determinators of Reality: it therefore was distinctly idealist. And the surprising, yet fruitful partnership between these different standpoints, nevertheless was remarkably productive, and both developed at a heady pace.

But, of course, it couldn’t last!

Such an unprincipled, pragmatic union was bound to lead to contradiction, and in time that is exactly what happened, with the 20th century Crisis in Physics.

Mathematics:

Nearing the Edge

Access to the New or Chaos at the Limits of Mathematics

In spite of their long and fruitful joint histories, Science and Mathematics could not continue to be mutually supportive beyond an unavoidably limiting final level. And, though the real crisis was encountered first in Physics, with the so-called Copenhagen Revolution, it also emerged in Mathematics with what they chose to call the new area of Mathematical Chaos.

The trouble with Mathematics is that it does not deal with Reality-as-is, but only and exclusively with Forms, originally extracted, it is true, from Reality, but always, and necessarily then “perfected” and abstracted, which entirely removed it, from its place in Reality, to produce yet another addition to a World entirely composed of such Forms and absolutely nothing else!

Now, such a characterisation was, and still is, totally rejected by most who used them, based upon the effective use of such Forms back in Reality to achieve various intended purposes, but though that is indeed possible, what is used is always only the formal and idealised extractions, and hence will only work, where they hold, which are neither eternal nor natural conditions, but, on the contrary, always strictly limited to a specific and necessary collection of conditions, for once these are no longer the case the forms immediately cease to fit!

Now, most of the time within what we tern as continuing conditions, or Stability, this was not a major problem, and Form could always either be directly alighted upon within naturally stable conditions, or you could construct and then maintain what were in fact artificial Stable Domains, within which such Forms were achievable, as long as those conditions were maintained.

The problems arose with the emergence of significant Qualitative Change, and this is not as rare as you might think, for it occurs for every single arrived at equation, for each will only “deliver” within its necessarily maintained range – its set of required conditions And, as soon as these are exceeded every such equation will inevitably fail!

Now, though these limitations may seem to be a major problem, they have been overcome to a remarkable extent by Mankind’s intelligence and adaptability, for they realised these limitations and worked hard to reliably maintain the required stabilities, and when it was no longer possible, they soon found an alternative situation that was constructible and maintainable and extracted from it its own crucial Forms and used them there.

The adept scientist, or even technician, would move from stepping-stone to stepping-stone across the tumult of Reality’s rivers of change, and such a method would work as long as such local footholds could be maintained.

In other words, as long as the river did not turn into an unstoppable flood: as long as a major cataclysm wasn’t occurring, all would be well!

But the mathematicians could never cope with the actual transformations from one stable Domain to another, for that was terra incognita and could never be mapped, without actually visiting it!

The predictive causality of real qualitative change was beyond Form!

Now, elsewhere in this Issue, the work of Hegel in attempting to address such Emergent Events has been brought into various important disciplines with some success.

The question that, surely, must be asked here is, “Could Hegel’s discoveries be also brought into Mathematics?”

Well the answer is both “Yes!” and “No!”.

For, investigators had long been aware of the “turmoil of the torrent”, but didn’t know how to handle it. Until, that is Lorentz began to address Turbulence.

Now Turbulence in water is evident immediately adjacent to the much more orderly “Streamline Flow”. You can see where the ordered flow breaks up into turbulence, and even where it can re-organise back into predictable flow once more.

Clearly, in Reality, such transitions under very similar causal conditions could transform one to the other.

And Eric Thom with his famed Catastrophe Theory had also seemed to promise something beyond this recurring impasse, but it wasn't to be!

He, as a mathematician, had merely found-a-form for moving from one stepping-stone to the next, NOT, it must be emphasized, for the causal transformation of one stability into another. That was still impossible, if only Form was considered. To deal with real change Content and Cause were undoubtedly essential.

Now, of course, mathematicians would never attempt that, for they were not scientists, but logicians and most important of all, idealists. They "knew" that Form was the cause of everything, and that major error made their Emerald City unobtainable!

Now, before we dive in at the deep end, we should remind ourselves of what Hegel had revealed about Stability and its inevitable Dissociation.

For, on approaching a crisis, there always appeared a Dichotomous Pair of concepts or principles, which could be effectively used, in spite of their being intrinsically contradictory: for they were totally incompatible!

And Hegel found that the only way to transcend the inevitable impasse, at the final boundary, was to embrace each of the Dichotomous Pair in turn, and investigate the assumptions on which it was based until the flaws were revealed and a breakthrough was achieved. He had originally come across the same forms in Thinking, and the resolution there was the sudden emergence of a new Idea, so that was his model in all such resolving situations.

Yet, it was also evident that by pragmatically switching between the two elements of the Dichotomous Pair, local solutions could still be found.

But also, and just as clearly, any real comprehensive explanation would stop dead!

An explanatory and a formal impasse had been reached!

Now, a certain kind of Mathematics, which either directly, using certain non linear equations, or indirectly, using iterative forms derived from ordinary equations, could reveal amazing behaviours towards the limits of the validity of the equations. They even called the area revealed Instability!

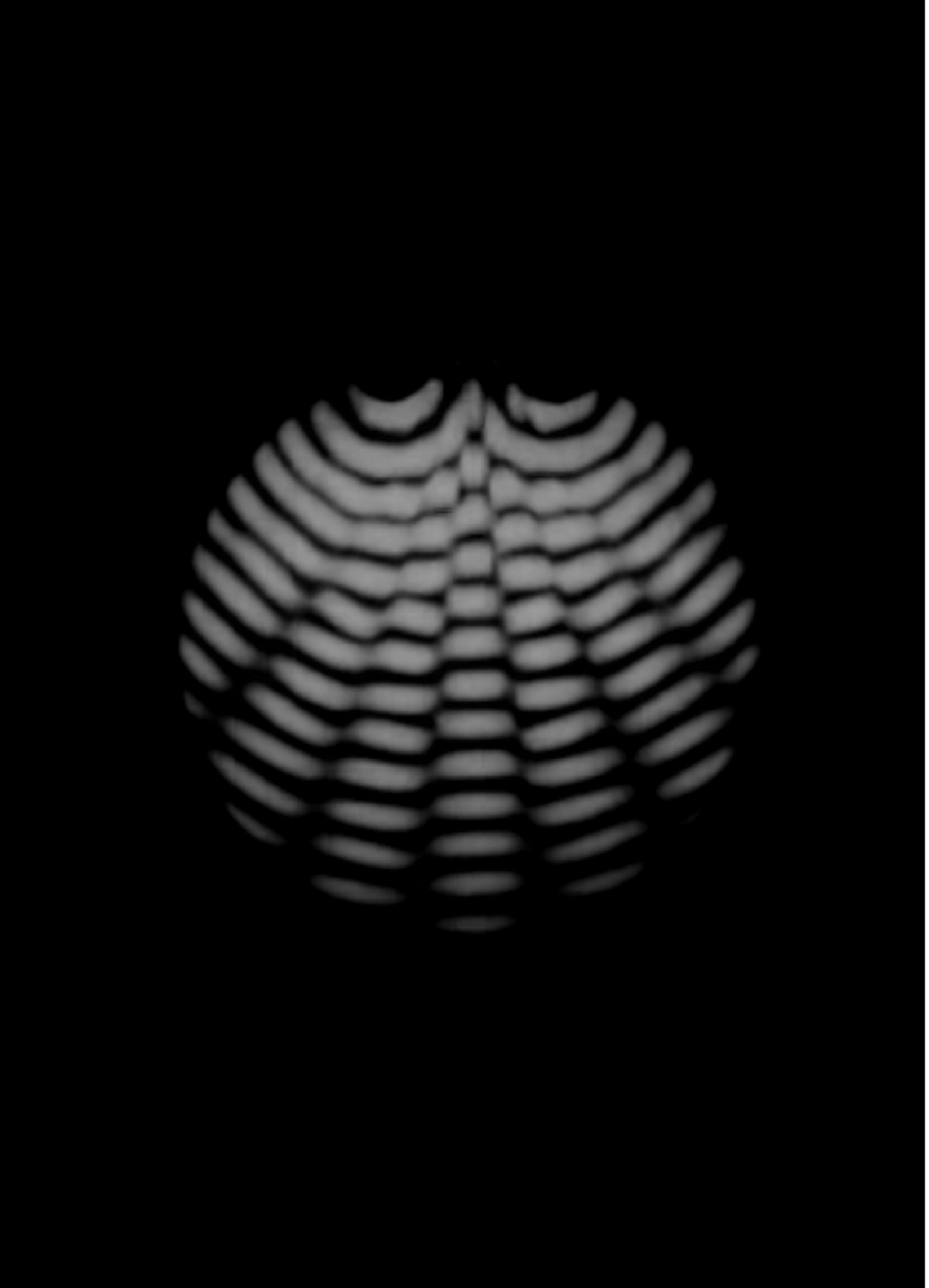
And this kind of Chaos was that mathematically expected final crisis!

For, it really defined the final Limit of all formal considerations: it was indeed their End! Though a great deal was revealed about that near-the-boundary behaviour of stable and formal systems, as embodied in equations, they could never transcend that limit!

My favourite picture of this area has long been that of the Great Red Spot in Jupiter's atmosphere.

It is a mammoth storm and at its centre is an extremely stable area (it has been there for centuries). While surrounding it is also a kind of "streamline flow stability". The region between these can, if a film is made of what is happening, be seen in totally unpredictable turmoil, yet bounded on both sides by a predictable stability.

The picture poses the question, "Though each stability can be reduced to a Form, can you produce one form to take through the transition from one to the other, that is both maintaining the two stabilities, and the qualitative transformations in between by Form alone?
The answer is, "No!"



Method:

A Game-Changing
Holist Experiment

This paper is one of a series about the true nature of Empty Space, but it is included here too, because the experimenters involved in a particularly important area of study on that topic, also actually devised a wholly new method of devising and building experiments, which were intended to reveal what might be happening in areas, which are currently somewhat impenetratable, and which, because of those difficulties, had led to the most significant retreat in Science for several centuries. That significant retreat was, of course, the Copenhagen Interpretation of Quantum Theory.

Now, it should be made clear that though the assumption of an invisible Paving of Empty Space composed of Positronium particles (or as I have renamed their stable versions – neutritrons), did indeed manage to solve the anomalies found in the famed Double Slit Experiments, it certainly hasn't solved the problem of the establishment of Electrostatic Fields in that same Empty Space, or even of any possible magnetic fields also said to be present there. The fairly simple solution of a paving composed of the above-mentioned single joint particle – the neutritron, could not deliver all the known phenomena that occurred in Empty Space.

Yet certain aspects of what had been successfully suggested in the Double Slit phenomena – the assumption of particles with totally cancelling-out pairs of opposite properties, would still be necessary with the still outstanding problems. For whatever things are there and producing these other phenomena, are also currently undetectable too. So, though the invisible particle, the neutritron, couldn't deliver, there is nothing to stop other particles, also similarly invisible providing the new features required.

And there is no reason why the whole of Empty Space should be containing only a single kind of particle. The similar invisibility, for the same sort of reasons, could be why other particles have also not been discovered as yet. Clearly, as with the neutritron, the route to defining (at least theoretically) possible occupants of Empty Space, should be by defining what properties they should possess, which would support the known phenomena we are trying to explain.

Let us see if we can do this.

The neutritron had the advantage of guaranteeing its own invisibility due to its internal components, which also enables it to hold, and pass on, quanta of electromagnetic energy. But, try as I might, I could not get it to provide an electromagnetic field, when a single charged particle was present.

It could, however, be achieved with at least two complementary but separate particles, though for them to also cancel each other out, the only way that that could be achieved would be by the elements being "randomly mobile", so that, overall, the net features would be zero both in Charge and in Matter type. Now, a solution, of sorts, was achieved. But, such a purely theoretical approach does nothing to tell us how such a situation came-to-be! Just as with the neutritron, the purely theoretical "solution" would not be acceptable without a convincing account of origin within an acceptable History of the Universe since the Big Bang.

Yet, in delivering this, we seem to always be hamstrung by the requirement for these particles to be undetectable. Over 50 years ago theoretical "solutions" were arrived at which used principles such as Symmetry and consistent sets of equations, to "people" the Universe with all sorts of elementary particles, most of which could indeed be detected and allocated with provable properties. But the nitty gritty was really only "formally-tight": things like quarks did make formal sense, and some sort of dubious scenarios were put together. But, the new situation brought into the mix by particles like the positronium (neutritron) meant that the crucial and most basic participants might well be of a similar nature, and hence invisible to the usual means of detection.

Now, a wholly new form of experimentation has recently been shown to be extremely useful in such areas, not by directly addressing them at the sub atomic level, but by attempting to replicate similar conditions at the macro level with macro placeholders for the actual participants at the sub atomic level, and studying them instead.This methodology is still at a very early stage, but has already delivered some very useful analogues and data sets.

The methodology was devised by Couder and Fort, French physicists, who attempted to construct similar difficult

situations to what occurred at the sub atomic level, but at a decidedly macro level. Remarkably, they were very successful indeed.

Yet the means they used were unheard of in Sub Atomic Physics. They found entirely macro entities, with no obvious link to the participants at the much lower level, but they were ones that they believed they could marshal into situations that were closely similar to what occurred at that other very different level. They effectively had to discover appropriate properties in various macro entities and carefully arrange them and impose upon them features that they knew were present in very different forms in those sub atomic areas.

For example, they decided the presence of some sort of substrate was likely, so they used a shallow tray of silicone oil, and applied a continuous vibration to the whole arrangement. Most applied vibrations didn't seem to give them anything useful, until they settled upon a strictly unidirectional vertical vibration. Of course, this alone didn't deliver anything relevant, but they had other macro analogues in mind for yet more sub atomic participants. So, for a particle they decided to use a drop of the same silicone liquid. This was meant as a stand in for an elementary particle, and it was dropped onto the vibrating substrate to see how it might perform.

Initially, it just coalesced with the substrate, but various changes in the vibration of the substrate finally managed to make the drop bounce! And, in so doing, it elicited a wave in the substrate. Then, with the right vibration rate, they managed to synchronise things so the drop kept on bouncing, and set up a clearly defined finite extension of a standing wave in the substrate surrounding the position of the bouncing drop. The reason it worked was that as the drop was coming down it encountered the wave coming up, and this gave a small kick upwards.

At this stage it didn't seem to have any relation to the phenomena at the sub atomic level, but they hadn't finished yet.

When they again very slightly adjusted the vibration rate the drop came down on a slope of the standing wave, and the whole arrangement began to move. At this point they had a drop/standing wave system that was stable and could move about. Could it in any way be an analogue for the Wave/particle Duality, which was causing so much difficulty at the sun atomic level? But, when demonstrated to sub atomic physicists, they all dismissed it as pure coincidence.

Until, that is, Couder and Fort began to rotate the substrate a regular rate. After the usually necessary experiments with various rotation rates, they managed to get the drop/Wave system to orbit around the centre of the substrate tray. And try as they might, they could not get it to orbit at most radii. That was strictly limited to only certain values. The orbiting was being effectively "quantized".

Now, no one could suggest that this was caused by the quanta known at the sub atomic level. But, how do you even begin to explain it at the macro level. And, perhaps even more importantly, what conclusions could you draw from it about the Different World of the sub atomic level?

Now, let us be very clear what Couder is actually doing is NOT constructing experiments in the usual way – that is one which simplifies and exposes (in the usual classical way). He is, on the contrary, both complicating and creating features not at all evident without the special artificial conditions he imposed.

Yet these were meant as macro analogue of the situation at the sub atomic level.

He had abandoned the usual pluralist methodology used in literally all scientific experiments, for a holistic alternative. Where analogous features were successively added in until a recognisable complex behaviour was produced. And, it was done to bring certain situations into the macro environment with artificial elements to allow the phenomena to be easily seen and studied.

Once more a holistic philosophical standpoint (either consciously or intuitively adopted) had delivered a method that managed to transcend the limitations of the usual pluralist techniques.

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