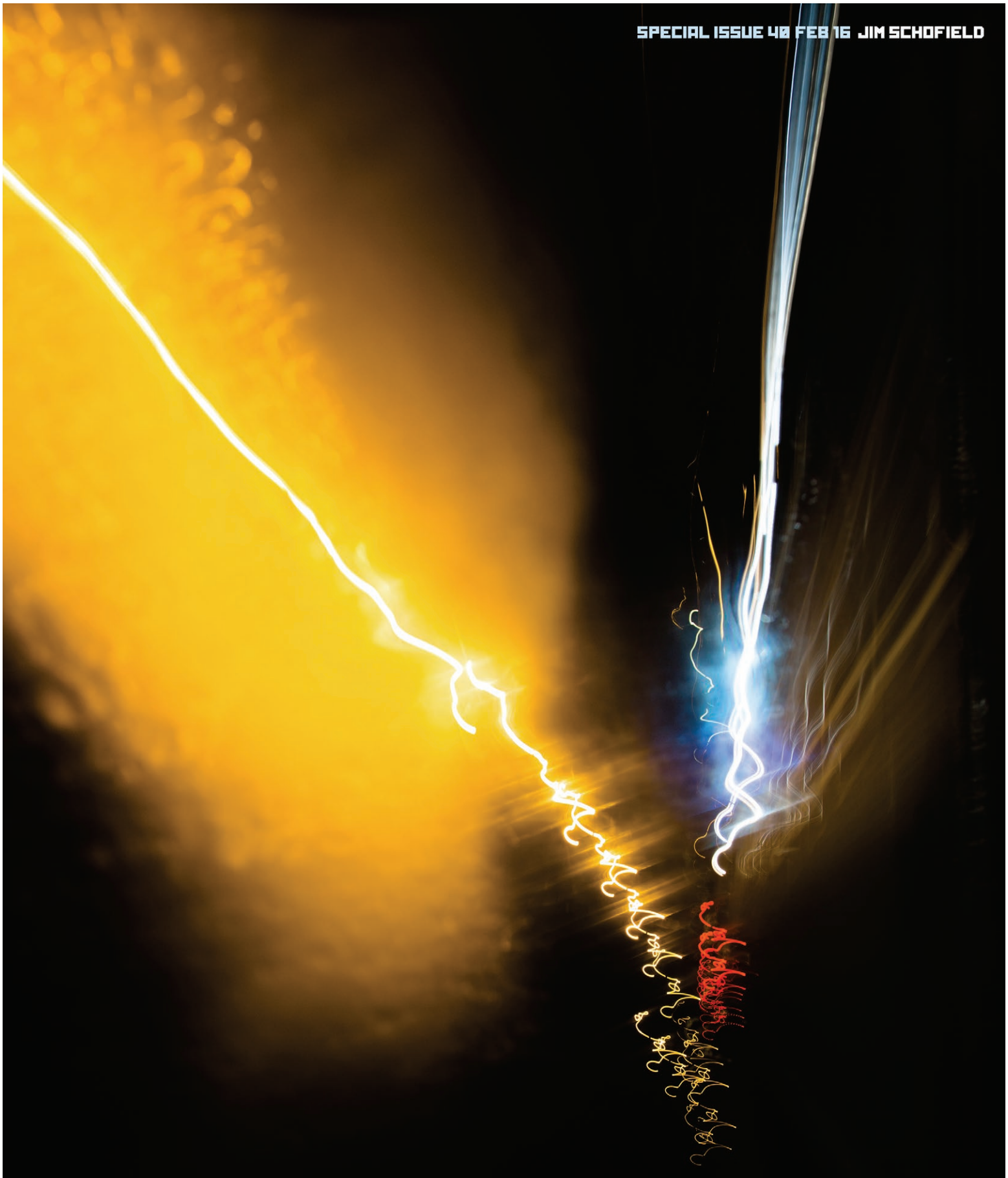
SPECIAL ISSUE 40 FEB 16 JIM SCHOFIELD



SHAPEJOURNAL

ENTANGLED UNIVERSE

THE REVIEW / FORM OR CAUSE / LOST IN THE UNDERWORLD OF DELIGHTS
REAL PHYSICS / SIMULTANEITY / LIGHT AND BLACK HOLES / WHAT CAUSES A SUPERNOVA?

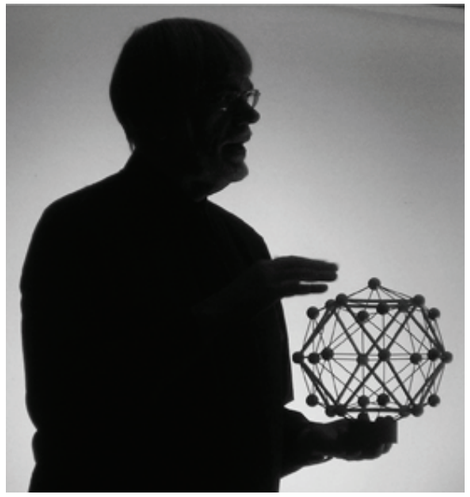
Words **Jim Schofield**
Design **Mick Schofield**
Cover Photo **Michael Coldwell**
Image Below **Pablo Carlos Budassi**

www.e-journal.org.uk/shape

Entangled Universe

Special Issue 40 / February 2016

Entangled Universe
preface



Welcome to the 40th Special Issue of the SHAPE Journal entitled *Entangled Universe.*

The writer of the following extended review was presented with an almost impossible task. Let me explain what the difficulties were!

It's as if we have researchers from two different planets, with completely incompatible ways of dealing with the identical natural relations pertaining in both their worlds. On one planet, the universally agreed method sought the purely formal relations for everything that occurs there. While in the other, they instead seek concrete substances, entities and their properties that determine physical causes concerning the very same phenomena.

Clearly, the first group of researchers aim to reveal Formal Equations, which embody the Laws that drive the observed phenomena. While, the second group attempts to reveal the actual Physical Causes for those happenings. Such alternative approaches are certainly not trivial, as they amount to totally different philosophic stances by the two groups. Those aiming solely for presumed-to-be Driving Equations are clearly idealists. While those aiming for Causative factors are materialists.

Connections between the two groups for the purposes of explaining their findings, initially in this case of the idealists to the materialists, seemed incomprehensible to the recipients, and the latter's responses were similarly meaningless to the delivering idealists.

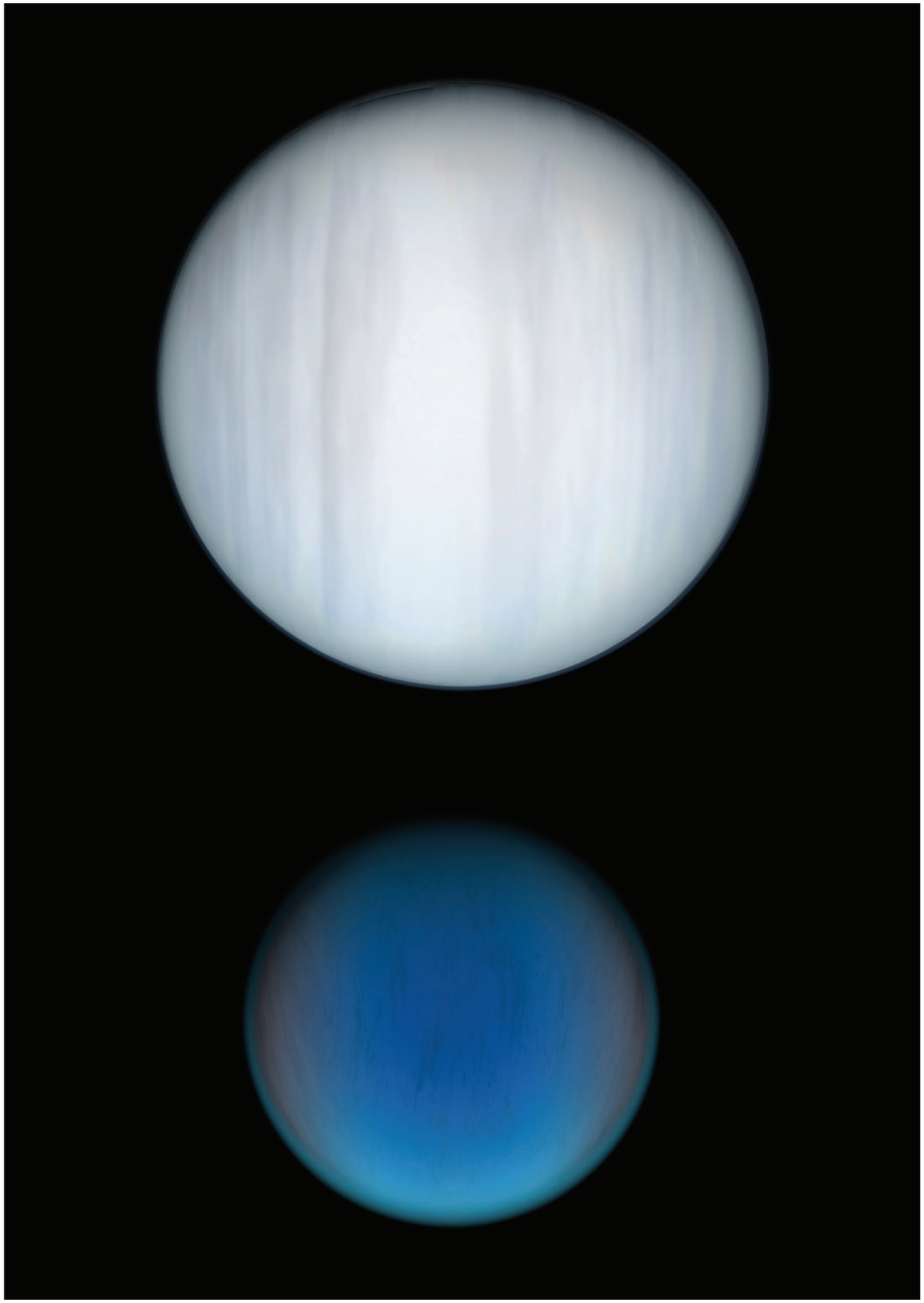
Thus, this review (by a materialist scientist) has been undermined by the assumptions and indeed the full set of premises presented (or, more often, left unstated) by the idealists. What the original *New Scientist* article, which presents this account, does, is deliver the purely formal descriptions of a range of puzzling phenomena, while the reviewer naturally attempts to instead deliver Physical Explanations of the same phenomena.

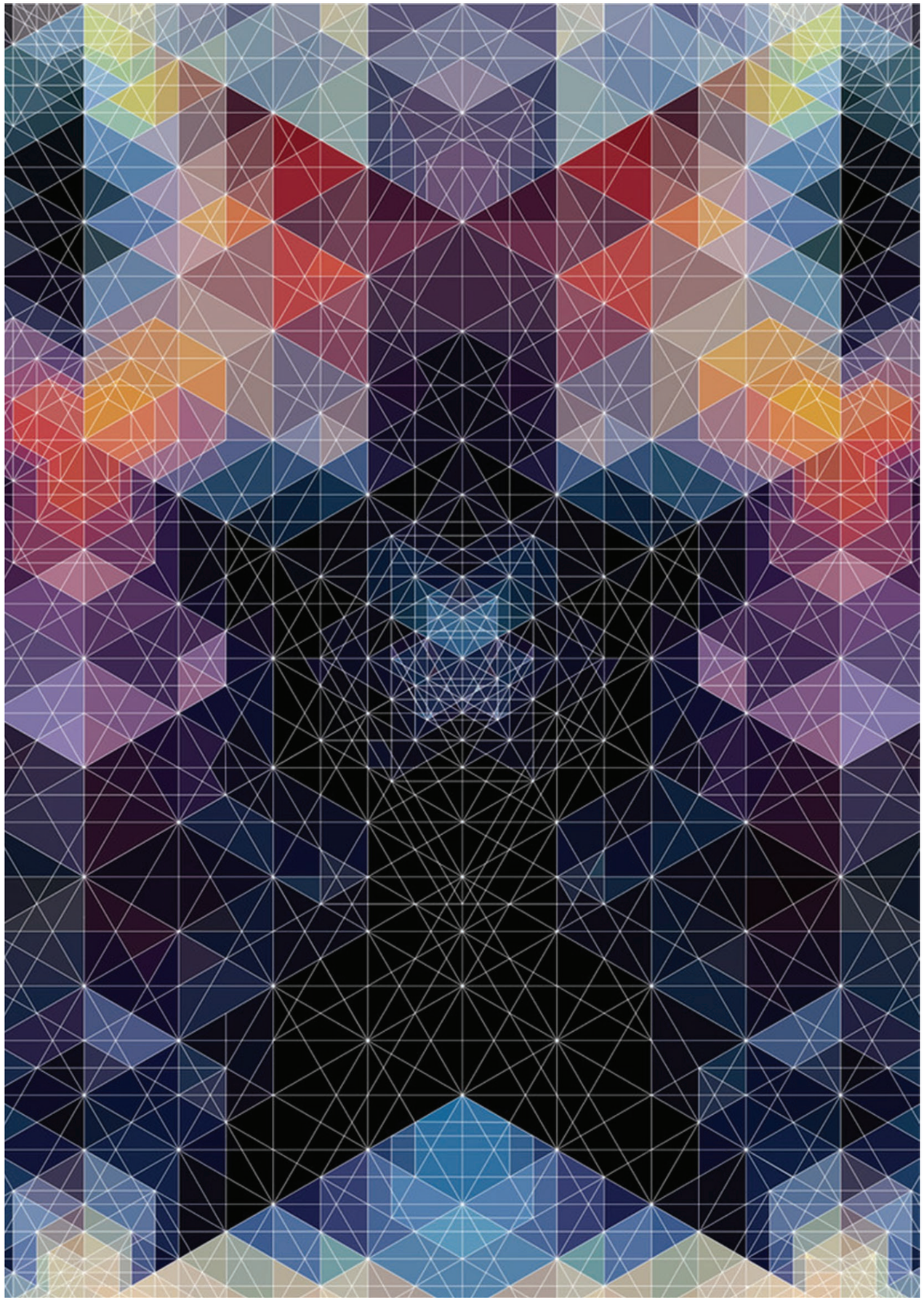
Naturally allowing the article, with its contentious standpoint to dominate, as he must, has led to the initial Review. But, it was evident, throughout, that the attempted translations, between two totally incompatible languages would never suffice.

So, in addition, the reviewer has also produced a series of, hopefully, more coherent ancillary papers, to deliver as far as possible the alternative materialist view in a self-consistent way.

Enjoy!

Jim Schofield
Feb 2016





Introduction

The Entangled Universe article by Anil Anathaswamy in *New Scientist* (3046) tackles a range of supposedly connected ideas in current Sub Atomic Theory. But, as with that overall stance itself, he joined the increasingly accelerated rush into the mixture of facts, "Laws" and speculation that has become the norm in this confusing area.

Every suggested solution begets yet another "rule of thumb" - designed to enable some sort of regular paths through a limited area, and the overall description is of a plethora of such meta rules which alone defines what can and cannot be done.

Clearly, we are being guided through an alien land, and without the necessary signposts of Physical Ground, to resolve anomalies; we are forced to travel with a dependence upon local maps.

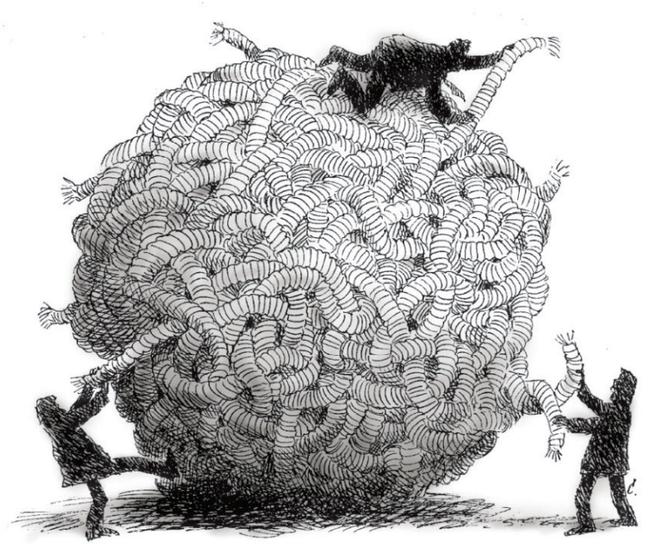
You have no single theoretical stance, so you have to keep them all, and decide when and how to jump from one islet to the next!

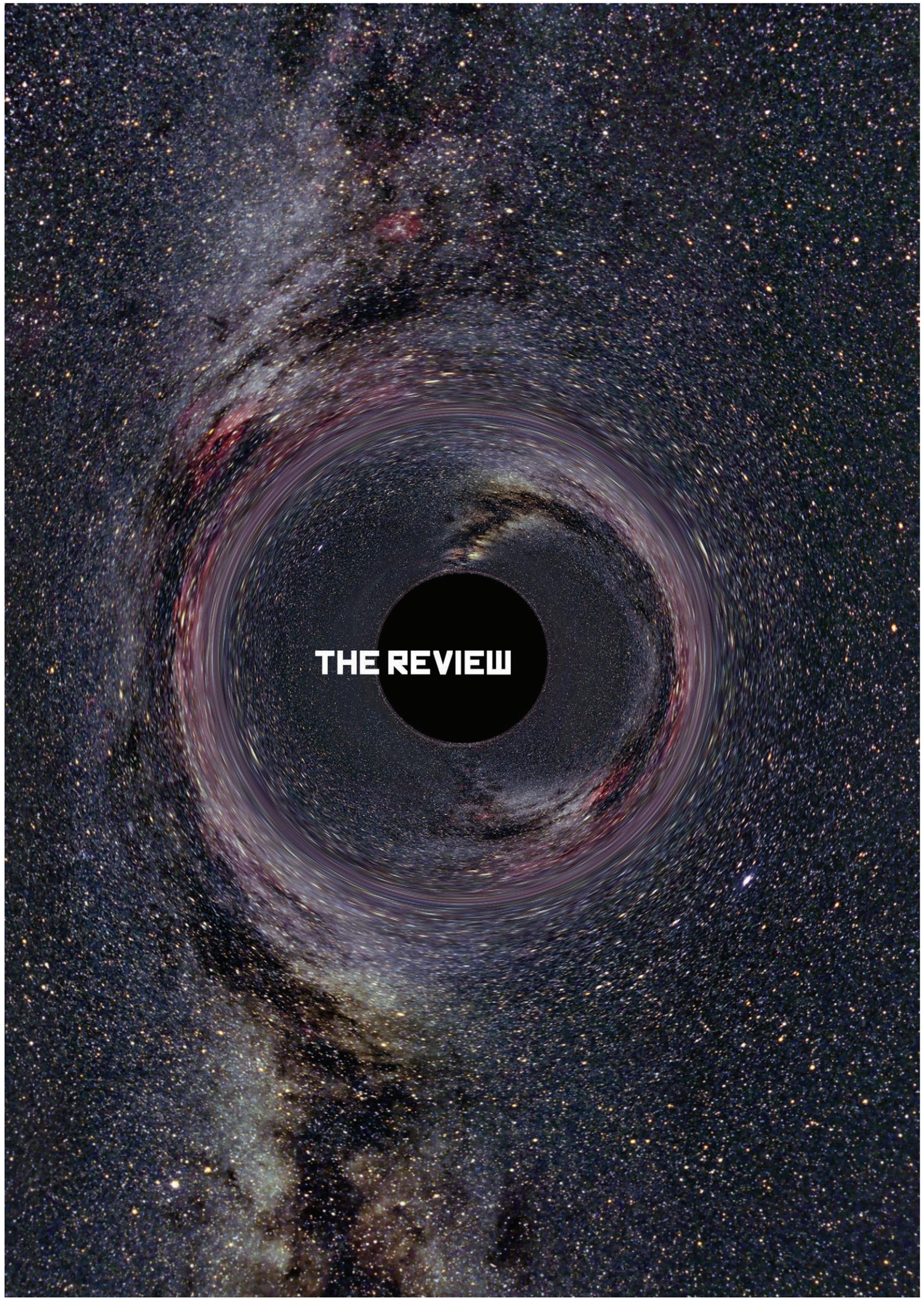
It is an almighty mess – very like the proliferation of epicycles in the Ptolemaic version of the Solar System, It can give you useable answers but no coherent, consistent and overall Theory.

The Gordian Knot of invention must be severed with a goodly dose of Reality – but how?

Clearly this is easier said than done, and after a couple of re-reads and copious notes, I realised that attempting to follow Anathaswamy's stepping stones between the various positions, would not clarify, but only confuse! I decided instead to write a series of separate papers- each one tackling a different bit of this messy article.

But it soon became a large response. I have written 13 short coherent papers each on a different topic, with a total length of some 6,000 words. But I still think it is the best way to deal with the *New Scientist* article as a helpful review.





Review: Entangled Universe
new scientist (3046)

This article by Anil Anathaswamy is exceedingly complex. It elicited, initially, the following preliminary notes, and thereafter some 16 short papers, that were considered essential in grounding the standpoint of the reviewers they are clearly significantly different from those of both the writer of the article, and those scientists he was writing about. So, as near as I could get, at this stage, to a comprehensive treatment, will involve ALL of this material.

The line in this article about Gravity can be read holistically, as an improved alternative to their common standpoints. But, this narrative follows the structure and content of Anathaswamy's article, without spending time on this reviewer's stance. Reading the many addenda is, however, available to those who are interested in the position of this critic.

The Review

Let us commence, with a look at the assumed context for real world interactions, on which the article is based. Now, though the path traversed by a moving material body is determined by the effects of all other matter affecting that vicinity, we also have recursion here.

The action upon such a moving entity also contributes to the overall effect, and hence, in turn, actually also affects those bodies too, delivering a changed effect, on any substrate through which our primary body is travelling.

The above isn't what is described in the New Scientist article, but it is a valid, holistic view! I am sure the reader will be well aware of the usual consensus view upon such things.

What is more, NONE of the bodies we are considering are AT REST. They are all moving and this causes a nexus of effects and recursions, which, though simplified into a "static gravitational field", never is as simplified as that.

And, as bodies get closer and closer to one another, these two-way effects will be larger and added to by other different forces (Earth and the Sun, for example, have immense magnetic fields surrounding them, which effect the paths of all charged particles.

The whole idea of Einstein's Space-Time Continuum is NOT a description of an actually physically existing so-called backdrop or situation, upon, or within, which, all phenomena occur. It cannot be that, as nothing is delivered as to what *The Continuum* is made of, and why it is as Einstein describes it!!

In effect, it isn't described, in terms of what composes it, but how it (or something in place of it) actually affects things, actually occurring or happening there. In other words, it involves NO Explanation – NO reasons and NO causes at all.

Clearly, it is an Abstraction, devised by Einstein, which "fits" what has been observed in Reality. So, in a sense, it is not Science! It is a man-devised and purely formal analogistic model that is as close as a pure abstraction can ever get to delivering Reality!

The quote that General Relativity never failed any experimental test is an interesting one. For, it could be

said of all equations, over quite extended periods, for two reasons, neither of which is the physical Truth!

The fit is related to how the equation was found from experimental data, and always only concerned itself with Form, and it has to do with equations being considered to be the actual eternal Laws of Nature. So, if it proved reliable, the Law was said to be proved! But, of course, it would fit for the general form employed was tailored to measured data, until it fitted exactly. It was a pragmatic fitting, and never a theoretical one!

So, these are never concerned with relations understood physically, and verified in terms of its real world causes, were they?

The mention of a Black Hole Singularity is, as always premature! For, a Singularity, such as this, always goes off to infinity in "depth" – it is a typical mathematical or purely formal concept – a Form without Context – a mathematically derived ideal and NOT a discovered entity or phenomenon.

So, as it is never discovered, it can only be formally established, and hence, assuming it in further deliberations, is Pure Speculation! The discoveries in Astronomy following these formal establishments are a complete inversion of the usual practice! This is not to say that something doesn't exist, but it isn't a so-called Singularity – for that is a formal abstraction only - just Mathematics and NOT Physics!

Also, if the real entity isn't infinitely deep, it will eventually FILL UP, and that, thus far, has not been considered. Hence, once more they work only upon a tidy speculation.

It also seems that Black Holes have a Temperature and Entropy. What can such abstract and generalist concepts mean physically, especially as the inferred size and nature of these Sinks mean that they must hold considerable quantities of matter, and, in a uniquely different form – certainly neither a solid, nor a gas!

Now, the inference is that everything comes in descrete chunks – but what would happen to a universal substrate both approaching the Black Hole and even within it? This question is posed because many anomalies of Quantum Theory have already been solved by the assumption of just such a substrate!

Now, Quantum Theory itself is said to have been definitively proved, but the same criticism applies here as for the Space-Time Continuum: both are purely formal, mathematical theories ONLY!

And we know why this is – as both theories are purely formal, and hence they only describe and cannot explain. Both, if they are to be classed as theories, MUST include physical explanatory, indeed causal, features in addition to the purely formal.

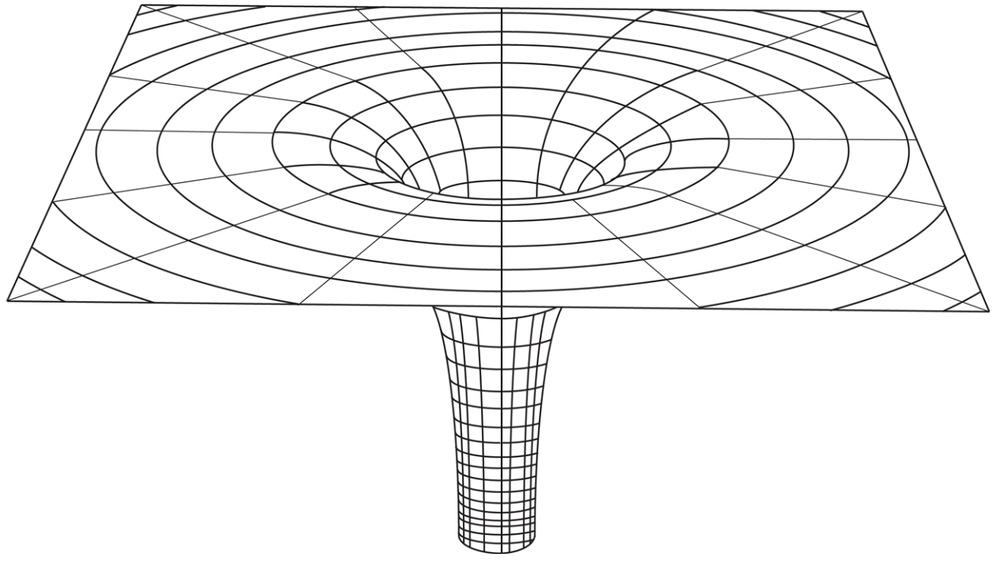
The problems associated with Black Holes are to be expected. The forms involved have been taken beyond their valid applicability So, the problems are converted into saying that Information is said to be destroyed – an impossibility for quantum physics. But, I can think of many cases where information is destroyed – every death of a living thing, for example, the Big Bang, and innumerable others. It is yet another formal abstraction, and hence NOT Reality!

Of course, if you define Information as something, which cannot be destroyed then, if something is destroyed, it cannot be "Information"!

The alternative suggested is a firewall of energetic particles, at the periphery of the Black Hole! Is that, then, the repository of all the lost Information? Notice how physical suggestions follow the failure of purely formal descriptions, once again! So, in attempting to integrate Relativity and Quantum Theory, they try to quantise Space-Time?

So, we once more abstract via both *simplification* and *idealisation* of the Context of Reality into Space-Time (which, of course, does NOT exist in Reality), and then abstract it again into descrete chunks as if it did actually physically exist!!!! Switching between Reality and Pure Form has now become a modern classic. It, used to be called Pragmatism. Inevitably, this descends into the most abstract entities of all, namely Strings!

And, though they fail to mention it, their supposed Strings are conceived of as only pure disembodied energy, given properties by allowing them to form these strings in an almost infinite number of diverse shapes! Thus, you will finally get Space-Time down to these Strings, which, of course, can only be either pure disembodied energy or pure *invention*!



It has to be asked, "Are they actually endowing Space-Time with integral energy?" For then it sounds awfully like a real, physical substrate!

Also, the vast number of options in String Theory seems to imply – "Give up now, you'll never do it!" All works OK, until a Black Hole is considered, for then its and massive caused depression into (and through?) the Space-Time Continuum, seems to constitute a totally-bottomless drop – A Hole in the fabric of Space-Time! And, it is the version of Entropy revealed there that is the problem.

Now, I thought Entropy was to do with organisation, and the more organisation there was, the more Order, then the greater (or less I can't remember which) would be said to be the Entropy involved. The Wormhole, which is to be the crux of the ideas being built in this article, is totally meaningless in concrete Reality. It gets its mileage by confusing a pure abstraction, without any physically-known basis, being once again, seen as physically existing (somehow).

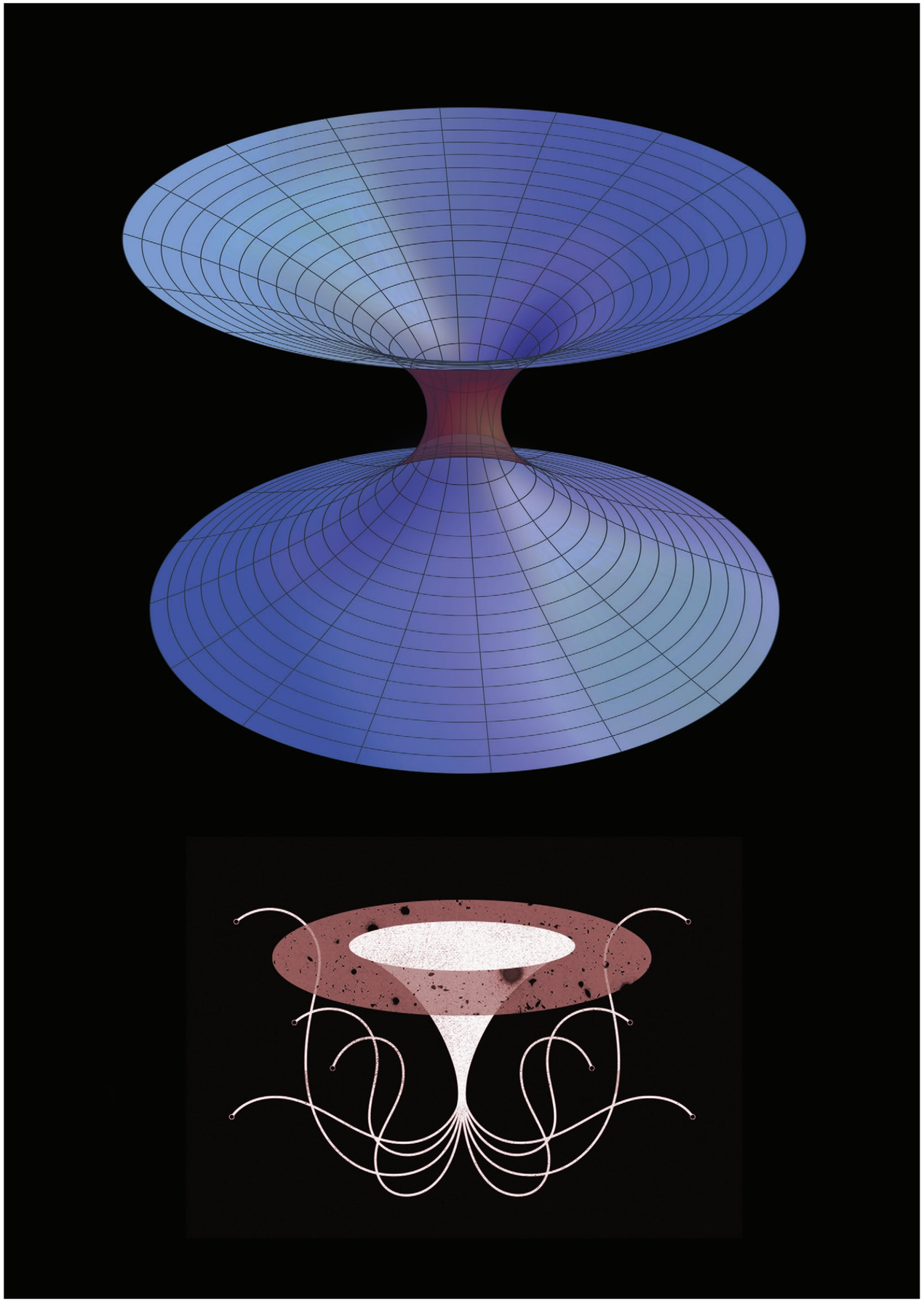
Obviously, conceiving of Space-Time into an analogistically model, then the certain, as yet unexplained, features of space and time, cannot then be considered as existing in a separate real space, which this Wormhole concept definitely does. It is a typical mathematical extension – allowing things from Ideality – the World of Mathematics, which can never exist, as such, in concrete Reality. All subsequent discussions about these man-made inventions cannot be about Reality! At best it can only reveal the idiocies possible in Ideality.

Now, we finally get to the intended target of the whole article - and *Maldacena*! What on earth is Maldacena's Formal comparison really about? He finds that two purely formal descriptions of invented situations are very similar. They are:-

1. String Theory equations, supposedly describing the Gravity in a given volume(?) of space-time, and
2. The Quantum equations describing the surface of that same volume.

Several questions immediately come to mind with this odd statement. "Why consider a volume of the formal construct of space-time?", and "Why work out the surface quantum equations of that volume?"

Its Mathematics at its most abstruse, equating the purely formal constructs and finding similarities. What else would you expect?



So what?

The same formal equations very often appear in describing very different things. You can't just equate them causally, because they are the same formally!

The very mention of considering a pair of Black Holes from the outside of our Universe (in another Dimension), and the assumption of the necessary Dimension as being the same-as-the-real-world's three dimensions: it is inconceivable!

The conclusion of this purely formal similarity was that the "outsides" (what?) of the Black Holes were "quantum entangled" – which means absolutely nothing *physically*! To make such suppositions means that you take the formal presentation of Quantum Entanglement, and assume that these are, somehow, TRUE, for the formal representations of Black Holes, and, only then, could the assumed Wormholes "actually form"! Wow! What does this load of nonsense mean?

How could the unusual equation ER = EPR, along with the same Pure Form, for two totally different theories, allow some cross reasoning, that ended up with the conclusion that a Wormhole would only form if the outsides of the Black Holes were quantum entangled? [You would have to ask a mathematician, for it certainly isn't Physics]

NOTE: *ER = EPR refer to the two papers published by Einstein and colleagues in 1935.*

See what you get when you abandon explanation?

Limited ONLY to Form, you are forced to endow it with some kind of cause! And hence, you inevitably slide into Idealism, and concentrate all your studies and theories entirely within Ideality – the World of Pure Form alone!

Entanglement (we are informed) can occur in varying degrees. Once more what can that possibly mean?

Quote "the Mathematics was sufficiently well established". What does this actually mean? And, why should it be a "clincher"? Does it simply mean that enough formal manipulations have been achieved for the formal validity of the Mathematics to have been established? If so, it isn't Physics but just Mathematics – the Rules of Form when ignoring Context!

Good grief! Entanglement can exist in varying amounts! Since when and why?

Entanglement between the Black Holes' *surfaces* – again! What are they actually talking about? One thing is certain, is that it isn't about Reality!

NOTE: It is remarkable how utterly detached these people become from Reality, and how they regularly confuse the formal features of Ideality, with the concrete features of Reality. For example, they take something like Surface Tension (in the real World, and apply it to some "surface" in a multi-dimensional and hence purely formal space. Even the backwards effect of Einstein's Space-Time Continuum, supposedly physically causing what we in Reality call Gravity, is a similar "trick"!

Another quote, "Reduce the entanglement between the Black Holes surfaces to nothing"? What does that mean?

I thought was a permanent link between two things from a common source, which was maintained no matter how far apart they became! And, hence, a change in one would be instantly reflected in the other. How can this be either there or not there, or even only partially there? What could affect such a relation? How could such a relation be gradually changed, until it is no longer the case? That would imply that any connection could degrade and end up as non-existent! But, you have to explain it physically: for Pure Form cannot drive Reality!

Such things cast grave doubts upon the Quantum Entanglement connection, and infer that other reasons can explain the phenomenon, which though originally "in-step" since separation, could be individually affected to finally break the seeming resonance!

The synchronisation could have been initiated on creation of the pair, and moved on, in-step, in both driven by identical internal processes in both. Clearly, in spite of an initial synchronisation, the fact that the causes are internal in each of the two cases, there is no reason why other external reasons could only affect one of them and break the supposed "Quantum Entanglement"!

Their explanation is that there is a connection, which can be linking them both, until it "snaps"

Our researcher even reverses the said process, and somehow increases the entanglement to again form a Wormhole once more! [They don't get paid for this, do they?]

So how do these "researchers" interpret ER = EPR? Maldacena suggests that they are aspects of the same Physics! (What?)

But NOTE: There is, as always, with these so-called physicists, ZERO Explanation. It is always just a descriptive association at its most formal – no physical reasons are necessary, they assert: that Mathematics is the *Cause*!

Quote: "Space-Time is a manifestation of Quantum Entanglement!" Untrue! At best it shows these purely formal arrangements are *formally* related, but cannot say they are physically/causally related at all! And once again we are told. "Space-Time = Entanglement"!

The marked comment in the article making Space-Time a so called backdrop is yet another formal version of the possibility of a real physical substrate, and when translational travel of particles, by quanta of electromagnetic energy are replaced by bucket brigade propagations in a still substrate, could not the speed of propagation of certain communications exceed the Speed of Light?

There follows a bit about the Wormhole connection between entangled particles... This rapidly becomes the ultimate in speculation – a connection outside of space and time, and hence immediate, removes spooky stuff at a stroke, but only requires the impossible inventions to deliver the necessary answer. Wow!

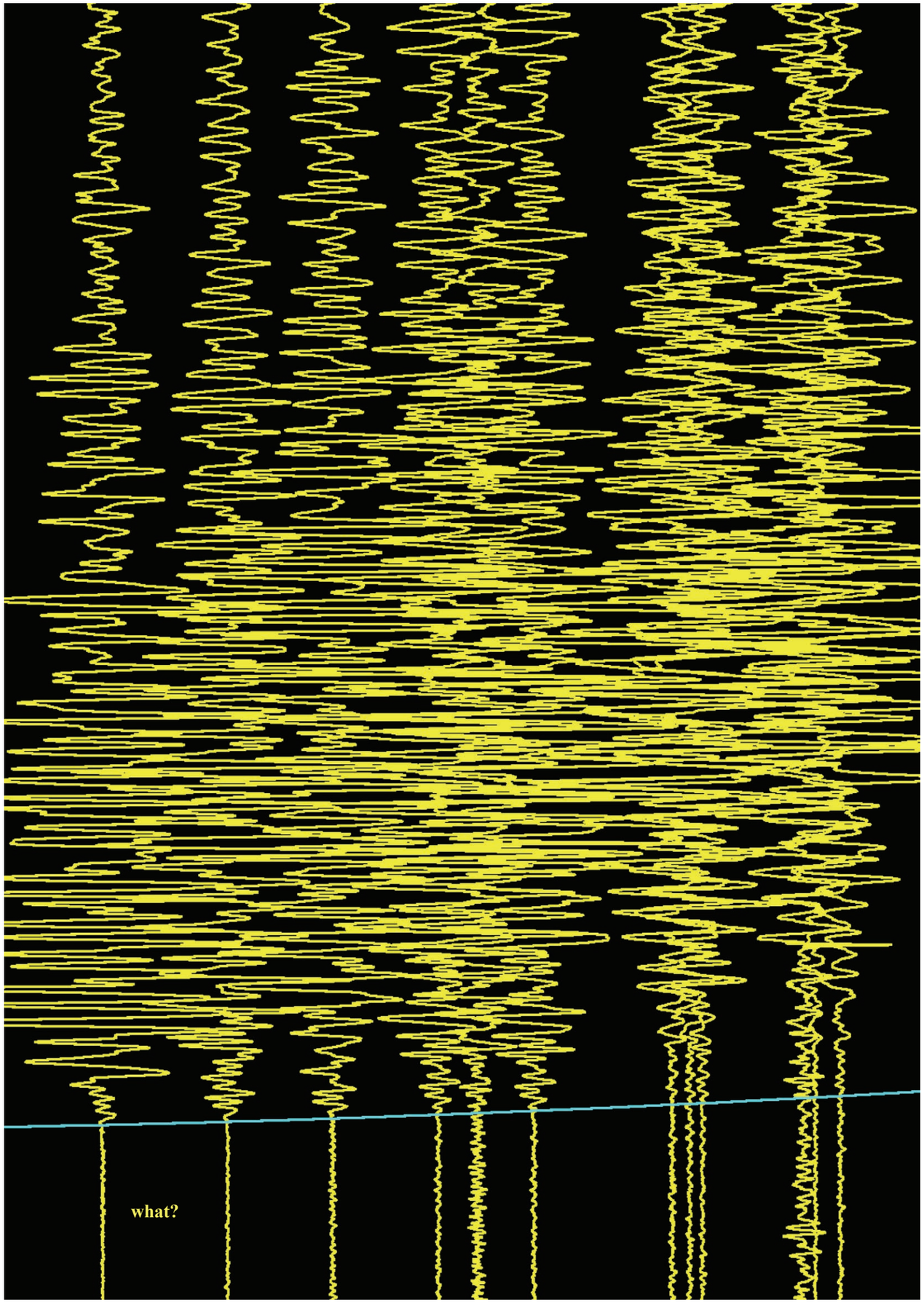
The throwaway line, of not including the expansion of Space, reveals the method – Invent Space-Time, invent multiple dimensions, including one outside of Space-Time. And finally, invent the expansion of Space, and, after all of these constructions, answers though purely formal are possible!

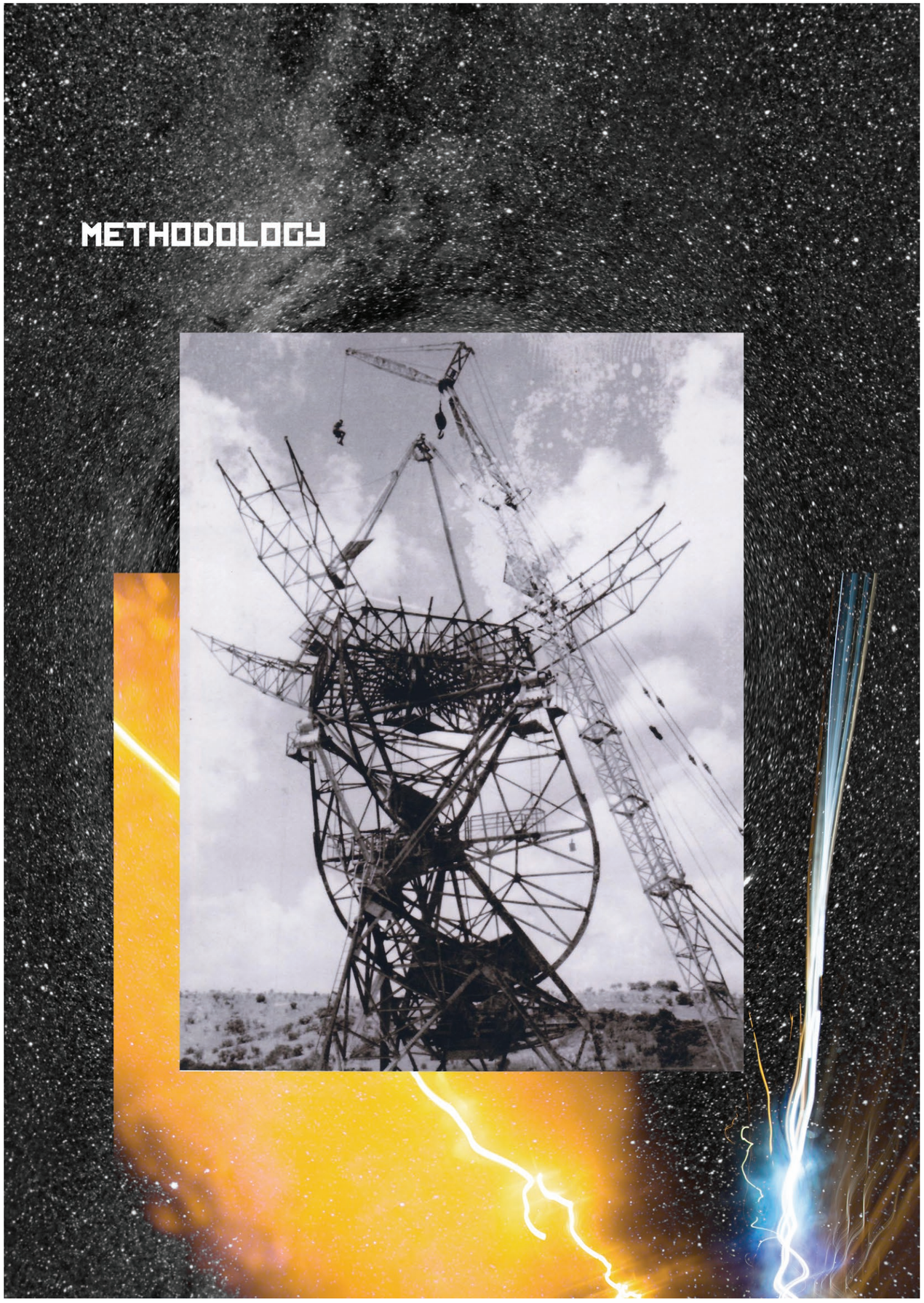
NOTE: They are now bringing expansion into their maths to take their work further.

Finally, the theorists bring in Superposition:

How can this impossibility be explained physically? Well, though these mathematicians have no ides, there are ways! For, if a particle moves within a physical substrate, not only does the particle affect that substrate, but also the substrate, under changed conditions, can then produce manifestations elsewhere, which can erroneously be credited to the original particle, and it can be the two simultaneous contributions that explain what appears to be superposition.

Superposition. This Principle of Quantum Theory effectively means that different states are simultaneously present – or, in real terms, two different possibilities are simultaneously possible, and the slightest change will precipitate one rather than the other – nothing magical so far... But, then they change this to saying that two incompatible states are happening at the same time: that is nonsense!





Form or Cause
what determines phenomena in reality?

Perhaps the differences between a Formalist approach to Reality, and the alternative Materialist and causative view requires further clarification.

It must be so, as Mankind for millennia has been oscillating, to and fro, between these approaches, and even embedding them both, in an effective, pragmatist amalgam. So, rather than a presentation as a single choice-of-sides, we should, instead, explain how both stances have been jointly employed, sometimes by the very same investigators, for centuries – with the necessary rider –"only where they fit!" And, in addition, both approaches are found to have causes themselves, for being considered valid possibilities.

The long-held cornerstone to both approaches has always been Reductionism, which, finding one cause-below-another (as far as it was possible to investigate), caused people to presume that it would be the same, all the way down to some fundamental particles, until there, finally it stopped at the terminal level! And, such a banker belief became the common basis for all existent phenomena, though they would act within a multiplicity of hierarchical Levels, each produced by the one below it!

Now, with that foundation, it is easy to see how the formalist position could arise. For, down through all the layers from Phenomena to first-cause, such formal relations were always evident, in appropriately arranged contexts. The "arrangements" were conceived as merely revealing what was there but hidden by a multiplicity of other relations, all acting together. It rapidly became clear that such "patterns" could always be revealed by appropriate arrangements, so that they MUST be the determinators throughout!

Now, of course, there must be a measure of validity in that conclusion, for such revelations were repeatable, every time! And it was evident that the levels did seem to form a hierarchy, so an historical reason for that sequence was assumed to have to have been the case over time.

But, nevertheless, we cannot ignore the fact that such straight-through formal relations are, each and every one, never causal: they are, quite clearly, only descriptive! At each level, different physical causes produce each and every phenomenon, including their visible Forms.

We say that Forms are universal: the same ones appearing all over the place. But, they only describe! Hence, we should not confuse that Universality of Pattern or Shape, with real, physical causes, which will be different with each and every phenomenon, and, at each and every level! Not least, this is because Reality's various levels are NOT simply developable from prior levels, and there are literally millions of examples. The prime and telling example must be the failure of many, many researchers to recreate even the most primitive Life from its component parts! And, the same can be said not only about abundant causes in Living Things, but also about literally all evident developments in complex non-living Reality too. Development is not merely incrementally achieved!

The Emergence of Life was not a mechanical inevitability. It created the wholly new! It would have to be a Revolution of some kind. And, the same thing is clearly true for all truly qualitative developments in Reality.

So, mistaking the Universality of Form, along with an evident common origin, for all Causes is certainly a major error we make all the time. The alternative, physical causes are different to Pattern or Shape: they are termed Causes, and they can only be achieved in terms of active substances with their many properties, which not only physically drive the actual change, but, in addition, can enable a meaningful explanation as to why things happen the way that they do.

The alternative formalist approach is Pure Idealism. While the causal approach is always Materialist.

The Values of Abstraction

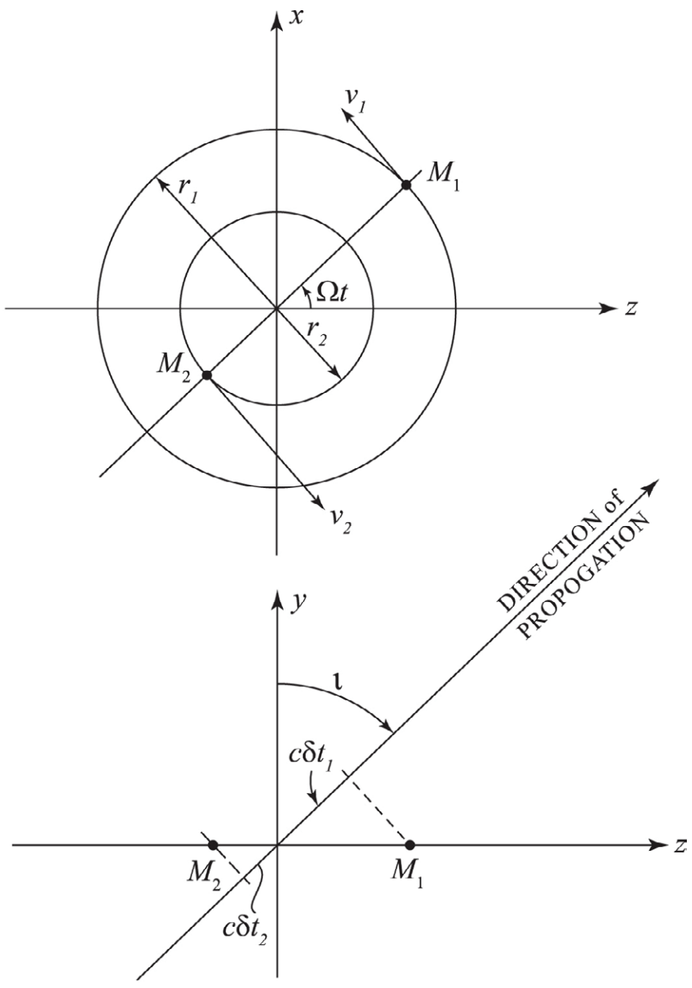
On considering just how useful the process of Abstraction from concrete Reality, and the subsequent simplifications and idealisations have been in Science, we have to explain exactly what we have achieved, and why that is a valid way to deal with Reality.

Now, these methods can, and indeed do, reveal something objective about the situation under study, but also, and crucially, they will ultimately mislead further theoretical developments. This latter flaw has been explained at length, but the values of the technique are not elaborated upon beyond the pragmatic – "it works so it must be right!"

But, the crucial questions must be, "Why does it work, when it is clearly a short cut, involving significant assumptions, and even major principles (such as that of Plurality)?

The best way to explain its efficacy is to justify the simplification on the grounds that we are concentrating only upon a dominant feature of the situation, so that it has a reasonable helping of concrete truth in the simplification. And secondly, that the idealisation cleans up the evidence to allow a simplified version of a dominating contribution to shine through!

We effectively divide off part of the situation, and its major contributions, from the rest of the involved factors. Now, this wouldn't be so effective if we didn't also do a whole set of other things to focus the experimental situation. We have become increasingly empowered, and indeed adept, at farming experimental situations, to be simplified, and more analysable than Reality-as-is could ever be.



Counting, Measuring & Processing Phenomena
the abstracting and quantisation of both of these

The inclusion of Operators, as a "Valid extension of Number," within the discipline of Mathematics, has crucial consequences, both for the new inclusions, and for the recipient discipline itself as well. For, immediately, it redefines straightforward counting and measuring Numbers unavoidably, when they appear in association with Operators – for they can also be transformed into Operators too! Instead of being what they were before, they are now something different – they have become Processes!

Thus any version of a mathematical form or expression, in which an Operator legitimately occurs, must be about processes and operators, and can no longer interpret what look like Numbers, as such; they now must be operators too.

Notice the crucial difference, when we consider an equation, such as :-

$$\mathbf{V = 4\Pi r^3/3}$$

This is a formula about the volume of a sphere. It is, of course, purely quantitative!
But:

$$\mathbf{Ax^2 + bx + c = 0}$$

with its generalised result of:

$$\mathbf{x = (-b +_{or}- sqrt(b^2 - 4ac))/ 2a}$$

which, allowing solutions that include things like:

i - meaning SQRT(-1)

immediately means we are no longer dealing with Numbers, but with Operators, which are actually Processes! The mere bringing in of i - "Turn anticlockwise through 90 degrees" allows in the crucial process of circular motion, and that of oscillations to also be included.

It isn't Number Theory any more! It has become a classic pragmatic mix that (with appropriate extra rules), so that it can handle an important area of Reality, in an idealised form along with Number.

But, you certainly have to be careful. The quadratic equation dealt with above, can be wholly to do with Number, when solutions don't involve i, but if they do, they only make sense as Operations. I well remember being taught all of this as being extensions to Number, and that was incorrect!

NOTE: A circular motion can be analysed into two linear oscillations (of appropriate size and frequency) acting at right angles to one another, and both forms can be handled with the inclusion of the "magic i". Notice also that both interpretations can be mixed, as long as the user knows which is which! So, a solution such as 5, for example, can mean either the number 5, or the operator – "increase by a factor of 5 times"

There is, of course, a compelling reason for Mankind to make such extensions to Mathematics. It was the first intellectual discipline that Mankind created, and its methodology was evidently extremely powerful. Man, therefore, wanted such features in all his investigations, and the methods he used stemmed directly from his long established approach of Pragmatism – "Don't worry about WHY; can it be made to work?".

But, being brilliant in knowing how to solve a problem without understanding it was bound to lead to more involved problems later on. For Mathematics, as the pinnacle of Pragmatism, never asks "Why?"; it exclusively concerns itself with "How?", which, when you think about it, is clearly no basis for Science.

A Muse on Formal Theory

As I continue to work through Anil Anathaswamy's article in *New Scientist* (3046), I find myself being led into a strange, foreign world.

We are confronted with a version of Sub Atomic Physics, in which absolutely everything is based solely upon formal equations, along with so-called "explanations", which are in fact, after the event narratives determined by and attached to those primary sources – the Formal Equations.

Now, before the Copenhagen "revolution", explanations were very different, for then they were based upon physical substances and their known properties. But, since the crisis and eventual collapse of the old bases for such Theories, caused by the discovery of the Quantum, and so-called Wave/Particle Duality, all that was abandoned and, "only formal equations could be trusted!"

But, of course, such narratives are not explanations at all, but mere speculation emanating from formal equations as the absolute Truth of Reality, which, of course, is far from being the case!

In more detail, this so-called "Theory" is merely a rationale based upon the "assumed generality" of Form.

Please notice, that I said "generality" and not universality. There can be no doubt that forms are universal: the same forms crop up all over the place without identical causalities! They are merely the common patterns of Reality and not its causes!

It is precisely this Form, which is taken with others via the aforesaid rationale that ALONE is said to produce all real world phenomena, and are, therefore, wholly self-consistent and sufficient in that task.

The objective, for such a standpoint, must surely be to demonstrate these assertions, and hence deliver the reasons for all phenomena, if and only if, the Formal Equations have been established. I'm afraid that the whole of that set of ideas and reasoning is total bunkum! Equations can never be sufficient, because of three major reasons.

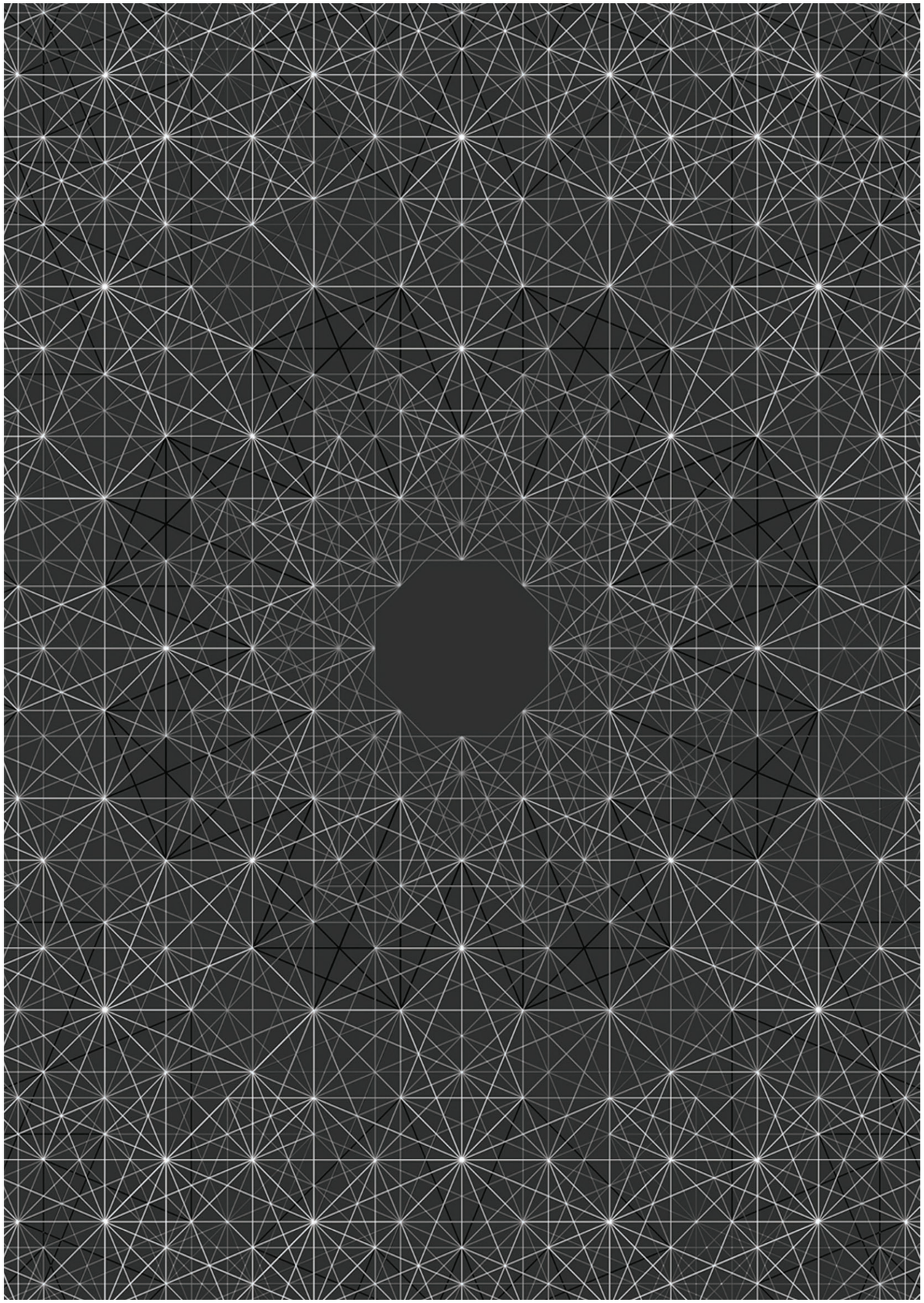
ONE: they are just formal descriptions

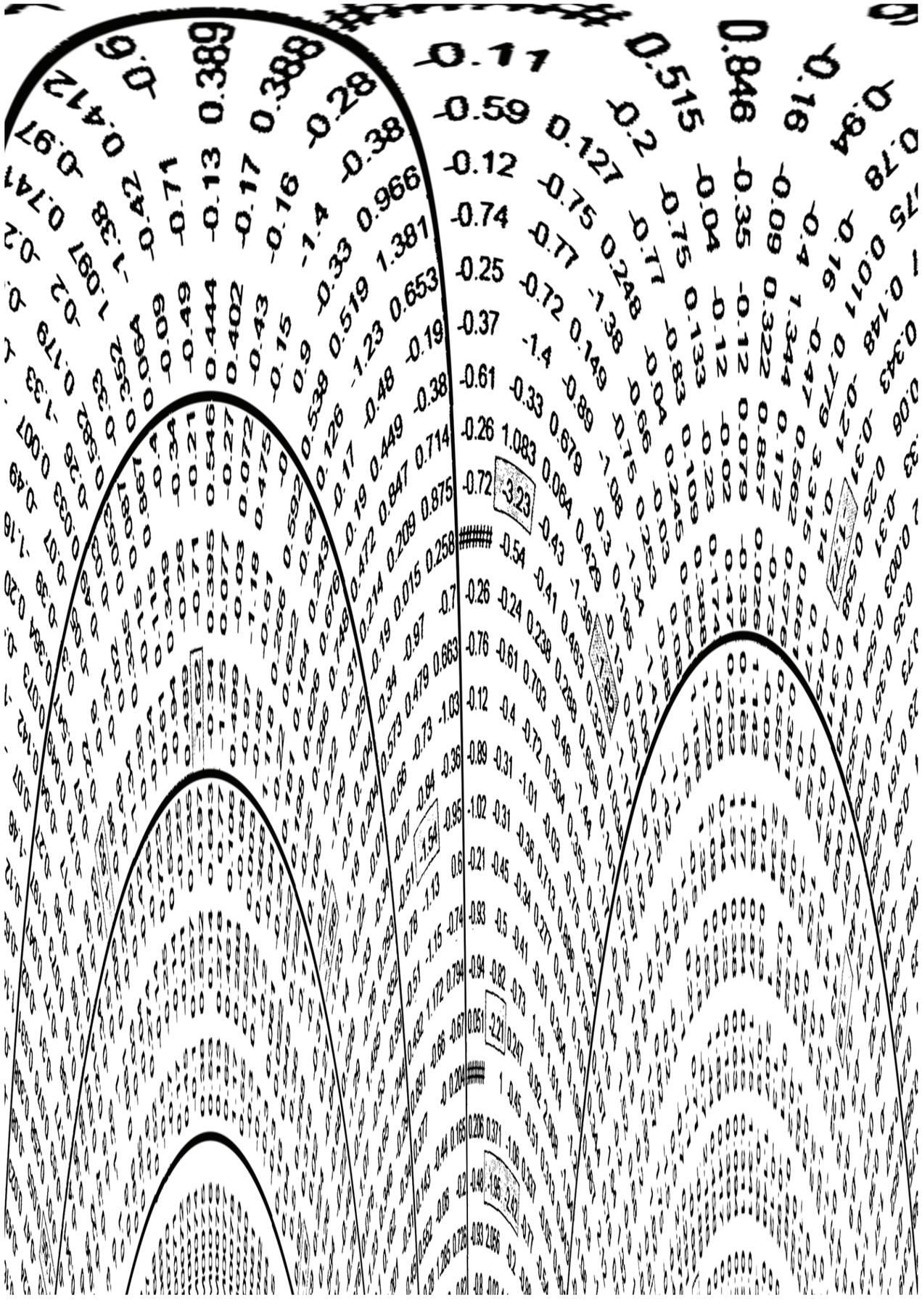
TWO: they occur in many different contexts, so, how can they explain each and every one?

THREE: they are abstractions from reality so how can they drive physical phenomena: they will surely require *physical* causes!

Clearly, to abandon attempted explanations for mere descriptions, no matter how succinct, productive and manipulatable, that just wont do. If the premises for explanations are failing, you must find out what is wrong with them and change them to something better.

Form is about appearances, patterns and shapes, but what is required is Cause!





The Inevitable Slide into Ideality

On struggling through the "Entangled Universe" article in *New Scientist* (3046), I have been drawn to certain damning conclusions concerning the kind of Mathematical Physics being discussed there.

I remember, once before, being similarly exasperated by the reasoning used by Andrew Wiles, in his proof of Fermat's Last Theorem, when he brought together many different formal proofs from a large number of separate researches to enable him to finally deliver the long sought for result.

But then, my criticisms were misplaced, because you can certainly do what Wiles did, when you are only dealing with Number Theory - for then, such things are, indeed, legitimate.

But here, when supposedly dealing with real-world Physics – in other words, concrete Reality, and real relationships and causes in a concretely existing World, you most certainly cannot do that.

Wiles' method was OK, because everything involved was Pure Form. But, that is NOT the case here in Physics! Yet, once the decisions at the Solvay Conference (1927) had been taken, and the necessary requirements for proofs in terms of physical Theories, had been dispensed with, and replaced entirely with purely formal equations, and their purely formal manipulations, the dice had been cast, and Objective Reality was now seen exclusively in purely formal terms.

Mathematics was no longer the Handmaiden, but now, installed as the Queen of the Sciences, and most definitely supreme in the realm of Sub Atomic Physics. Things were definitely downhill from then on!

As I have demonstrated, elsewhere, in a whole series of papers, the trouble with Mathematics, when studied in its own terms alone, is that its natural Home World – that of Pure Form alone, which I call Ideality, takes over completely, and the whole exercise drifts away from concrete Reality and its real world constraints, and into the various reaches of Ideality: and these are both much less than those of Reality, while simultaneously including many formal constructions that exist only there. Then, you are no longer doing Science, but exploring the nether reaches of Ideality. – You have become a mathematician!

The proof in this New Scientist, article is made crystal clear, when one of the investigations links a couple areas to a third – namely Information Theory. Now, as soon as such an area is involved, we can no longer kid ourselves that we are primarily considering concrete Reality.

With Information, we have admitted that we are merely talking about how WE – human beings, attempt to deal abstractly with Reality, and, in so doing, removing things into Ideality – the world of Pure Form alone.

Clearly, once there, the consideration of how things relate to one another in that world, require some Meta-Method – which they call Information Theory. It seems that this is becoming the Lingua Franca of Ideality.

Lost in the Underworld of Delights

Surely, the time has finally come when we must demote the voluptuous allure of Pure Form, for the driving concrete substances of Reality-as-is, in spite of all its all-too-evident difficulties. The once supposed Queen must be seen for what she actually is – a curvaceous and desirable Handmaiden, delivering a multitude of delightful dances as, it must be said, very appealing reflections of Reality, rather than exposing its true nature and necessary complexity.

The articulations and smooth idealisations MUST be superceded by a more concrete, coherent, consistent and comprehensive view only available via the true, wise Queen – Science! The ultimate dead-ends made inevitable, by chasing only the alluring forms of the dancers, must be abandoned for the finding of Causes rather than appealing Shapes!

The recent article in *New Scientist* (3046) entitled "Entangled Universe", by Anil Anathaswamy, led us ever deeper into the Underworld of Pure Mathematics, by pretending to be the revealing path to Truth, but ending up only in the inky blackness of failed illusions.

Meaning to develop yet another critique of The Copenhagen Interpretation of Quantum Theory, I had embarked upon extracting each and every assumption, rule, principle and law, embedded in that stance, to expose its basis as being entirely in Form, and its false path to Theory. But, though I will complete that task, I must also, and primarily, condemn that whole approach as the cul de sac that it surely is.

Let us be crystal clear, Form is never Cause! It is always a simplification and an idealisation of naturally occurring pattern, allowing predictions and effective use, in appropriately arranged circumstances only! It exhibits the inevitable product of Mankind's first achievement – Pragmatism, and though it can empower Technology, it does absolutely nothing for Understanding!

Indeed, the current state of Sub Atomic Physics is a direct consequence of that basic method! Billions have to be allocated to providing an ever more powerful Technology to deliver more and more new data to require processing, and formal integration into the current structures, while, at the same time hiding the real mutually affecting Causes, via elaborate Domain constructions, and ever more abstract mathematical representations.

Let me provide a simple example! In my youth my University lecturers told me about the Double Slit Experiments, and the contradictory results that seemed impossible to explain. Thereafter, the Copenhagen Interpretation was also elaborated, which, being only Form plus Speculation, never explained anything of these experiments, but merely described them in a usable way. Yet, when I finally decided to address this set of experiments, entirely physically, looking for the substances and their properties that could actually explain all the anomalies, I was able to do it, merely by involving an undetectable substrate.

Now this clearly revealed the route that Physics had decided upon, and that which had once depended upon had now been effectively banned! Sub Atomic physicists had embraced Mathematics – not only as an effective descriptive as well as a useable tool, but also as the Sole Cause too! Henceforth, for them, Law now actually determined phenomena, instead of just describing them.

But, of course, there was more to it than a mere switch of means. One always-present strand of Science, since its inception, was allowed to dominate, and also its distinct philosophical basis was adopted completely too. The old mixed philosophical standpoint of traditional Science was abandoned for the worship of Pure Form as the reason for all Reality.

Scientists shamefacedly dropped materialism, though dressed up with a supposed experimental basis, which wasn't determining, but actually itself was determined by formal reasoning – Mathematics!

Context?

Let us consider the major differences between totally unfettered Reality and a carefully arranged and maintained experimental situation.

Reality-as-is contains absolutely everything, though in varying situations, they will occur in different mixes and of different amounts of the factors involved. Basically, any experiment, carried out directly upon unfettered Reality, does not, and indeed cannot, reveal reliable and useable relations. Too much is going on simultaneously, and what dominances there are in each and every situation can be both very different and will always be temporary! So, what Mankind gradually learned how to do was to deliberately and directly modify such situations, significantly, in order to quieten down the natural variations. The situation was not only "nailed to the ground", but also in such a way that a particular dominant factor would be purposely made to emerge very clearly and reliably.

The key addition, to these chosen Domains, was, of course, Control! For, it became increasingly possible to remove certain, non-targeted factors, completely, from the mix, while others could be held constant to remove their contributions in that way. The intended ideal scenario was to have only a couple of things being allowed to vary – and, then, only doing so in a systematic, measureable way. With such Farming of experimental Domains, the real world situations were transformed into much more intelligible situations, and dominant relations between significant variables could be easily extracted by carefully taken measurements, over an available range.

Thereafter, these were then further transformed into algebraic formulae or equations, by a chose of appropriate Form from the mathematicians' extensive catalogue, along with the use of the acquired data set, to fix that general Form's various constants. Thus, a general form was made into a particular instant by means of the collected data!

The result was a formula that encapsulated all the carefully farmed-for and extracted data.

But, let us be clear: the particular instance of that form only had concrete validation over the range that was allowed in the experiment, while the Formal Template used to achieve it had NO implicit limits to its range!

Now, such achievements are, of course, both terrific, yet also misleading, when it came to extending the range of applicability.

NOTE: Only as long as the exact same conditions were constituted as were the case in Extraction, AND the range was identically limited, would all be well!

So, having found the sought-for relation, in those ideal conditions, (to establish some sort of basis), it would be natural to extend the context as far as possible, using the acquired formula without change! And, of course, to assume that, though hidden by many other simultaneous factors, the acquired formula was also true exactly-as-is in totally unfettered Reality too!

But, such an assumption would NOT be reasonable at all: no evidence for that was involved in the whole set of operations. To assume that would be speculation, and "Not Yet Proved" (if ever it could be?)

Clearly a generally taken-on assumption has been employed to allow this extrapolation. It is the famed Principle of Plurality and it is WRONG!

The various processes involved in the extraction did not just extract the given relation in perfect condition. On the contrary, these processes both simplified and idealised an actually existing factor by the very means we used to obtain it.

The question is, "Is this valid?"

Well, there are two diametrically opposite answers to this question. The first is "No!", and the second is, "Yes!" The "No" must have precedence for what we have in our hands is NOT a generality: it is most definitely a very constrained particular! So, if we are to use it with confidence, we have ensure the replication of the exact conditions from which it was extracted.

Only then can we use it with confidence!

And also, a resounding "NO", if you are (with Plurality) assuming that the particular exists exactly as extracted within totally unfettered Reality – for that is purely wishful thinking!

And, an even louder rejection must be involved, if the particular extracted version is to be used in the furtherance of the theories involved, For, then, such a mistake leads us deep into the mire! It is totally INCORRECT

Remember what we did to get our equations: we both simplified and idealised the factor, taking the targeted phenomenon out of the very context that produced it, and, very important indeed, turning it into an unchangeable, Natural Law! And, that is NOT what it is!

Notice the crucial difference between Use and Understanding – The extracted and tailored formula can be used, as long as the appropriate conditions are established. But, the same form cannot be used in explanations and in further developments of Theory!

Reality is not pluralist: it is holistic!

Now, there was a philosopher, who got closest to dealing with this problem, and he was GWF Hegel (almost 200 years ago).

Hegel's self-chosen remit was *Thinking about Thought,* and he realised that whatever abstractions we made, from Reality, would be compromised not only by our farming of situations, but also by the underlying assumptions and principles, which we instituted to make their employment in further theorising possible.

Mankind had cleverly devised premises, which enabled the abstract concepts to be "used further".

The trouble, of course, was that these bases were NOT the required Absolute Truth – ever! And, consequently, a surprising and unavoidable anomaly always ultimately appeared.

Within each and every inadequate set of premises, we would arrive at a pair of current concepts that were mutually exclusive – they couldn't possibly both be true! Now, this had, to some extent, been realised in a single case 2,300 years earlier by the Greek Zeno of Elea, concerning the concepts of Continuity and Descreteness. And, he had produced his famous Paradoxes to demonstrate the case, in various ways.

But, he (and later Hegel) were generally ignored, and for what were universally considered to be "good" pragmatic reasons. For, if you kept both arms of that dichotomy, and simply learned exactly when to use each one successfully, there could be an acceptable measure of success, but NOT a resolution of the contradiction: only a purely pragmatic solution was what would be achieved.

So, as these Dichotomous Pairs occurred regularly in many diverse areas, based upon a succession of agreed-but-flawed premises, this sort of pragmatic solution became the norm.

Of course, such "frigs" couldn't do what was required to transcend the causing impasses, and develop our coherent explanations, with sound and encompassing understanding. But, though theoretically poor, our pragmatic use was relatively unhindered.

But, in spite of the continued use of these pragmatic solution to this day, Hegel, himself, was well aware that such were theoretically untenable, and knew that the dichotomies presented had, somehow, to be transcended theoretically. And, he devised a method to do precisely that!

While most investigators wasted their time by just hammering between the two arms of the dichotomy to try to find which was indeed the most fundamental, Hegel tackled things very differently.

He determined that the problems resided in what were the underlying premises for both arms of the dichotomy. So, he took to unearthing these premises in full, and seeking alternatives that would indeed transcend the impasses.

The method was sound and indeed brilliant: it became known as Dialectics, and when imported from Hegel's idealist standpoint into the materialist alternative, by Karl Marx – the method became a crucial underpinning of real reasoning.

Yet, it was a holist conception and was not taken on by the majority of scientists, who were universally pluralists. To this day, even the so-called foundation science of Physics has stayed with the old methods.

Even at the presumed to be highest level with the Copenhagen Interpretation of Quantum Theory, the pragmatist technique of retaining both arms of dichotomy and switching between them, is still the standard method.

The only alternative in the Sciences, has been that when such pragmatism was untenable, the alternative version of the very same frig, was to merely use the impasse as a definer of the boundaries of New Sciences, each of which would have a kind of acceptable consistency within its own defined area.

A Non-Ideality Context

The article, by Anil Anathaswamy in *New Scientist* (3046) ranges far and wide both in Quantum Theory and in Relativity. Of course, in such a small paper, as in this critical response, most things have to be taken as established elsewhere, and thus, accepting such proofs as are available, they are here related together purely in a purely formal way – as has always been the case, since its origins in Quantum Theory in its initial triumph in 1927 at the Solvay Conference.

Now, elsewhere, the writer of this paper, theorist Jim Schofield, (a physicist who disagrees profoundly with the current stance of Mathematical Physics), has proposed various physical situations to explain aspects that are dealt with very differently within the currently dominant stance in Quantum Physics.

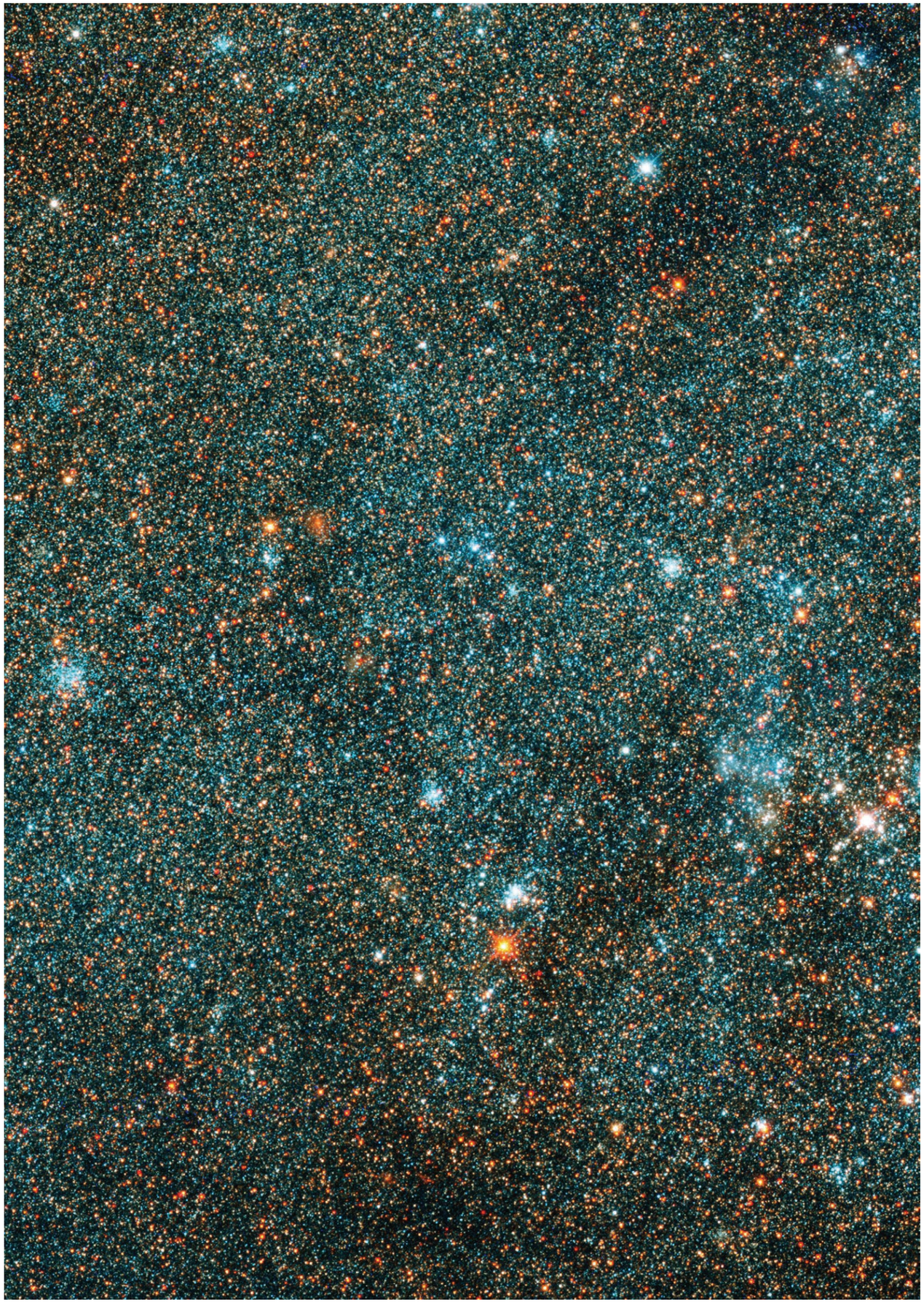
His main, and clearly enabling, assumption has been the suggestion of the presence of an undetectable, but both affected and affecting *substrate*.

And, with this addition, he has been able to fully explain all the anomalies of the famed Double Slit set of experiments, and also the propagation of electromagnetic Radiation through "Empty Space".

In addition, such phenomena as Pair Productions and Pair Annihilations also fit perfectly into his conception of the nature of that Universal Substrate.

He is currently addressing the inexplicability of so-called Quantum Entanglement via the concept of synchronised development processes in pairs of particles created by the same single instantaneous process. And, his purpose in tackling the New Scientist article is also to criticise the ideas, therein, about relating the Space-Time Continuum and Quantum Entanglement as different sides of the same coin, and hence the route to a *Theory of Everything.*

Clearly, with other elsewhere-elaborated research, attempting to explain the quantization of electron orbits in atoms (once again made possible by the assumption of an underlying substrate), it is becoming clear that a very different route to the purely formal weirdness of the presently dominant Copenhagen Interpretation of Quantum Theory seems to be clearly possible.



The Real Explanatory Physics

Though we, as is always the case generally, have also, along with the writer of *Entangled Universe*, to assume that the reader will already know about both Relativity and Quantum Theory, there remains a major problem in not including what these key theories actually mean in scientific circles, in the article being reviewed and in the ideas of the reviewer.

Both of these theories come out of just one of the historical-three-component combined stances, which for centuries have together constituted an "integrated" approach to Physics! They, in opposition to that remarkable amalgam, are starting once more with the earliest and most primitive stance of all, namely Pragmatism.

For, it was on that historical basis too, that the ancient Greeks put together their brilliant contribution to produce both Formal Logic and Mathematics (as in Euclidian Geometry)! Thereafter, from much more recently, the fruitful basis of experimental investigations was included, which that could only be materialist, and became the default assumption as to what Science was really about.

Now, the new and the historical contributions were philosophically at variance with the prior positions, but, perhaps surprisingly, the new approach kept both, and merely switched between them, but, of course, they had been doing this for millennia due to Pragmatism. For, it had long been all you could do, when your understanding was unavoidably full of holes: you trusted your bankers even if they were philosophically contradictory!

Now, this sufficed until the latter part of the 19th century, when mostly materialist explanations started to fail.

First, this happened with Black Body Radiation, and then with the Photo Electric Effect. No suggestions could cope with either of these until Planck suggested the Quantum –which was a descrete gobbet of pure energy and nothing else,

Einstein used the Quantum to adequately explain the Photo Electric Effect, and went on to also undermine traditional Physics with his Theory of Relativity. Now, both of these new concepts were NOT physically established, but purely formally they could be made to fit previously inexplicable features of Reality. Now, though Einstein still insisted upon a materialist basis for Physics, these new ideas were handle-able ONLY in purely formal terms – there were NO physical explanations available!

Nevertheless, no explanatory theories were forthcoming, and more and more physicists, who were delighted with the new Physics, commenced to deal with it entirely formally!

The implicit change was to permanently dump all explanatory theories in the sub atomic realm, and deal only in Equations.

The trouble was that the equations that were devised to handle these situations, made absolutely no sense physically. They mixed probabilities into spatial situations, and switched whenever it helped between considering an entity as a Particle, and then as a Wave.

The argument raged with the formalists gaining ever more ground, until the New Physics was established at the Solvay Conference in 1927.

Thereafter all explanations were replaced by formulae.

Physics, at least in the most basic, Sub Atomic Level, had changed to being predominantly and even primarily idealist! Of course, it didn't make the new overall view totally consistent, so a host of unexplained Meta Rules (Rules of thumb again both eternal and absolute) that were added in to make things work.

The final result was the now ubiquitous Copenhagen Interpretation of Quantum Theory, and the whole of the reviewed article by Anil Anathaswamy in *New Scientist* (3046), is based solely upon this theoretical stance, as were all the investigators he tells us about.

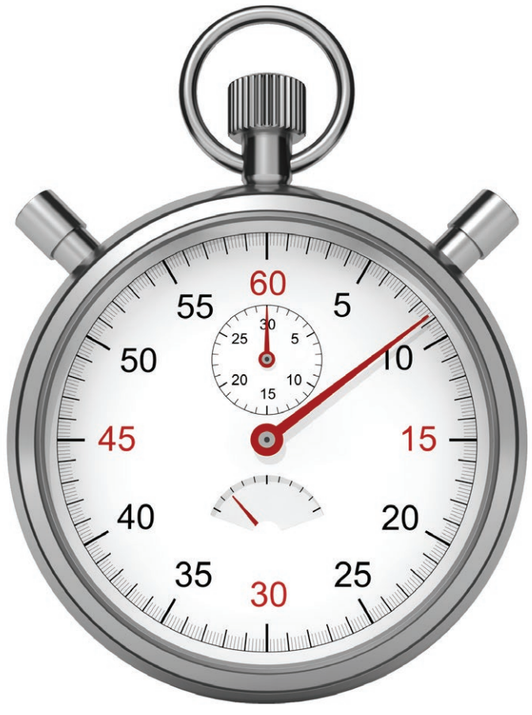
And, in it the proliferation of new, purely formal laws (and their accompanying Rules) are pressed into providing an alternative to materialist explanations.

There are what seem to be physical mentions, but they are all subordinate to and derived from the formulae.

In so doing, the Forms alone are still insufficient, so they have been extended deliberately into a wider realm than Reality, which, because it only contains Pure Forms, is clearly Ideality!

The reader must be made clear that this review is NOT a subscription to Copenhagen, and, therefore, considers most of what is currently merely delivered in the guise of Modern Physical Theory as in fact, merely Form, extended into multiple Dimensions, Strings, Superpositions and Wave/Particle Duality.

This critical contribution is then a part of his current task to return Physics to being a materialist discipline, which aims primarily at explaining phenomena entirely in terms of the matter and its properties - but NOT, I must emphasize, mechanistically. The writer, in addition to being a fully qualified physicist, is also a philosopher and the reader will frequently come across his consistently holist line in contrast to the pluralist stance of those he is criticising. His stance is NOT new: it is part of a 2,500 year-old tradition including Zeno, the Buddha, Hegel and Marx, but applied for the first time in a century to Physics!



Simultaneity?
can it occur within relativity, and if so how?

Let us depart from Relativity, at least initially, to position the problem of Simultaneity in concrete Reality.

Once in that concrete World, let us consider two events happening at situations separated in Space, but happening at exactly the same time. And, clearly, there can be nothing wrong with such a situation, in this context.

Let us suppose that the effects of those events are propagated, so that they will meet one another at a position exactly half way between the two original events. Clearly, on meeting they will, in some way, affect one another. Now, if something else were in that precise position of contact, both would affect it "simultaneously"! But, it would not be evident to an observer of that point that what was being observed was being caused by two separate events, situated elsewhere. Whatever happened would look like a spontaneous development of what had been there before.

Now, without any further evidence, such a misinterpretation would indeed be possible. The investigator may well use what he already knows about that entity. He might well, on sound prior evidence, interpret what happens as being an internal development, or alternatively as the result of some single applied exterior cause.

But, in the latter assumption, the assumed situation, which is that it is NOT two simultaneous causes might well cause problems, if interpreted in either of the other ways suggested.

The initial point, of this case, is to show that simultaneity may not be obvious to such an observer, depending upon that observer's position, as the two causing events are unlikely to be seen as simultaneous. Indeed, it could only be seen as such, if the observer was indeed positioned at exactly the same distances from the two causing events.

Any other position for the observer would see three apparently unconnected events, happening at different times. And if the times and distances involved were prodigiously large, the chance of a correct interpretation would be zero!

NOTE: this fragment is obviously a first step into addressing General Relativity, for a likely and interesting set of occurrences.

NOTE: Also, in a substrate of reasonably closely-packed units, the above possibility might well be very common indeed, and could be misinterpreted as internal developments, rather than being caused by simultaneous exterior causes.

Why a Black Hole?

Now, in Fred Hoyle's scenario for the trajectory of development for stars, the initial availability for aggregation was mostly deemed to by of Hydrogen, and as the evr increasing collection grew larger, only one kind of nuclear fusion reaction , at the centre of that that body could occur and turn it into a shining star. And, Hoyle's consequent sequence of phases occurred each time that the availability of resource was insufficient to maintain a stable balance between exiting energy and matter on the one hand, and inwards effects of Gravity on the other.. For at such a point the star would collapse, and continue to do so until the conditions were created for another different form of fusion with a different resource could be triggered off.. Now, Hoyle calculated that such phases could follow one another until the process could go no further with the production of Iron (Fe). At this point the usual collapse occurred, but this time carried on until the whole star exploded in a massive range of different fusions – infact sufficient to produce all the rest of the elements we now find in oue universe. This ultimate explosion was termed a Supernova, and seemed to terminate the sequence once and for all.

So, what then is a Black Hole?
The usual idea isa that with the transformation of Matter from almost entirely Hydrogen to the whole range of elements, the usual trajectory became impossible for the conditions for a single resource nuclear fusion could never occur agai, and multi resource Supernovae would also not be possible. Aggregation in such circumstances would not be interrupted by episodes of fusion. It would carry on down to compress matter into stupendous densities, No shining star would be produced, andin fact something very like the exact opposite would result. Indeed, the concentration of matter would be so eneormos that nothing could excape from the concentration. Not even Light!

Hence this concentration would deliver what seemed to be a "hole" in the Universe into which an inexhastable stream of matter, and Light would vanish It was termed a Black Hole! Its gravitational pull, though, will be enormous, and there is evidence that such an entity will probably reside at the centre of every existing Galaxy – the central "plugholele, so-to-speak for matter no longer able to create the concitions for a "shining star". But, surely, we cannot extrapolate this process for ever?

Why should this process carry on, without, by its own action, the conditions for it to terminate? Yet, all the recognised processes involved do precisely this. The very term Singularity, infers an infinite process: it allows us toNOT address how such a process will indeed terminate!

Now, the evidence seems to be that Black Holes are always local. We have such evidence from the idea of Black Holes at the centre of Galaxies. But, we are also aware of an event, some 13,7 billion years ago, and termed the Big Bang, in which the whole of the current Universe seemed to have started from. So, in the light of the various pieces of evidence, we are pressed to consider it as a Cosmic scale collapse and sunsubsequent explosion, dwarfing not only those occurring in the various star phases, but even the gigantic Supernovae.

Let us be clear – there has to be a physical reason for that event. The mathematicians used formal manipulations as an alternative to an explosion resulting in the alternative of the *Expansion of Space* itself, as the explanation, and delivering of a formal model only, as being totally sufficient. But, of course, such a substitute for a theory cannot be accepted for such an amazing nad crucial Event!

I am therefore impelled to consider that the almight effects of Gravity acting locally in stars and Supernovae, can also act on a larger scale in Black Holes, and ultimately also be the result, on a cosmic scale of a collapse , by Gravity, of the whole Universe. A final coming together with enormous concentrated energy, into a tiny area, can easily be seen as causing the Big Bang, and even be extended to the whole thing being repeated in cycles.

Down the Plughole

The relationship of a Black hole with the presence of a universal substrate (containing matter) is certainly worthy of consideration.

The theories proposed by the writer of this paper, which assume the presence of such a substrate, have managed to solve a whole series of contradictory anomalies in the present, sub atomic versions of Physical Theory - those based upon the Copenhagen Interpretation of Quantum Theory, so it is certainly possible that considering what would happen in the vicinity of an enormous Black Hole Sink would be extremely interesting, and might throw, once again, a very different slant upon a consequent theory of these significant objects in the Cosmos.

Theoretical work, concentrating on the units of such a substrate, have revealed valuable new information, which has transformed things attributed to Wave/Particle Duality, instead, to mutual and recursive interactions between moving particles and such a substrate!

The hypothesis, that these units consisted of a mutually orbiting pair of an electron and a positron, which was named by this theorist as a neutritron, would be totally neutral in every respect, and hence undetectable!

But, though this was true in most respects, it wasn't if we considered positions in extremely close proximity to that joint particle.

For, as the joint-particle occupies a finite space, positions much closer to one of its constituents than the other would always be possible very close up.

Only in these very close positions there would be many non-neutral conditions!

Now, these would never be constant, however, for the two component parts of the neutritron were constantly orbiting one another, and hence though non-neutral in any instant, the properties of such positions would be constantly varying between the two sets of properties due to each sub particle in turn.

NOTE: Nevertheless even in these positions, the effects over time would still be neutral!

What was demonstrated was that the effects, on one of these very close positions, would vary exactly like electromagnetic radiation, with a pair of electrostatic and magnetic effects at right angles to one another varying at a frequency determined by the orbiting of the two component particles.

So, in the presence of a Black Hole, a distortion of each and every unit of the substrate would surely expose the usually cancelled features over more extended areas of the distorted joint-particles of the substrate.

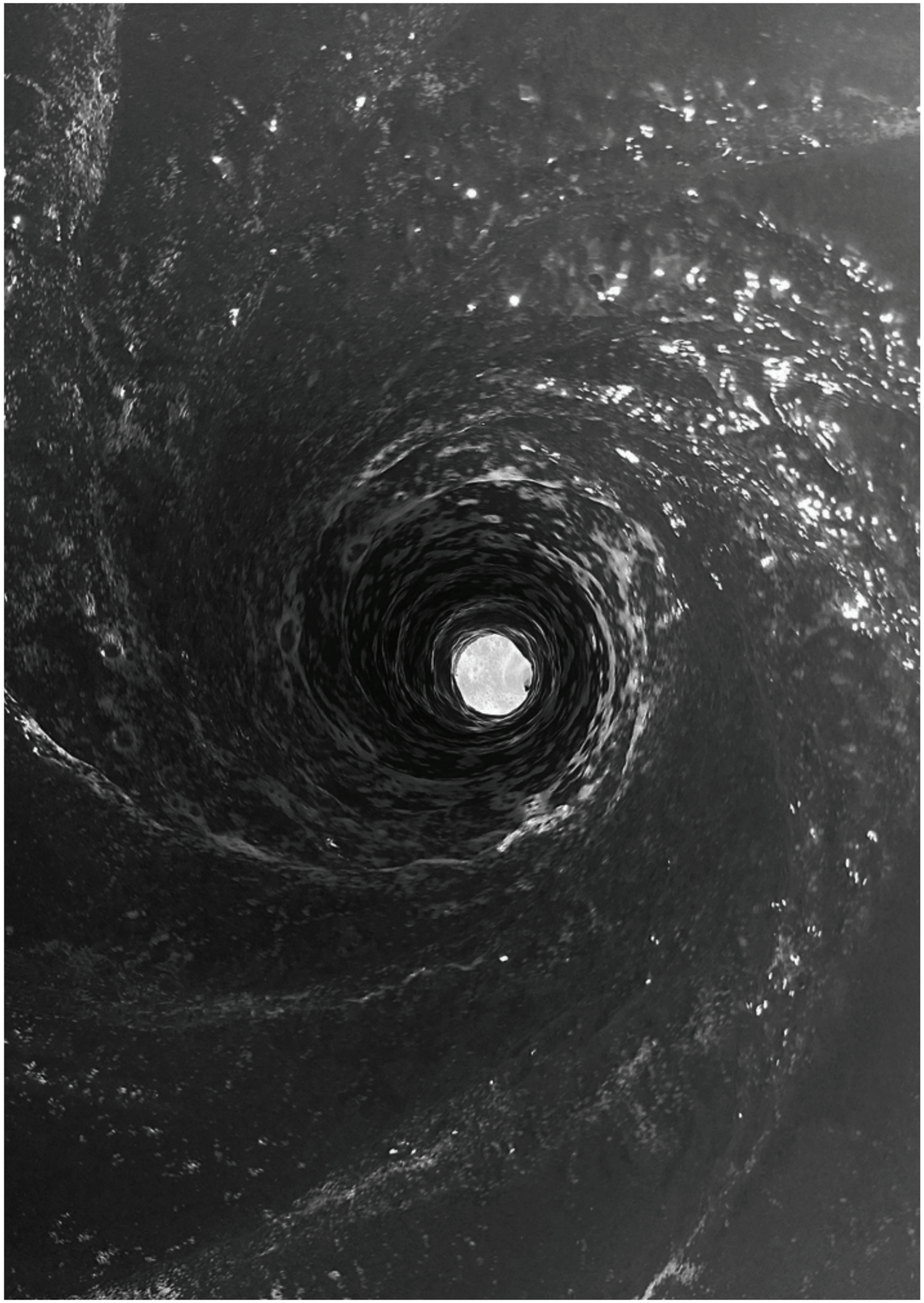
Under such circumstances, if the Black Hole could act gravitationally upon the matter content to draw the units, along with everything else into its inexhaustible maw!

If this were true, the Black Hole would certainly be acting as a plughole to the nearby substrate. Presumably, as the effects would be extremely local to the Black Hole, and elsewhere just a natural filling of the void left by that local inflow, the net effect would be like water disappearing down the plughole in a bath – but here spiralling down to "oblivion".

Now, if this were true, it certainly has implications! One is that the Black Hole, will since its formation, have been gobbling up substrate continually, so that it will more and more contain a vast number of these substrate units – either still as joint particles, or dissociated into their component paths.

Now, the question has to be asked, (though not if you are a follower of the wormhole fantasy), "What will change within the Black hole? Will it reach a point of no return and terminate the entity?"

WE must remember that the usually assumed result of an encounter between independent electrons and positrons is that they mutually annihilate one another producing only energy.



So, if these ideas are correct, a Black Hole will not be a permanent entity, neither will I merely evaporate away. It will surely, at some point, explode, and on a mighty scale – like a Big Bang?

Now, stepping back a bit to the more normal stable arrangements. Outside of the Black Hole, the spiralling substrate will at times be carrying other much more massive entities with it.

The actual spiralling of stars has been observed around a black hole at the centre of a galaxy, but such orbits would be under threat if the substrate was being drawn into the Hole, and affecting the stability of such orbits too!

We certainly have to dispense with the formal nonsense of multiple parallel universes as being at the other end of a Black Hole, and face the this-Universe, probable-futures of such entities.

Notice that it could be in the substrate where the majority of Dark Matter may exist at present. And also, with the possible "sinking" of the universal substrate into such entities, we have to consider the variability of that substrate depending upon its situations.

Light and Black Holes

The most obvious problem about Gravity, when involved in Black Holes, has to be the unchallengeable affirmation that Light will also never be allowed to escape from the Gravity of such entities.

For, Gravity is supposed to be concerned only with Matter and that Light is disembodied energy, so how, physically, are we to explain this assertion.

In a matter distortion of the Space-Time Continuum being put forward as the reason for this, we are having Matter affect both Space and Time by its mere presence, and these together are the ground in which Light is propagated: the inference is that the effects upon this ground can be so profound that even the propagation of Light is, more or less, brought to a halt.

Of course, to even make such an assertion immediately raises major objections, for Einstein's suggestion, involving only formal considerations, surely cannot be seen as crossing over into becoming susceptible to causes (from around itself thus producing them in the physical World).

NOTE: But mankind's history is full of pragmatic mixes of similar kinds to Einstein's, which though clearly incoherent in their consistency, *work* when taken as a valid ground of opposite alternatives. Now, of course, Einstein's analogistic model does work, just as James Clerk Maxwell's suggested model of the Ether also worked. But, of course, such things are our only means of getting some kind of handle onto the behaviours of Reality, and are never the full story, or even true!

Mankind has no direct access to Absolute Truth, so they must do what they can with what fragments of *Objective Content* they can extract, simplify and idealise into a useable form.

The whole thing about Explanatory Theory is down to tackling what produces Real World phenomena: is it down to substances & their properties (Science), or, alternatively, down to Shapes and Patterns – generally termed Form (Mathematics).

Of course, both are used in Science, but with very different purposes. The seeking of causes is for understandable Explanations, while the seeking of Forms is about useable Descriptions.

Confusion arises because Forms also enable Prediction, and even Production, to be successfully achieved, so those who ask "How?" prefer Form, while those who demand to know, "Why?" go for Cause.

Now, clearly Einstein, having NO clear cause for the Force of Gravity, concentrated upon developing a Form that embodied as much of Gravity as he could, and his correction of Newton's version seemed to dispense with an invisible Force, and replace it with a distorting ground – his Space-Time Continuum. The establishing of his new version was down to it delivering phenomena that the old version could not. It was a better, current description, and as with all Forms, it could be used.

Yet, it didn't explain why Gravity acted as it did: it only *described* how Gravity acted!

But, at its heart, it was a peculiar amalgam of formal description and causal happening. Confusingly, physical Matter was deemed to distort the purely formal Space-Time Continuum! How does that work?

Now, there will be a reason for the improved success of Einstein's version of Gravity, but we, certainly, don't know yet what it is.

It boils down, therefore, to a better, and more holistic description, and nothing else!

I say "holistic" because the presence of a universal substrate in a two-way causal relationship of physical entities would do exactly the same. If, for example, there were an invisible but real universal substrate, consisting of neutral but susceptible particles, involving matter, then Gravity acting upon a series of these which are actually propagating light, would seem to be affecting the Light itself directly.

But, of course, in those circumstances, that would not be true! It would instead be the units of the substrate, which include matter, being affected, and as they compose the propagation track, it would seem as if the disembodied Light that is being affected.

With such a situation, the effect of a Black Hole on Light would actually be its effect on the carrying substrate, which would, itself, be drawn into the Black Hole, like a sinkhole!

Now, at this stage no such explanation is available; the point of delivering such a narrative here is to make clear the difference between a description and an explanation. Einstein's Theory is NOT an explanation, is it?

Now, there is, of course, a problem with this suggestion. The neutritrons, supposedly composing the undetectable substrate, in the above alternative, would be undetectable, because of their composition, which includes exactly equal amounts of opposites in charge, magnetism and even matter-types. But, the absolute neutrality is evident only beyond a certain distance away.

From afar, all units of such a substrate will be neutral in every possible way, but, not only would things be very different inside the each substrate unit, but also in situations very close to it but immediately outside.

In very close proximity, the effects will NOT be neutral, throughout, but only over time.

Now, we can imagine that if our substrate units are also internal carriers of Light energy, they must be the same not only throughout Empty Space, but also up to and even into Black Holes as well.

The question then becomes, "What effect will a Black Hole have upon these very special substrate units? Will they be dissociated into their component sub particles? NOTE: This is actually directly assumed for that situation, and Pair Productions are generally agreed to occur, (which is exactly what a neutritron dissociates into).

Now such an occurrence would immediate dismantle the energy carrying function of that, and all other such combined particles, so propagation would be terminated. Clearly, if the assumptions employed in this interpretation are correct, energy will suddenly be available from carried energy in the prior substrate units.

What Causes a Supernova?

This question is crucial, because of the result, which both the effective death of the star involved, and the flinging out of the vast majority of its prior substance, that not only distributes that far and wide, but also converts enormous amounts of it into all the higher elements beyond Iron (Fe).

WE are certain that the Supernovae were each caused by an enormous collapse of a shining star. It was the ultimate stage in Fred Hoyle's explanation of the evolution of stars through a series of forma of nuclear fusion, with inevitable collapse; when sufficient resource was no longer available, only to via a cataclysmic collapse produce the energy for the next phase with a wholly new product. These phases were stable interludes in which outflows of matter and energy were finally balanced by the inwards pull of gravity. But, finally no more phases of that kind were possible, and the terminating collapse of the Iron producing phase, carried on down to such an extent, that the tremendous effects cause the explosion which made all the other elements and ended the stars active progress for ever.

Clearly a simple extrapolation of these prior collapses could get nowhere near explaining the Supernova: it was clearly of a very different order!

The reason for prior stabilities was that possibility of a balance between a single immense nuclear fusion process and Gravity.

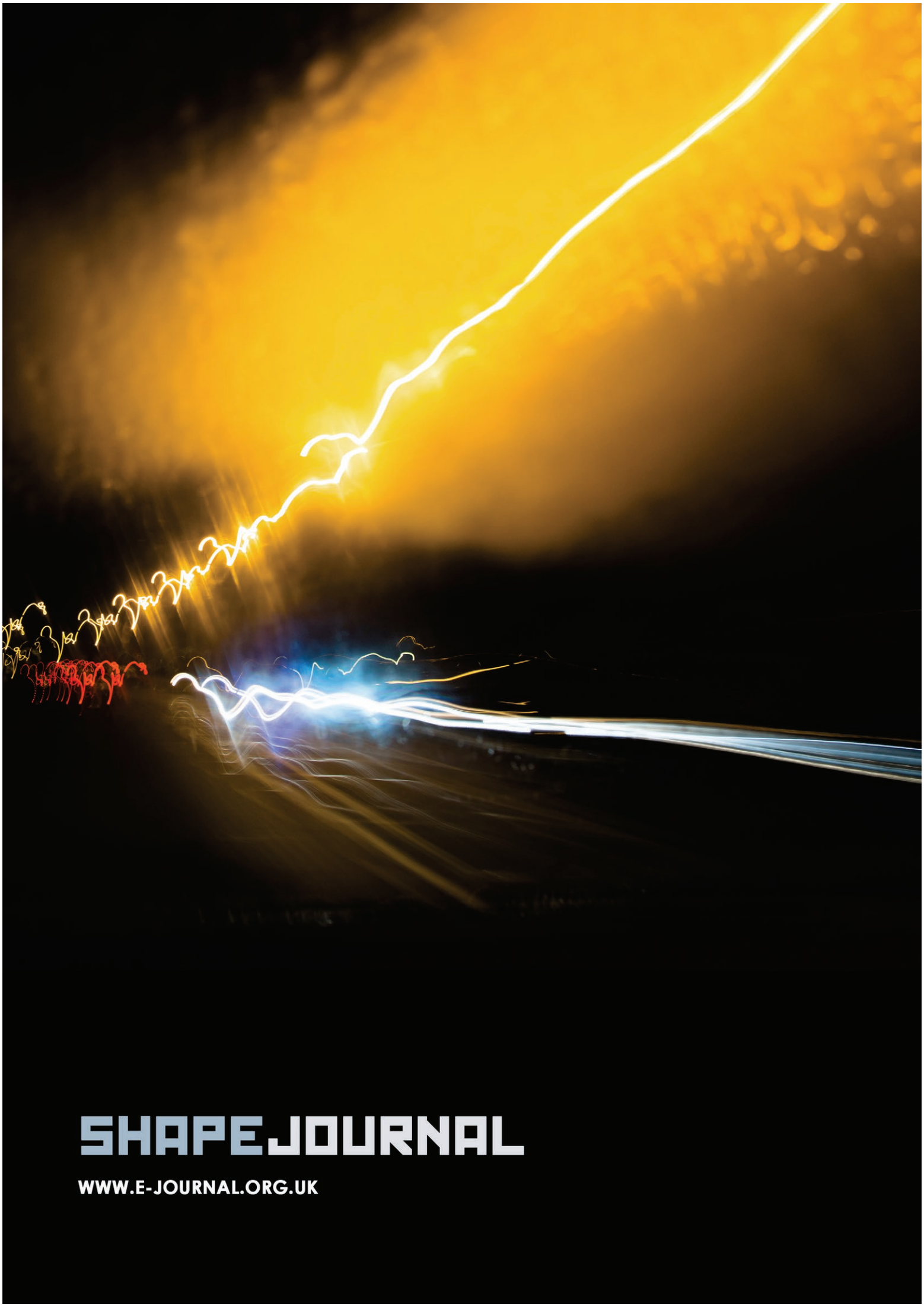
But, when the final collapse occurred NO single process could play that role, and the various fusions that did occur, would do so at different times – none of them enough to hinder the collapse caused by Gravity. In fact a cascade of smaller explosions ended up carrying most of the substance of the star to pour into the emptiness of Space.

The result would be the almost total dissolution of the Star!

Now, the usual pre-Supernova phases in the trajectory of star development occur because of the availability at each Phase of sufficient prior nuclear material to sustain a long lasting period of fusion.

Clearly, in a Supernova event, you never get into that position with any single type of fusion, so the collapse continues arriving at each and every new fusion type, without any intervening stabilities. This sequence of different fusions are never enough to, in any way, halt the collapse, indeed, the continuing collapse causes the sequences, until, finally an explosion of colossal magnitude terminates the Supernova event!

What must be happening in this final explosion, which can outshine a whole galaxy of normal stable stars? It is because the avalanche of many new types of fusion in quick succession that such a major explosion dissociates the whole star.



SHAPEJOURNAL

WWW.E-JOURNAL.ORG.UK