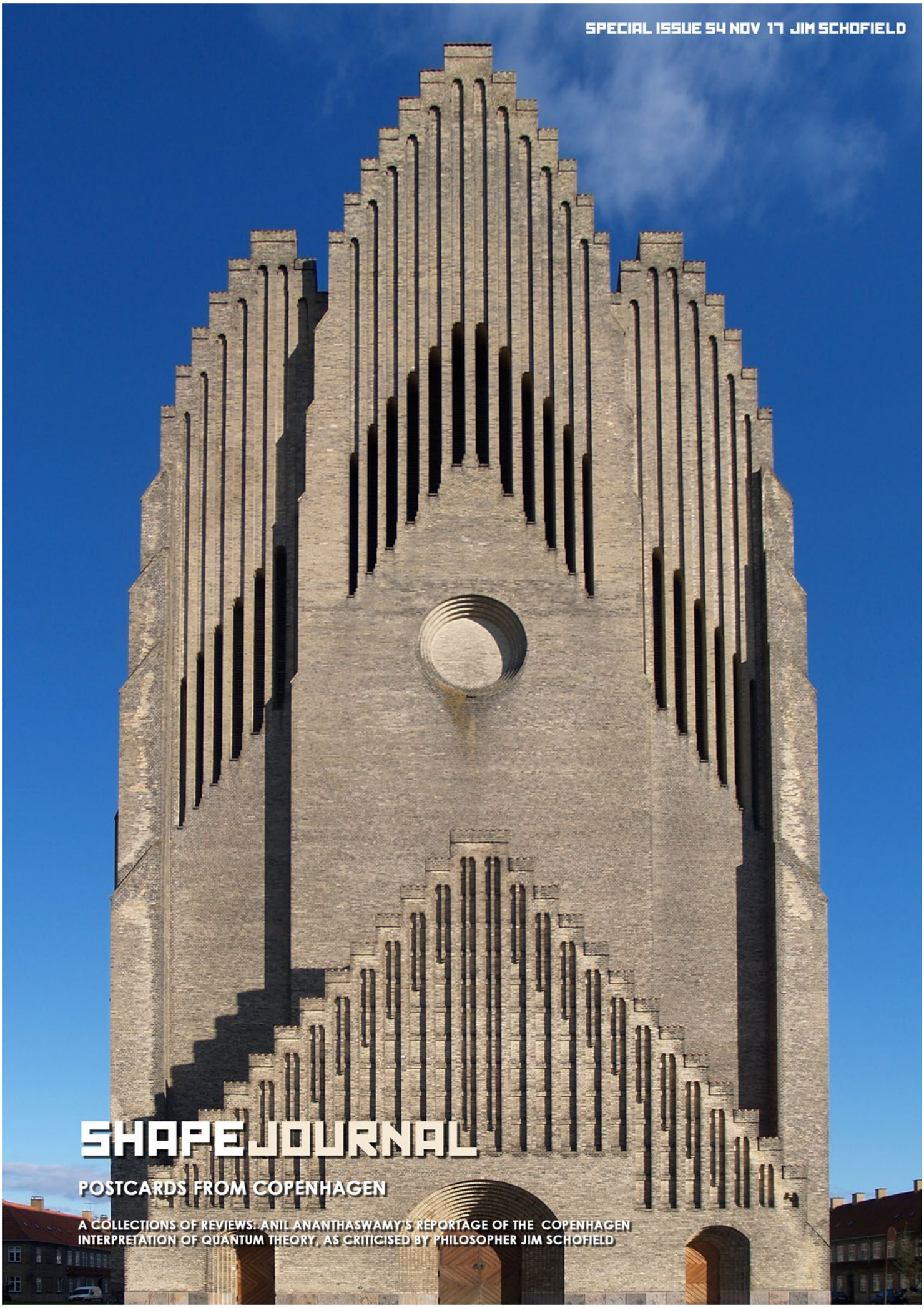
SPECIAL ISSUE 54 NOV 17 JIM SCHOFIELD



SHAPEJOURNAL

POSTCARDS FROM COPENHAGEN

A COLLECTIONS OF REVIEWS: ANIL ANANTHASWAMY'S REPORTAGE OF THE COPENHAGEN INTERPRETATION OF QUANTUM THEORY, AS CRITICISED BY PHILOSOPHER JIM SCHOFIELD

Words **Jim Schofield**
Design **Mick Schofield**

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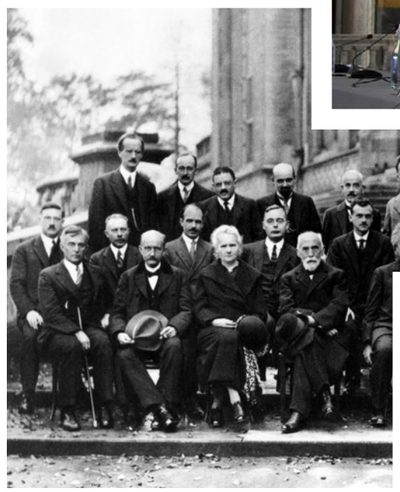
Postcards from Copenhagen

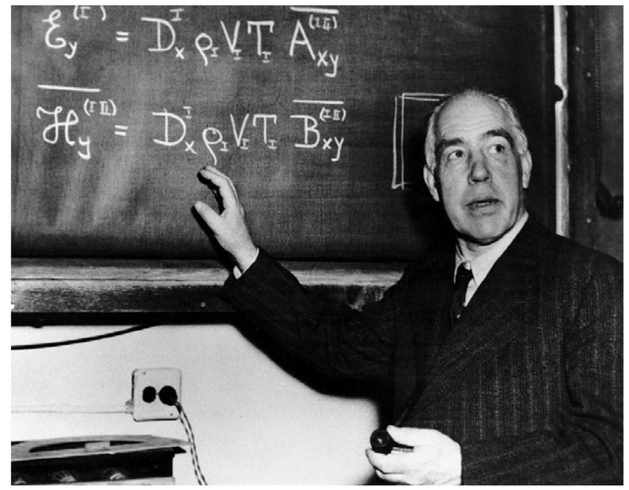
Special Issue 54 / Nov 2017

Anil Ananthaswamy's reportage of the Copenhagen Interpretation of Quantum Theory: a critique by Jim Schofied

Introduction

Anil Ananthaswamy's Supportive Reportage for Copenhagen





Welcome to the 54th Special Issue of the SHAPE Journal.

For, the whole period of my published criticisms of the Copenhagen Interpretation of Quantum Theory, the writer of this paper has had to deal with a regular series of articles in New Scientist by Anil Ananthaswamy, who trenchantly writes in support of this now generally accepted, but clearly idealist, view of Sub Atomic Reality.

In an important way, I have to thank Anil, for he not only presented me with diverse targets to deal with - such as in his contributions on Mathematics, but also, by such excursions, allowed my much wider philosophical and historical stances to be dealt with in tandem with my Physics-based criticisms.

So, in his own seeking for wider confirmations of his preferred stance, he made my position all the easier to express.

And, this is because not only Copenhagen, but also the Classical stances in Mathematics and the Sciences, have all been stymied by the same illegitimate amalgam of Pragmatism, Idealism, and Materialism - all of which (and also including Formal Logic) have persistently been further damagingly distorted by the universally agreed-to Principle of Plurality.

But, the most pernicious component, when it comes to dealing with the inevitable contradictions generated by this amalgam, has certainly been Pragmatism - "If it works, it is right!", as the legitimising stepping-stones across each-and-every illegitimate transfer - always blanking-out the contradictions with a pragmatic by-pass.

As the reader can imagine, specialists usually rigorously keep to where they can justify their differing stances, and only make brief and narrow ventures into other disciplines to excuse their pragmatic hops over evident difficulties: but then finally, Copenhagen ended that old "solution", for good.

Truly Major philosophical changes were unavoidable, which, in the case of Copenhagen, meant a dumping of the Materialist component in the amalgam, and a switch to considering Formal Equations as the primary, driving Truths of Reality!

The original source of all the problems, which finally came-home-to-roost in the 20th century, was, of course, the highly successful, pre-intellectual method termed Pragmatism, which was then coupled with the first of Mankind's brilliant intellectual achievements - Mathematics!

For, this was wholly idealist from the very start - via the Euclidian Geometry of the Ancient Greeks.

So, as each pro-Copenhagen article appeared in New Scientist, I immediately responded via a dedicated review, so that now I have almost a dozen responses - all published on the SHAPE presence on the Web.

So, with the latest of these on the Origins of Mathematics, I felt a whole issue of the SHAPE Journal should be allocated to re-releasing these responses.

All of Anil's articles are clearly mentioned and available via New Scientist if required.

Jim Schofield
November 2017

I, Algorithm

or Artificial Intelligence with Probabilities

This article, in New Scientist (2797) by Anil Ananthaswamy, describes how the old (and now dead) Artificial Intelligence based on Formal Logic and Neural Networks has been re-vamped by the inclusion of Noise and Probabilities.

It is, I'm afraid, not a new and great step forward, but an old "solution" to the unanswerable problem, "How do you improve upon a purely formal and pluralistic, and hence totally unchanging, artificial system, which is intended to deliver some sort of machine-based intelligence?"

So, instead of strict determinism only, you merely need to add a bit of random chance, and then deal in the probabilities of various alternative outcomes. To put this new system into the language of the participants, these new systems of Artificial Intelligence "add uncertainty to Formal Logic – in order tobring reason into a noisy and chaotic World".

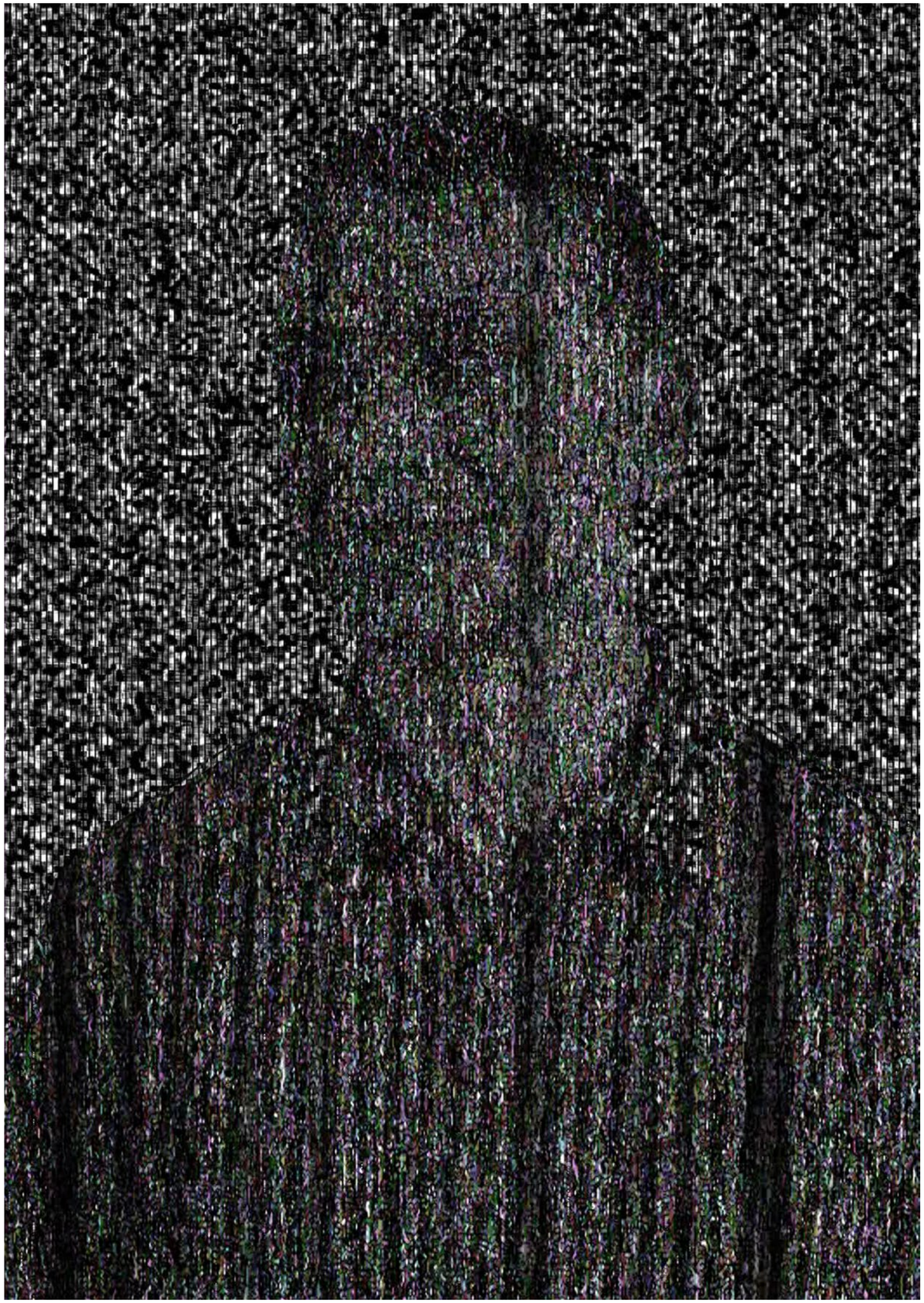
It is a proposed "new" application of the same standpoint as was used in the Copenhagen Interpretation of Quantum Theory almost a century ago. But, sadly, the real world is NOT basically deterministic PLUS "noise"! It is holistic!

And to attempt to analyse it pluralistically is doomed to failure. So the trick, as usual, is to continue with that old methodology, but to heighten the "flavour" with the added "spice" of Random Noise and the coherence of Statistical Methods – using averages and probabilities on top of a still wholly deterministic basis.

Now, to echo the revolution that occurred in Sub Atomic Physics may appear to be an important development, and in the same way may allow better predictions in this sphere as it did in Physics, but in BOTH areas it certainly does NOT deliver the Truth! In this particular instance it seems to apply very well in the area of infectious diseases, but we have to be clear not only why it works there, but also, and most importantly, why it isn't the general solution that it is claimed to be.

It works when many factors are acting simultaneously, and with roughly equal weights. For, in such circumstances, many alternative diagnoses are available, and hence various distinct results are possible. The important question is, "What is the correct diagnosis in a given particular case?"

Now Neural Networks had delivered a system that could be modified to more closely match real weightings of various alternative situations, but they were crude to



say the least: absolutely NO indication of why and how these changes were concretely effected were revealed. It was merely data without a cause.

Now, this new version of AI returns to such ideas, but adds the 1764 ideas of Bayes embodied in the Theorem which carries his name:- which is,

If the conditional probability of Q implies the conditional probability of P

then

the conditional probability of P implies the conditional probability of Q

[**Bayes Theorem**]

And, this was, for the first time, a basis for being used with Causes and Effects, not only in the usual direction but backwards too (that is diagnostically).

The constructed systems were so-called Bayesian Networks, where the variables were initially purely random, that is of equal weight, BUT thereafter dependant on every other involved variable. Tweak the value of one and you alter the probability distribution of all of the others.

Now, this, on the face of it, appears to be very close to Holism, but has a clearly fictitious starting point, where all are equally-probable. The "saving grace" was then that if you knew some of the variables you could infer the probabilities of the other contributions.

Now, when you think about it, it doesn't seem at all likely!

Starting from a wholly fictitious starting point, why should the inclusion of some reliable data move ALL of the probabilities in the right directions? Clearly such systems and associated methods would have to functionally be very close to Iterative Numerical Methods, and hence dependant on a convergent starting point for a useful outcome. And, as with such numerical methods, these too needed to be refined and improved until they began to become much more reliable than prior methods.

Even so, it is clear that such methods are full of dangers. How do you know whether you are considering all the necessary factors? Gradually researchers began to produce models in certain areas which were much more reliable. The key was to build them so that new data could be regularly included, which modified the included probability distributions.

But, as it did not ever deal with answering the question, "Why?", but only the question, "How?", it was still dependant on the old methodology, even if it was overlaid with Bayesian add-ons.

Indeed, to facilitate such programs, new languages began to be developed specially designed to help construct such self-modifying models.

To give some idea of their powers AND limitations, it is worth listing the principles on which they were based.

1. Equal likeliness of all contributing factors must be the starting point
2. Algorithms must be very general
3. New data must be straightforwardly included to update the probabilities.

Now, this is clearly the ONLY way that the usual pluralistic conceptions and analyses can be used in an actually holistic World. The basis is still Formal Logic, but real measured data can modify an initial model in which everything affects everything else, but as to how they do it, there are NO revelations. The ever-new data merely adjusts less and less arbitrary figures, and, by this alone, the model improves.

The model learns nothing concrete about relations, but improves as a predictor, based on regularly updated and reliable data. It sort of shuffles towards better diagnoses without knowing why! Nevertheless. There could still be no guarantees. It is a pragmatic method of improvement and NOT a scientific one.

Also, experience has shown that the gathering of new data can be altogether too narrow, and the seriousness with which it is collected much too slight for the methods to always be depended upon. Behind the robot diagnostic program, a very experienced "doctor" would certainly come in handy!

There is also the problem of "current ideas" guiding the actions of the data collectors, and hence "tending" to confirm those current ideas. You cannot discover a new cause, if you are not measuring for it, can you? The method is NOT a genuine holistic nor a scientific one! And the most important omission has to be that Time and Trajectory are not part of the schemas.

Miller's famous Experiment was indeed holistic, and produced amino acids from a modelled holistic system, but it too lacked Time and Trajectory information. This author's (Jim Schofield) redesign of Miller's Experiment has the same core set up as in the original, but surrounded by a time-triggered set of diagnostic sub-experiments, regularly sampling what was present at crucial positions throughout the set up and throughout the whole time that it was running.

The results would then have to be laid out on a series of related timelines, showing WHAT was present and WHEN. The relationships over time and place would then be available and sequences and even cycles of processes could be revealed and interpreted.

The half-cock nature of the latest version of model based on Neural Networks but involving Bayesian principles, though it will produce ever better simulation-type computer programs, is still immovably grounded on pluralist principles, and so will be limited in its applications, and most important of all, will REDUCE the amount of real analysis and explanation to the Lowest Common Denominator of "the computer says that….."

Once More Into The Slits, Dear Friends!

Preface

Once more the perennial Double Slit Experiment has been recast: in an effort to prove or dismiss its universally agreed conclusions about Wave/Particle Duality It seems that, like Marxism, it has to be regularly disproved conclusively, for it to be finally and conclusively buried. So the new form does everything it can, and comes up with exactly the same as all the other efforts, in that it confirms the counter intuitive conclusions – the Duality remains! But there has been a very different refutation of the Double Slit Experiments, and that, of course, has not been addressed. It is that by the author of this review.

The unrevealed opposition to the usual conclusions on all the Double Slit Experiments states instead that:-

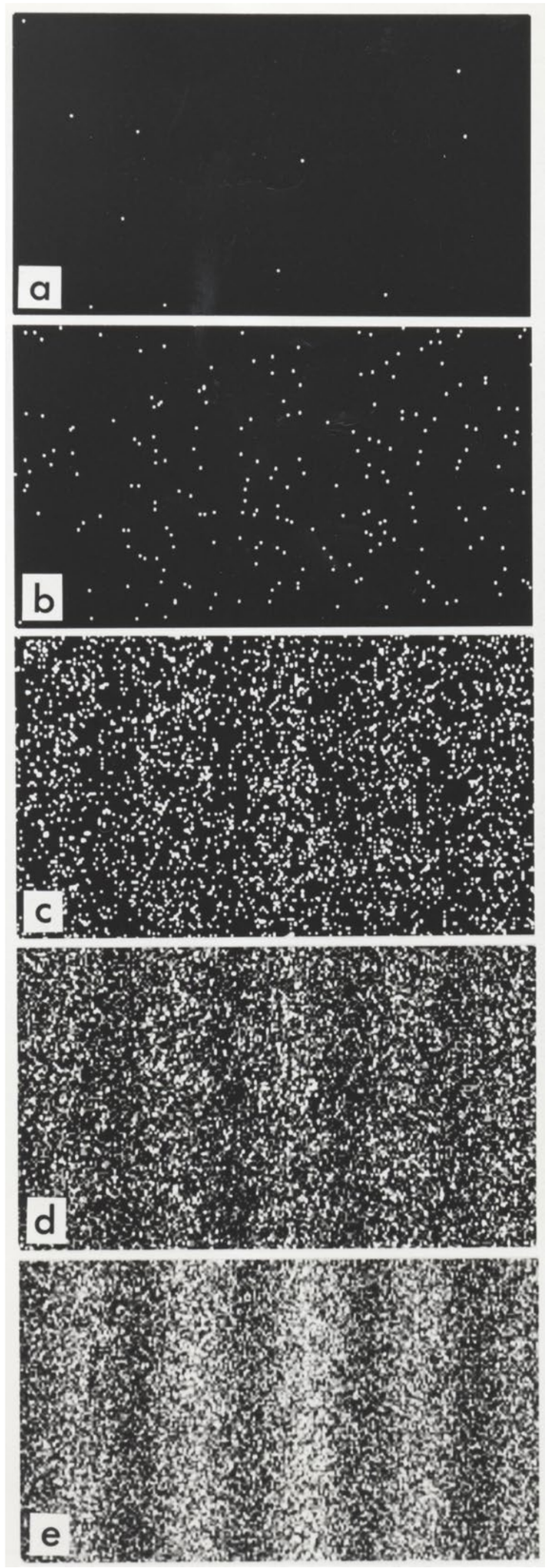
"If indeed a particle is a particle and cannot be a wave, and all the wave phenomena being detected in these experiments are those taking place within a "paving" of undetectable Empty Photons, which exist everywhere, then, though we may still seem to have a few outstanding problems to solve, there is a sound alternative to that conforming to the Copenhagen position."

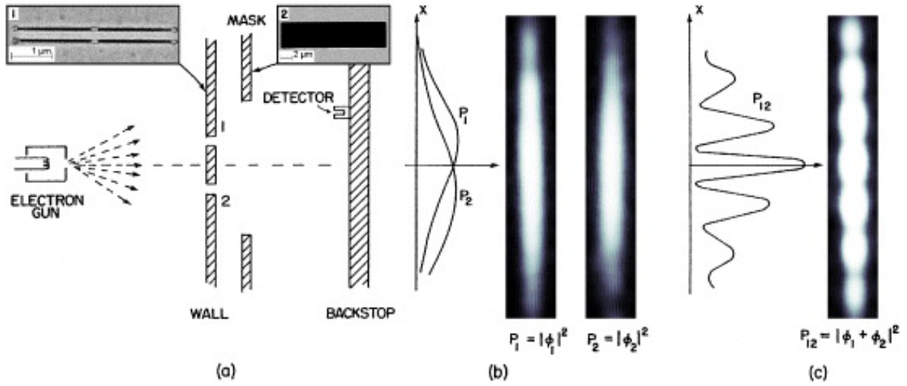
The Theory of the Double Slit by this writer explained the phenomena by two necessary processes.

ONE: The inciting of a disturbance in the universal Empty Photon paving by an incoming particle or other source, which carried on, as a wave, to the Slits, passed through them both, and interfered with each other on the other side. And,

TWO: The subsequent passage of the original exciting particle, though one or the other of the slits, and which on encountering the interference pattern, was appropriately deflected (or not, depending upon its particular diffracted trajectory), and then finally captured on the detection screen.

The disturbance of such a pristine set up could be quite easily caused by almost any inclusion of anything in the area beyond the slits, which would cause its own disturbances in the paving there and destroy the prior interference pattern.





And once that had been messed up, a particle going through either slit would merely suffer diffraction there, and would carry on to be detected at the screen.

The either/or of the Copenhagen Interpretation occurs because they insist that only the causing particle is present. And hence, it must change its nature to deliver the attained results.

But, the presence of a susceptible paving involves two components – one giving particle characteristics, and the other – the paving, giving wave-like characteristics. Yet the latter is also very easily messed up. The question may be posed, "What happens to the particle when the wave results are obtained at the detector screen?"

No problem!

It hits the screen and is detected. It doesn't vanish into becoming a wave, as seems to be implied (if only temporarily).

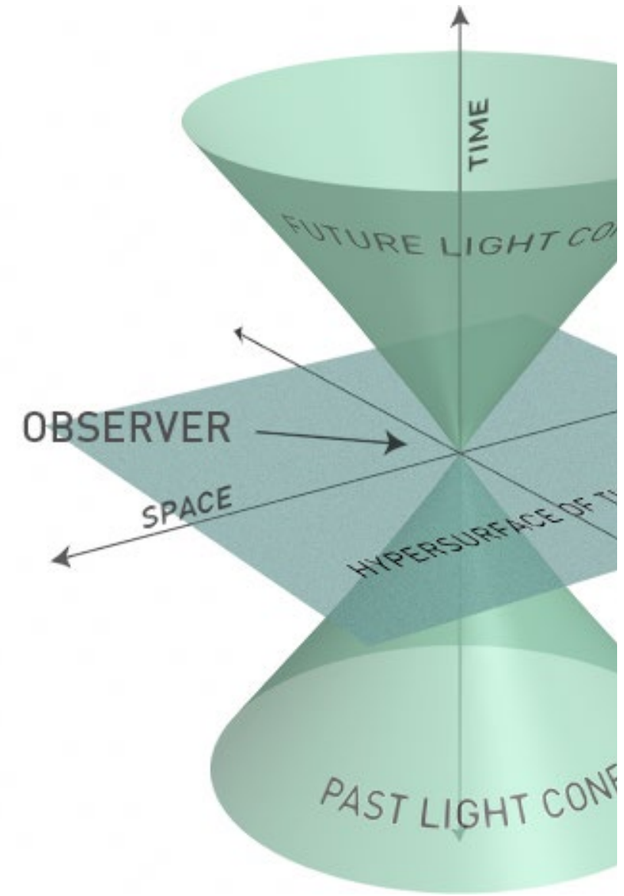
To get the interference pattern on the screen, you need a series of particles, which build it up overall. The problem the Copenhageners have is that if only one particle is involved it hits the detection screen in just one of the right places to be part of an overall interference pattern on the screen. "How does it know where to go? It must act as a wave!"

But it doesn't: it acts as a particle throughout, but both affecting, and in turn being affected by, the universally present paving. Remove the wave and it acts as a particle all by itself.

It is amazing that they are still doing the Double Slit Experiments with ever more clever add-ons, but crucially their assumptions do not vary one iota! And because of this, they are totally incapable of addressing the problem in any other way.

Anil Ananthswamy's article in New Scientist (2898) is typical. When presented in the way he, and the Sub Atomic physicists do, they can only come up with the usual dichotomy – the classic impasse guaranteed by any incorrect set of assumptions Your bases are rubbish, Anil! Think again!

Abstract Space & Abstract Time



Space and Time?

When and why did we start to use these conceptions effectively? It was, surely, with the very special case of the movements of heavenly bodies, such as the planets and their moons, for they seemed to behave consistently over "Time". And, that kind of an environment was ideal for such extractable abstractions to stand out. The Solar System is a uniquely isolated and thinly spread system of material objects, which seemed to follow single trajectories under their evident mutual influences It was a perfect scenario in which to formally-define both Space and Time as the frameworks in which these movements took place. They, above all things, seemed to be totally unchanging – a Reference System, which we could conceive of, to enable us to deal with the real nitty gritty - the mutually-defined movements of the bodies within that "unchanging" context.

Indeed, if we think about it, that defined set of ideas were the beginnings of Science in the modern sense. And, even more importantly, the beginnings of how human beings could get a dependable handle upon Reality: we began to simplify, or more accurately, abstract from Reality, concepts like Space and Time, which certainly were better than prior conceptions, and definitely allowed a great deal more to be extracted using these as a foundation.

But, at the same time, there was, and still is, no way that we could directly alight upon Absolute Truths concerning that Reality. For absolutely everything that we did manage to extract and define, were various kinds of simplification. Yet, nevertheless, real gains were achieved because these were never merely arbitrary inventions.

They, at their best, always contained more Objective Content than their predecessors, and hence led to deeper and better understanding at each and every stage. Now, the importance of Space and Time cannot be overemphasized. For these have allowed a continual development of scientific ideas for over 400 years.

But, the trajectory of such "constructed steps" always and inevitably leads to a seemingly final impasse. The foundations, though adequate for many useable superstructure ideas, will always, in the end, reveal their limitations, and turn into a barrier to further development, and it is the stage we are at with the current concepts of Space and Time, that have been in crisis since the victory of the Copenhagen Interpretation of Quantum Theory at Solvay in 1927.

Now, Anil's preoccupation with the primacy of Space or Time, is the usual reaction to such an impasse, whereas, of course, it is never which one we choose to be primary and definitive, but exactly how we transcend both to get to a new level entirely, which will be closer to actually existing Reality.

An Non-Ideality Context

"Entangled Universe", an 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, yet actually existing, and both affected-and-effecting 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.

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.

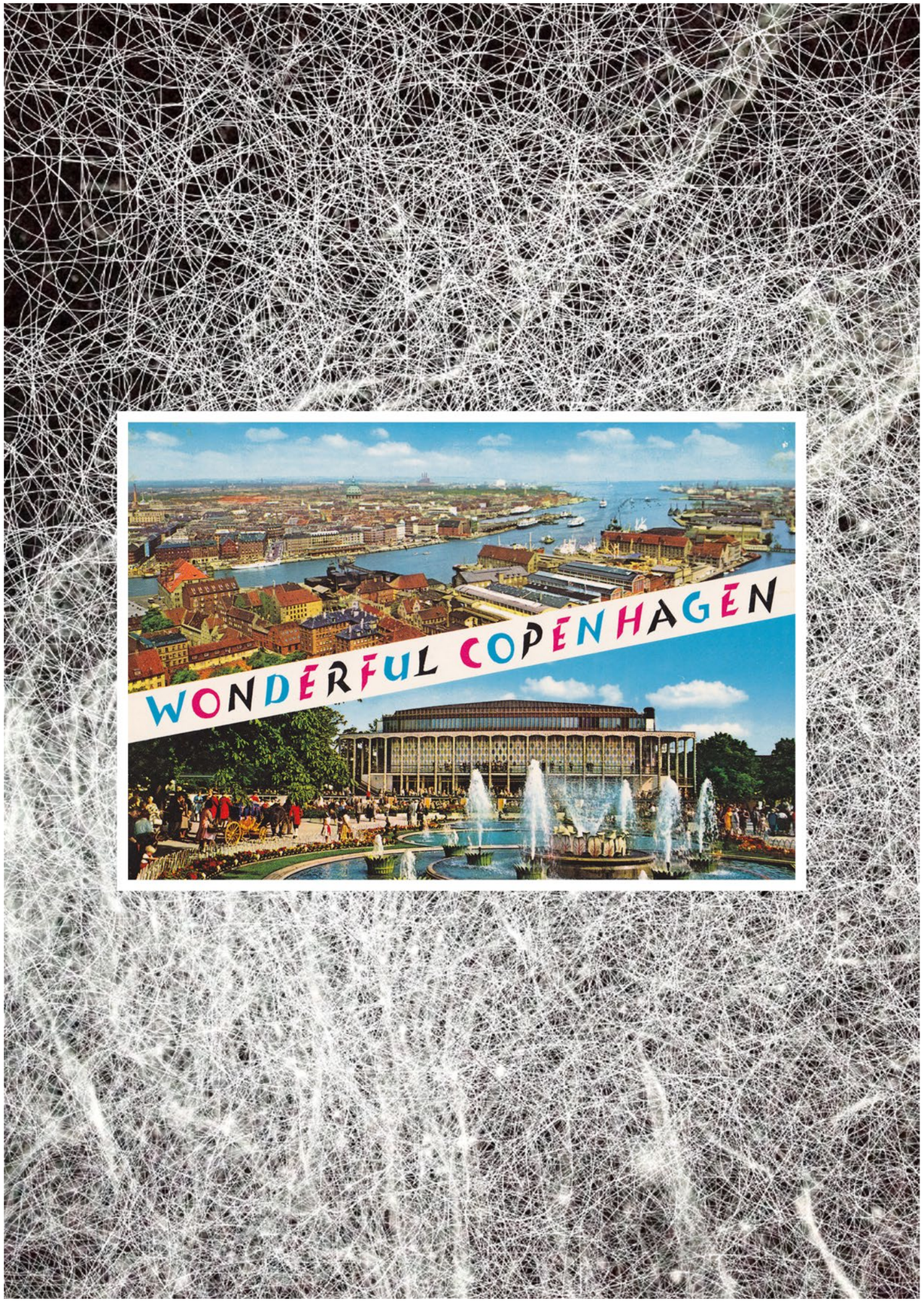
I'm afraid that the whole of that set of ideas and reasoning is total bunkum!

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 so how can they drive physical phenomena: for 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.



Review:

Entangled Universe

This article by Anil Ananthaswamy is exceedingly complex.

It elicited, initially, the following preliminary notes, and thereafter some 16 other short papers, that were considered essential in grounding the standpoint of the reviewer: for 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 pluralist standpoints. But, this narrative follows the structure and content of Anathaswamy's article, without spending time on this reviewer's stance. But, reading the many addenda is, however, available to those who are interested in the very different 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 will inevitably have recursion here!

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

The above account 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", is never as simplified as that.

And, as bodies get closer and closer to one another, these two-way effects will be larger, and also 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!

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!

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.

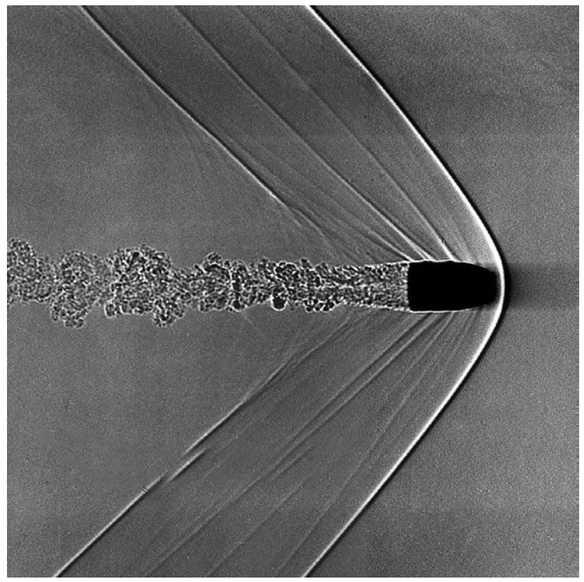
And let's be absolutely clear, universal descriptions embodied in equations, which may well apply in multiple non-causally-related phenomena, were now considered primary to generalised explanations, which were exclusive to causally related cases.

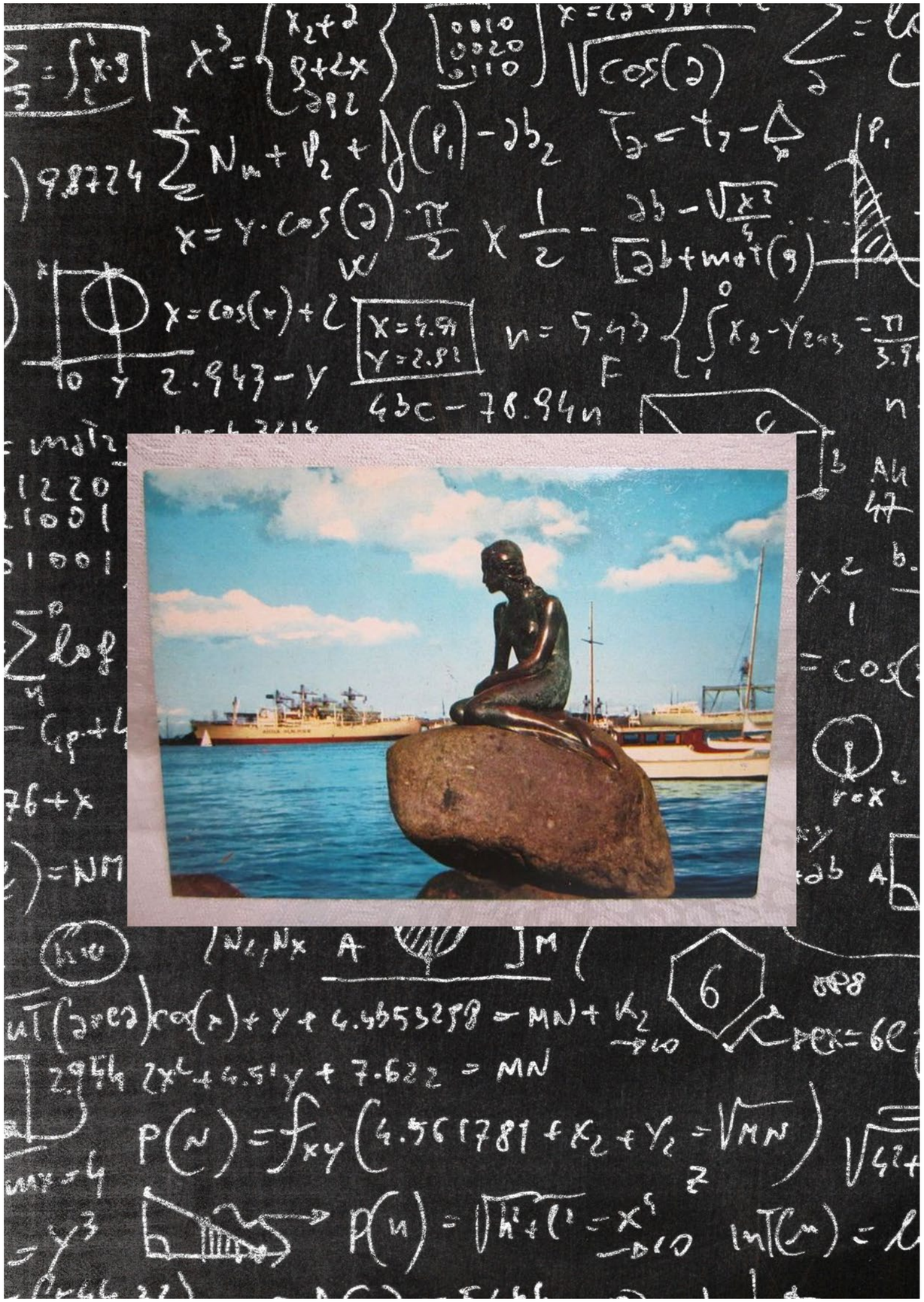
And, in it the proliferation of new, purely formal laws (and their accompanying Rules) are pressed into providing an alternative to materialist explanations. There are what seem to be physical mentions, but they are all subordinate to, and ofte eve derived from the formulae.

But, in so doing, the Forms alone still remain insufficient, so they have been extended deliberately into a wider realm than Reality, which, because it only contains Pure Forms, is clearly the man-made World of 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!





Holism & Mathematics I

In the article in New Scientist (3141) entitled *The Origin of Mathematics* by Anil Ananthaswamy, he asserts,

"Increasingly, it seems as if humans are the only animals with the cognitive ability to hack their way through the undergrowth (that is Mathematics). But where does this ability come from? Why did we develop it? And what is it for?"

To start from there, as he does, asks the wrong question at the wrong time: much more fundamental questions must be addressed first, otherwise, Mathematics is givem much too significant a status in how Mankind makes sense of its world.

The earliest conception of the Nature of Reality that Mankind could possibly have arrived at, could only be Holistic. That is "Everything affects everything else!" And Mathematics is most certainly not that: it is, on the contrary, entirely pluralistic, which did not emerge as such until very much later in Man's history.

For, as Man began to discern individual causes, and their effects, he soon realised that, in every situation, there were always multiple collections of such causes, all-acting-simultaneously, to give results due to those various collections, and even, alternatively, to different proportions, of such causes. Indeed, Man's control of these situations seemed wholly impossible, until, by chance, he came across more limited mixes, wherein one-particular-factor dominated, and a single cause was clearly evident.

And, this was important, because such situations could be controlled! And, if he could remove enough confusing factors from more complex situations, he could then control them too, and use them to deliver intended outcomes.

But, we mustn't speed ahead too quickly: even the realisation of the relatively simple developments, outlined above, took many, many millennia to be achieved, and, for almost all of Mankind's existence, it was the first, holist view that had to dominate.

With no means of separation of causes, and hence no control, numerical skills were limited to counting people and animals, and NEVER involved the amounts of this-and-that needed to produce a particular thing. Most used-things were found-as-is, and used as-they-came - like fragments of flint or sticks from dead trees.

And, the following stage didn't take things much further: for example, using those found flint-fragments to shape

those found sticks-of-wood into something more useful. Indeed for 90% of Mankind's existence his "culture" was largely confined to ever better ways of "knapping" flint into better forms for effective use. So, even simple counting didn't become a significant activity in this early period, and Mathematics was inconceivable in such a context.

But, there was an unavoidable, cerebral activity, concerned with staying alive, and, if possible, actually prospering. And, it had to do with the means of Life that Mankind had to employ, and if possible, improve! Mankind was an Ape - related to Chimpanzees and Gorillas, who was, originally, like them, purely vegetarian, living in the trees and eating mainly fruit. But, something, perhaps climate-change and/or loss-of-habitat, forced them to descend, to live on the ground, switch to bipedal locomotion, and even hunt other animals to supplement a diet of wild root-crops and fruit. The release of the arms-and-hands to be used, instead, for manipulative purposes, soon transformed the Hominid-line, so, by the time of Homo habilis, Man's ancestors were already Knapping Flint and were soon making effective weapons for hunting - like spears and even Bows-and-Arrows.

The language and thinking processes just had to develop along with the changes in the mode of life, and "Everything had to have a name"! And, even more important, types-of-things also had to be recognised and named: Categories were recognised, and this involved a kind of Abstraction, wherein certain common features identified different animals or plants as being "of-a-similar-nature or means-of-life to others of the same Category.

The beginnings of Analysis were emerging - usually about properties, causes and functions, and essential to an increasingly successful means-of-life. But the processes employed by Man were not yet transformative: that required the beginnings of Metallurgy, which arose ultimately out of Man's conquest of Fire, and the freak occurrence of extremely high temperatures in the presence of certain rocks (or Ores). But, when such discoveries were made, the Recipes for successful use, began to require amounts of the necessary substances involved, and hence measurement and counting, which had developed originally in accounting with organisations from farms to empires. began to be important in productive techniques too.

It had been the previous Neolithic Revolution that had started the whole process, as Mankind had abandoned the Hunter/Gatherer mode of life, for Farming and Animal Husbandry in a fixed place and with concentrations of others in villages and towns. This major transformation also precipitated many new skills such as Pottery Making and Weaving, so more and more categories elicited more defining Abstractions to facilitate communications. And, Metallurgy also arose out of this new means of Life, and it too demanded both Abstractions and measurements.

But, counting was a trivial, though dependable, abstraction: what was to constitute Mathematics was located in a very different area of Abstraction, which was originally entirely spatial and concerned with "Shapes"! The simplification of such forms in Nature into more easily-dealt-with, Ideal Forms, like Squares, Triangles and Circles, allowed a great deal more derivations, properties and calculations to be made that, nevertheless were close enough to the naturally occurring Forms to be increasingly useful.

What enabled this development were idealisations that were both impossible and useful at the same time.

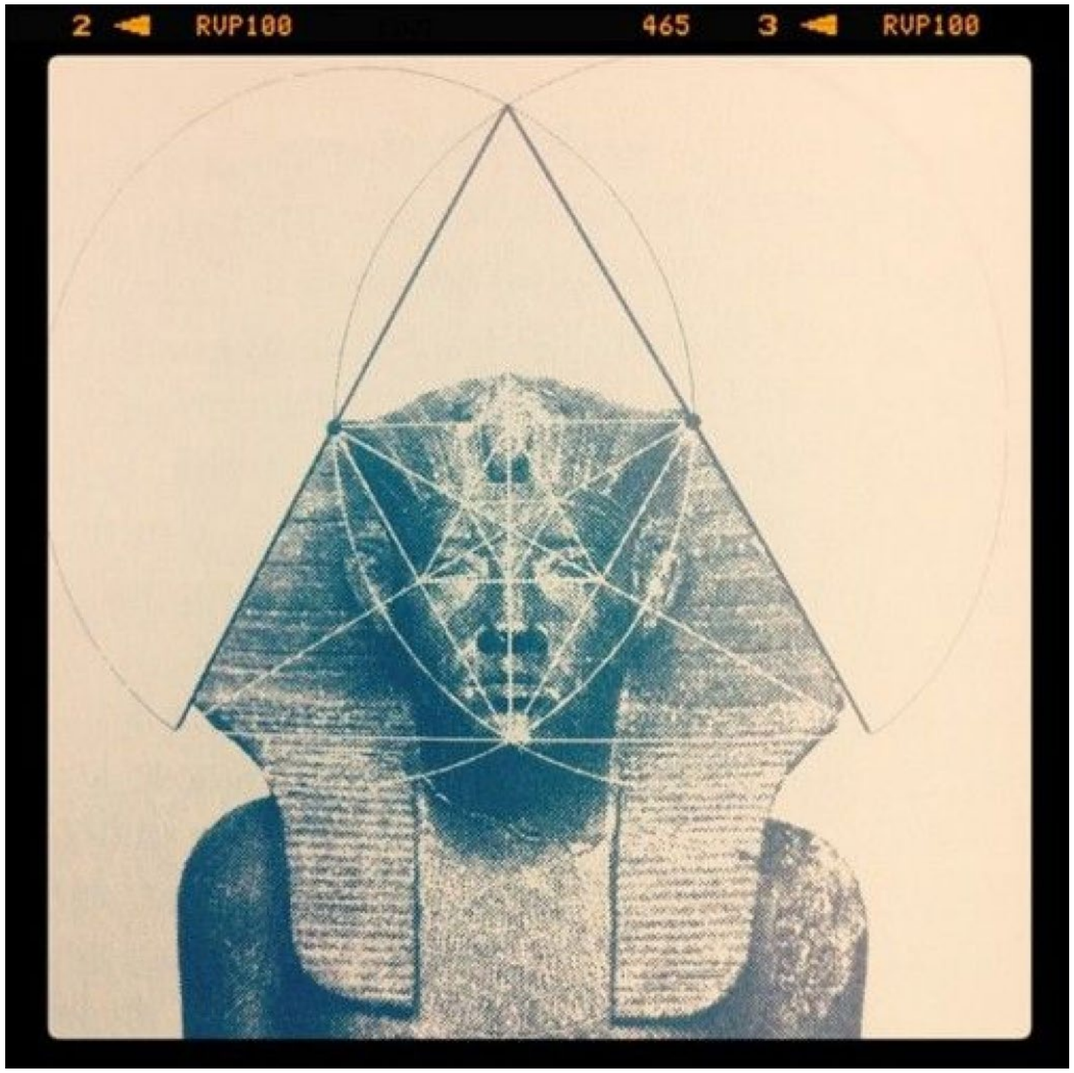
Positions were identified by dots of zero-extension-in-space, allowing precise positions to be identified. Lines were conceived of, with zero width. and, usong an extended set of such axioms, an idealised version of spatial Reality was constructed, that enabled a host of logical derivations to be revealed and used.

What had been constructed was a simplified and idealised reflection of Reality that enabled many useful results to be extracted and effectively used. Abstraction had now greatly transcended the possibilities of mere Number.

However, though such abstractions were more and more conceived of as the Hidden Truths or Essences of Reality, it wasn't true!

Indeed. though concretely-derived aspects of Reality, they were neither equivalent-to, nor the essence-of, that Reality.

They were in fact a selection-from Reality consisting of Idealised Form alone, and absolutely nothing else.There could be NO physical, chemical, biological, social or any other aspects of Reality: only Form was involved! To address these aspects the Sciences had to be involved/



Mathematics uis NOT a Science!

Karl Friston, a computational neuroscientist and physicist at University College London (cited by Anil), may say that the essential processes of survival by Mankind means doing mathematics, but he is mistaken! Indeed, he is so wrong as to condemn Mankind's Understanding of its World to mere formal description: and that is not only never enough, but when it is embraced in the way that Friston says leads to the same crises have occurred in Modern Sub Atomic Physics.

It is not by chance that Friston is a Physicist: he clearly agrees with the Copenhagen Retreat that now dominates in that discipline, and agrees precisely with his suggestion as to the way forwards.

But, let us be crystal clear what are the consequences of putting Mathematics as the basis of his Science. It puts Form ahead of Content, so patterns are no longer the result of physical properties as causes, but are, instead, turned into the reasons for such phenomena. Eternal Formal Laws, as embodied in mathematical formulae actually drive Reality, and make it what it is. That would make everything determined by abstract purely formal laws alone - all properties and qualities arise out of purely quantitative relations.

It is the Definition of Idealism.

But, such relations DO NOT exist as such in Reality! They exist in the reflected World of purely formal relations and absolutely nothing else we call Ideality: it is the realm of Mathematics ONLY.

So how do modern physicists manage to relate their Purely Formal World to Reality? They do it in several ways. First, they depend greatly upon Pragmatism: "If it works, it is right!" Second, they allow unfounded Speculation - inventing unexplained things such as strangeness, which they can represent in equations, without ever knowing what they are!' Third, they import what they claim to be philosophical reasons for things being different "at the quantum level".

Now, taking these together, it is easy for an actual philosopher, such as myself, to ridicule such an amateurish amalgam of Idealism, Pragmatism and invented Philosophy as a totally invalid stance. Admittedly, it did replace the prior Classical amalgam of Idealism, Materialism and Pragmatism - along with a steadfast adherence to the Principle of Plurality, but to jettison the most important of these components, while doing nothing to address the invalid amalgam, effectively torpedoes the whole stance!

As with all who worship Mathematics as the driving essence of Reality, they are mistaking a Reflection of Reality in purely formal terms, for the living Reality it reflects: they mistake Rules of Form for the Causality of concrete Reality,

And they are very different things!

Form never explains, it only describes, and does it in terms of patterns: that is why it can predict. But mere Prediction falls a long way short of Explanation

Holism & Mathematics II

The New Scientist article goes on to talk of what it considers to be the "mathematical models" of both ourselves, and of our world, and "these models try to ensure our survival in a complex world that follows the laws of physics" !

And, that last quote succinctly encapsulates the basic position of these Mathematics worshippers.

First, the World itself "follows the "Laws of Physics", which have already been defined as purely mathematical, and, therefore, encapsulate-able in the usual purely Formal Equations.

And then, the models in our brains (also seen as mathematical) then ensure(?) our successful negotiation both in and through that World, using such models and nothing else!

Do these people realise just how totally idealist their stance is?
The answer to that question is certainly, "No, they do not"!

And, it is because they are imposing their "successful" experiences with computers and robots, onto cognitive, living beings, such as ourselves!

As the ex-Director of Information Technology in a College of the University of London, and having specialised for many years in Computers-in-Control, as well as working with biological researchers, one the one hand, and sophisticated mathematicians, on the other, for most of that time, I can dispel such models as very far from what happens in Human Beings (or even most animals too).

It becomes increasingly clear the the overall positions of both the writer of the article, and the scientists he writes about, have been determined crucially by the current consensus standpoint in Physics and Technology, since the victory of the Copenhagen Interpretation of Quantum Theory at the Solvay Cobference in 1927.

And, the whole area of Artifucial Intelligence and Robitics has been erected upon the very same delusions. But, Using formulateable patterns is nothing-like Understanding phenomena causally! It is an ancient and continuing error to treat them as involving the very same premises and philosophical stance - For they certainly don't!

We are even informed that we can "explore abstract concepts in depth and communicate them to others" - but what is actually meant is merely only one kind of Abstraction is involved, namely the formalisms of Mathematics, while the really important Abstractions concerned with explaining Causes-and-Effects have been totally dropped ever since the retreat at Solvay!

Despite a long detour into how humans conceive of Number, other evidence surely seems to establish it as a cultural achievement, and "This suggests that once mathematicians have learned their symbolic language, they start thinking in ways that don't involve normal language. It sounds strange, but it's almost like being able to download an intuition into another world, the world of mathematics, stand back, and let it talk back to you again" says Friston.

Yes! That certainly makes more sense to me. But, notice how restrictive the discussion is. I'm afraid Number is insufficient to understamd anything: for it is quantitatively-abstract ONLY!

Indeed, our writer admits "mathematical innovation seems to describe the things we see": the key word here being most definitely "describe"!

Yes, mathematical means can describe ALL FORMS: that is what Mathematics does, but such a facility cannot distinguish between identical forms - between things casting identical "formal shadows": it is certainly NOT equipped to do more!

"When David Hilbert developed a highly abstract algebra that worked in an infinite number of dimensions rather than the familiar three dimensions of space, for example,

nobody could have foreseen its use in the emerging field of quantum mechanics", observes our writer, and he is correct: but it only extrapolates the describing of Form into acompletely virtual "Space".

NOTE: the extension of 3D trigonometry into N dimensions has to be a colossal trick! What else could it be? Strict conformity with Trigonometry would merely overlay new dimensions back into the 3 dimensions of Space! Remember, Graphs were a formal transfer to aid in visualisation, BUT using real Trigonometry!

Copenhagen describes everything and explains *nothing* in its "special" World!

"To many physicists today, the success of mathematics as a language speaks to its primacy in the organisation of the universe".

Yes, we have noticed this too, and it is both a mistaken and profoundly distorting World-View!

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