

SPECIAL ISSUE 57 MAR 18 JIM SCHOFIELD

SHAPE JOURNAL

DEATH TO COPENHAGEN

THE QUANTUM / COUDER & COPENHAGEN / QUANTUM FLUCTUATIONS OR THE UNIVERSAL SUBSTRATE?
THE TRUE BUT HIDDEN PATH / VORTESIMILITUDE / ROVELLI'S REALITY / WHY QUANTISE SPACE AND TIME?

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Rorate caeli desuper by Anselm Kiefer, 2016

Death to Copenhagen!

Special Issue 57 / March 2018

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Death to Copenhagen!

(introduction)

by

Jim Schofield



The demise has been noted; and the last rites said, so the time has come to bury the beast!

The Copenhagen Interpretation of Quantum Theory must be laid to rest. Such a final necessary conclusion has definitely arrived, as its remains are beginning to stink!

Three things had to be done to bring things to this long desired state:

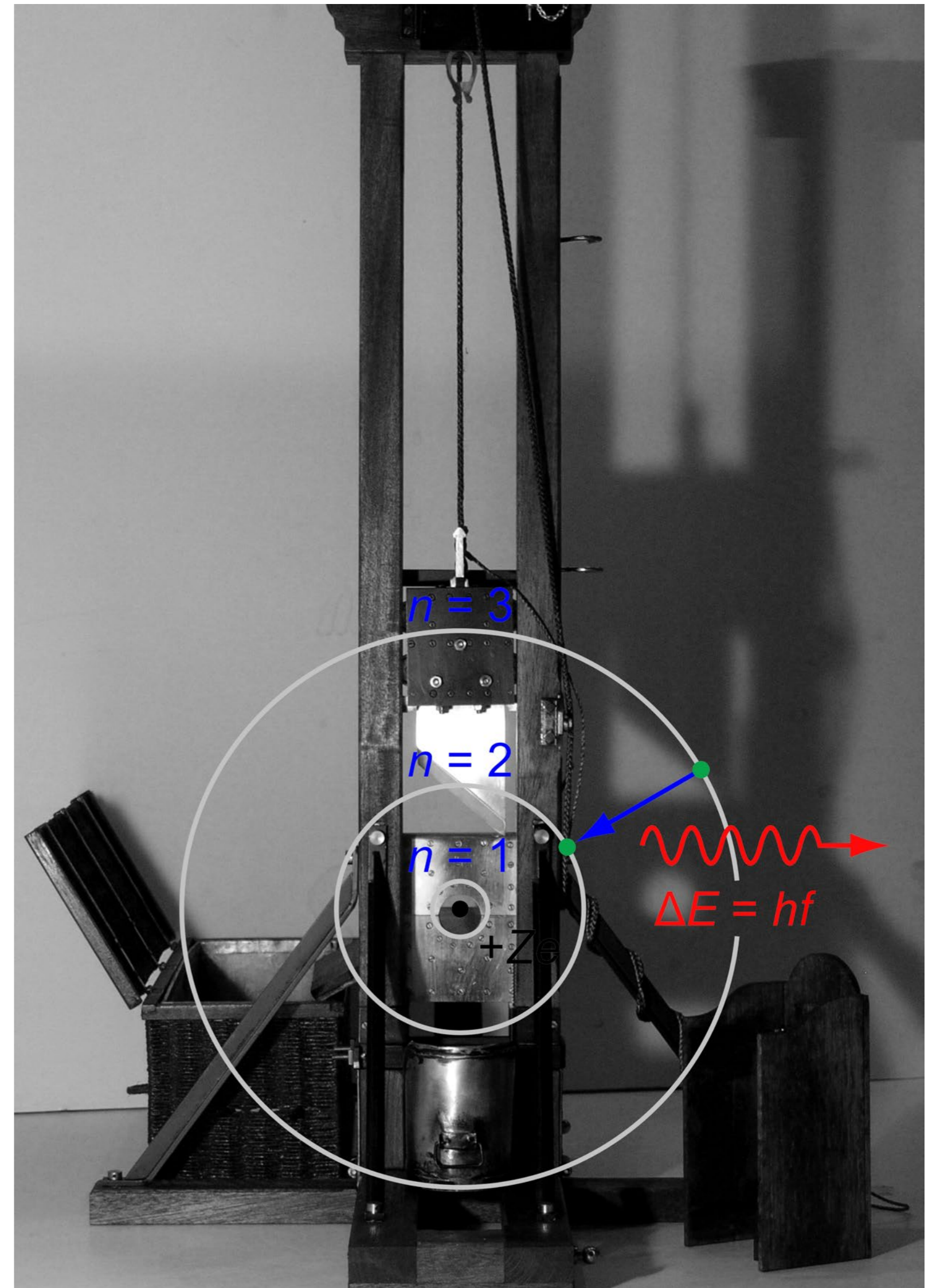
First, an alternative coherent, consistent and comprehensive *Physical* Explanation had to be found for all of the many anomalies of the Copenhagen Interpretation. And, it has been achieved here, by the inclusion of a currently-undetectable, but definitely-existing Universal Substrate, which has been theorised using only known particles.

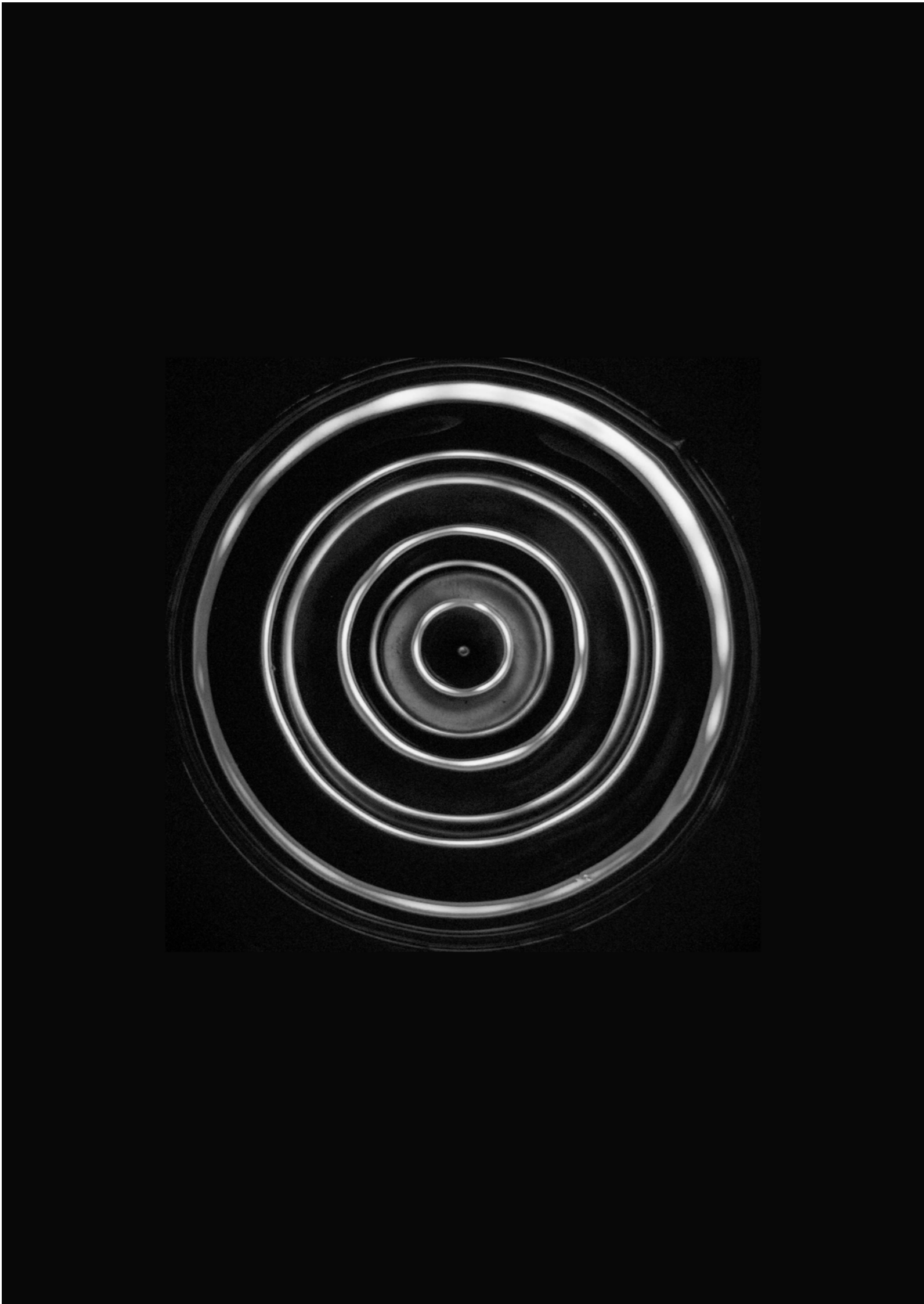
Second, the illegitimate amalgam of contradictory philosophic stances, underpinned by the Principle of Plurality, and excused by the regular recourse to Pragmatism, had to be totally dismantled and replaced with a new approach to Science.

Third, there has to be an explanation as to why the equations used in Quantum Theory give answers that match the Reality. And, this turns out to be nothing more complex than fitting-up pure formal relations to a situation, by using that situation's measured data. It is a useful oft-employed pragmatic trick!

But, the real cause of this great impasse was the abandonment of theories which actually delivered the most Objective Content, and replacing such a policy with one which allocated all cause to Pure Forms, so jettisoning things with unsubstantiated features for a "pure and whole description", that delivered reliable predictions without a trace of the actual causality involved.

Presented here is the long-delayed interment of a long dead idea. To work out where we go next, we must return Physics to a genuine materialism.





The Quantum

Intrinsic or Caused?

The whole basis of the Quantum Revolution in modern Sub Atomic Physics is that the Quantum of electromagnetic energy is intrinsic to the Nature of Reality, so that all theories have to be modified to build this requirement into them. But, could it be that there is a purely physical explanation for energy being cast into, and thereafter maintained as such discrete forms?

This might seem almost sacrilegious to literally all modern physicists, but a purely theoretical investigation into the possible effects of a totally undetectable, but both affected-and-affecting Universal Substrate, has questioned that assumption, by finding physical ways that such energy might have a Quantum nature imposed upon it - especially as the very same nature would, thereafter, in its normal means of propagation, be rigidly maintained.

There was, of course, another good reason for embarking upon such an investigation, which was clearly that this theorist was unhappy with the anomalous results of the New Theory, especially in the whole series of Double Slit Experiments, which had become cornerstones of the Quantum Revolution, and had, in addition, also led to the dumping of Physical Explanation entirely, for a wholly formal mathematical description as being "more reliable", and still allowing prediction and reproducible phenomena.

As far as this physicist was concerned, however, the real heart of Physics was in its explanatory power, rather than its reliable formal predictability, so he embarked upon this exercise to also investigate all possible avenues for such an alternative to be available.

And the Double Slit Experiments with their supposed "Wave/Particle Duality" cried out for a substrate-based solution.

But there was an obvious problem - there was no discernable Substrate!

Clearly, if one exists it must be totally undetectable by current means, while also effectively functioning as a propagator of all Electromagnetic Radiation. Whatever it was composed-of would have to be, self-hiding, while entirely capable of carrying quanta of electromagnetic energy.

It could only be a joint-particle, of the same basic model as the atom, but composed of sub-units - opposite in every possible way, but capable of carrying energy also hidden within it.

The obvious theoretical candidate had to be a mutually-orbiting pair consisting of:-

An Electron of ordinary matter and a negative charge

plus

A Positron of antimatter and a positive charge.

These, being of the same size, they would share the same orbit, but always occupying the exact opposite positions within it. Such a joint particle would be invisible, but could carry a quantum of energy by the promotion of its internal orbit. But, why should that carried energy be only as a Quantum?

The answer to that question is also answered by this new particle, but only revealed in its crucial role as part of a Universal Substrate. So, before we go any further we should establish just how this joint, neutral particle could possibly form an effectible and affecting Substrate.

It doesn't seem possible for such a neutral particle to be capable of forming any kind of "connected-Substrate", but investigation of these particles, in very-close proximity to one another, has shown, theoretically-at-least, that they can! For, when very close together, the sub-particles of one such unit will transiently be able to affect those of another. Indeed, as the sub-particles orbit they will cause an oscillating attraction and repulsion affect upon the two involved overall Units. And, the consequence would be that units - getting close enough, would be captured into a loosely-connected form, we termed a Paving! And, all participating units would oscillate about mean positions at fixed separations of all the units involved. This would make a bucket-brigade propagation of quanta possible at a fixed speed - the Speed of Light - "C".

Now, for those impatiently awaiting the Creation of the Quanta, we are finally approaching the point where an explanation can ultimately be delivered.

It concerns the various possible modes of the Paving!

For, though the form described above will be the default mode of the Substrate Units in quiescent regions, it can very easily be dissociated into its components Units, which in the consequent free-moving form are usually termed *Photons*.

And, the same material interlopers that precipitated such a dissociation will also tend to drive them into Streams and even Vortices. And though these these modes will be usually temporary, there is one set of circumstances in which that will not be the case - it is that inside all atoms!

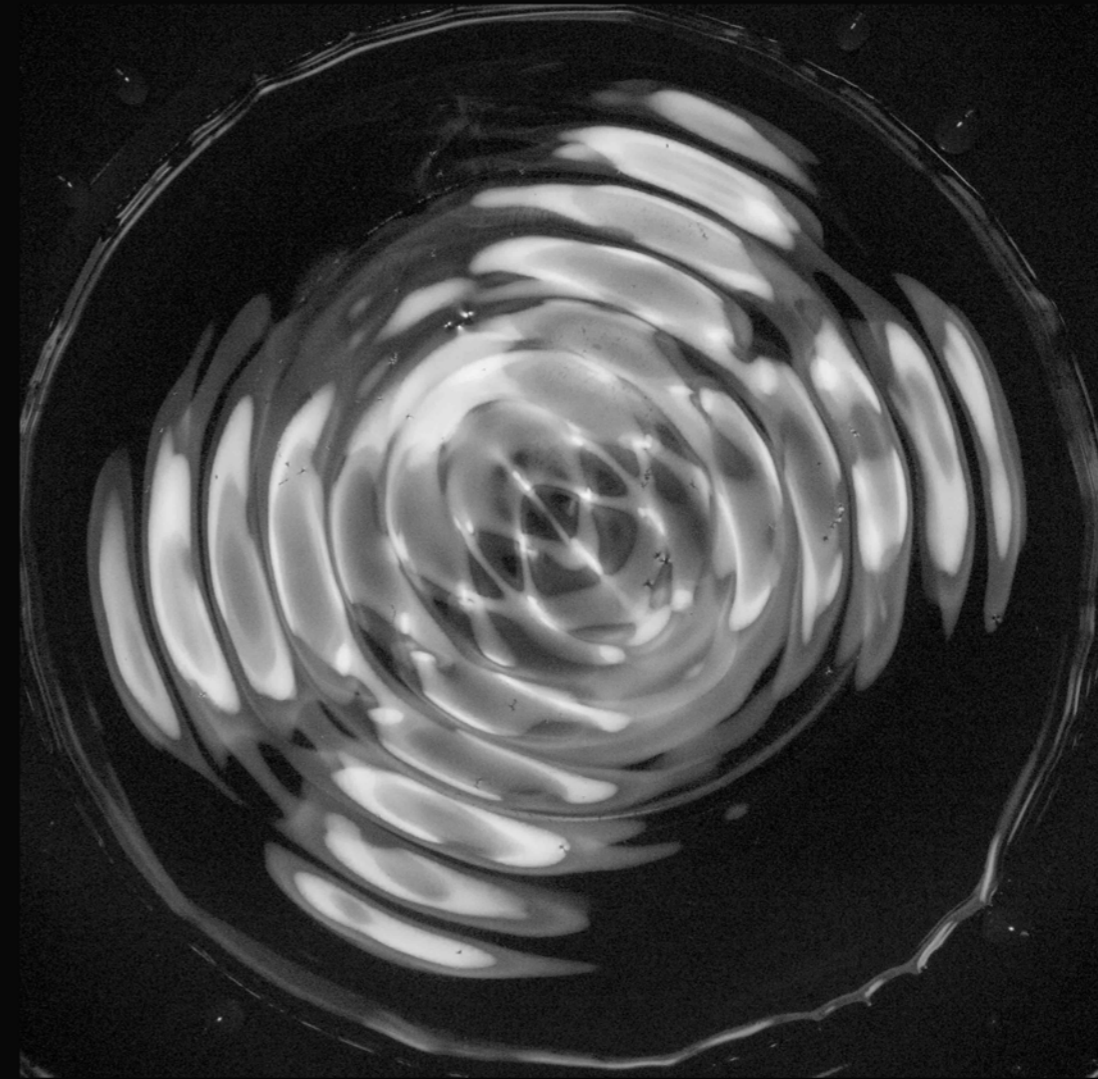
For there, the dissociating cause is an orbiting electron, which will constantly return, and re-affect the photons and the caused Vortices in every single orbit.

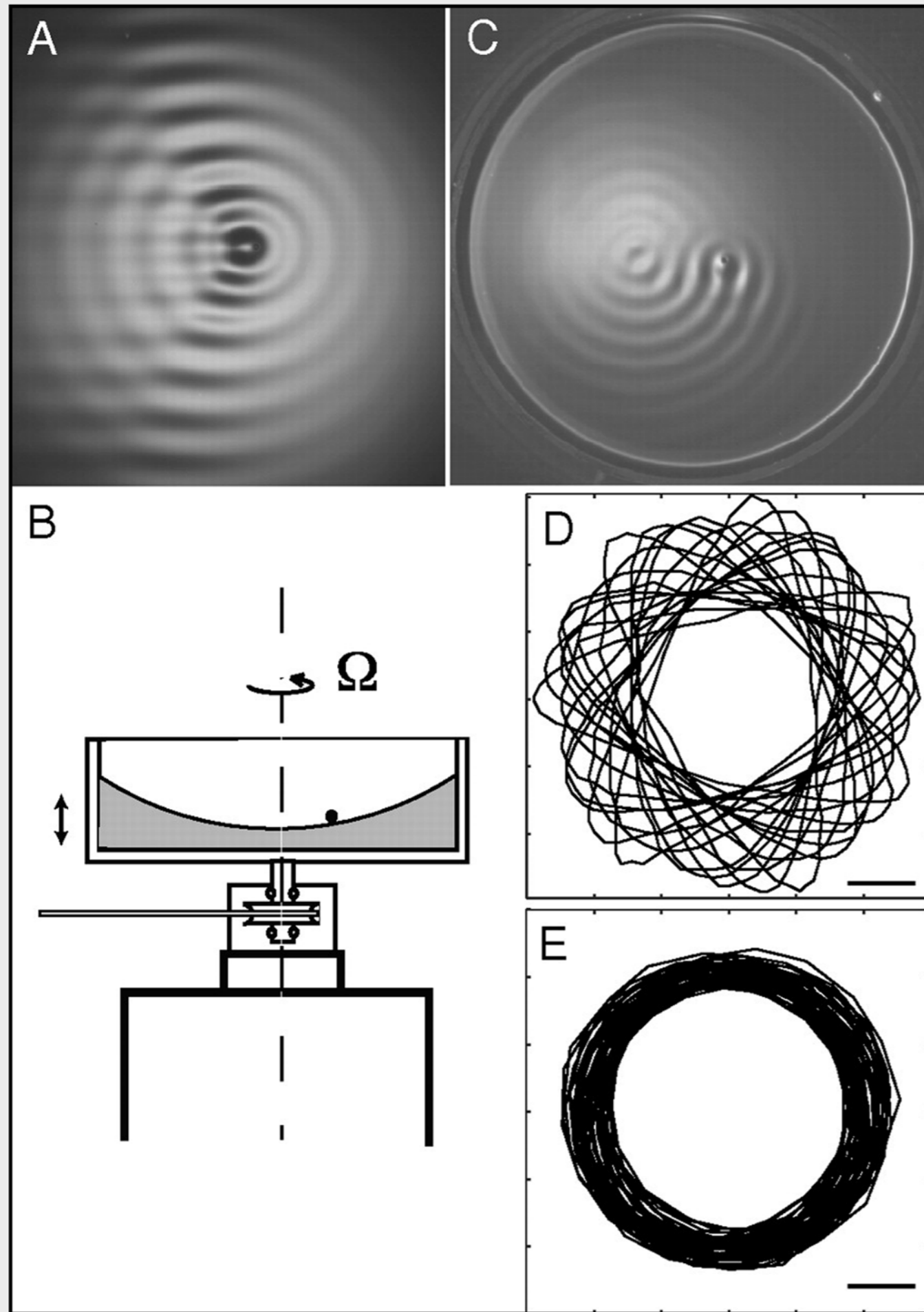
The energy will come from the orbiting electron and into the photons and Vortices, but the orbit will decline somewhat, so that upon a certain orbit, the energy will be FROM the photons and Vortices and BACK into the orbiting electron.

And there will be only a small number of optimum orbits, which display a persisting balance, so become Stable: these are the *Quantised* Orbits for that atom.

Hence, all transfers of energy changing these orbits will always be between that atom's stable orbits.

It is only in atoms where the specific quanta of energy are determined!





Yves Couder's experiments have shown a new way of investigating quantum claims at the macro level...

The True but Hidden Path

Physical alternatives to Copenhagen

One aspect of defeating the Copenhagen retreat in Sub Atomic Physics that is being currently considered, is to say the least, ironic! For, that effort must use the very-same formal methods that the Copenhageners use (if the new situation, namely Couder's Walkers Experiments, proves to exhibit the same features) in order to establish the same general formulae exactly, but there in a purely macro level of phenomena.

You might well ask, "Why would that demolish anything, surely it would merely confirm the Mathematics involved?"

Well, no, it certainly wouldn't do that, for the Copenhagen Interpretation of Quantum Theory, and General Relativity too, are significantly-dependant upon what are termed Natural Universal Constants, namely Planck's Constant h , and the Speed of Light, C .

So if, in quite another area of study, say at the macro level, I was to discover the same sorts of phenomena, involving the same general equations that Copenhagen deals with at the Sub Atomic Level, and that actually turns-up its own and quite different "supposedly universal constants" - in place of h and C , then, it would totally undermine the arguments for these two being natural - that is only revealed, and certainly not determined, by Heisenberg's Uncertainty Principle, and Einstein's formal Relativity.

But, could such a discovery happen? Well, it already has - at least physically - with Yves Couder's series of experiments at the macro level! It only remains for the same formal approach to be applied, to deliver what we are talking about. And, as work is well underway to do this to those surprisingly similar Walker phenomena, with Couder's investigations, involving merely a tray of silicone oil substrate, subjected to a constant vertical oscillation, surmounted by a bouncing drop of the very same oil.

What Couder managed to achieve, with this deceptively-simple macro set up, was the creation of a new entity, consisting of the bouncing-drop, surrounded by a standing wave in the surface of the substrate. And, the resulting entity not only persisted, but also moved around without any further imposed intervention (hence the name "Walker").

And, these investigators began to find many resonances with features addressed at the Sub Atomic Level concerning phenomena, such as Wave/Particle Duality - as evident in the Double Slit series of experiments.

Various emulations were devised-and-implemented to mirror the Effects obtained with the Double Slits, and further adjustments even also managed to produce Quantised orbits at that same macro level!

Clearly, something physically-similar was occurring which, though it could be described, could never be "explained" in the same way as the Sub Atomic Phenomena had claimed to be by the Copenhagenists! Two main possibilities could result from a successful undertaking of this sort.

One alternative, by actually achieving the equivalent constants to h and C , might well result, without involving the assumptions absolutely vital to the Copenhagen interpretation. Indeed, if such things could be shown to happen at the macro level also, an alternative NON-Copenhagen explanation of the phenomena at the macro level could well also apply to those at the Sub Atomic Level too.

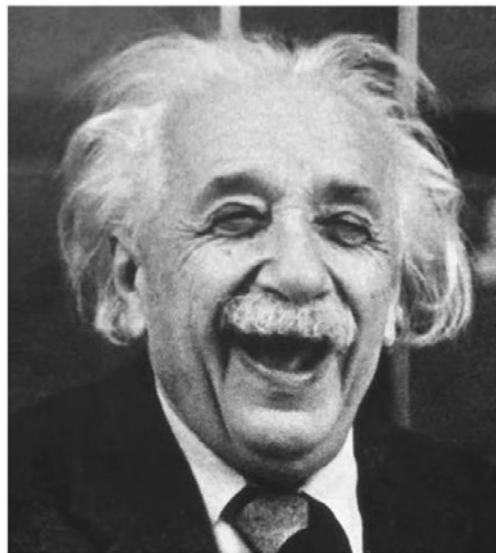
A new version of Couder's groundbreaking experiment is now necessary to move forward.

Copenhagen Refuted

Have We Finally Arrived at the Demise of Quantum Theory?

EDITOR: Please note before reading on - this paper is quite a few years old now (2010), some of the theory involved has moved on substantially - but it is still very relevant to the defeat of Copenhagen, as it goes through the underlying assumptions of Quantum Theory, one by one, and presents the issues and tasks to be completed.

Let us briefly list the Foundations Stones of Quantum Theory, which after a relatively short time also led to the famed Copenhagen Interpretation of that Theory, and the abandonment of Explanation for a system *entirely* dependant upon Equations.



“The more success the quantum theory has, the sillier it looks.”

~ Albert Einstein ~



THE FOUNDATION PHENOMENA

COMMENTS & TASKS NEEDED

The first of these was:

The Ultra Violet Catastrophe

This was a straightforward case of the normally applied theories failing to deliver what was directly observed. A Black Body was supposed to deliver a certain spectrum of wavelengths when it was heated up to a state when it actually glowed with light as well as heat. Principles that had been used in all sorts of areas of Physics just didn't work in this area, and try as they might, none of the re-formulations that were tried were any better.

Then Max Planck suggested a version in which the radiation, instead of being given out continuously, was assumed to only be emitted as discrete Packets (or Quanta) of energy. The continuous integrals of the Raleigh-Jeans Theory were replaced by Planck with discrete sums of his suggested discrete quanta. The Theory worked! And as such it was an exceptional aberration, and other physicists re-looked at similar areas to see if the same sort of assumption could be extended to other phenomena.

Planck's idea was that the energy was given by $E = nh\nu$ where h was Planck's constant and ν was the frequency

Comments: The changes made by Planck are significant from another point of view. For, in addition to considering only gobbets of energy, this other aspect was in the switch from continuous integrals to summation of discrete values, for here were also the dreaded consequences of Rates of Change occurring in Differential Equations. This feature was that the assumption of continuity could break down (as has become apparent in the recent past revealed by the study of Mathematical Chaos). Also the oscillators (source of the radiation) didn't just take on any level of energy, but specific quantised amounts. Yet there is still a question. Was that quantisation being allocated to the right place, or could that feature have been imposed by the processes of transmission and propagation?

We have to admit that in the new physics we did not know what imposed such discrete amounts of energy on Radiation. For if that propagation was via quanta in photons *as receptacles*, it could be the actual photons that imposed these constraints.

THE FOUNDATION PHENOMENA

The next area to be successfully addressed was that of
The Photoelectric Effect

This phenomena as when the falling of light onto a particular type of solid surface could lead to an electric current if a potential difference was applied and a complete circuit arranged.

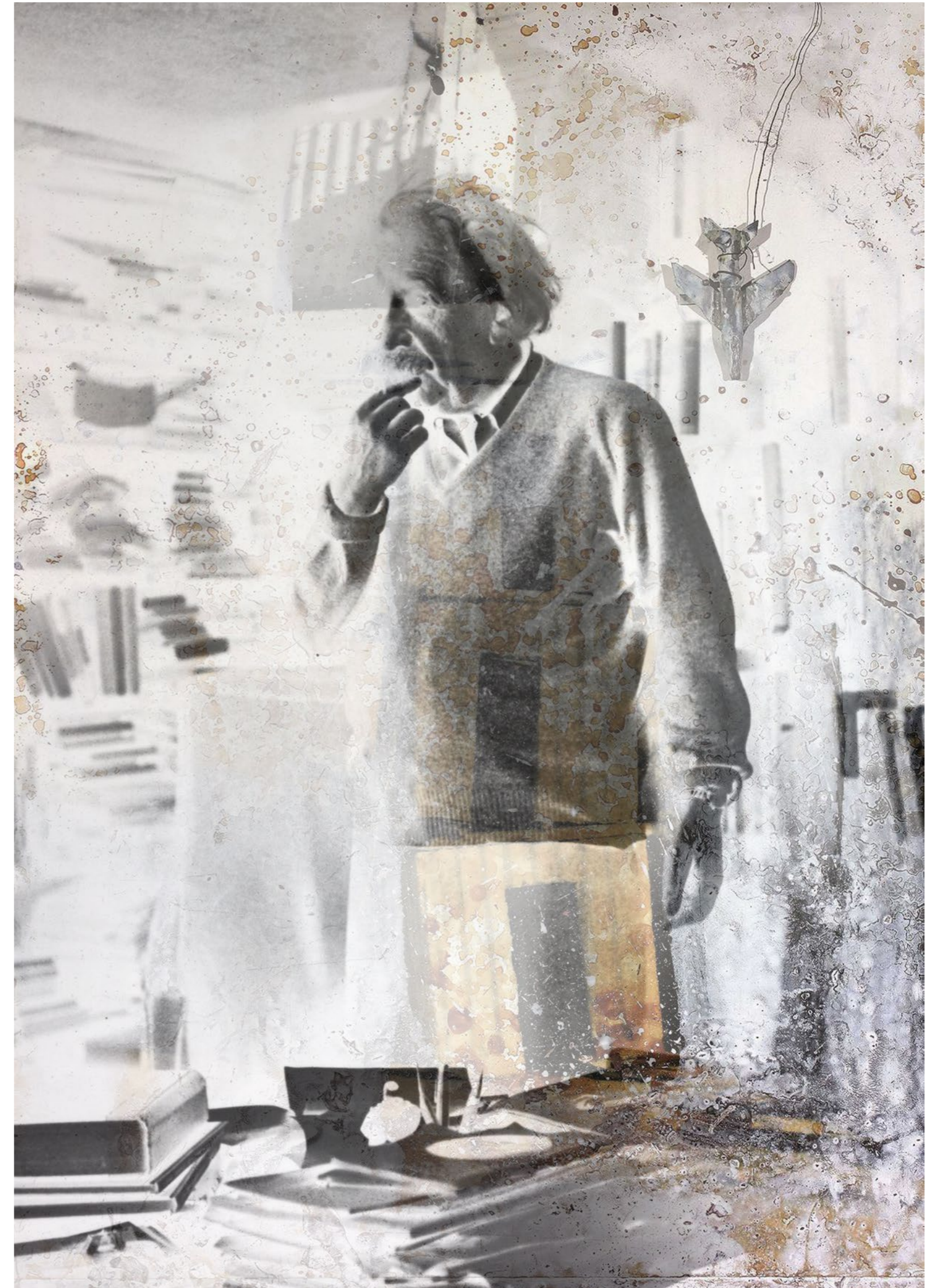
Classical Theory again did not match to what was observed. Instead of the energies involved being related to the intensity of the light applied, it turned out to be determined by the frequency of that light. Now, it was expected that the electrons would require a certain amount of energy to break them free and allow them to become part of a current, but instead of a threshold intensity being the trigger, it was a threshold frequency that made things happen. Frequencies lower than the threshold could not cause a Photo Electric Effect no matter what the Intensity was. Einstein applied Planck's ideas to the light and the problem was solved.

COMMENTS & TASKS NEEDED

Comments: The electrons involved are not tightly bound in individual atoms. They are termed "free" electrons within the body of the metal, but they can't actually leave the metal. They are something like the molecules of a liquid, in that they need sufficient energy to break them free from their usual mode.

Now, for these to be brought into the realm of alternative ideas, which contradict the Copenhagen approach, they must be re-interpreted in terms of Stationary Empty Photons with full E-M capabilities. First, these Photons are NOT particles: they don't career across Space like particles. They ARE Space and all that moves is the E-M disturbance induced into this "paving" of Space. Yet even with these changes, Einstein's explanation works in the very same way, though only the E-M disturbances move and not the Photons themselves.

NOTE: While the principles of this idea (Empty Photons paving space) remains the same, it has now been developed into a full theory of the Substrate - the 'Empty Photon' has been replaced by a mutually orbiting Electron and Positron (called a Neutrutron), undetectable by the usual means, yet capable of carrying quanta of energy through the promotion of mutual orbits - more information about this theory can be found elsewhere in this journal.



Compton Scattering

In this phenomena Light is scattered by electrons. Now experiments showed that the effect on the light was that it was both deflected away from its original course, AND reduced in frequency too.

These features could NOT be explained by the prevailing classical theories and Compton suggested that if the light was coming in quantised gobbets and acting like particles (as suggested by Planck) the explanation was straightforward. He treated BOTH the electrons and the Light as particles undergoing a sort of collision, and using the theory for such collisions except that the light's energy was given by Planck's formula, the Effect was explained very well.

Comments: One important feature of this is that the scattering would impart a sort of Red Shift on the involved light. Clearly, if the new ideas are true they should work here as well and we will have to reinterpret the phenomenon in terms of stationary Empty Photons.

So, we have to have a disturbance being propagated by the stationary Empty Photons, which bring it into interaction with the electron. Something must then happen which gives the observed results. What is it? The resulting electron will still be an electron but changed somewhat, while the light will now go off in a new direction (once again as a disturbance in the stationary Empty Photons).

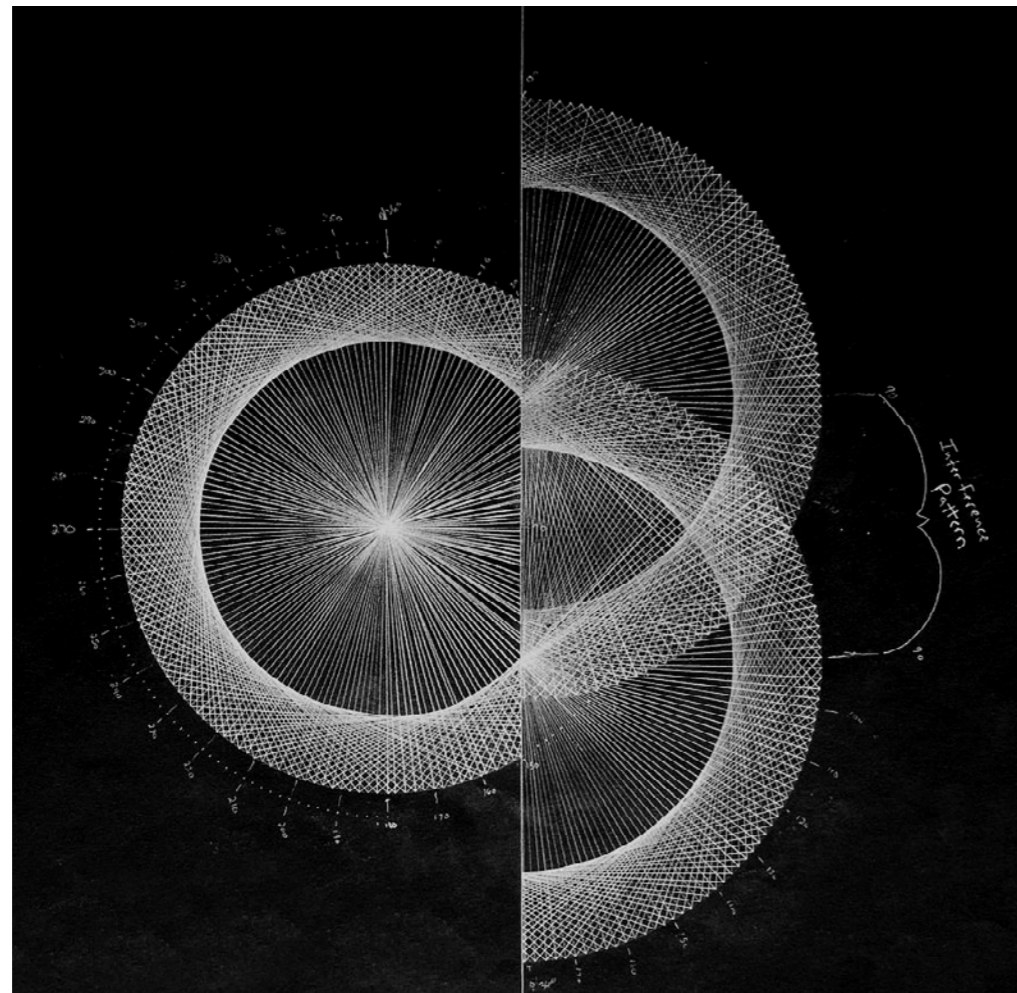
IMPORTANT. Compton had to make the assumption that here light was acting as a particle and NOT as a wave. Clearly the only options are classically seen as a particle *or* a wave. We have to demonstrate that with the new Theory such a dichotomy would not arise.

Pair Productions

Paul Dirac had "combined" Relativity with Quantum Mechanics (somehow!), and hence posited the existence of the positron – a positively charged particle, yet in other ways very similar to the electron. And later on the same was inferred from the seeming production of positron/electron pairs, apparently out of nothing in the cloud chambers of high-energy accelerators. There was no doubt at all that something very like this had indeed occurred. The explanation was that a very high-energy photon must have passed near a heavy atomic nucleus. Clearly, some sort of interaction (without a collision) had caused the high-energy photon to be pushed beyond its limit, at which a positron/electron pair was precipitated as the only possible outcome. Clearly, such a situation could only be temporary! The heavy nucleus would be passed and the conditions for the continued existence of the pair would surely vanish. Questions were definitely posed by this phenomenon and perhaps another later observation may be contrived to help the explanation a little further. For, at another time, a positron and an electron were actually seen to come together and immediately vanish. The situation was regarded as one in which the continued existence of the electron and the positron was undermined by their coming together and a resultant high energy photon was postulated as the result. This was immediately interpreted as Pair Annihilation and coupled with the prior evidence for Pair Production obviously led to a whole bunch of theories incorporating BOTH.

Editor Comments: The original comment is no longer appropriate. Pair Production and Pair Annihilation have now both been explained using the new Substrate Theory.

Pair Production can be explained in terms of a dissociation of a Substrate neutrutron ("Empty Photon") into one electron and one positron. While an appropriate encounter involving a free-moving electron with a free-moving positron, could result in their mutual capture into an undetectable neutrutron - Pair Annihilation, surely?



THE FOUNDATION PHENOMENA

COMMENTS & TASKS NEEDED

The Wave Equation

Louis de Broglie (1923) came up with “All material particles display wave-like properties” and the famed Double Slit Experiment (like Young’s Slits but using electrons) led to the conclusion that De Broglie was right and we then had “Matter waves” (in this case of electrons)

Comment: But what if Space were composed of a substrate of Empty Photons with full E-M properties, which, without actually moving, could propagate all E-M radiation by induction alone?

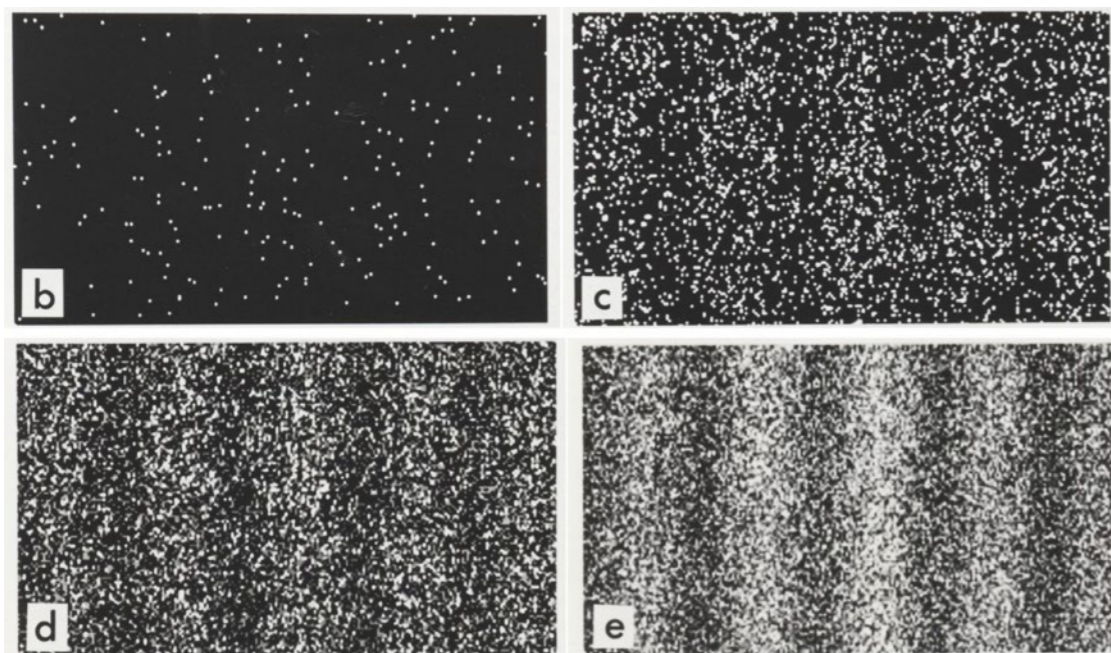
An important diversion is perhaps necessary here! In the Double Slit Experiment, there can be no doubt that the electrons start as electrons, continue as electrons and finish as electrons on the detection screen. Each individual electron goes through ONE, and only ONE, slit of the available pair of slits, yet is, by some means, deflected or not deflected to arrive at its final position on the screen. What do the Copenhagen school actually say happens?

They say that each individual electron goes through BOTH slits, “as if it were a wave”, and, on the other side, interferes with itself (again like a wave), only then, its direction having been determined, does it gather itself back together (as a particle) to hit the detection screen as only a particle could – at an appropriate point.

Is this really the best explanation they could come up with for observed phenomena? Because this is laughable!

What a magical thing the Copenhagen version is! This cannot be anything like the phenomenon of pair production. There is not enough available energy; there can be NO switching to and fro between wave-like properties and particle properties. Something else must be involved which can and does cause these phenomena.

Editor Comments: These issues have also since been solved in Jim Schofield’s Theory of the Double Slits - an interference pattern in the Substrate causes deflection of the electrons.



THE FOUNDATION PHENOMENA

NOTE: The Copenhagen School insist that the necessary energy is supplied by US, when we intervene to measure such phenomena - also another handy myth?

But, if you run the experiment long enough the summation of all impacts does indeed produce an interference-like pattern on the screen.

“A-ha!”, they ejaculate. “There you are! All we have to do is to use the Wave Theory NOT for individual events, BUT just for the *probability* of an Event.”

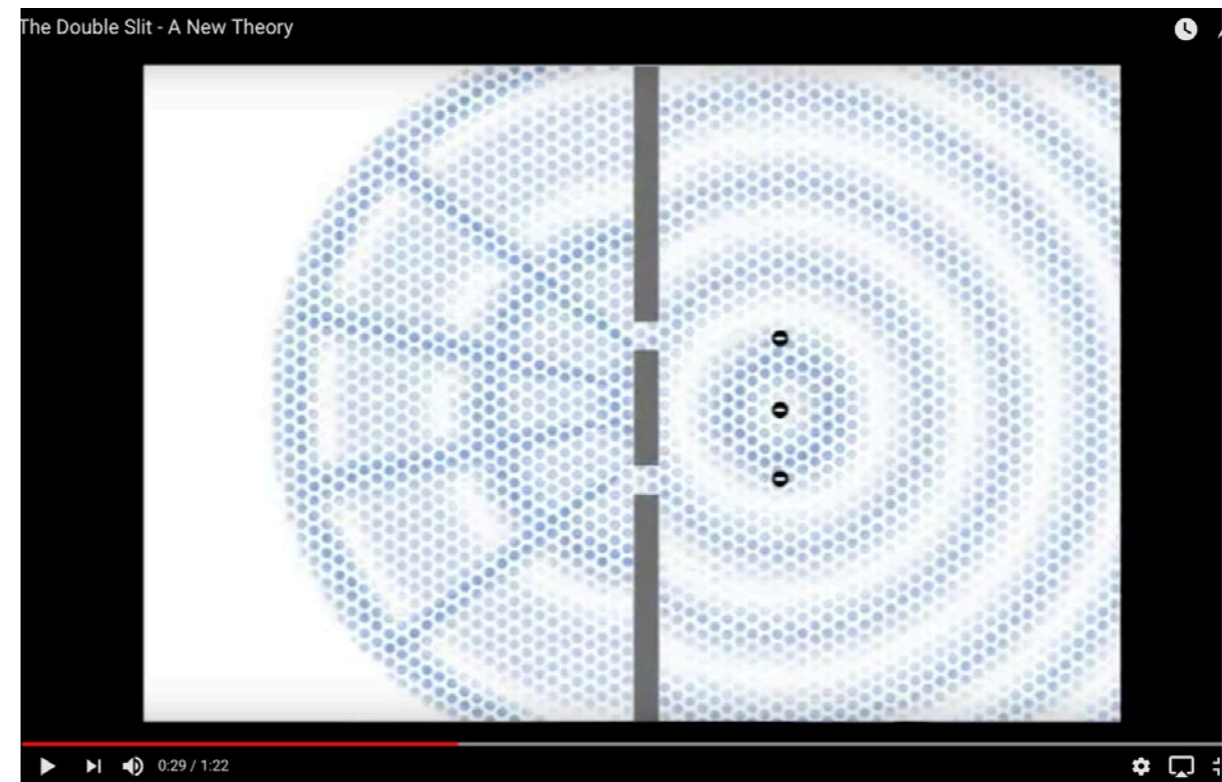
COMMENTS & TASKS NEEDED

Comment: If measurement did this I'm afraid that you would have to explain both why and how - and they don't do that! It is therefore an excuse, a placeholder for a real scientific theory. Yet they use wave theory to help them with the positions(s) of impact on the detection screen. They cannot of course, predict any single impact EVER.

Editor Comments: Wave function collapse can also be explained in terms of an underlying Substrate - it is merely the dissociation of the preceding interference pattern in the Neutrinos.

Comment: That is the cul de sac into which they find themselves, and it proves that their theories are simply wrong. If the electron is an electron throughout, something else must be influencing its trajectory. For the electron is never affected with the Single Slit situation, so the arrangement of the Double Slit must be crucial and involved in the behaviour beyond the slits. There must be something else passing through both of the slits and interfering on the other side, and then affecting the electrons as they come through. What could it be? And what could cause it?

The answers are surprising. It is Space itself, and the changes in that Space are caused by the electrons themselves. After all, these are charged particles, and Space is certainly entirely capable of propagating E-M disturbances all by itself. So it certainly has E-M capabilities (*E: again this is proto-Substrate Theory! 'Space itself' can be replaced by the presence of an as-yet undetected Universal Substrate*).



This animation was created to show how a paving of “Empty Photons” could physically explain the Double Slits experiments - you can find it here: <https://youtu.be/bcqFrWqXI3E>

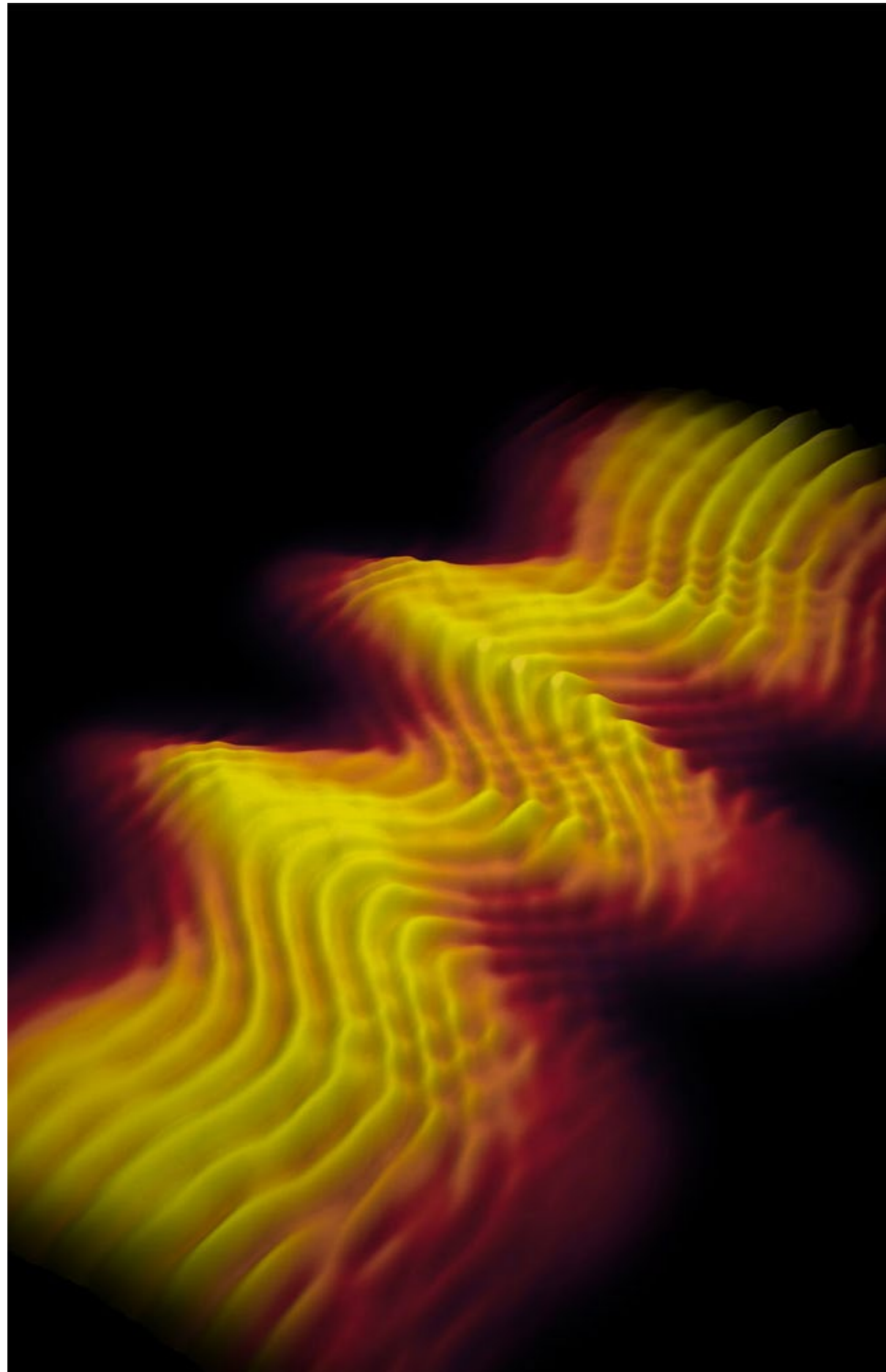
It seems impossible to explain unless we consider Empty Space as paved with so-called “Empty Photons”, which have the necessary E-M properties to both propagate radiation AND be affected by a moving charged particle. Clearly there must be an induced effect on the Empty Photons, which propagate it in the usual way at the speed of light, so that it would be well ahead of the causing electron, would pass through both slits and interfere on the other side.

It matters not that the following electron can only pass through a single slit. For whichever it is, it will encounter the interference pattern and be deflected if it is traversing any sort of addition zones, but go straight on if traversing a cancellation zone. Thus the very passage of the -ve charged electron had induced a wave disturbance, which after the later inference, having passed through BOTH slits, could affect the following electrons.

One last point is crucial! If the electron had this effect before the slits, it will continue to have the same effect after the slits. But on that side there are NO SLITS to transform this disturbance, AND it will flood the interference pattern with a new, single source disturbance. So, you would never find the interference pattern whatever you did.

The same thing caused it, interacted with it and whooshed it away!

NOTE: There is, as you might expect, a great deal more to it than this. All the many objections to it had to be addressed and these are not appropriate here, but will, of course, be fully expressed in the final Theory of the Double Slit Experiment, which has already been published on SHAPE Journal.



THE FOUNDATION PHENOMENA

The Heisenberg Uncertainty Principle

Measurement is supposed to bring out the alternative wave and particle behaviours.

Now, it is here that the final, idealist “nail in the coffin” was added by the theorists of the Copenhagen School. With Heisenberg’s Uncertainty Principle we were told that the precise calculation of both the position and the momentum of a particle could never be simultaneously known, and the limit was given by this Principle, and you could then only find probabilities. So, they immediately went on to say that ONLY probabilities were possible for all situations in this area of Physics. They thus use the appropriate Wave Equation to give them probabilities for value of the involved parameters.

COMMENTS & TASKS NEEDED

Comment: But if a charged particle induces a wave in the “universal paving of Empty Photons” throughout Space, then any moving electron (a particle) does NOT change, but does generate the above described wave propagation (as also described by Bohm with his Pilot Waves) It then can encounter situations which are influenced by either of the two entities involved, or indeed BOTH as in the Double Slit).

But also the insistence on probability equations for predictive purposes AND the banning of holistic explanations as self-kid are also mere mathematical constructs for such complex situations.

But if the alternative theories presented here are true, the wave equation is about the disturbances in the Empty Photons, and it is this, which then affects any involved particles.

What does this mean for uncertainty?

Quantum Fluctuations

or

The Universal Substrate?

When the Michelson-Morley Experiment put paid to *The Ether*, all that remained was a total vacuum, and absolutely nothing else. But, that left a major paradox - namely, "What delivered the Propagation of Electromagnetic Radiation through absolutely *Nothing*?"

And, we know of the causal relationship of both Electricity and Magnetism to Electrical Charge, and also, in the case of Magnetism, to "A Moving Electrical Charge"

Can you see the Paradox?

Now, in the now usual classical pragmatic way, Mankind replaced Explanatory Physics with Descriptive Mathematics, which can deliver the required results entirely without a causal explanation. It has been, after all, how Science has been able to progress since its inception. For, its long-standing contradictory-philosophical-amalgam of both Materialism and Idealism has always been solved via "If it works it is right!" - the credo of Pragmatism. So, by keeping to those easier formal paths, within appropriately-farmed domains, an extensive-if-inadequate expanse was indeed delivered, and could deliver both prediction, and even effective production. Why question it?

But, what about "Action-at-a-Distance" - gravitational and other far-reaching effects? How did they work?

And, where did the energy come from to implement such effects? We know that NO diminution of energy at the supposedly-causing Charge was happening, so what was supplying it?

It could only be that perplexing "Empty" Space. Where else?

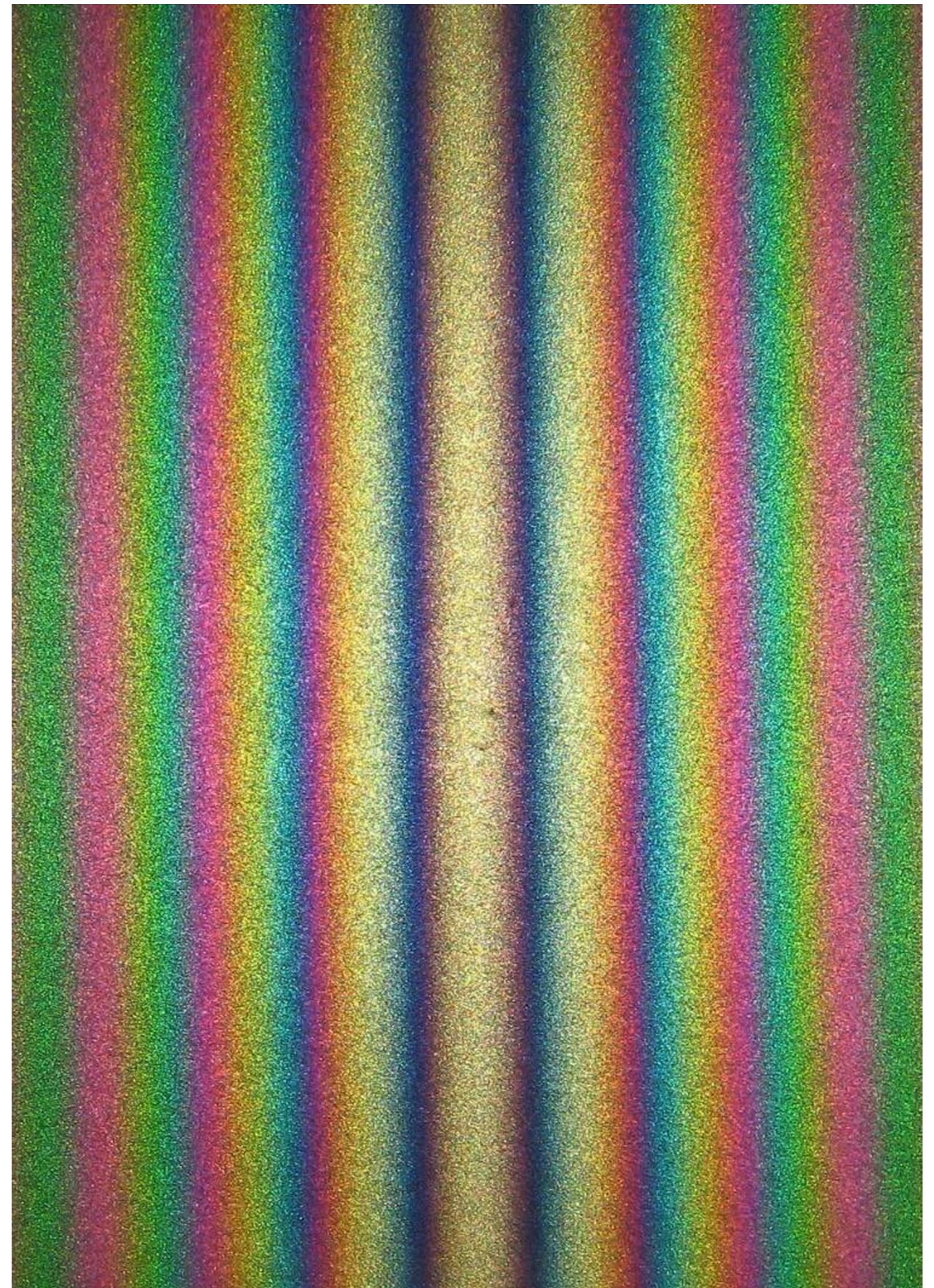
And finally, the mathematical physicists had to agree!

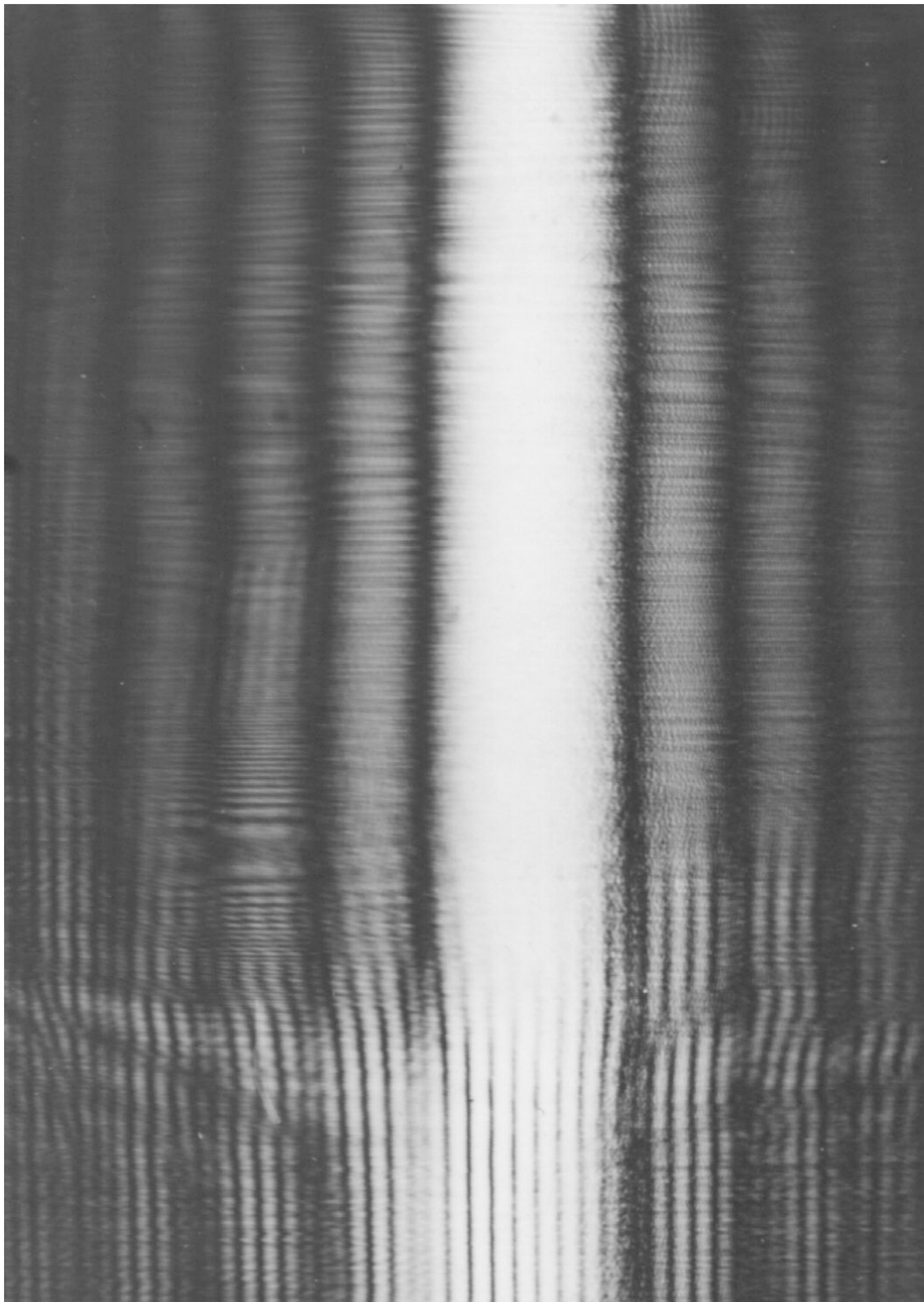
It was, they decided, Random Quantum Fluctuations totally filling Empty Space that had to be the source: though it was normally entirely cancelled-out due to the perfect randomness of opposing factors within those fluctuations, though they could, however, re-organise around suitable initiators into a disembodied Field, yet having focussed and made-available energy to deliver the effects of the field. And, remarkably, the energy resident in all of those random fluctuations is also claimed to be enormous, but the different kinds of fields could only remove varying amounts of the cancelling random effects, leaving different kinds and powers of fields.

Now, remember, all of this supposedly involves NO resident matter in the vacuum, just high energy random fluctuations, which are normally totally canceled!

Now, mathematicians may be happy with such "solutions", but explanatory physicists should not be and materialist philosophers certainly not. They were surely solutions dredged from the infinity of possibilities in Ideality - the Realm of Pure Form Alone, which unlike Concrete Reality has NO real limitations, but only formal rules.

But, another possibility has now been extensively researched. It involves the universal presence of an existing, but currently undetectable physical Substrate.





But, the initial problems involved were significant! For, no individual Elementary Particle would suffice - it had to be a compound particle (or even several such particles) to deliver all that was required. And, unlike these vague Quantum Fluctuations, it would have to fully explain ALL its functions for Fields, with both focussed, available and directed energy, naturally replenished in explainable ways when used up in field effects.

It would involve both Matter and Charge but, on the one hand totally masked when quiescent, but, on the other, clearly evident when activated. The task was undertaken entirely theoretically, in the style of James Clerk Maxwell's Model of the Ether, in other words known Physics would be brought together to theoretically deliver a Unit of such a substrate that could deliver a particular range of phenomena.

What was first chosen to be tackled were explanations for all the anomalies of the ill-famed Double Slit Series of Experiments. It would be an Analogistic Model delivering more Objective Content than the current Copenhagen interpretation of these experiments.

The strategy was to limit the components of a suggested joint-particle to the members of the subset of Elementary Particles termed the Leptons.

And, the most obvious, and simplest, candidate was a mutually-orbiting pair, consisting of one Electron and one Positron! For, this would deliver a Unit, neutral in every respect, but capable, via the promotion of its internal orbit of carrying a quantum of electromagnetic energy: for when it did that as a free-moving entity it would be a Photon!

This theorist had been made aware of the Positronium, as discovered in the Tevatron at Fermilab, but considered that its instability would not fit the theoretical requirements for the Unit of an undetectable Universal Substrate, so this version was assumed stable and re-named as The Neutrion!

There were, of course, problems, for an important property of the Universal Substrate, in these Experiments, was that it would have to be affected by, say, a moving electron, and carry that consequent disturbance ahead at the speed of light, to the Pair of Slits, pass through both and cause an interference pattern beyond the slits, so that when that causing much-slower-moving electron

finally arrived and passed through one of the slits, it would be diffracted by the Slit onto a path through the Interference pattern, and hence be further deflected (or not) to finally arrive at the detection screen to identify that path.

But, in spite of having the neutrion, we still had to show how it could form a connected-Substrate-system to deliver that propagation in a *given direction* and at the Speed of Light!

Ultimately, all these problems with the Neutrion were solved, as well as those with the Magnetons and Gravitons to deliver everything required from a quiescently undetectable Substrate.

Bucket Brigade Quanta Propagation and Interference

Though the suggested Theory of a currently-undetectable Universal Substrate has succeeded in answering many of the anomalies generated by the Copenhagen Interpretation of Quantum Theory, it also involves discrete quanta of electromagnetic energy in the explanation of its propagation, so its role in Interference will be very different from that of continuous waveforms in a classical, elastic medium.

The key to the functions of such a Substrate can be clarified by the description of one of its series of undetectable units - the Neutrion. For this is composed of a mutually orbiting pair - one Electron and one Positron. Now, these are composed of matter (for the electron) and antimatter (for the positron) but though electrostatically attracted to one another, they are kept apart by their incident relative velocities in a stable joint orbit, which can also be promoted by the addition of extra electromagnetic energy, and demoted by its off-loading to another such, but as yet unpromoted unit. Indeed, though as free-moving units, these become the fabled Photons, they can also, very easily, form a loosely-connected, yet closely-linked Form termed a Paving, which positions the units equidistant to one another, and so facilitates propagation at a generally fixed speed - C .

For, though in continuous classical media it is the elasticity of the medium that allows an effective combined effect of two different waves in a classical case of Interference, it occurs very differently with such a Paving.

When discrete quanta are involved, which are always, in the new theory, primarily embodied in internal orbits within discrete Substrate Units, the usual theory is no longer applicable! Why? It is because a unit once having its internal orbit promoted with a quantum of electromagnetic energy simply cannot absorb another

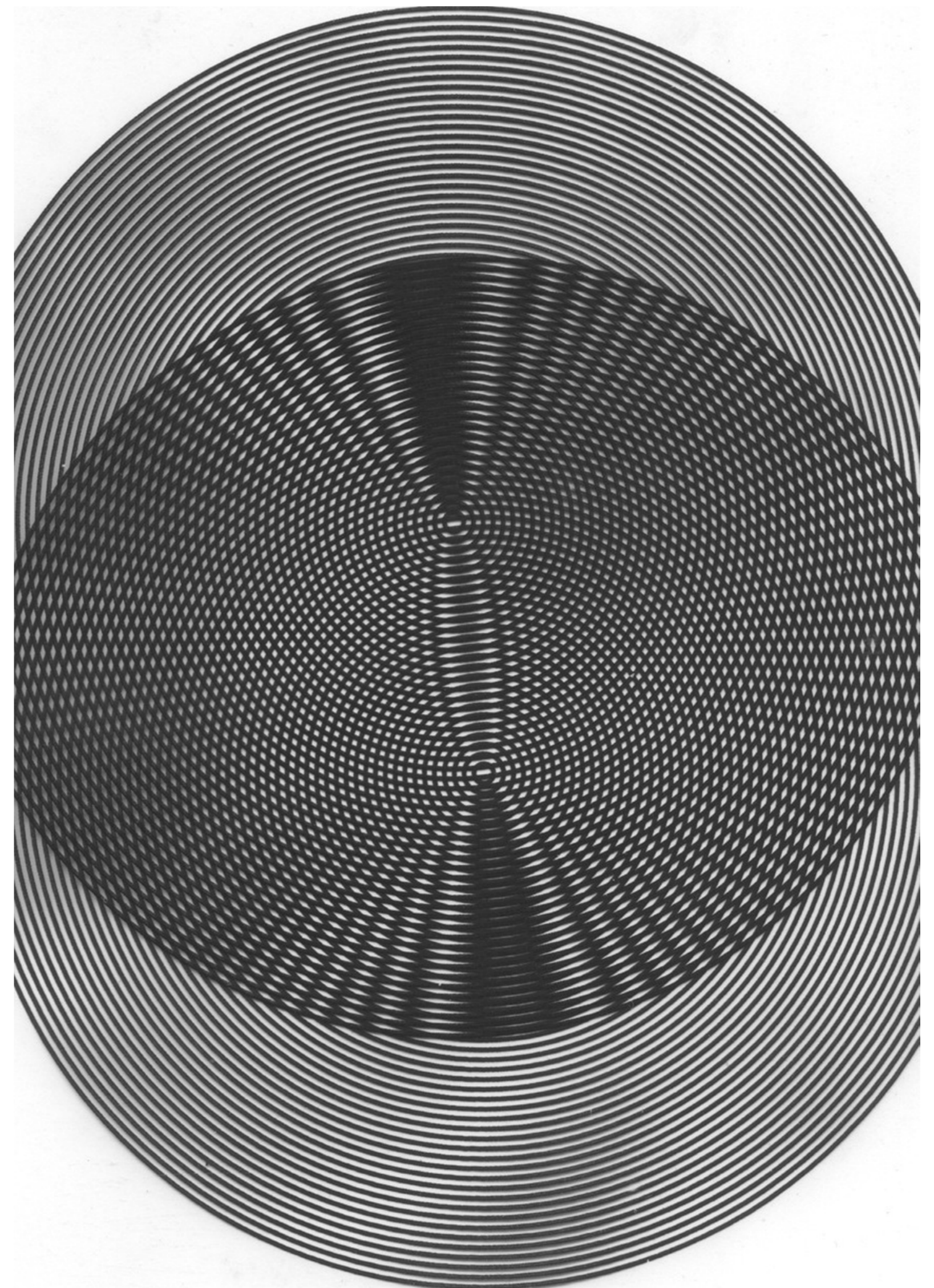
exactly out-of-phase quantum, in addition, without it simply cancelling out to become unpromoted, and hence could not propagate that. While, in contrast, if two exactly in-phase quanta were involved, they would both be absorbed, thus raising the internal orbit to twice the level.

So, in a situation with two such strands re-orientated to cross one another's path, some consequent sequences would now have nothing to deliver, while others will, in contrast, have twice their normal load.

And, such quanta streams arriving simultaneously all over a detection screen or other effectible recipient could in some places receive twice the originally carried load, while in others there would be nothing to deliver. The result would therefore be an interference pattern upon it!

If these points are true, then the two propagating contributions will continue after multiple crossings but transformed into the combined eliminated or amplified streams.

In other words, though interference still occurs, it is due to a very different mechanism to that produced in a classical medium! And, crucially, phenomena such as the Photo Electric Effect will still be explained via single quanta of energy delivered ultimately by a single, immediately-adjacent unit of the Universal Substrate.





Rovelli's Reality

In listening to a podcast of Carlo Rovelli's ideas upon the Nature of Reality, I was taken upon an interesting, historical trajectory, which reflected the many objective glimpses that Mankind has seen-but-misinterpreted, ever since the crucial initial extractions of the Ancient Greeks.

His account was informative, but oscillated between requiring a stage composed of total emptiness, to one of an everywhere present Universal Substrate of some indeterminate kind.

But, by the time of the 20th century, when all possible kinds of a material Substrate had finally been totally discounted, the new nature of this "underlying communicator" was first reduced to Fields, and thereafter to finally include the Source of Absolutely Everything, including all observed entities and events. This was the now-assumed Quantum Reality, based ultimately upon the Random Quantum Fluctuations, occurring absolutely everywhere, but also ultimately generating absolutely Everything Else!

Yet, in contrast, the agreed, focussing-implement homing in upon such productions was, in fact, the actual source of all these conclusions - namely *Mathematics*.

Mathematics is a purely virtual reflection of Reality, which can only ever deliver Pure Form and absolutely nothing else, but ALL non-formal aspects of Reality have now been dismissed as misleading-and-illusory. Mathematics has thus been promoted to the sole determinator of Everything!

Reality was now, therefore, both totally idealistic and pluralistic - exactly like Mathematics itself! And, the consequent crucial damage was down to the now universally-accepted basic premise of Plurality, which only considered eternally-fixed components, such as those which had allowed the invention and subsequent development of this study of Pure Form alone.

Now, it had always been a problem, throughout the whole period considered here, but was always "got-around" by keeping several, totally contradictory stances simultaneously available, and switching between them as circumstances demanded. From the very outset, in Ancient Greece, Materialism, Idealism and Pragmatism were all retained, and switched between via, "If it works, it is right!" So, Pragmatism justified the switches, and success in achieving objectives was always regarded as wholly sufficient: while a coherent, consistent and comprehensive Understanding was always secondary to pragmatic success.

And, of course, the dropping of Materialism by the Quantum physicists merely accelerated this focussing upon eternal Forms exclusively.

But, that was never the only, or even the best, solution.

Throughout his historical account, it was evident that literally all the features of waves had been revealed by material media, investigated on the physical Earth, so, I found that the idealism of Mathematics was inadequate to ever explain what clearly happens in so-called Empty Space, or even in the "do-everything" Quantum Field.

What was needed was a *material* Substrate, composed of discrete, energy-carrying and transporting particles, which were all currently undetectable. And, pursuing that line, theoretically, I have been able to explain all sorts of Quantum phenomena physically, including every single anomaly presented by the ill-famed Double Slit Experiments!

Now, before I take this route any further, I must attempt to address the main problem of the currently accepted approach, which is "Where does the energy come from which delivers the energetic action of the Field?" It can only be from the Random Quantum oscillations that are claimed to fill all of Space, which usually cancel out, but are somehow re-organised by the presence of a totally

non-active initiator, which, by some means, elicits the fluctuations to become a directed and ready-to-fire quantum of applicable energy. Don't ask me how!

But, I can, on the contrary, fully explain exactly how the Magneton Units in my defined undetectable, Universal Substrate, physically move towards inactive, yet eliciting "sources", with directed orientations to completely surround them or form linked structures, to form the units of either electrical or magnetic physical fields, which will naturally take in sufficient energy from elsewhere in the Substrate to make exactly the necessary Field in every associated unit! And, once established, be available to deliver exactly appropriate effects, and in the right direction, and, thereafter, be appropriately replenished energetically in the same way as before, from elsewhere in the Substrate.

Interestingly, both types of field are delivered by exactly the same pair of Substrate Units, but spatially re-organised in very different ways to produce the Magnetic and Electrical Fields.

This paper responding to Rovelli's podcast is not the place to deliver the whole Theory of the Universal Substrate, but sufficient from it will certainly ask major physical questions of the idealistic Quantum Theory alternatives.

Vorteesimilitude

One aspect of the assumption of a Universal Substrate composed of tiny, currently-undetectable particles, was the radical re-assessment, along with an alternative explanation, of "quantized electron orbits" within atoms, as being, on the contrary, due to regularly-maintained vortices (in the Substrate actually inside the atom), which were, intrinsically, energetically-associated with those orbits, and had, consequently, necessarily arrived at only certain maintainable radii as stably-achievable.

Now, clearly, such sweeping away of the idealist nonsense of the Copenhagen Interpretation at the Sub Atomic Level in that crucial anomaly, could not be left there! Quite apart from the many other anomalies of that Interpretation (which had also to be addressed), there, in addition, emerged a whole new area of Physics to be researched to reveal both the properties, and the possible modes, of such a Substrate, which would, most certainly, transform that whole, currently messed-up area, and not before time too!

Much had already been done in Turbulence studies with other phenomena in mind, but what was different here, was that usually merely transient, and quickly dissociating phenomena, might, in particular special circumstances, be caused to persist in stable, transformed and transforming situations. The key factor was always the regular, repeated recurrence of phenomena, due to special situations, such as orbits and spinnings, or even rotations of things within such a affected and effecting Substrate.

The possibilities were greatly extended when it was established that such a Substrate not only could indeed exist, but also could be, very easily converted into various, very-different modes - crudely analogous to the Solid, Liquid and Gaseous Modes of "ordinary" Matter.

For, these immediately allowed the Substrate to be dissociated, usually temporarily, into forms which allowed both driven Streams and even Vortices of its

composing units, which then very differently interacted with any originally causing interloper.

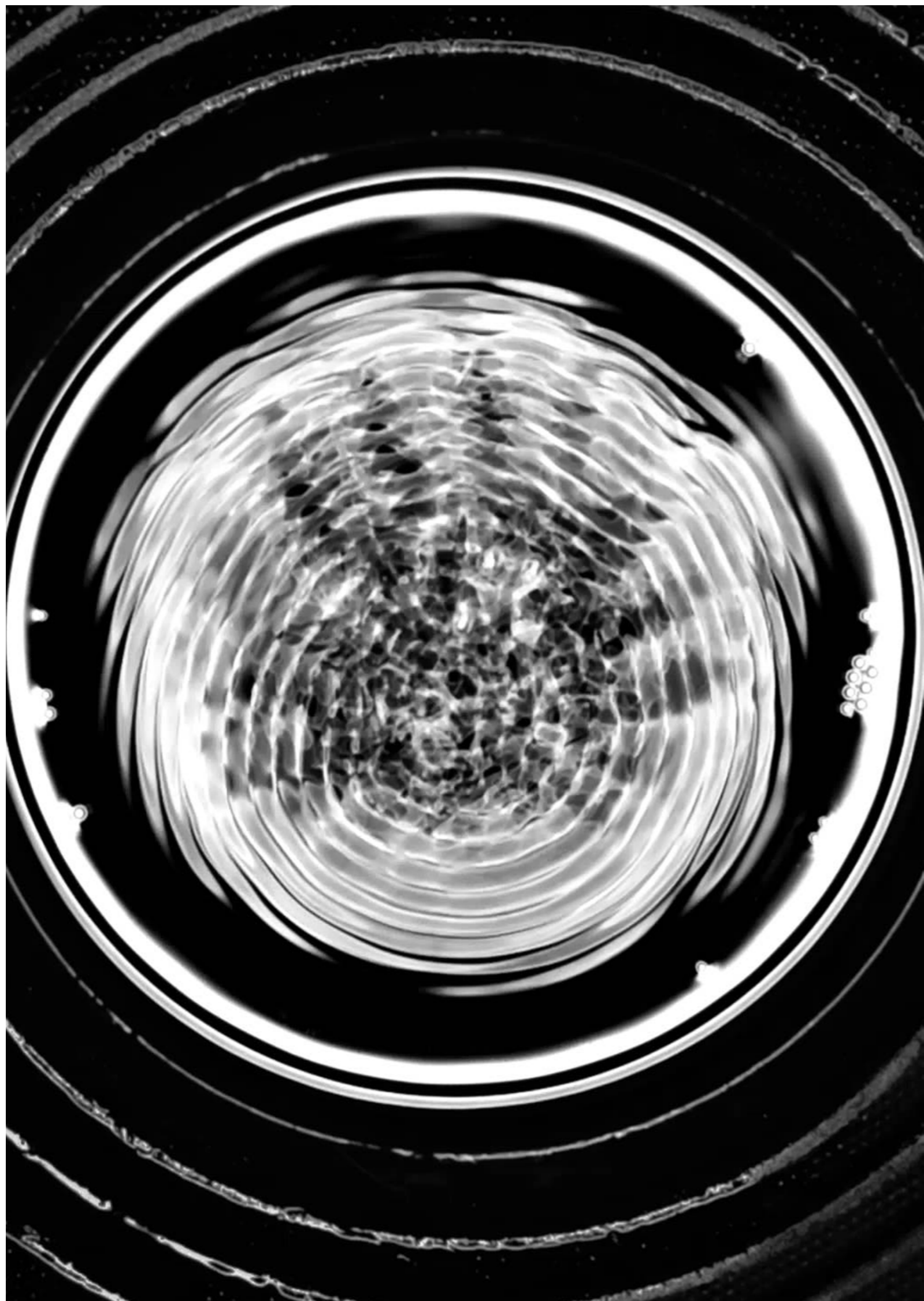
Clearly and significantly, causality, within such a Substrate, could go both-ways: the Substrate could be affected by phenomena taking place within it, AND could then, in turn, cause effects upon those phenomena, which would not have been possible in the absence of such a Substrate, and also would not even be predictable from such a Substrate's initial undisturbed mode.

And, of course, the usual "Desert of Nothingness" that has been both the universally-insisted upon external Empty Space, and even the identical internal "Space within Atoms" could be transformed, wherever recurring cycles were present.

Of course, the required-energy, for maintaining such stable situations, would be necessary, as would maintained rotations, spins and orbits. But, in our Solar System we have the Sun-as-engine both gravitationally and electromagnetically, and a multitude of controlled planets, moons and other material bodies, as well as similar situations all the way down to the Sub Atomic Level.

Perhaps the most revolutionary experimental evidence for a re-appraisal of "substrates", was supplied by the "Walker Experiments" of the French physicist Yves Couder, who in an effort to deeply investigate the full consequences of Substrates, not only removed his context to the much more easily observed and controlled Macro level, but also successively eliminated all other material content, until only the "substrate" remained!

And then, by adding in only energy, in various forms, he managed to create persisting "entities" - his "Walkers", with properties and behaviours, which were previously considered to be impossible. The obvious target area, for Couder's discoveries to be fruitfully applied to, had clearly to be in Sub Atomic Physics, so it was that which



persuaded this theoretical Physicist to abandon the purely Maths-led approach and instead research, purely-physically, the possibility of a currently undetectable substrate, yet one which could be both affected-by, and effecting-of, any contained phenomena occurring within it! The problem of where to start was obvious - at the Elementary Particle level. But, all research in that area was totally dominated by giant Accelerators and Colliders, and the Copenhagen, purely-mathematical descriptions and analytical purposes.

That was definitely out!

So, this researcher concentrated upon two factors:-

1. Undetectability
2. Joint particles

The intention was to investigate pairs of Elementary Particles that could form undetectable-yet-stable unions, and also be the active-constituents of a Universal Substrate. The Leptons seemed ideal, and the phenomenon of Pair Production suggested the first candidates, namely the Electron and the Positron.

Now, the usual energy-to-matter explanation of that phenomenon, never convinced me, whereas an undetectable, mutually-orbiting pair of these two particles, which could be dissociated by energy above a certain upper limit made sense from both sets of requirements.

Yet, though we now had an undetectable particle (for it would have no overall electrical Charge or Magnetism or Mass), it certainly didn't appear conducive to forming a coordinating Substrate either.

Yet, hiding-cancelled within it were precisely such properties. Might very close proximity between its individual joint-units allow these to become active? Careful research showed that the answer was, "Yes!" The contained charges and magnetic effects, though cancelled-out at most separations of the Units, did not do so when units were in very close proximity. For then, the charges could be effective when internal, orbiting components from different units got very close to one another. For then, the effects would be both transitory, yet also both recurring and alternately attracting-and-repulsing, causing an oscillation of both the Substrate

Units, as long as they remained very close together. So, in relatively quiescent circumstances, moving individual substrate-units would actually occasionally closely-encounter one another, and then stay together. Over time, all the units would end up in this loosely-connected arrangement, which I called a Paving! And, though this Paving could very easily be dissociated back into separated Units, that would only be very local, and re-association and repair of the Paving would be both easy and quick. Also, when in the Paving, the Units though oscillating, would, on average, be equally spaced apart.

Now, the mutual internal orbiting also allowed each unit to hold a quantum of electromagnetic energy, by means of the promotion of that orbit, but would immediately decant to an adjacent "Empty Unit", and that process of propagation, over those fixed Unit-separations would necessarily also deliver it at a "Constant Speed of Light" too!

Now, elsewhere, such an account as this has been carried through on many fronts - this forms a thorough-going alternative to the Copenhagen Interpretation of Quantum Theory. But in this paper our objective is somewhat different, as the regular discoveries made during that other crucial task have now opened up a whole new area of Physics concerned with an extended hierarchy of Sub-Atomic levels, with discrete functions, all happening within a general, undetectable and multi-level, Universal Substrate.

It soon became necessary to find real physical explanations for exactly how both Electrical and Magnetic Fields are erected and maintained within a particular level of the overall Substrate, and, subsequently, successively reveal the characteristics, properties and even distinct and very different Modes, of these structures, and how they change from one to another.

In particular, the transitions between different modes of a Substrate Level have turned out to enable the explanations of many, so-far-inexplicable phenomena and properties, the most significant being in the dissolution of modes into alternatives, involving very different properties.

The most important being those involving maintained, and stable Vortices.

The Ideal as the Source and Determinator of Reality

Instead of the usual universally-accepted “Empty Space” as the ground for all phenomena, a multi-level, multi-mode complex and both effectible-and-effecting Substrate, could explain a whole raft of phenomena - currently NOT explained, but instead fitted-up to an illegitimate transformation of probability Mathematics, AND a mauling of Philosophy.

Over a remarkably short period since the publication of *The Theory of Emergences* and that of *The Theory of the Double Slit Experiments*, this theoretical undertaking has proceeded apace, and even the topic of Fields Within a Substrate has been established, wholly consistently with the existence of The Quantum, BUT never without it having a *material* intermediary and carrier.

Some 2,500 years ago a remarkable discovery was made in Ancient Greece, which has both empowered and limited Mankind ever since.

You will be well aware of the former conclusion, related to the “realisation of the qualities of Formal Logic”, and will doubtless have heard something of the latter, related to their creation of Mathematics. But, the possibility that both of these are equally true, yet both due to the very same mistake, is totally discounted by that other discovery of theirs - the considered to be primary Formal Logic.

Yet Mathematics actually came first! And, it was the success of that idealistic system, that suggested the same sort of discipline in Reasoning! It was the inclusion within Mathematics of the Principle of Plurality that gave it both solidity and developable power.

For, Mathematics dealt in eternally-fixed and ideal elements, which together allowed the building of a reliable overall system. And, to make the Statements of Reasoning similarly fixed would endow it with the same sort of constructional reliability too.

So, to use Logic to damn or to justify Mathematics is clearly illegitimate.

No, what actually was taken as justifying these (along with the soon to be initiated Science) was the manipulative and developable nature of fixed elements - the pragmatic helpfulness of Plurality. For “If it worked, it is right!” was still a dominant component in Mankind’s thinking, so, here, it enabled the building of coherent systems of ideas in all sorts of areas.

BUT, it also left out of consideration the qualitative changes that not only do happen in all things, but are essential in all trajectories of development.

But, nevertheless, such a simplification was not only understandable, but also essential, for the usually immediately-evident nature of all things in Reality is what we term Stability - so “taking snapshots” of Reality (which is what Plurality delivers) is clearly a necessary first step, even though the relations it delivers are NOT true forever.

Plurality enabled the building of Stable systems, which occur in Reality, but are NOT permanent features of it. Nevertheless, within stable situations, either natural or man-made, such pluralistic relations are useable: It is how Mankind has built all he has. But, over extended time-periods, it will never explain developing Reality.

Indeed, the ancient Greek, Zeno of Elea, was aware of the problems involved in Movement, soon after the original revelations were made. But, no real attention was brought to bear on the difficulties for a further 2,300 years.

Indeed, the temporary successes delivered by Plurality, involving fixed idealised concepts and entities, were sufficient to deliver many many useful things, and our technological world has been its product.

But, in studying nature, and in areas where *qualitative* change is involved and its occurrence unavoidable, the pluralistic approach, necessarily, can only explain it in terms of increasing *Complexity* rather than Qualitative Development, and the Creation of the Entirely New never gets addressed at all!

So, it should be no surprise that all the problems involving real qualitative change, and specifically those involving the first appearance of the Entirely New, can never be successfully addressed without a major Revolution in our intellectual premises and investigative and interpretive approach and methods - the Origin of Life on Earth is the Prime Example!

A start was made some 200 years ago with the Dialectics developed by the Idealist philosopher Hegel, and, thereafter, those made by the Dialectical Materialist philosopher, Karl Marx. But, Marx did not carry over his approach to the key areas of Mathematics and the Sciences. Indeed, that task has only been comprehensively undertaken in the last decade.

Several major developments had to be involved!

The Ideal had to be replaced by the Real!

Plurality had to be replaced by Holism!

And, the study of Stability has to be both added-to and transcended by the study of Emergences - those crucial Interludes, in which Stabilities, first totter, and then totally collapse - to be replaced by wholly new ones at a higher Level!

Though stable periods are generally relatively-long-lasting (some seem to extend to billions of years), their seeming permanence is never (as is usually assumed) due to eternal Natural Laws, but, on the contrary, due to a balance of diverse and even opposing multiple contributing relations, which normally act-together as a local self-maintaining-situation, until some more significant change begins to undermine that balance, which eventually causes some kind of crisis.

Usually, such crises are temporary, and the prior stability is quickly re-established. But, ultimately, there will always be sufficient changes to totally undermine the Stability, and cause a complete collapse - seemingly heading for a total dissolution.

But, it occurs at such a point, that all the restorative features of the Stability are finally lost, and the surprising constructive capabilities of many simultaneous, yet diverse, processes, begin to resolve themselves into new, balancing sub-systems, and then, finally, into an Overall-System-Stability of a wholly new kind.

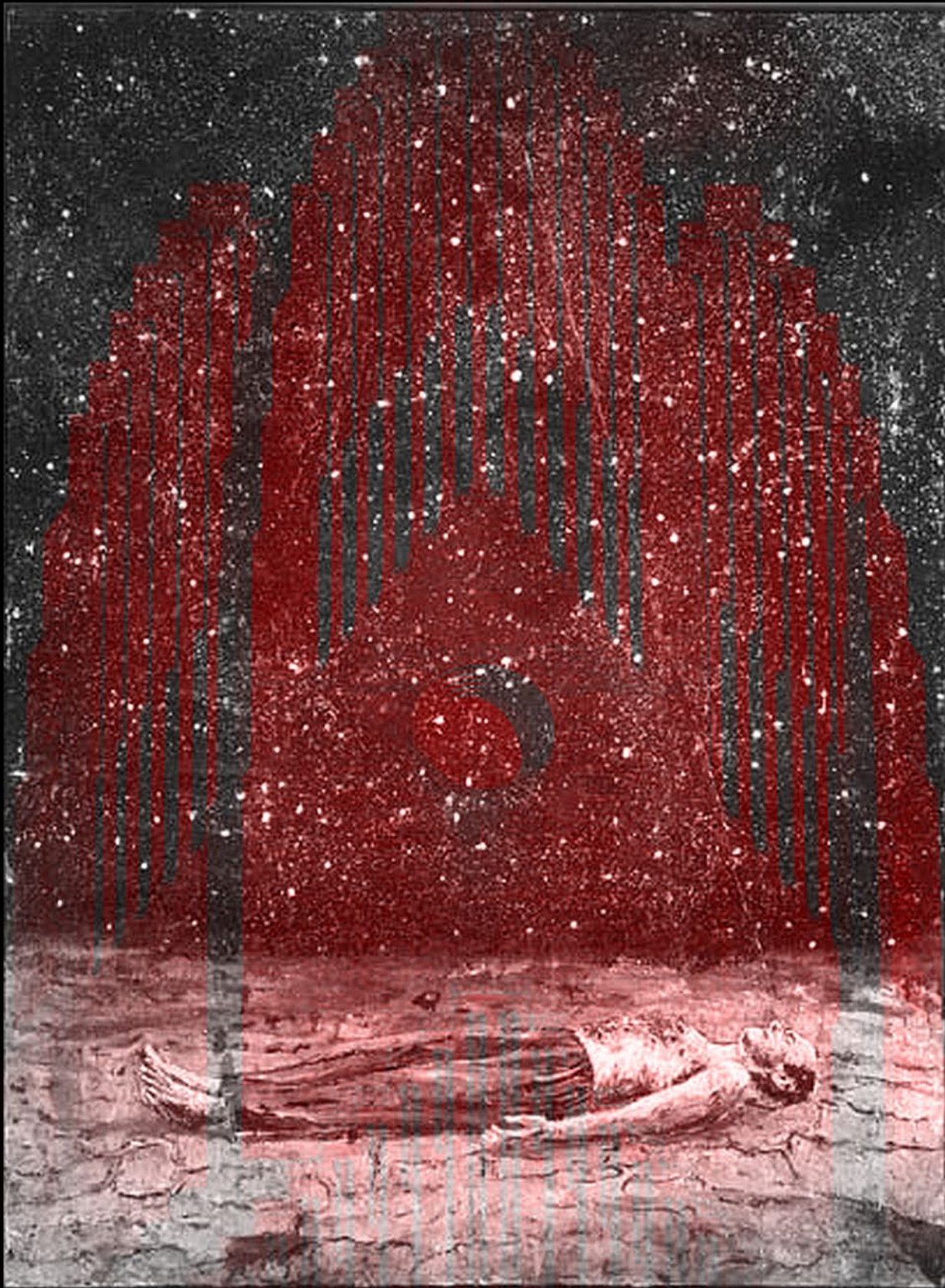
And, remember, all this is generally hidden within a long-persisting Stability, terminated with a sudden, seemingly instantaneous Emergent Interlude, so the observer is only aware of The Switchover, without any revelation of the causing qualitative trajectory of Change!

Though the above is clearly a very brief description of what has had to be applied across the widest range of Pluralist Sciences, elsewhere, the priority has been clearly identified and completed!

It was, of course, the demolition of the staunchly Idealist Copenhagen Interpretation of Quantum Theory, lying at the base of all current specialisms in Physics and Cosmology.

RIP.

Now let's help a new Holist Physics emerge!



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