

ISSUE 65 MAY 19 JIM SCHOFIELD

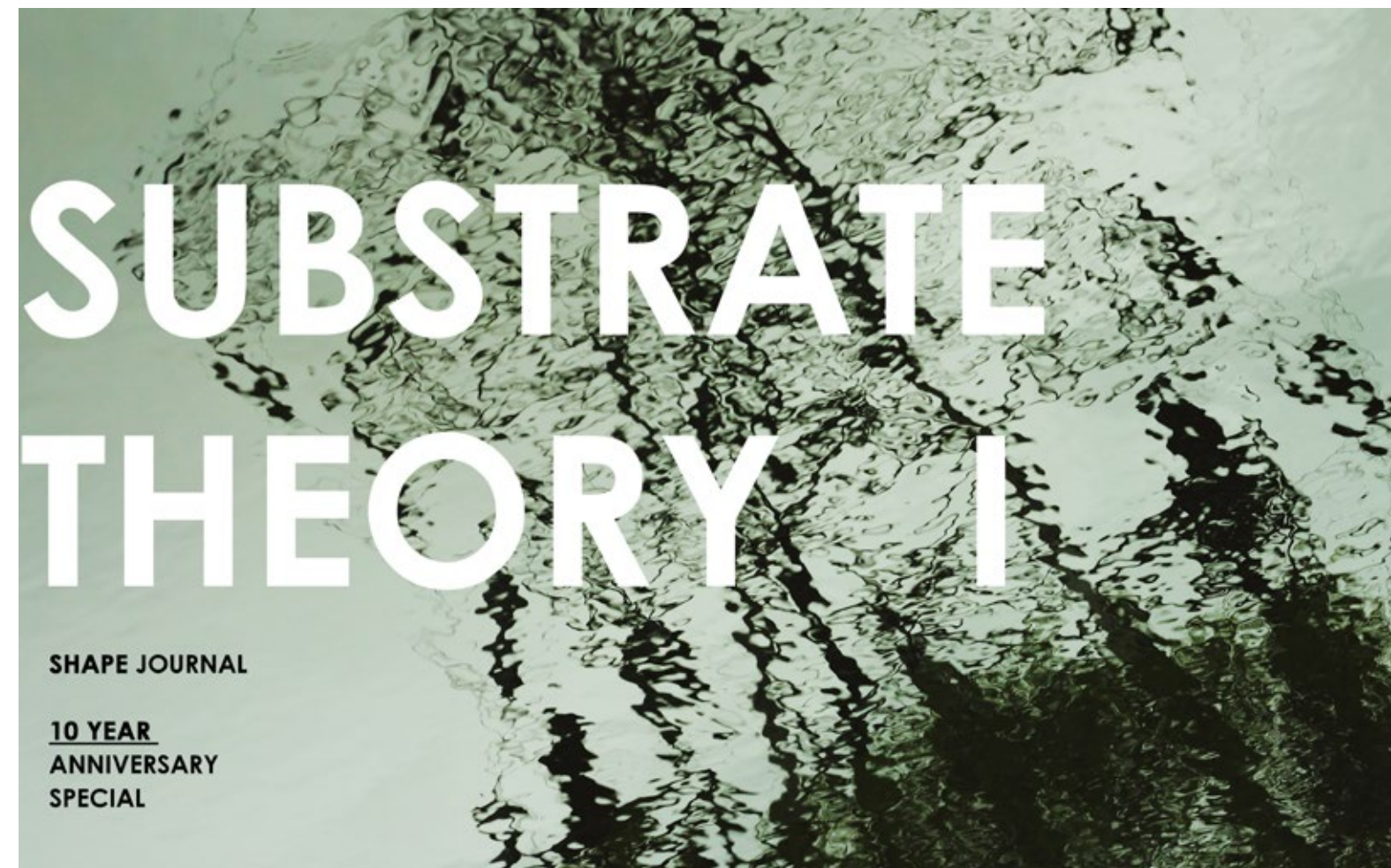
10 YEAR
ANNIVERSARY
SPECIAL

SUBSTRATE THEORY PART ONE

SHAPEJOURNAL

THE LEPTON SUBSTRATES

WHAT IS SUBSTRATE THEORY? / THE HETEROGENEOUS UNIVERSAL SUBSTRATE / THE NECESSARY PREMISE / MAGNETONS
CONSTRUCTING THE LEPTON SUBSTRATES / ACTION-AT-A-DISTANCE EXPLAINED / GRAVITONS AND THE SUBSTRATE



This issue of SHAPE Journal is the first in a two part bumper edition on Jim Schofield's Substrate Theory, curated to mark the 10 year anniversary of this publication, and to finally bring together all of the crucial materials for this burgeoning physics.

Both issues feature photography series *Alternating Current* by Michael C Coldwell

The Lepton Substrates

Issue 65 / May 2019

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What is Substrate Theory?

Preface

by

Mick Schofield



Welcome to Issue 65 of SHAPE Journal, the first in a special two part series which attempts to fully outline Jim Schofield's pivotal theory regarding a Universal Substrate.

This is a completely new approach to sub-atomic physics that hypothesizes the existence of as as-yet undetectable heterogeneous material substance, filling all of known space. Unlike its distant cousin, James Clerk Maxwell's Aether Theory, this new Substrate conception can explain all Quantum phenomena, the anomalies of the Double Slit experiments, Wave/Particle Duality and its own strange illusivity.

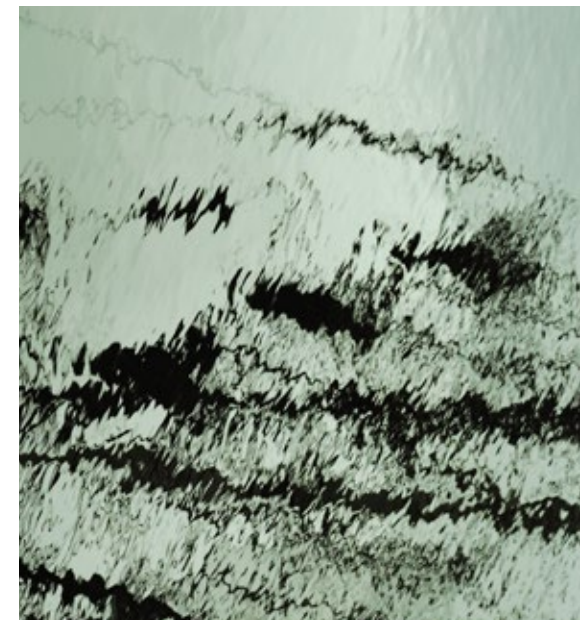
Without wishing to sound hyperbolic, the ideas contained within these issues are nothing less than a revolution in science - a complete rethinking of contemporary physics from the ground up; committing to the scrapheap of scientific progress much of the last century's detour into a realm which we might call Quantum Ideality.

The near-total dominance of Mathematics in the field has lead us further and further away from the material reality we purport to study. The more advanced our technological solutions become, the more convoluted our route to truth, the more self-fulfilling our prophecies.

In Substrate Theory we see a genuine attempt to return physics to materialism, but also to try and explain materially, the many weird and wonderful phenomena we *have* observed at the Quantum Level. This is no simple return to the halcyon days of simpler classical physics, not a retrograde movement at all, but instead a new gesture towards a truly holistic study of the material universe - a methodology that eschews virtual particles, Quantum Entanglement and all manner of Mathematical constructions, which uniformly fail to explain the material causes of the most basic physical phenomena - gravity, the propagation of light across space, disembodied magnetic and electrical fields.

While Substrate Theory certainly has the potential to upturn the entire apple cart of modern physics, the pieces of the puzzle still need assembling, even if all the elements have been devised.

This issue begins that process, collecting together various prior publications on the theory, and weaving them together into a coherent narrative. This is a somewhat difficult undertaking as the ideas are always evolving - the goal posts moving.

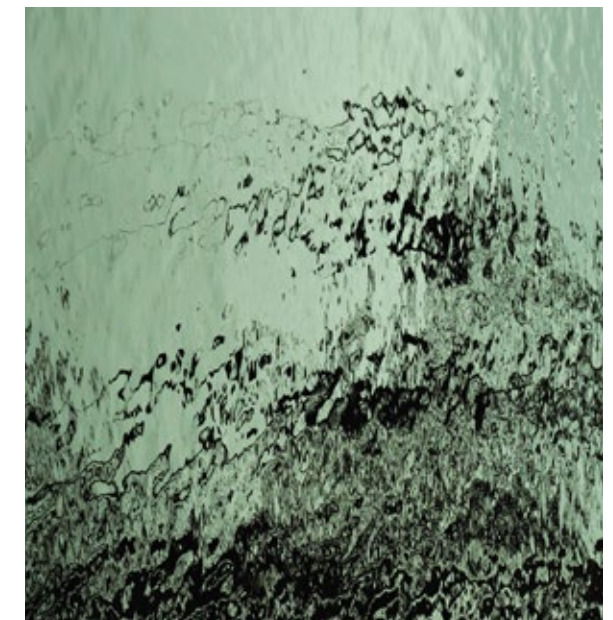


Our editorial solution to this problem is to split the task into two parts.

In the first installment, The Lepton Substrates, past papers on Substrate Theory are collected together in historical order, with some new editorial pointers mindful of when certain ideas were first published, at what point in the theory's evolution certain assertions were made, and that some of the original ideas have been necessarily superceded, but are still required here to understand the theory in general.

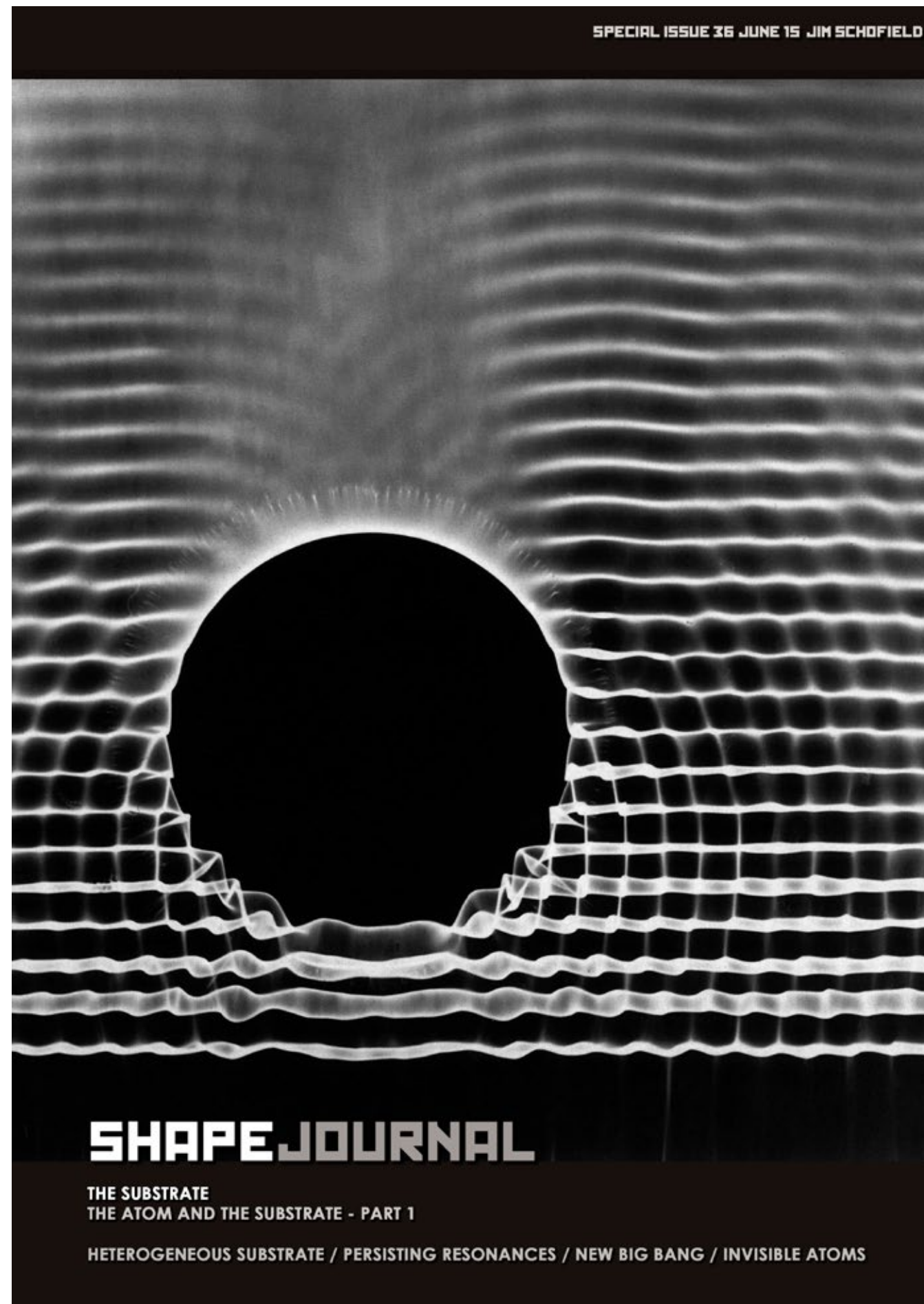
All the foundation arguments and elements of Substrate Theory are explained and discussed here. From the original notion of 'Empty Photons' pervading all space we start to see what these entites might actually be. How pairs of mutually orbiting Lepton particles must be undetectable, but could easily pave 'empty' space. What those different Leptons are and how they can carry quanta of energy in orbits, passing them bucket-brigade across the universe. How quantised orbits may have a material explanation in a dialectical relationship between levels of the Substate.

Over the course of The Lepton Substrates the full picture begins to form and the unexplained contradictions of Quantum Theory start to fall like dominoes.



In the second part of this series, *Towards the New Physics*, we look beyond the nuts and bolts to the potentials, publishing Jim Schofield's latest writing on Substrate Theory, which sees how the Universal Substrate can help tackle all the biggest questions in physics, from the Spacetime Continuum to the Uncertainty Principle, from Casimir Effect, Redshift, Time Crystals, Superfluids and Dark Matter, to Virtual Particles and the work of Frank Wilczek.

What becomes increasingly apparent in all this research is that even if this particular model of a Substrate is wrong, the basic premise that one exists is right. It has been the missing premise since 1927 - the invisible elephant in the room of an ever-more esoteric Physics. Substrate Theory explains far too much to be ignored any longer, in a discipline which has all-but abandoned explanation for the most obscure of Mathematical games.



Papers from *The Atom and the Substrate*

Jim Schofield introduces the world to Substrate Theory in 2015.

The next five articles were originally published in 2015 in another big double issue of SHAPE, *The Atom and the Substrate*.

This was the first attempt at laying out a possible model for what the Substrate may be. The theory was still at an early stage (magnetism and gravity are not yet fully integrated), but many vital concepts and constructions were laid down here for the first time, and this remains the best description of these elementary components.

This writing followed special issues on 'Empty Photons' and the The Theory of the Double Slit (2011) which successfully employed the concept of a substrate to explain both wave/particle duality and the collapse of

the wave function in these experiments. These early achievements lead Schofield to develop these ideas further into a new physical theory, and a fundamental split with the Copenhagen Interpretation of Quantum Theory.

While these papers focus on defining the initial Substrate unit, the Neutriron (or Empty Photon), and relating it to the atom, we see an early admission that while this pair of Leptons can explain propagation of EM radiation, it fails to deliver on magnetic or gravitational fields. Schofield begins to examine whether other Lepton pairs could deliver these as part of a heterogeneous mix.

These are described in detail later in the issue.

The Invisible (yet Active)

Contents of Empty Space

Following a long investigation into various phenomena revealed since the discovery of the Quantum, over a century ago, it becomes increasingly clear that the anomalies that came up could only be addressed in a scientific, explanatory way, by the assumption of a physical substrate filling all of so-called “Empty Space”. Of course, such a substrate was not an original idea, for it seems an inevitable conception when attempting to explain what actually and persistently happens there, so it has come up before.

At one time all scientists believed in such a substrate, which they called The Ether, and though it was entirely a theoretical construct, it did seem to answer many of the questions posed by phenomena of “Empty Space”.

Indeed, it was on the basis of a conceived-of Ether that James Clerk Maxwell derived his equations of Electromagnetism, which are still used to this day!

But, that theoretical medium was never found. Try as they might, the scientists involved could find nothing that actually fitted the bill, and the whole concept was eventually dropped. Yet, similar undetectables have always been considered, and new ones are added to the list of necessary substances all the time, to “theoretically” explain anomalies – from Dark Matter to Dark Energy, and invisible Dimensions galore!

Frankly, there has to be something out there, which is both susceptible to disturbance and positively reactive, but which cannot, by the usual means, be positively and directly detected.

As a theoretical exercise, therefore, this researcher attempted to devise a particle, which was of no net charge, no magnetic effects and remarkably no apparent matter content either. Clearly, the only way, such an entity could possibly exist, was by it being composed of other

sub-particles with opposite properties, which effectively cancelled each other out, within a stable union. Now, there is a well-established model that could be used as a starting point. It is, of course, The Atom!

It may not, initially, seem appropriate, until we consider its Form and its widespread occurrence throughout the whole of known Reality.

In the simplest case, the Hydrogen Atom, it consists of a positively charged proton, orbited by a negatively charged electron. And this delivered a neutral entity, but with an evident net Mass and a magnetic dipole effect. But, it is remarkably stable, and its two elements are kept apart, in spite of their opposite charges, by the relative speeds they had, on first encounter, which was transformed into the speed of orbiting, and thus kept them apart.

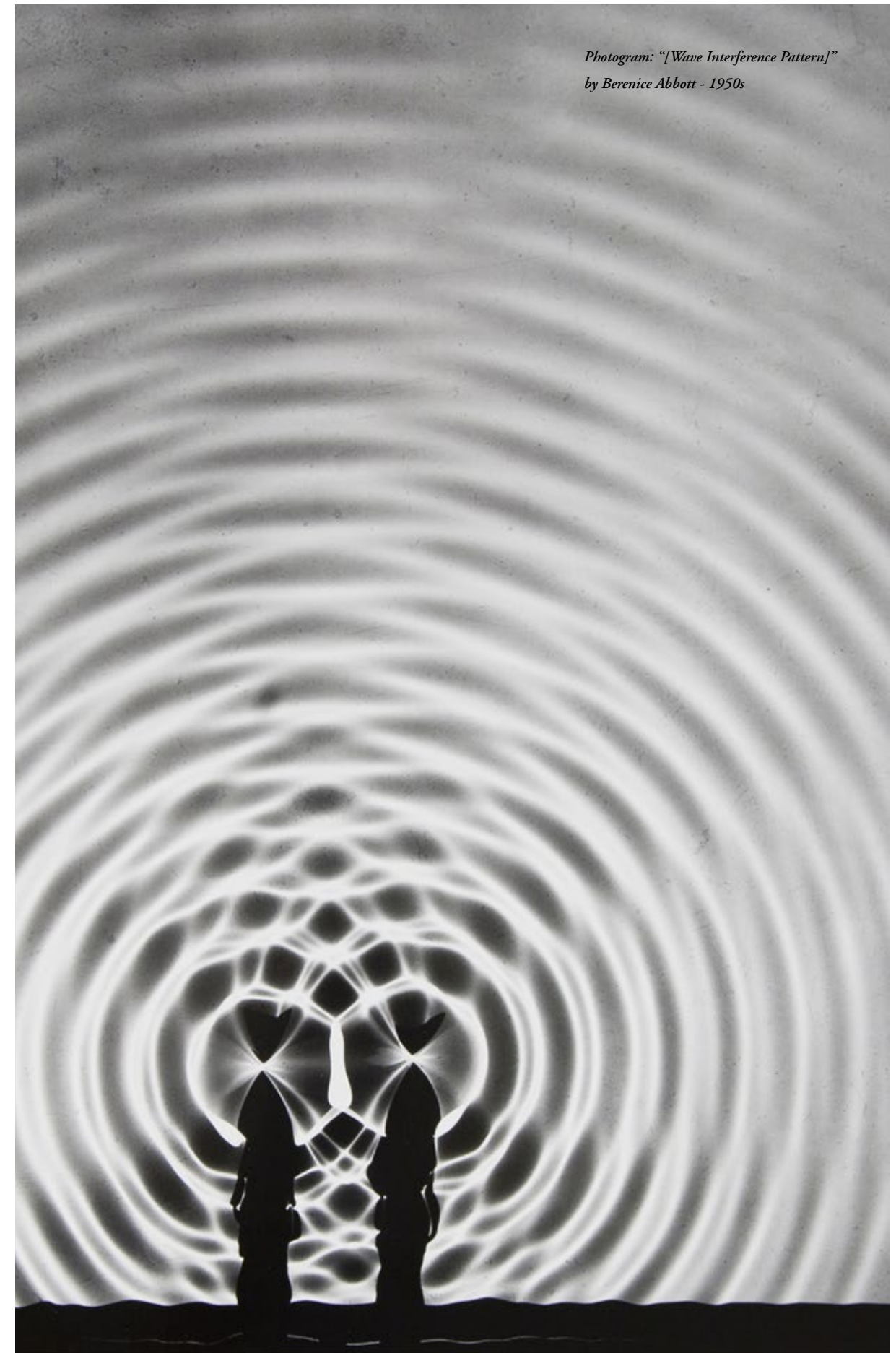
It is not an unusual pattern, for, as we know in Cosmology, Stars, Planets, Moons and even Galaxies follow very similar stable patterns indeed.

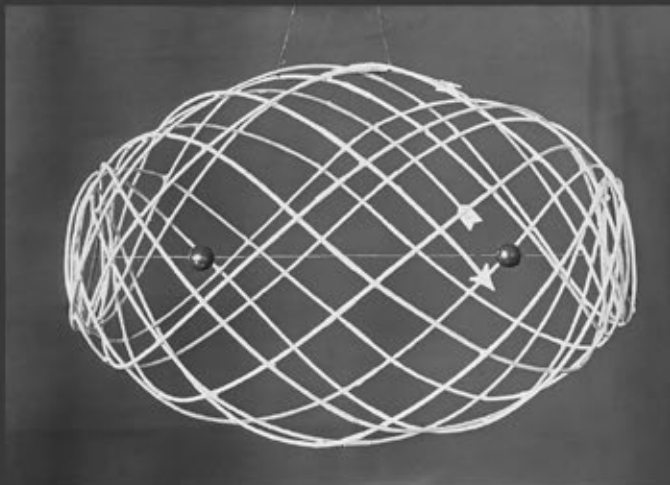
The question becomes, “Could we construct another joint particle, on the model of the atom, which could cancel out all the properties of its component parts, and thus become undetectable?” For, if the two components were of exactly equal size and opposite charge, both the net charge and the magnetic effects in the combined particle would be zero.

All that remained and spoiled our intentions was the unavoidable and eminently detectable Mass!

Clearly, the question presents itself, “Could we have sub-particles of directly opposite matter types?” For example, if we used one electron and one positron, with one of ordinary matter and the other of antimatter, perhaps the result might be an undetectable joint particle? But, not only that! As with the atom, it could also contain extra

*Photogram: “[Wave Interference Pattern]”
by Berenice Abbott - 1950s*





Invisible Atoms

Let us consider the usual model of the atom, and its ability to hold energy internally via the orbit of its outermost electron. Now, we have a workable theory that limits the possible orbits to a set of discrete radii, so that incoming energy can promote such an orbit, while outgoing energy demotes such an orbit to a lower allowed level. If true, we have a direct relation between energy and these orbits.

If it had only one possible promoted orbit above its intrinsic base level, then things would be different, but there are in fact many of these legitimate orbits, and a demotion is not always down to the bottommost, base level, but can be between promoted levels. Thus, the actual frequency of the orbiting electron is NOT the frequency of the outgoing quantum of electromagnetic energy. It relates to the energy difference between the two levels involved.

Hence, our conclusion is confirmed: it isn't a physically communicated frequency that is delivered, but a frequency directly determined by the energy difference between levels. So, orbits and oscillations are merely the modes of existence of energy, and as physical movements can be communicated from a source atom to something else, with similar capabilities.

The idea of the totally disembodied quantum of energy, in these terms, seems meaningless.

Now, the assumption of an invisible medium, composed of physical, yet undetectable particles, is the better conception for how such quanta could be propagated across what appears to be totally Empty Space. But, in spite of the attraction of this idea, the failure to detect such a medium was a major problem. Science shelved the issue, yet continued to use James Clerk Maxwell's equations of Electromagnetism, which were derived on the assumption of a physical (if undetectable) medium.

It was, as is common when such an impasse is encountered, a pragmatic fix! But, after the discovery of the quantum, and many evident anomalies, this hole in theory, just had to be addressed. Could there be a medium composed of real, yet undetectable, particles, which, on the model of the known atom, could handle these quanta of energy, in such a way as to propagate it over what otherwise would be seen as totally Empty Space? And, if this substrate consisted of mutually orbiting pairs (on the model of the atom), but at the same time neutral in-every-aspect, then the problems could be solved.

It was these considerations that led to the theoretical definition of the Empty Photon or *Neutrtron*.

Defining the Neutrtron

This is a joint particle consisting of two mutually orbiting sub particles.

One is an electron - negatively charged and composed of ordinary matter.

The other is a positron - positively charged and composed of antimatter.

Thus, to our usual methods of detection this entity is *invisible*. And yet its joint orbit could be promoted by absorbing energy, and demoted by its release - just like in an atom. Such a particle could feasibly propagate electromagnetic energy via a bucket-brigade transfer of energy from unit to unit of a substrate (paving of space) consisting of such Neutrtrons in close proximity to one another.

Also, if by some transition too much energy were endowed to such a unit, it would dissociate into its components - an electron and a positron - giving us a physical explanation for the well known phenomenon called *Pair Production*!

While in the opposite direction a separated pair of these same components with the appropriate orientations and speeds, could seemingly vanish by forming a new mutually orbiting pair - giving us a physical explanation for Pair Annihilation.

A Final Point: All the anomalies of the famed Double Slit experiments can also be physically explained by the presence of a universal substrate of these joint entities, without any recourse whatsoever to the consensus Copenhagenist stance.



electromagnetic energy in the very same way, by the promotion of the orbits to a higher energy level. And, in the same way could release that energy via the demotion of such orbits.

Doesn't this ring a bell? Have we not defined a physical Photon? It would be undetectable as a particle, but could carry energy within it!

But, as well as existing as a "disembodied" quantum of energy, it could also exist everywhere without any extra energy, and be totally undetectable: it could be the basis of an undetectable substrate – as an "Empty Photon"?

Now, this entity, or something very like it, might well answer quite a few questions currently unexplained in Modern Physics. And, one famous experiment literally cried out for such an entity. It was, of course, The Double Slit Experiment.

But, to play a role in that experiment, this particle would, somehow, have to be literally everywhere, forming some kind of substrate. So, it was, therefore, conceived of as forming a "Universal Paving" composed of these particles – not a liquid or a solid, put a Paving of discrete particles in a close-packed formation, actually filling all of Space.

NOTE: And this would be a new phase of matter, because its inter-particle effects would be almost non-existent. So, without the usual electromagnetic linkages, it certainly would be nothing like a solid or a liquid. And, of course, NO action-at-a-distance would be involved. The substrate, itself, would deliver all communications in a bucket-brigade, unit-to-unit way!

The problems and anomalies of the whole range of Double Slit Experiments were tackled with this paving as a universal intermediary, between the missiles fired at the Slits, and finally recorded upon an ultimate detection screen, and everything was causally explained!

Yes, absolutely everything, including the vanishing of phenomena when things were attempted to be detected in various regions of the experiment. Compared to the usual Copenhagen-based standpoint, with its Wave/Particle Duality and Probability

Mathematics, this alternative was infinitely preferable, and didn't involve the major idealistic retreat of the Copenhageners. It was, indeed, worth investigating, and delivered a theory containing more Objective Content than that which it replaced.

As always, of course, such a theory cannot claim to be the Absolute Truth, but using the criterion of containing more Objective Content, it had to replace the usual theory.

And, the most important unexplained phenomenon in Nature is surely the Propagation of Electromagnetic Energy (such as Light) through totally Empty Space. Could our suggested paving of these undetectable particles fit the bill? The answer was, once again, a resounding, "Yes!"

For, the quanta of electromagnetic energy could be passed on from unit-to-unit, in a bucket-brigade fashion, and the renowned, but unexplained constant Speed of Light would now be merely the speed of transfer from one particle of the paving to the next.

And, to cap it all, this actual particle has been observed in the Tevatron at Fermilab, and there termed the Positronium. And though, in those circumstances, it was shown to have an incredibly short lifespan before it dissociated back into its components, that is what you would expect to happen in that strange environment. It was an assumed stable version that would play the role within such a universal structure as a general paving of "Empty Space".

Now, before everyone has a fit, let us be clear what has been achieved here. It was from the outset a purely theoretical construct to see if something like this was possible. The Positronium (or Neutrtron, as its deviser has called it) may not be "the Truth"! But, something like it may actually be involved.

And, as it has turned out in this continuing line of investigations, this particle alone cannot be the sole ingredient that permeates the entire universe, for, in spite of its successes, it has also failed to explain (with its current composition at any rate) several other major

Apples and Oranges

Handling Quanta

questions that also have to be answered for such a space-filling substrate. For example, it cannot explain Fields, both electrical and magnetic, and even more importantly, it cannot explain Gravity.

Yet, why should such a substrate be simple? We like things to be simple and elegant but this doesn't mean that they are! Why should it contain only one kind of elementary unit?

We have a good, general analogistic model, involving the cancelling out of properties via mutually-orbiting sub particles. Could not space be filled with a variety of such similarly undetectable units, but with different contents and modes of existence? Using the same basic premises, it is surely possible to devise other joint particles with different properties to the Neutritron, which because of their differences may well be able to deliver all the as yet unexplained features?

The necessary theoretical line was obvious.

Could we, theoretically, devise other undetectable particles, which could deliver the other phenomena?

And, in the initial attack upon electrostatic fields, it was attempted using this time, the pair of mirror-image joint particles, which in equal numbers, and moving about randomly could also be effective en mass – for they would cancel out over the population instead of within each and every joint particle. And, by making the joint pairs those of unequally-sized particles, these could deliver effects that the Neutritrons could not.

Now, this research is still in the early stages, but already several concepts have been considered – the static paving AND the randomly moving, gas-like entities.

But, as with the matter states of Solid, Liquid and Gas, we can conceive of different states or phases, which could act together to ultimately deliver all the phenomena occurring in so called “Empty Space”, a space that is in fact anything but empty.

The research proceeds!

In considering both the origination and the propagation of quanta of electromagnetic energy, we must go a little deeper in comparing the atom and the neutritron. For though atoms have their own set of quantized energy levels for their orbiting electrons, which are determined by the nature of the substance of which the atom is the smallest unit, that cannot be said of the neutritron, for it is supposed to propagate ALL possible quanta from ALL possible atoms. So, it cannot have such a predetermined set of allowable levels: it must accommodate absolutely all possible quanta from all possible sources, within quite wide limits.

Now though the neutritron handles all possible quanta from atoms, it will not be able to handle any beyond a certain maximum threshold value. For, above that, the neutritron itself would dissociate into its components – one electron and one positron (giving us Pair Production).

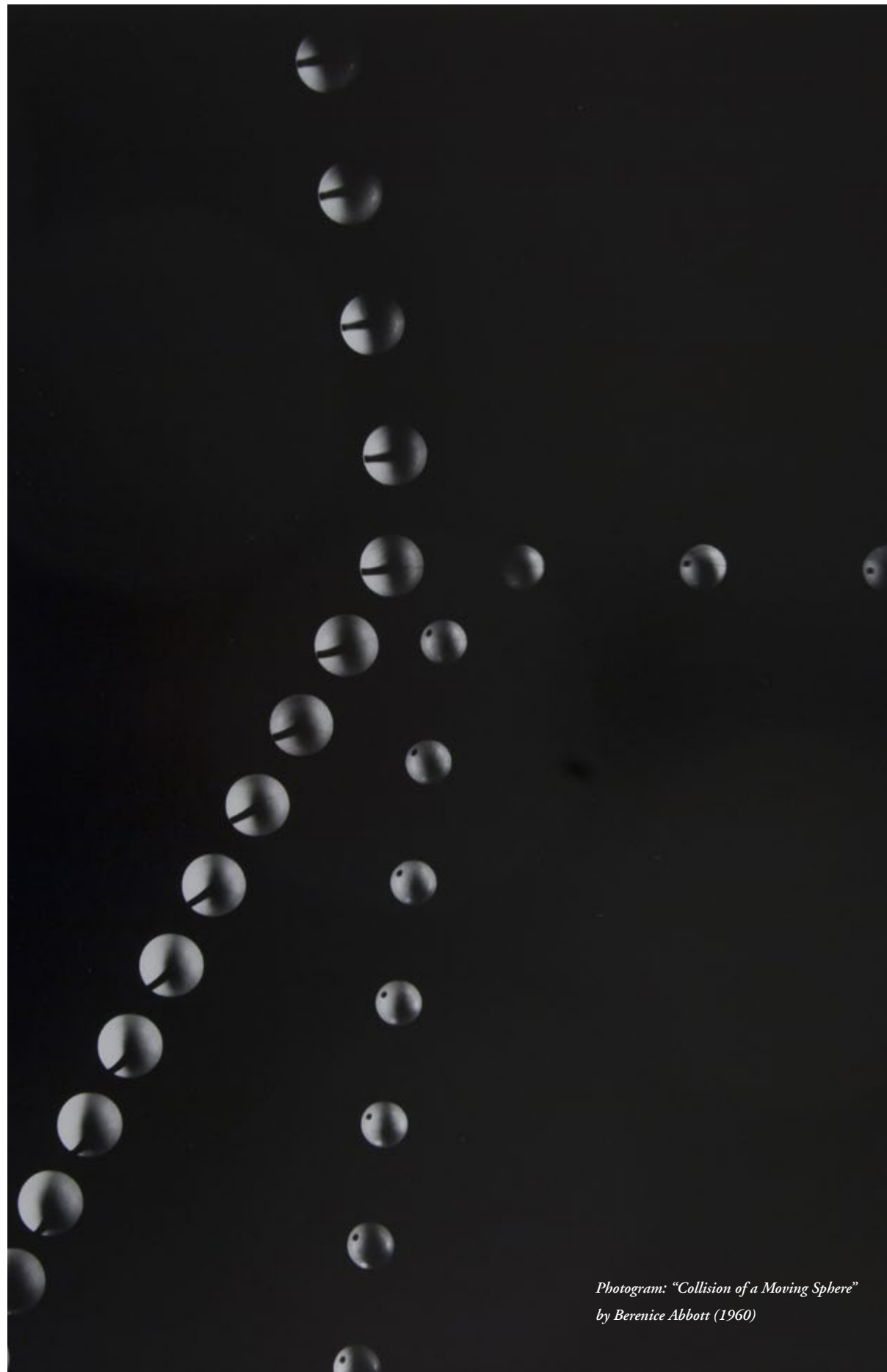
The atom is very different. For, instead of a completely flexible capacity, it can only deal in a fixed range of discrete energy levels, and consequently discrete values for the quanta that it can absorb and emit. It is this very feature that allows the type of atom from which energy had originated to be precisely defined and recognised. While, the necessary intermediary, allowing the propagation of such energy, though similar in many ways, MUST be capable of transferring almost any size quanta. It is even possible to state categorically that it is the type of atom involved, which determines the precise nature, both in frequency and energy amount that are propagated throughout the Universe.

The original source always being what determined that, while the neutritrons of the substrate, have no such limitations, and can handle all sizes of quantum (up to its upper dissociation limit). Let us probe a little further. The only stable state of an electron orbiting within a particular type of atom has to be in what is termed its Base State. This state is determined by the actual construction

of the atom: it is intrinsic to the atom continuing to exist. All possible levels, above this base level, are transitory, unless the context, in which the atom exists, is such as to prevent it unloading that elevated quantum of energy. And, this could only be the case if there was nowhere close for the quantum to be released to.

Now, such a condition is a profound consequence, which is only likely, if all other nearby atoms are already promoted in the very same way. The general state of the substance involved can prevent demotion and release; otherwise, the promoted situation will immediately demote to release its quantum. The only condition is that there is an un-promoted atom nearby to receive that quantum. But, if all the interstices of Space within that atom's vicinity were occupied with already filled neutritrons, with no built in quantized levels, then, the only option that the quantum would have, would be to stay where it was, within its current atom. Such situations in such circumstances would be normal, as with such ease of propagation, energy would move into a locality until all units of the substrate were at the same level, and, from there, any atoms would be promoted generally to equal levels too.

You can't naturally move uphill, so the quantum will stay where it was. Clearly, we cannot deal with the issues addressed here, by treating an atom and its elevated internal state in isolation. It will behave differently depending upon its Context! Indeed, within a given context, which is everywhere elevated to the same level, the quanta within atoms will stay where they are. But, an atom elevated within a context that has not been so elevated, will immediately unload its quantum to the nearest available recipient. It could be another atom, but in the most general context, it will be to a unit of the substrate - a neutritron, which, itself, being then elevated, will immediately decant to the next available unit - usually another neutritron.



Photogram: "Collision of a Moving Sphere"
by Berenice Abbott (1960)

Now, because we are assuming a common means of propagation, via a universal substrate of such neutritrons, whatever the original transmitting atom, and whatever the size and nature of the quantum involved, we are clearly dealing with different entities when talking about atoms and neutritrons.

NOTE: In Couder's Walker experiments, he was able to produce his Walkers merely by the interactions (both resonant and recursive) of vibrations within a single substrate, AND a remarkable and contributing sub mode of the same substrate as a bouncing drop. But, when he added an overall rotation to the whole set up, he was able to produce quantized orbits to his Walkers.

Now, the analogy is obvious, and may turn out to be crucially important! The atom with quantization is like the Walker with an overall rotation, while the neutritron is more like the Walker before the quantizations were produced by the added rotation.

Of course, such analogies are always both simplified and idealised models, but they can, nevertheless, have more Objective Content – more aspects or parts of the truth, and therefore deliver legitimate steps forward: they can certainly replace what so evidently delivers less!

One major implied rule seems necessary to be overtly expressed here. Once formed, a quantum of electromagnetic energy will reside in an appropriate vehicle – be it an atom or a neutritron, and will not be able to be eroded or divided in any way. It will retain its characteristics in all subsequent transfers between such vehicles.

The problem of the atom seems to be that its structure will only allow certain fixed (quantized) internal levels, whereas the neutritron has no such limitations (apart, that is, from its dissociation, due to a too large a gobblet of energy transfer), it will take, retain and maintain what is given to it, until the conditions for an unloading occur, when it will immediately deliver that quantum.

Hidden Levels of Reality

What is rapidly becoming clear, following the assumption of a Universal, yet invisible, Substrate, embracing the entire Cosmos, is that several hierarchical levels must exist below that of our literally beloved Fundamental Particles.

Indeed, once the known phenomena of these previously considered bottom-most entities of Reality are situated within such a substrate, rather than the current idea of a totally Empty Space, it produces, immediately, at least two extra levels.

Initially, a substrate was devised as composed entirely of units (neutritrons), which were, themselves, a union of two already known sub-particles mutually orbiting one another, in a closely similar way to the usual model of the atom. This was suggested, initially theoretically, as a means of causing the joint particle's invisibility delivered by quite normal and well known properties, which, nevertheless, made them undetectable directly by the usual methods. The sub-particles were of opposite charge and matter type, yet were exactly equal in size to one another.

The resulting unit, the neutritron, (already observed at Fermilab and there named the positronium), was, because of the cancelling properties of its components, made invisible (undetectable), yet could both hold and deliver gobbets of electromagnetic energy, and hence finally remove the anomaly of so-called disembodied radiation being an oscillation of nothing in a totally Empty Space. It also removed all the other anomalies thrown up by the infamous Double Slit Experiments.

Yet, as Yves Couder's experiments have shown, such a substrate (in his case silicone oil) could, entirely alone, deliver phenomena such as his famous Walkers, without the involvement of any other entities whatsoever. Couder's Walkers were merely phenomena of his substrate alone, affected by a set of oscillations interacting with one another in a remarkable way. So. Any Universal substrate should deliver similar phenomena also! Now,

even the suggested extra levels are unlikely to cover all possibilities.

The neutritron, for example, couldn't explain electromagnetic fields subtended into what was usually considered to be Empty Space. And, even when other invisible particles were also included, which could, indeed, deliver such phenomena, there still remained the outstanding problem of Gravity to be explained.

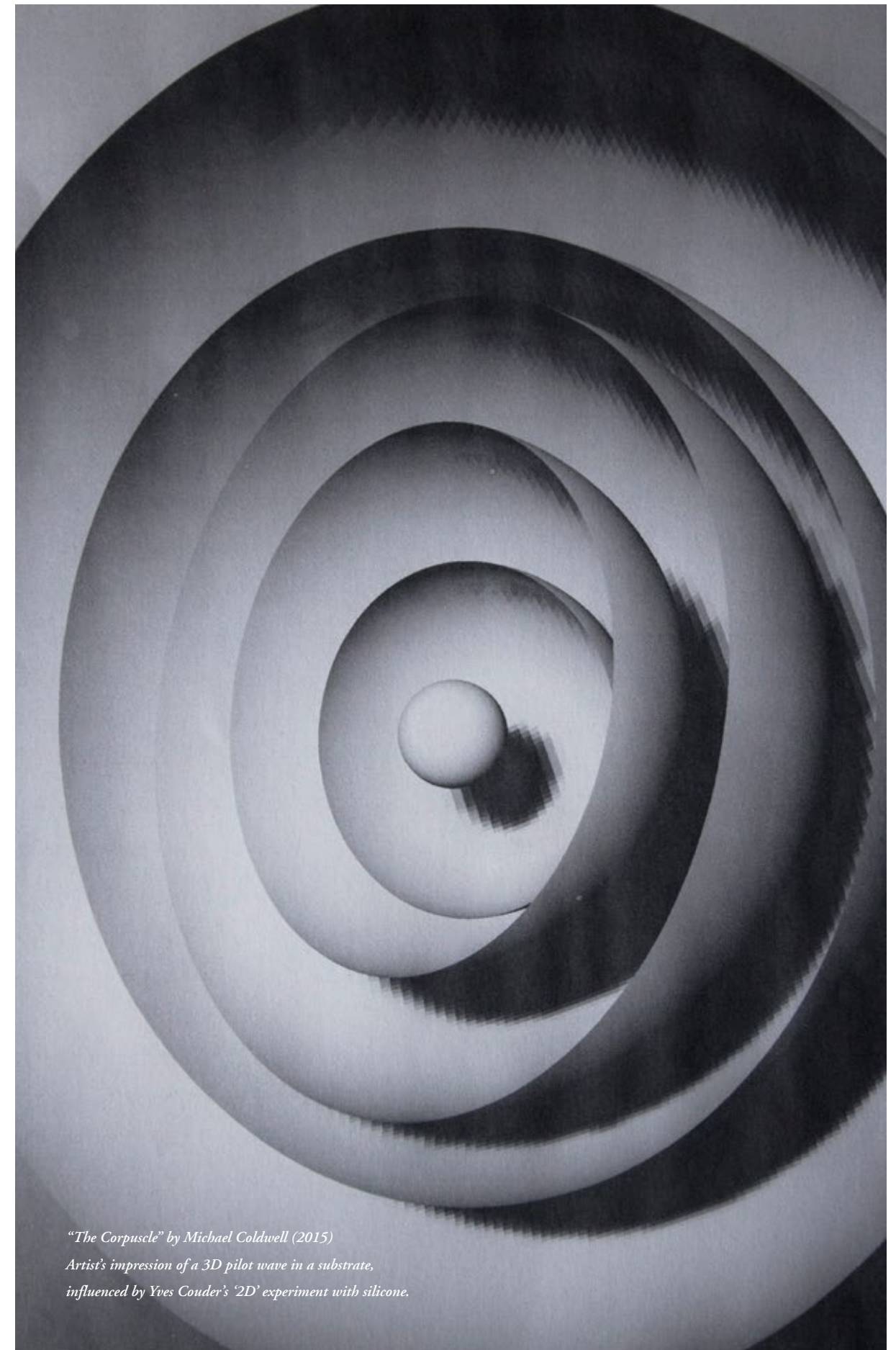
Clearly, this new approach is insistently, and primarily, physical – and not at all formal.

So, Einstein's purely formal Space-Time Continuum will have to be explained physically, in terms of a real physical level too!

Indeed, it is even more involved than that. Theoretical investigations have placed the new Universal Substrate not only surrounding all of Reality's material objects, but also even within the atoms themselves – filling their inner spaces too, and creating a very different environment from so-called Empty Space. Indeed, within atoms, wholly new phenomena are already known – such as the unexplained stability of electron orbits, and their lack of energy losses, which in unconstrained circumstances would normally be the case in similar circuses at other levels. Somehow, the stability of such orbits is achieved physically, and that will certainly require a full explanation.

Note: Physicists familiar with the History of the Sub-Atomic Realm will be aware of the various attempts to oppose the Copenhagen retreat, by also considering Hidden Levels. David Bohm's ideas were of this nature, though he was never able to reveal what any of these hidden levels could be.

But, it must be emphasised that ALL the alternatives (including Einstein's stance), were compromised at a much deeper level. Indeed, all three alternatives rested unavoidably upon an amalgam of contradictory



"The Corpuscle" by Michael Coldwell (2015)

*Artist's impression of a 3D pilot wave in a substrate,
influenced by Yves Couder's '2D' experiment with silicone.*



Sculpture: "Quantum Cloud"
by Antony Gormley (1999)

premises, which had been juggled between for millennia. And, the most fundamental of all was the belief in eternal Natural Laws, which could be encapsulated in purely Formal Relations. They all believed this, yet arrived at contradictory positions in attempting to answer the more basic question – “Why?”

With the research intimated here, we are pursuing a similar path to Bohm, but with very different imperatives. First, we believe that many important phenomena cannot be explained without some form of invisible substrate. BUT still constructed from already known particles in various combinations that make them impossible to detect by the usual methods. Already, three quite separate proposals have been addressed

1. Propagation & the Double Slit anomalies (Schofield [U.K]).
2. Electromagnetic Fields via Magnetic Particles (Tambe [India])
3. Gravity via Multiple Levels of “Ethereal Particles” (Borchardt [U.S.A])

But, what seems to be making these new routes possible is the abandonment of the universally adopted Plurality, for the much more real Holism, and a steadfast abandonment of Formalism (Mathematics) as the essence of Reality. It is essentially a philosophical revolution, but still at it's beginnings!

>>EDITOR'S NOTE:

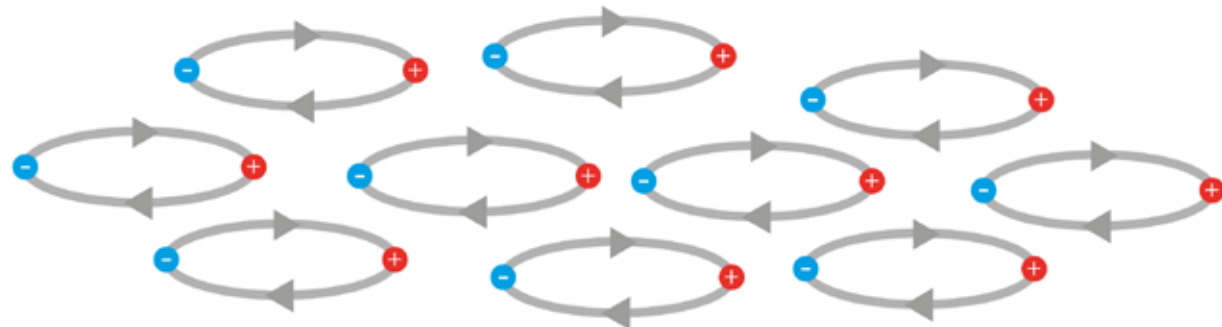
These imports from the work of Tambe and Borchardt to help cover magnetism and gravity have since been superceded in Substrate Theory (using Muons, Taus and Neutrinos), but they do show how these ideas began, especially with regard to a material Substrate operating at multiple levels of reality, and vastly different scales.

See The Nanocosm (Special 52, 2017) for further reading.

*The following paper entitled **The Heterogeneous Universal Substrate** also suffers from these early mis-steps, using Borchardt's ethereal particles to try and explain gravity in terms of a Substrate. These ideas have been replaced, but the paper is included here for its diagrams, and to show the evolution of these ideas.*

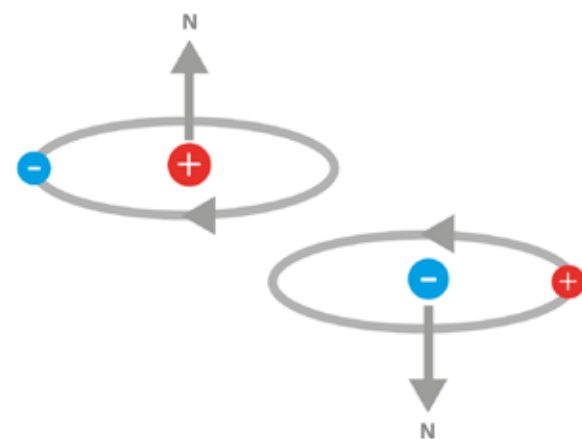
THE HETEROGENEOUS SUBSTRATE

The suggested components of the substrate are as follows



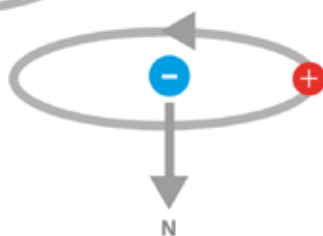
THE NEUTRITRON

Above is a formal diagram of a static substrate of Neutrित्रons, which consist of a mutually orbiting positron (antimatter) and electron (matter), allowing the propagation of EM radiation throughout all space.



THE TWO MAGNETONS

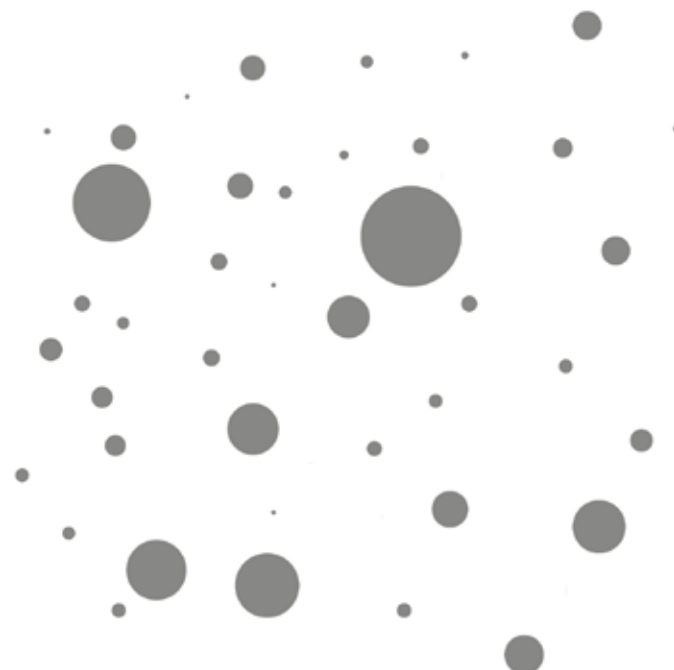
A randomly moving substrate of magnetons which come in two configurations, mirror images in both charge and matter type, allowing the propagation of magnetic fields.



THE ETHEREAL PARTICLES

Right is a formal diagram of a randomly moving and constantly colliding substrate of ethereal particles, also neutral in all respects. These particles come in many different sizes, each effecting bigger ones, finally delivering gravity to aggregate masses.

I intend to construct an analogistic model of this universal substrate composed of all three above particle types, in the manner of James Clerk Maxwell's model of the Ether.



The Heterogeneous Universal Substrate

This work represents my first attempt to construct an analogistic model of a Universal Substrate - a sea of particles permeating all space - in the manner of James Clerk Maxwell's model of the Ether. This new model will attempt to explain propagation of light, electric and magnetic fields, and even gravity, in terms of a heterogeneous "paving" of the Universe.

The proposed components of this substrate are depicted opposite - they are the Neutrित्रon, the Magnetons and a series of inert "Ethereal Particles". I have written much on the neutrित्रon (empty photon) before, but these other particles are new considerations.

THE MAGNETONS - These two differ from the neutrित्रon in being composed of a pair of particles of different size, which dramatically changes the form of the pair of components in each, and gives each a magnetic moment. They conform to the same principles of "invisibility" as the neutrित्रon in their mix of opposite charges and matter types. The two magnetons are

effectively mirror images of one another, so that in a random mix of equal numbers of each kind, the overall result will be neutral in every respect, including a cancelling of their magnetism.

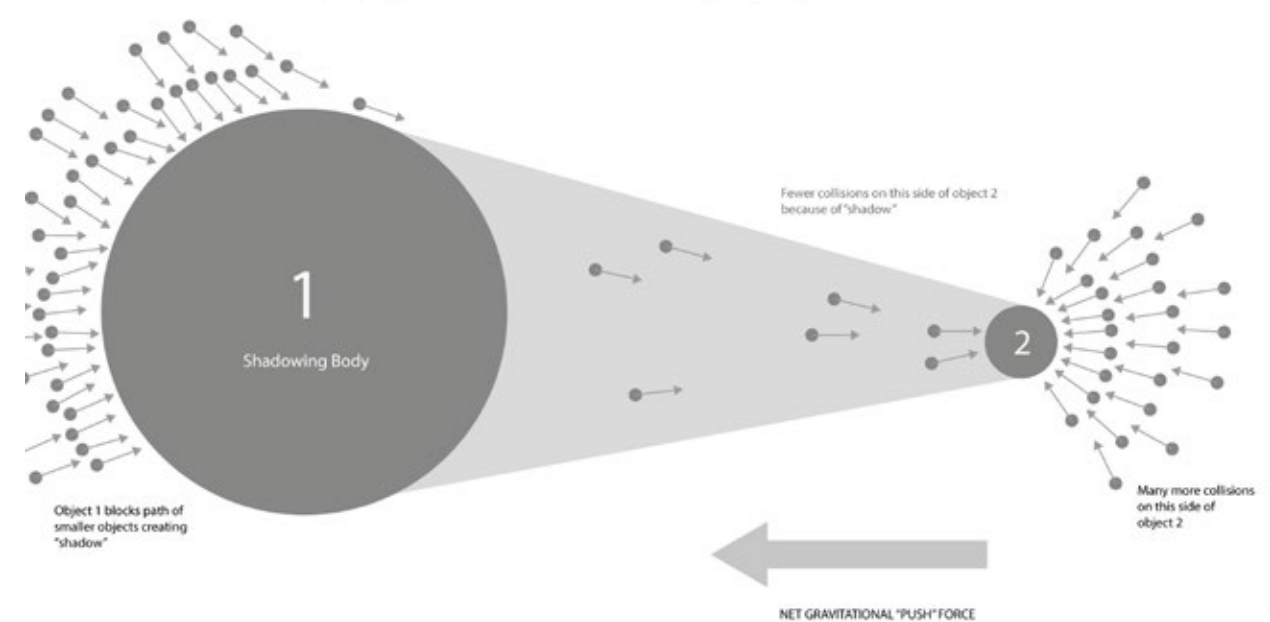
THE ETHEREAL PARTICLES - Now these elements of the substrate were devised purely as a physical explanation of gravity, by means of the "push" effect of their collisions. They are neutral in every respect, but are of different sizes (literally infinite in extent going downwards to ever-smaller sizes).

The key function is termed "Shadowing" - bigger entities shield adjacent particles from some collisions in the direction of the shielding body, and hence resulting in a net preponderance of hits towards that body. With a host of such sizes, the overall results everywhere is for movement towards larger bodies.

The idea is illustrated below.

GRAVITY BY SHADOWING

Based on Glenn Borchardt's theory of gravity via an infinite scale of Ethereal Particles - gravity as a push force!



These are not all the products of this theorist's work alone. The Neutritrons and the Magnetons are my inventions, however that conception of magnetic fields in space was originally introduced to me by Mohan Tambe, while the idea of "Aetherial Particles" causing gravity was developed by Glenn Borchardt.

The original inspiration for the heterogeneous substrate came from James Clerk Maxwell's conception of the Ether, a diagram of which is included below.

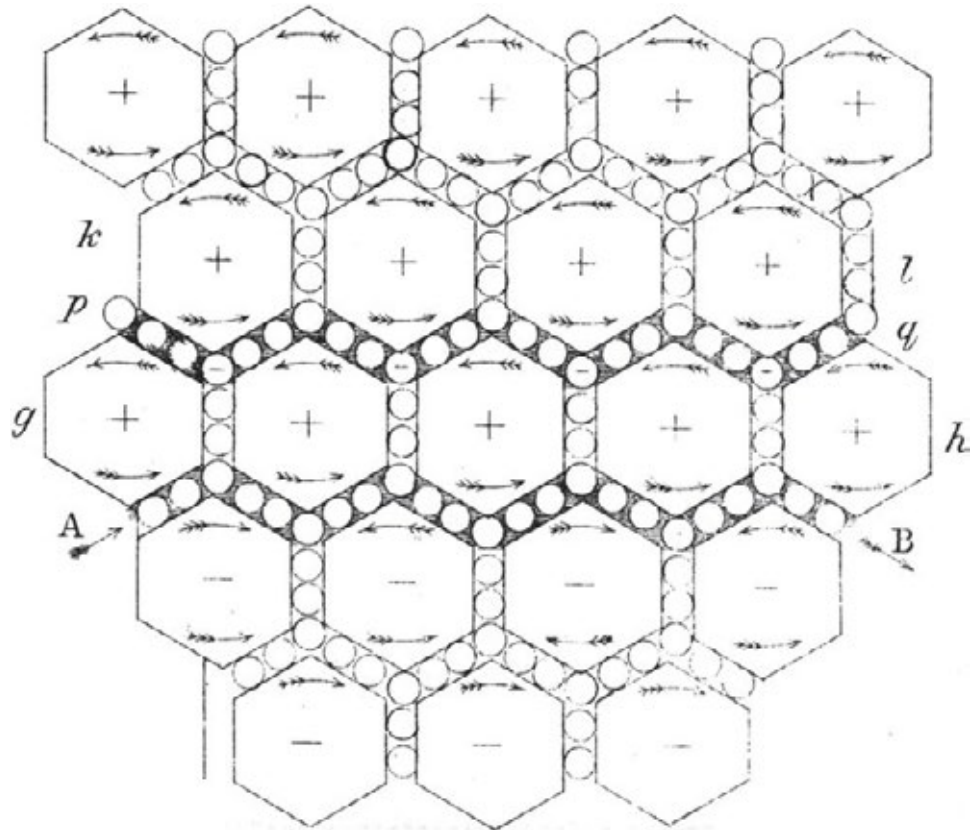
Notice that his substrate is also heterogeneous. It is composed of static "vortices" and moving "electrical particles". So if we admit a certain amount of Objective Content to Maxwell's discarded model (remember we still use his derived equations for electromagnetism), we should at least attempt to update it - including our current suggestions as to how a universal substrate could remain undetectable.

And crucially we must not lose sight of several important properties of our proposed components (above).

First, they are all, either individually, or in-collection, neutral in all the usual measurable ways. But, they act together differently.

The neutritrons form a relatively static paving (see Schofield), While the magnetons normally form a random, gas-like cloud, wherein it magnetic properties cancel out (see Tambe), but when concentrated by the presence of a charged particle, will gather around it, in concentric shells, to deliver a Field.

Also, in the presence of an externally applied magnetic field, these magnetons will line up along so-called magnetic lines of force. In fact, they are the actual cause of such lines of force, building chains outwards from some source to link opposite "magnetic poles" together, and in doing so create the Field.



Finally, the "Aethereal Particles" are considered to be in vast quantities, but extremely small, though of a vast range of sizes (see Borchardt). Their effect in space will be of cancelling out collisions, but in the vicinity of much larger masses, a shielding effect caused by net directional push forces, which are said to constitute Gravity.

Now, clearly, just treating each set of these different components separately is a pluralist method. And, to an extent such may well be a reasonable ploy in Space. But, as soon as they are mixed with matter particles of much larger sizes, and even with driven flows of these, the situations will certainly differ markedly.

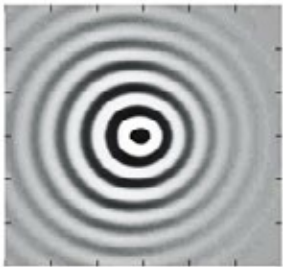
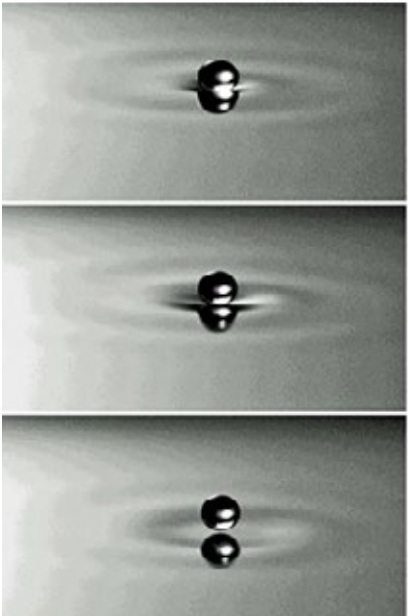
The problem to determine is "How?"

The only thing I can think of is to follow Yves Couder's lead, and construct at the macro level, experiments that enable us to investigate what might be happening at the micro level.

Of course, such a construction will not be easy. Couder, in his experiments, reduced his contents to a single substance - silicone oil, consisting of a falling drop and a vibrating tray of the very same oil. His active forces are mere oscillations, and with such a minimalist set up, you would think that what he actually managed to achieve would be impossible. But, the opposite was the case! He effectively removed any accidental causative inclusions, and his adjustments then boiled down to merely adjusting a few parameters of the various vibrations involved.

It was a remarkable effort, and amounted to a significant breakthrough in experimental methods. To succeed with our objective, will be even harder, for, somehow, we have to include three different components at different levels. But, as with all macro analogues of micro entities, it is unlikely that a single contrived set up will suffice. We are likely to have to take partial models, and then make the integration theoretically.

In the Couder-Fort model for deBroglie waves, particles "bounce" above or below a 2-D surface, due to an external energy of vibration which has been applied to the entire system



"deBroglie waves" created by bouncing oil drops



July 6, 1995 in crops

Substrate as Sump and Source

With no action-at-a-distance considered possible in a totally empty conception of space, this author proposes that all effects across such distances must be communicated by some form of substrate. Even an electron orbit within a Hydrogen atom cannot be directly explained by a totally disembodied “force of attraction” between opposite charges – a positive one in the nucleus, and a negative one in the electron. Instead, the orbit of the electron must involve a constantly applied deviation of the already built-in movement of that entity to make it become an orbit.

So, if there can be NO disembodied forces acting across empty space, the question must be, “How could the original movement of the electron (before capture and at that time presumably in a straight line) be diverted in this way?” Clearly, it couldn’t possibly happen without the simultaneous presence of the positive charge in the nucleus and its own negative charge. So, the first thing must be, as the free electron approaches the nucleus, their aligned fields in a real substrate and composed of magnetic substrate entities, which we will call magnetons, must interact. They must have been originally affected by the positive nucleus in one place, and the moving negative electron in another, to build real material fields of concentric shells to finally form unified fields. It is then this distortion of the substrate, which, thereafter, determines the path of the electron. The latter will suffer constant deviation to its course, which, only in ideal conditions, results in an orbit. What is special about this sub-world is that it is stable! It doesn’t constantly leak energy, due to the work being done on the electron to divert it.

[Remember, in the Double Slit Experiments, the new explanation was due to a kind of interference-like alignment of the substrate beyond the Slits, which diverted, or not, the electron depending upon its path (indeed caused by the very electron which had made that pattern to be established in the substrate)]

Now, there is no such thing as perpetual motion, and particularly in such a thing as an orbit. Remember, if

the changes are never reduced, and remain constant throughout. So the situation will require energy, from somewhere else, to allow such a stable entity to continue to exist! And as that certainly does not come from the charges, which remain exactly the same throughout, it can only come from a literally infinite substrate, which in one sense is the catch-all energy retrieval system involved. The substrate, therefore, takes on another role apart from its various interactions with material objects and charges.

It must, as this theorist has maintained from the beginning of these investigations, be capable of holding and propagating energy. This demanded an atom-like structure involving two mutually-orbiting sub-particles, which could absorb energy by the promotion, and release it by the demotion, of such internal orbits. The rest-mode of such substrate particles was originally taken as being empty of such extra energy loads, and was termed as an “Empty Photon”. So, of course, when “carrying”, it would be equivalent to – a Photon.

But, there is so much energy criss-crossing the Universe all the time, that such Empty Photons were probably a necessary simplification, and a more likely scenario, especially in equally affected localities, might well be for the elements of the substrate to contain a small amount above their base orbital state.

This would be inevitable in localities, where all elements were holding the very same gobbets of energy, for then there would be nowhere for the energy to be decanted to.

Clearly, such a substrate would not only be a catch-all for lost energy, but, in addition, could make it available locally when required, and which thereafter could be replenished from further afield in this universally connected substrate.

The substrate could then be both Sump and Source – attending at the phenomena within it, and catching losses, as well as providing energy when necessary.

FIELDS BY MAGNETONS - 1

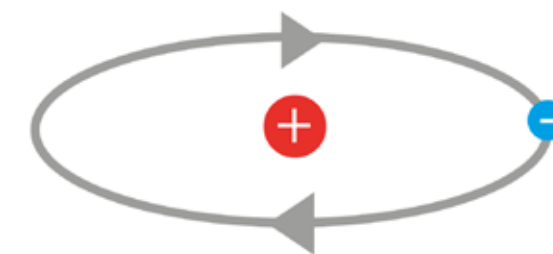
Of course not all electrons encountering protons are captured to produce Hydrogen atoms. So, the most general case must be the one in which the encounter results in no continuing relationship. The two charged entities carry on after their encounter.



In such cases the aligned magneton will link, connecting the two, and thus deviating the relative paths, but, they will then break apart until there are no connections remaining



What happens when the electron is captured?

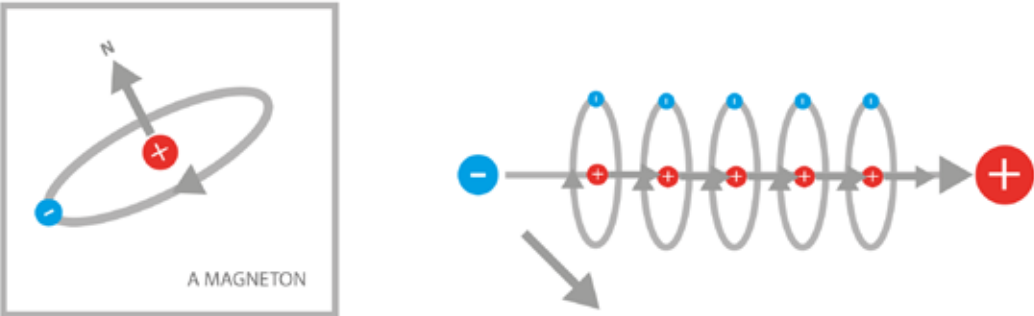


FIELDS BY MAGNETONS - 2

Aligned magnetons produce fields around positively and negatively charged particles.



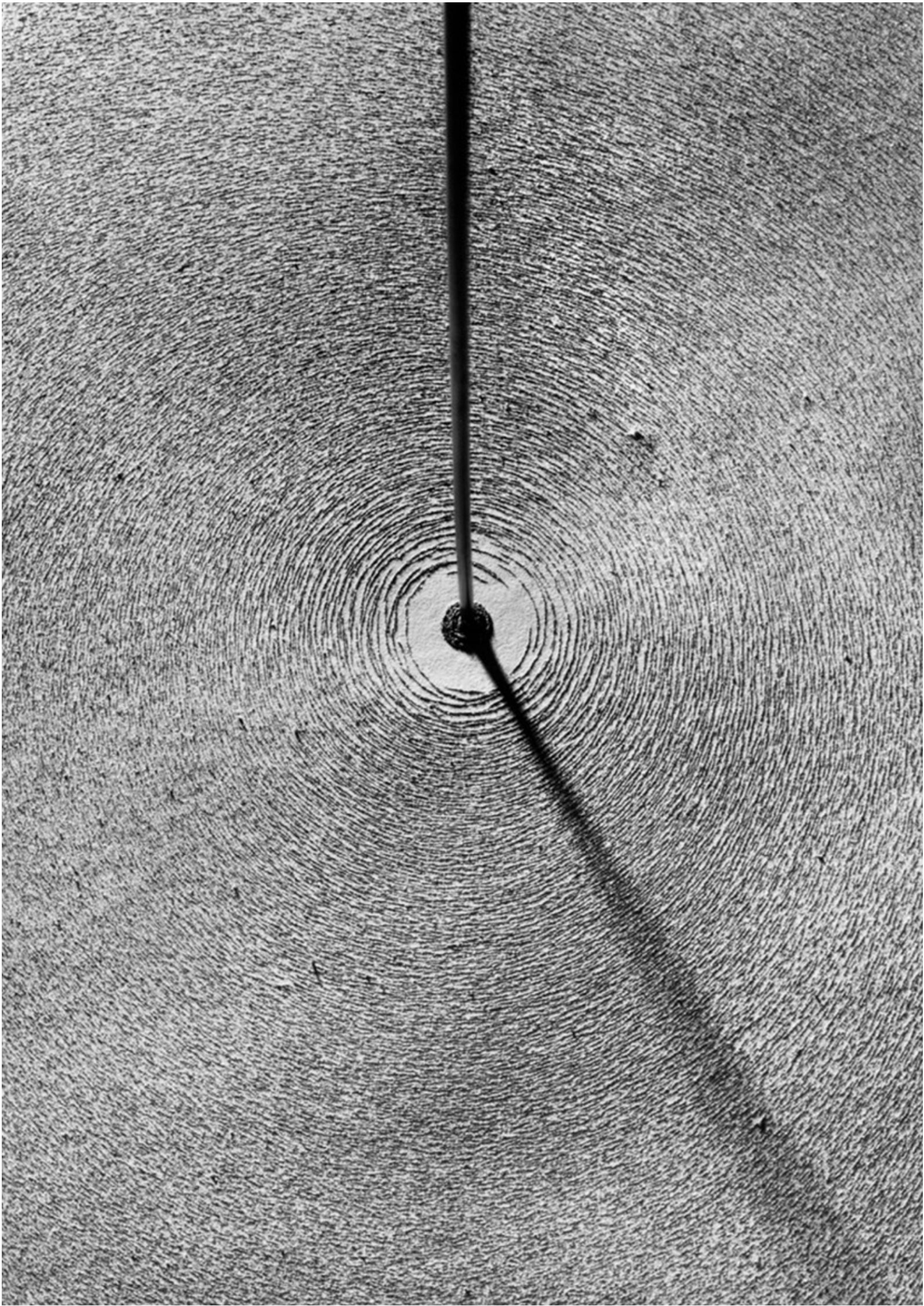
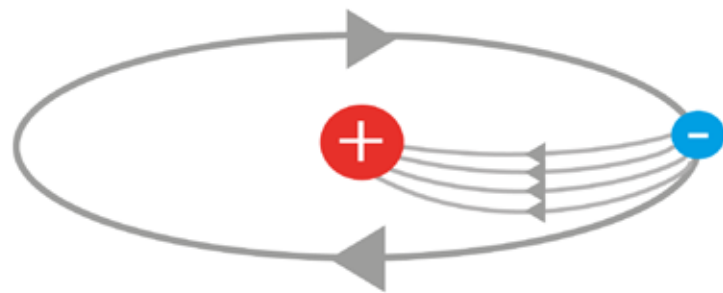
Strands of Magnetons link up connecting both particles.

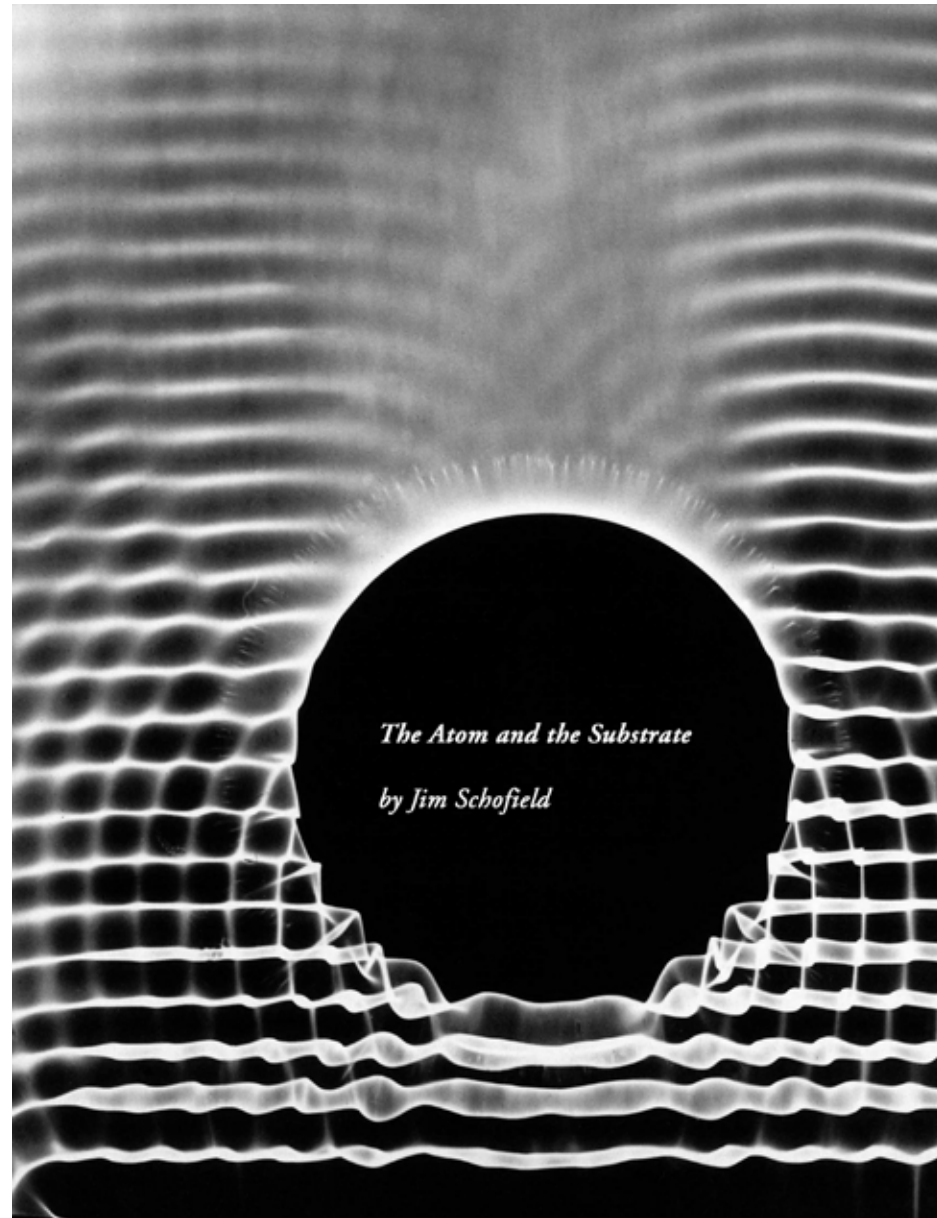


The strand distorts the direction of the electron. On closer approach new strands form increasing deviation.



Strands form from the fields of the two charged particles.





EDITOR'S NOTE:

If you would like to read more of these earlier papers, you can continue reading the original series in Special Issues 36 and 37, which were also published as a limited edition book by Jim Schofield, entitled *The Atom and the Substrate* (2015).

While somewhat outdated they still stand as the best introduction to these ideas, with easy to follow diagrams and descriptions of the forces involved.

The next paper on Substrate Theory is more substantial and deals with the philosophical reasons for rethinking science and considering a substrate as a necessary premise for all investigations. It was originally published in Special Issue 51, *Holist Cosmology* (2017).

Following this we will look at the Lepton units of the Substrate in more detail, looking at how magnetism and gravity might also be explained using the theory.



Neutritron substrate composed of electrons and positrons

Magneton substrate composed of taus and muons



The Necessary Premise

A Holist Ground and Context for Reality

The Substrate was an early assumption, and it certainly performed well in explaining many phenomena, but it could be neither detected nor studied in itself. Certain phenomena, such as with the propagation of Light across seemingly empty Space, this did infer that there would have to be some sort of *medium* present to facilitate such a transfer of energy.

But, as Science moved inexorably into a “forms-primary” stance, such an invisible and unformulateable ground, just had to go!

20th century Physics denied that there was any kind of Universal Medium or Substrate! And thereby, terminated any attempted explanation as to what both caused and then facilitated these evident phenomena.

Everyone, it seemed was wholly satisfied with useable equations alone. Real understanding was becoming surplus to requirements.

That isn't Theoretical Physics: it is mere Technology!

Though the majority of scientists swiftly proceeded with their ever-increasing catalogue of formulae, many anomalies were constantly cropping up, and what is even more important, the explanatory side of this important Science, dwindled into an inessential (merely excusing) narrative, and was then banned altogether as speculation.

However, a minority of the Physics community was still not convinced, especially as the anomalies in the Copenhagen Interpretation of Quantum Theory continued to proliferate, and they insisted that there has to be such a Substrate.

And, as soon as such a substrate is assumed – so that nowhere is there the alternative Perfect Vacuum, Everything Changes!

All the assumed Fields, from Electrical to Higgs', must be effects upon a Universal Substrate.

So, clearly, conceptions of the actual nature of that substrate become of paramount importance, in order to explain the phenomena acting both within it, and indeed, upon it.

NOTICE: The alternative was that there was only completely Empty Space, so no attention whatsoever was given to such a myth as a Substrate, and their vast store of formulae was all they really needed.

Such a stance could only go one way – the formula became the nitty-gritty of Reality and all further studies would have to start with those as the primary objectives. Naturally, our descriptive Form is only ever a consequence, and never the prime cause, so the new mathematical physicists thereafter felt free to speculate about what grand abstractions could be conceived of as a purely “Formal Ground”.

I read many papers describing various disembodied fields that are, it seems, the “real causes” of all presumed “forces”, but, what are they? What could be the substrate, and how do observed phenomena interact with it?

To answer such questions, let us investigate a common phenomenon, and attempt to explain it!

The initial assumption could be that a given particle, with some physical properties, such as charge, must have some sort of effect upon the substrate, even though we cannot get direct evidence of any such an effect.

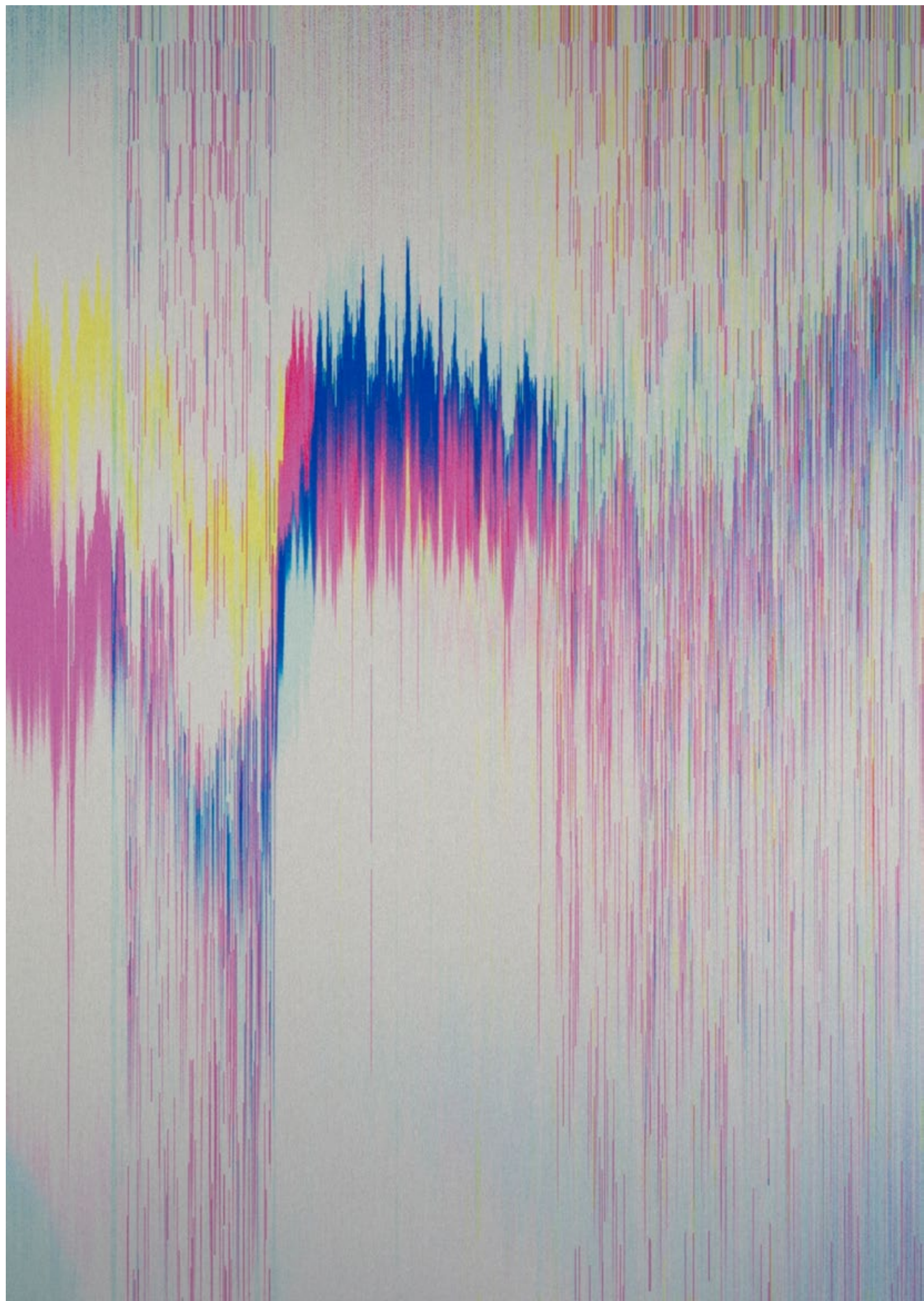
This is surely the nub of the two alternate views, yet explanations are impossible with the formal stance, yet are possible, but hidden, on the alternative physical stance.



Now, deciding between these two may seem impossible to judge, until we define what the units of such a substrate could be. To make them (as yet) undetectable, all those involved in this research had to conceive of impossible-to-detect substrate units. And, to give them their undetectability they were conceived of as having both positive and negative charged sub-particles within every type of substrate particle, which were also composed as one of matter and the other of anti matter.

One resultant design – the neutritron (initially termed the positronium by its discoverers in Fermilab), would indeed be totally undetectable. Yet, with its two sub-particles mutually orbiting one another, it could actually hold energy internally in promoted versions of its orbit, and release such energy by demoting it.

So, considering just such a candidate Substrate Particle, it was unavoidable that the structure of this, and any other possible substrate units, be first theoretically



devised consistent with both the above suggested form and all known phenomena. If experimental evidence, from the past, along new tailor-made experiments are used to rigorously test such possible forms, they could be either confirmed or proved inadequate. So that is what was done in considering the effect of a charged particle upon the substrate units surrounding it.

Starting immediately next to that “source” the particle must be reacted to by the immediately adjacent substrate units to somehow establish changes in them and to further propagate similar effects in the units ever further away from that particle as initiator.

Notice the key fact is that the “causing” particle is NOT providing the energy for these changes: they are instead the natural response of a complex dual-particle substrate unit in a system, which then can influence other such units in a kind of Field Propagation.

The discovered Inverse Square Law of charge fields and Gravity Fields, makes it clear that it is the successive surface areas of spherical shells of changed substrate units around the initiator, which make this the only possible Law as the surface area of a sphere is $4\pi r^2$, so that the response of the units will be successively reduced with each succeeding shell.

Notice that the substrate units have organised themselves into this concentric shell environment, in response to the presence of the particle. And this will continue to be the case until such threshold is passed, which terminates further effects in the substrate.

Some theoretical research has already been undertaken by this theorist (J. Schofield), and it has made clear that the substrate must be composed of more than one unit (in addition to the forementioned neutritron).

But, the problem was that, after having very successfully cleared up all the anomalies of the Double Slit Experiments, which was achieved using that single neutritron unit alone, attempts to explain electrical fields with that unit proved to be impossible.

Yet, the gains achieved by the neutritron could not be discarded, so what had proved appropriate in its design must be applied again, but this time attempting to produce an electrical field, by means of other undetectable units!

Why should there be only one type of particle in the substrate?

Now the implications of such a set of assumptions could only be that the substrate would also include these different particles. Well, that seemed reasonable, if the type that could be defined could produce an electrical field, but when not so activated, still in other circumstances be wholly undetectable, and as before supplying the energy that the field required solely from the substrate.

The conclusion was that the particles required would consist of two mirror-image forms, which, in equal numbers, and moving randomly would “in-sum” cancel out all properties again, but instead of within a single particle, it would be across all areas of the substrate.

Now, this alternate statistical cancelling-out of properties, overall, allowed them to be extant within particular particles, but cancelled in sum.

Now, this might seem to be a long shot at explaining electric fields, until you conceive of these normally randomly moving mirror-image particles aggregating around the “causing” electrically charged particle. In a system based upon their magnetic dipole effects, with radially orientated units making up concentric shells around the “cause”.

Now, before going on to these new particles, it is necessary to stress the problems solved by the neutritron, in the Double Slit phenomena, included not only Wave/Particle Duality, but also Electromagnetic Propagation through “empty space - and to cap it all it also explained both Pair Annihilations and Pair Productions too!

The objective for our new units was becoming clear – it was, of course, to give them a magnetic dipole effect, so the joint particles would again be made up of two sub particles of different sizes and opposite charges. In sum, over collections of these particles, all the properties would cancel out, if moving about randomly, but gathered together and statically oriented around a charged particle, they would deliver an Electric field (or to be more accurate, give exactly the same properties an ideal electric field was supposed to have).

These first efforts did begin to explain phenomena, but, of course, Copenhagenist theorists have been surmising

all sorts of fields (even the Higgs' Field to explain the existence of matter, which it certainly did not achieve!). It seems to me that the basic new assumptions are on the right track, but as with all new theories, in any new area, the best we could expect is that our models will better reflect Reality – will contain more Objective Content than the theories that they replace.

I always, in a discussion such as this refer to James Clerk Maxwell's Theory of the Ether – with its interacting vortices and “electrical particles” that was never confirmed, physically, yet, nevertheless, delivered his Electromagnetic Equations into our hands.

Maxwell's Theory clearly had superior Objective Content to its predecessor.

NOTE: It is interesting that Maxwell's model, having relatively static, but rotating, vortices, which were associated with relatively free-moving “electrical particles”, for, these ideas have resonated with the initial steps in a wholly new model – with relatively stationary neutritrons and free moving “magnetons”.

More of these ideas will be dealt with later.

So, dumping the Ether (because it could not be detected) meant also throwing away its Objective Content, and merely keeping his equations, as the essences of the situation!

Such actions make crystal clear some of the basic assumptions of the scientists involved in this decision. To dump the analogies that enabled the devising of the equations, yet keeping those equations, tells us exactly where they stood.

The simplest explanation is that it was a purely pragmatic decision, and partly, at least, that was true. But, the more revealing reason is that they considered the equations had actually captured the essence of what was being studied – “as all equations do!”

It made Natural Laws the drivers of Reality; it was a step in the direction, which ultimately led to Copenhagen!

Now clearly, I do not trust only my ideas and theories: I have always searched for colleagues with similar objectives to my own.

So, I have become aware of several serious scientists with similar stances but different solutions. And, needless to say, several have shown up the weaknesses in my contributions and have given me new areas to both address and integrate.

Many years ago I read about David Bohm, and read his book *Chance and Causality in Modern Physics*, and am aware that neo-Bohmians still exist, But, my first real contact was with Mohan Tambe (of Bangalore in India), and his concern about fields in an existing Universal Substrate, for he made it clear that my current ideas were inadequate in the areas he was tackling. Following first contact we kept up a furious interchange for most of early 2013.

Somewhat later I came across Glenn Borchardt (of Berkeley, California) with his idea of a multi-layered substrate, which he used to explain Gravity as a “push force” – implemented solely by impacts of the substrate particles along with relative sheltering regions caused by larger substrate aggregations.

Recently my colleague Dr. Peter Mothersole told me about Wallace Thornhill (from Melbourne, Australia), whose ideas, in some areas are very close to my own, though in others, very different.

Clearly, we all have the same motive force, we are sure that Copenhagen Interpretation is idealist nonsense, so the opponents of that stance are involved in searching for a physical, explanatory way of dealing with the avalanche of crucial anomalies that inexorably followed the discovery of the Quantum.

So, it is my intention to study these potential colleagues, for their various solutions.

Now, it isn't at all likely that anyone has yet alighted upon a comprehensive and consistent set of answers, but as James Clerk Maxwell proved with his famous analogistic model of The Ether, partial models are quite valid steps forward.

I am personally convinced that a complete revolution in approach, methods and theories is required, which will involve a root and branch transformation of the assumed premises of Theoretical Physics, AND, crucially the consistent philosophic basis must be Non-Pluralist, Non-Idealist, and Non-Pragmatist!



Indeed, a long period of philosophical studies has led me to pursue the Holist stance of scientists like Darwin, Wallace and Miller.

If I differ with a potential ally, I will not be surprised. For my own current contributions, though productive, DO NOT cover several extremely crucial areas, such as fields. Also, we are not part of an extensive and burgeoning community of co-workers: so we are to a major extent

isolated, and our own training, not to mention the beliefs of the majority of physicists are locked into the Copenhagen approach.

In order to transcend the multiple impasses, fixed into the current consensus position, we will have to break entirely new ground. And, of course, it has been done in the past.



HIDDEN MATTER

Charles Darwin's Origin of Species was sat upon by him for over 20 years, because he knew that his methods did not conform to the consensus alternative. While Stanley Miller's Experiment in looking for evidence for the Origin of Life, though it did manage to produce amino acids – crucial components in living matter, was taken to be a dead end, as no one, not even Miller, knew how to take things further. Amazingly, the generally-agreed approaches and assumptions if other scientists were incapable of seeing how such gains could be built upon.

Even very recently, the French physicist Yves Couder, with his brilliant series of “Walker” Experiments, in spite of re-writing experimental methods completely, and working in a holistic, additive way (which I have termed “Constructivist Experimentation”, and by so doing, managed to achieve quantized orbits at the macro level, without any quanta involved at all. He has had his achievements dishonestly claimed by Copenhagenist scientists, rather the giving credit to a completely unique holist approach.

All three were, and are, threatened with drowning in an ocean of conservative and pluralistic views.

But, sadly and very importantly, it isn't just Copenhagen that stands in the way of transcending the impasses now emerging on all sides.

Indeed, since the very inception of observation and explanation of Reality historically, Science has been imbued with at least three completely contradictory stances!

From the Hunter/Gatherer period of Mankind's development there was the concept of Pragmatism, and in spite of other very different approaches, the old reliable stance of, “If it works, it is right”, has remained as strong as ever.

And then, from Euclidian Geometry via Formal Logic and the Principle of Plurality, this became increasingly established as the only basis for Evidence and Cause.

Finally, and via Equations, there was, ushered in, the Idealist conception of Reality - that it is due entirely to being driven by eternal Natural Laws. But of course, no matter how apt, Abstractions cannot drive Concrete Reality!

From the first, Greek mathematicians and “Natural Scientists”, along with the central tenet of Plurality, dominated Science, and even true Experimental Science, when it began to become important in the Renaissance, did not change that assumption!

To make the essential breakthrough, ALL these contradictory stances just had to be addressed at the same time.

For, they all coexist in current Science due to the long-standing Principle of Pragmatism, to allow it – namely, “If it works it is right, And if it doesn't work, switch to one that does!”

With such a catch-all view, you allow them all to remain and be used when they seem to work!!”

NOTE: It is, of course the major tenet of Post Modernism, which prefers to “keep everything” rather than attempt a distortingly incorrect “consistency”! But, in a small way, the prodigious, yet more fruitful, task has now begun!

Quite apart from the necessarily purely scientific investigations, this theorist has also turned to the significant gains of the philosopher GWF Hegel, and his equally remarkable student, Karl Marx, to primarily criticise current scientific assumptions, and substitute a better (more real) philosophical base, via new premises.

It amounts to a truly holist approach (like Darwin and Miller) but, hopefully systemified into a coherent, consistent and comprehensive system.

I had, of course, to commence in my own area of professional qualifications: being a physicist, I decided to make an assault upon the ill-famed Double Slit Experiments.

Now, I must admit that my focussed approach was at that time by no means clear, but, by the time I had removed ALL the anomalies of Copenhagen Interpretation of those experiments, I was clearly on my way!.

Immediately, the gains of that successful work reflected revealingly upon several other Key Areas such as The Propagation of Electromagnetic Energy through so-called Empty Space, and even the strange phenomena of Pair Productions and Pair Annihilations

These definitely constituted a start, but the real problem just had to be FIELDS!

Let us proceed!

Now, many of the major opponents of that, currently consensus position – The Copenhagen Interpretation of Quantum Theory, are what might, with justice, be called “classicists”, for they desire a return to the pre-Copenhagen approach. But, the thing they regret most, in the consensus approach, is the total abandonment of physical Explanation, and the reliance solely upon the purely Formal Equations of the Copenhagen stance. And also, and for very good reasons, they abhor the mathematical/idealist tenor of the whole of that stance. But, they also refused to recognise the contradictions inherent in the classical approach. But, they did depend, greatly, upon Explanation, which was significantly different philosophically. To dump the main jewel of the old amalgam, for a pure, abstract and bloodless formalism, was, to them, the major crime! They demanded to know “Why?” – literally everywhere, whereas the Copenhagenist could answer that question NOWHERE - “Obeys this equation” is certainly NOT and explanation: at best it is only a description.

There is also another stance appearing among these radical opponents to the current “wisdom”, which is much less frequent, and these, who follow their opposing stance, for purely philosophical reasons, are the Marxists! Now, this might cause the other “radicals” to be discontented, but that, though understandable, would be unfortunate.

For, after the debacle of Lysenko, which was deemed by those who couldn’t possibly know, to be closer to Marxist/Materialist approach than Darwin’s writings, caused the credit to that discipline to justifiably wane, and many scientists, who did know the necessary Science, correctly interpreted the supposedly “Marxist” view as “the tail wagging the dog!”

But, of course, that position had never been Marxist, but a crude and wrongly simplified version of it. It was a debased form reflecting the deterioration of the “state-approved” version of Marxism in the Soviet Union in the 1920s and 1930s, under the Stalinist beauracy. Neither Marx nor Engels would have supported such rubbish, and neither would Lenin. The transformation in so-called “Theory” was due to the transformation of the Soviet regime under Stalin, and the seeming loss of true

Dialectical Materialism, for something much easier to assert! And, it is surely up to today’s Marxists to redress the balance and address the problems, not only correctly, but in a better way than any other standpoint could possibly achieve.

I have been in the Marxist Movement for well over 50 years, and, in spite of joining the Communist Party, I had to tackle Marx’s work literally alone, when it came to his philosophic stance and method.

You will notice that I rarely quote Marx, or any of the other great contributors: it is my job as a Marxist, to contribute daily to the Marxist position, and particularly in my professional areas of Physics and Mathematics, but, uniquely, with a philosophical basis for developments in all the sciences.

And, after a long gestation period, new Marxist contributions are now being made, at least by this theorist! But, others are beginning to get involved, if only slowly.

Let us also see why the Non-Marxists’ (among the modern-day critics), in their return to classicism may be misguided.

From its inception in Ancient Greece the Mathematical and Scientific approach had, as already mentioned, three conflicting components. So, let us look at them once more and see what pitfalls would be unavoidable in such an amalgam.

First, and foremost, was the prevailing stance of Pragmatism, which was, with justice, well entrenched. It is the epitome of a purely knowledge-based system, delivering from successful experience, via suck-it-and-see methods: it wasn’t meant to and certainly didn’t explain anything, but all sorts of dubious speculation could be attached to it! Yet, it had allowed Mankind to spread across the whole of the Earth, even though their means of life at the time was still as a very unimpressive predator, though hunter-gatherer is the most apt description.

But, what was brand new were the methods used in finding some way of accurately describing Nature, which via observation, took rough forms from evidence all around them, and both simplified and idealised them into recurring forms. And, it was these idealised Forms that were seen as the key extractions, and investigated

in preference to all other available features. Immediately, this was different to the still dominant pragmatic stance, for it seemed as if the Perfect Forms were seen as the partly-hidden causes of what was being studied.

It was a dramatic attempt to understand as well as describe. But it didn’t actually do that: it was in fact a more sophisticated and succinct form of description! Indeed, this idealistic approach was carried over into a new general philosophical stance by Plato. And, even included in the first “observational science” by Aristotle. Yet, it turned out to require another couple of millennia, before the crucial Experimental Science was added, and sufficient data collected to look for “natural causative relations”.

But, such are never clearly evident in Reality-as-is, and the new scientists took a leaf (or two) out of the mathematicians now very numerous and mature offerings, and physically took to perfecting the circumstances of an investigation, so that a particular pattern that was involved was made as clear as possible.

From then onwards, all experimental situations were farmed to display such targets as clearly as possible. And, when this was achieved, each relation was extracted as a required causing essence!

This wasn’t yet what became known as Science, for it did not involve any real explanations. But, it was extremely convenient that the available Forms, from the mathematicians gathered over the preseding millennia already possessed many perfectly useable types in their collections, so the obvious next step was to fit a general perfect form to the particular data taken from the experiment.

Yes, clearly that data was certainly NOT generally true: change the situation somewhat, and you would get contradictory information. The data was solely true of the particular farmed situation.

This last step deeply embedded Idealism into the general scientific method. But, what was achieved was NOT the relation as it occurred in totally unfettered Reality.

Let us be crystal clear Mankind had found a way of extracting idealised forms from extensively (and appropriately) farmed situations, and the fitting up of them by use of the data collected.

Was this actually delivering a general truth? The answer would need to be “Yes”, otherwise, there was still a major problem outstanding, namely, “How do we get the real world (unfarmed) data and its relations?”

To cement these necessary assumptions, the scientists involved devised, or maybe only appropriated, The Principle of Plurality, which may have been around before, but now, at the stage of a rapid increase in experimental science, and the consequent demands of Analysis, it became absolutely essential.

Let us see why!

The principle of Plurality assumed that the observed and measured nature of Reality was wholly determined by multiple, eternal Natural Laws, which simply added together, in various mixes to produce all phenomena. And, in doing this, no such Law was in any way changed!

This was a crucial premise, for, if true, the laws found by the current farming methods, would be exactly the same as those acting in totally unfettered Reality – in Reality-as-is!

But, if it wasn’t true, then the extracted laws from farmed experimental set-ups, would always be different, depending upon the circumstances, in which they were acting. Indeed, the extracted Laws could only hold in exactly the same conditions from which they had been extracted.

And, guess what? That turned out to be exactly the case! What things were being found were never eternal Natural Laws, but relations, that though very similar, were different in different contexts.

Now, unsurprisingly, Plurality was universally adopted by scientists: it became an unstated, but always assumed premise of Experimental Science.

Yet, it isn’t true! So why was it so vital to assume it unconditionally?

The reasons are not difficult to understand. The replication of circumstances for use was not difficult, so users could depend upon it, as long as those conditions were rigidly maintained.



MATERIALISM

The alternative to Plurality is the Principle of Holism, which insists upon the exact opposite, indeed, “Everything affects everything else”. And, clearly, this would make Plurality wrong!

ASIDE: These two premises had arisen, almost simultaneously, around 500 BC, originally with Plurality in the Greek civilisation, and Holism in India, developed substantially by The Buddha.

Now, interestingly neither a pluralist stance nor Mathematics were any good at explaining “Why” things behaved as they did. They could describe “What” was involved and, “How” it appeared in suitably conducive circumstances, but the statement, “Obeys this relation!”, is NOT a real explanation.

Now, the still dominant Pragmatism, ensured that the pluralist route would be the “right one”, for in appropriate circumstances, they, together, allowed both reliable prediction and successful use. Also, in what became extensions to individual results, the found “Natural Eternal Laws”, became easily incorporated components in more complex or extended areas.

Yet Holism, on the other hand was significantly better when it came to trying to understand phenomena, so, suprisingly, it too continued to survive, when someone asked the question, “Why?”: it could relate general relations acting simultaneously and come up with a reasonable narrative and believable conclusions.

So, the “Tool Bag” of the scientists involved an amalgam of approaches: one based upon Pragmatism, another based upon Pluralist version of Materialism, a third based upon Idealist Mathematics, and a separate “explanatory narrative” based upon Holism!

So, in requiring a return to “classical” methods the majority of these opponents of Copenhagen were suggesting that prior amalgam of Materialism, Idealism and Pragmetism, flavoured with a dash of Holism, but also a very large slice of Plurality, as the means to overcome the iniquities of the Copengagen Interpretation of Quantum Theory.

But, that was the identical stance to that taken by Einstein against Bohr and Heisenberg at the 1927 Solvay Conference. And, he lost the argument because his alternatives were inadequate too, but were certainly

not what was the preference of the majority of physicists at that time. Sadly, many groups of scientists with the same anti-Copenhagen objective, have been trying that same supposed antidote, and have so far always failed to bring it off.

That isn’t to say, of course, that many of their criticisms are not valid, they certainly are. But, the post-modernist mixed bag of stances just wont do!

The problem is about Theory, and, particularly, in Science, for you cannot build a comprehensive, coherent and consistent standpoint, with opposing elements fused together by the validation of Pragmatism!

I personally, have been seeking allies in this task for many years, and being a Marxist, I looked to my comrades for help and support.

Sadly, I was always disappointed.

They were deeply involved in what they saw as Real Marxism, and the real fight was seen as being against dissenters to that aim, who they termed Revisionists (who certainly existed, as they do now, in much of academia).

My former comrades were not so rude to me, but did suggest that I ought to be doing something more useful in the Class Struggle.

They were wrong, I’m afraid!

The most vital weapon of all in that struggle is, and has been since Marx, *Theory!*

Winning in the battle against Copenhagen would not only win a sizeable measure of support in the academic community, and that can only be good, but also was, and had been since Lenin, the crucial next step in the Development of Marxism as an all-inclusive philosophical standpoint, and the required weapon in the political struggle too. To win Science to our banner was indeed possible, but not yet.

Marxism, itself, had to finally cast off the shackles of Stalinism in Theory, and begin to ally with the best scientists in the most productive and profound ways! I was originally recruited by academics in my University, when a student, and was interested initially by Marx’s standpoint and contributions, but finally won over by

Lenin's Materialism and Empirio Criticism - a polemic against the Science of Henri Poincare and Ernst Mach.

But, it was then, and should be now, today's Marxists that will recruit the forces to succeed.

With no support coming from professed Marxists, I finally turned to the internet and sought anyone with similar ideas, and most of them came from surprising areas of Science: the majority were Engineers.

Now, these scientists are used to making "ideal laws" work by adjustments to given sets of circumstances, to make them deliver what the law suggested should be the case.

And experience, in Modern Physics, proves conclusively that without these engineers, NO "confirmations" of new theories would ever be demonstrated. Indeed, returning to those who bade them to undertake such tasks, literally always resulted in the theorists inventing some new speculative factor, and mathematical dexterity to make things fit!

So, perhaps unsurprisingly, the best of these Engineers were at the heart of most alternatives to Copenhagen.

BUT, and it is a big BUT, their dominant stance is certainly Pragmatism, and that can never be up to the task at hand - for that will have to be primarily Philosophical and Theoretical.

Of my closest contacts, all are engineers. And you can see why! The worship of Ideal Forms as the drivers of concrete Reality, has never washed with engineers. And, even the totally exclusive preoccupation with mathematical theorems and Proofs, seems to them to be about something else. And the reasons are evident! They spend their time struggling with Real World difficulties to try to make the high-flown theories actually work.

The "other-World" speculations of the theorists, both physical and mathematical, are seen as practical objectives rather than the truth: they have to provide a tailor-made artificial context to deliver the only situation in which those theories will work!

Interestingly, though, these engineers have, themselves, developed their own mathematical "frigs" - determined solely by their own pragmatic stance, to help them

deliver. Ironically though, these were typical "tools" for engineers, many have been drawn into theoretical Mathematics, and treated in the same abstract way as the rest of that discipline.

NOTE: The writer of this paper is also a mathematician, so can validly make these criticisms, I feel.

But, in spite of a genuine rejection of the current consensus in Physics, we have to ask if the oppositionists can replace it with something better? The answer has to be "partly"!

For these specialists work at both ends of the scientific process - in observation and experiment as well as delivering the context and actuality for production.

So, they can be relied upon to deliver a constant stream of new data, as fodder for the theoreticians. Indeed, without the technicians, the rest of the monolith would collapse even now. What is generally called Science is almost always Technology!

Now, there is an alternative approach in Science, which is primarily philosophical - and that means no mere post-modernist mish-mash of contradictory premises. There must be a sound, coherent, consistent and comprehensive, monist view that can also successively transcend the inevitable series of impasses of the old amalgam, plus the new idealist theories also, and even the mistakes, flaws and omissions that will also, and unavoidably, occur within the new stance and its theories. But, it must be both consistently materialist and philosophically holist!

Now, the philosophical wherewithall to develop a sound holistic method of investigating concrete Reality, actually exists, and is now 200 years old. It was developed by the brilliant idealist Philosopher, Hegel, and came out of his extended and serious research into Thinking about Thought!

He became increasingly aware via his historical studies in this area, that human thinking was never able to alight directly upon the fabled, and sought-for, Absolute Truth, and considered it to be his job to establish both why this was the case, and what precisely allowed the inevitably consequent impasses to be overcome. He noticed that throughout Mankind's known history, each step forward in Thinking, after an exciting and productive honeymoon period of significant advances, inevitably

INFORMATION

ground to a halt! An impasse emerged presumably from the very same breakthrough ideas that had also caused the involved progress. To solve such a quandary was so unimaginable, that almost nobody could do it. The impasse didn't seem to have a rational solution. And also, our hard-won premisses had to be sacrosanct... But, that was most certainly incorrect!

Hegel was able to show that what had been achieved was not Absolute Truth, but a position with more Objective Content (parts or aspects of the Truth), which though in the short term led to some important gains, would, and always, finally hit the buffers, in the form of generating Dichotomous Pairs of totally contradictory concepts.

Indeed, when such contradictions emerged, it was always the signal that the previous underlying premises were no longer sufficient, and as they stood would never transcend the impasse.

These impasses occurred, time and again, but were only very rarely transcended. The usual "solution" was to "keep both", and switch between them on the basis of which would deliver a useful outcome, in a given context.

Attempts to derive one from the other, also always failed. But, Hegel was able to determine exactly what had to be undertaken to transcend such an impasse.

The common premises, for both arms of the dichotomy, had to be revealed, and rigorously criticised. No simple rejection would do, for the effective use of one or the other arm proved that they contained something of Reality. The solution had to keep that while dissolving the contradiction rationally. Clearly Hegel's objective was to correct the flaws in Formal Logic: he wanted to make it always work!

Without such a method, Mankind would perpetually "bypass" such dichotomies with a purely pragmatic switch approach", and hence would leave innumerable lines of reasoning prematurely terminated, or, at least rationally punctured. Human Thinking got more and more like a bush, with innumerable dead-end twigs. A veritable thicket, full of rationally terminal contradictions was the result.

NOTE: An "expert" is someone with a comprehensive knowledge of the bush, and who knows where to go, pragmatically, for a useable result!

And, Hegel finally began to make such transcendencies in his chosen areas. He would use the Dichotomous Pairs to identify their common premises, then criticise and change those premises until the dichotomy was dissolved. The method was termed Dialectics!

And yet, the achievement still had another vital step to be taken. As Hegel formulated it, it was solely about Human Thinking, but his student Karl Marx also realised that it was crucially also about how we thought about concrete Reality. He transformed the method by bringing the whole of Hegel's great contribution, wholesale into a Materialist standpoint!

With this move, the wherewithall for a significantly superior stance was available across the board in ALL human disciplines and areas of study. And, also crucially, in the very nature of natural development itself. Not only in how we thought about it, but in how it actually happened! It wasn't just a breakthrough in reasoning, but a discovery of the true nature of reality too!

Now, this reveals my approach for demolishing Copenhagen! I, of course, agree with my "return-to-classicism" colleagues on the necessity to condemn the idealist/mathematical current stance, and the essential return to materialist explanation of phenomena. So, many of their admirable arguments are mine too.

But, am not just a physicist, for most of my adult life I have been a serious philosopher too, and in the line of development of Hegel and Marx, so I am also and necessarily directed towards a trenchant criticism of Plurality, which is still believed in even among most of my anti-Copenhagen colleagues. But my chosen alternative engenders a stance uncommon in Science, and that is Holism – indeed in the construction of a holistic explanatory approach as primary! And, crucially I am also against Pragmatism – "If it works, it is right!".

Now, these two positions were an intrinsic part of the classical scientific stance, and even facilitate many explanations, but because of pluralistic consequences in Analysis and Reductionism, the impasses are not transcended.

Most obviously, scientific experimental practice, and its interpretation is imbued with these incorrect stances. And, I know, that if they too are not superceded, Copenhagen will NOT be vanquished.

It was Einstein and later Bohm's chink in their alternative position: they depended too much upon crucial premises, which were a significant part and even cause of our present day difficulties!

In addition, commencing from my chosen (in my opinion superior stance), of commencing from the gains of both Hegel and Marx, I must seek out and reveal Dichotomous Pairs, and unearth their causes in mistaken premises, and then develop sounder alternatives to those, so the the contradictory impasses are transcended. A tall order, but without that crucial remit NO solution will be found!

Now, premises can only be seen intellectually, so abstractions and concepts must be involved.

Important note: There is still a fly in the ointment. Hegel and many who followed him consider Dialectics as purely an intellectual method – an improvement in reasoning only. Yet the switch to Materialism also changed that idea. The premises to be criticised and replaced were not just ideas, but actually reflect existing entities too. The method could be extended to include physical entities which may have been omitted or wrongly defined.

In Science, the most crucial premise can be the Ground, or Context, within which the various phenomena occur.

I alighted upon the dumping of the prior attempt at defining a universal substrate, The Ether, as the key turning-point in Modern Physics. So, I commenced with an attempt to re-establish a very different universal substrate – because it now had to do a great deal more than was asked of its previous instantiation!

Primarily, it had, of course, to be undetectable, and capable of propagating Electromagnetic energy over vast distances, BUT, for the present, at least, it MUST be composed ONLY of particles that we already know about!

I commenced by attempting to devise an undetectable single particle, entirely out of known and stable sub particles. Evidence from both Pair Productions and Pair Annihilations seemed to suggest that a particle composed of an electron and a positron was worthy of study.

Clearly, picking such diametrically opposite components seemed foolhardy, for such a suggestion always elicited

the response – "They will annihilate one another on contact, how could they co-exist in a single, stable particle!". But, what if they didn't ever touch: what if they mutually orbited one another?

With this relationship, a joint particle of these two, would indeed have NO overall Charge, NO Magnetic Effects, and NO matter effects either as one component was ordinary matter, while the other was antimatter!

Yet, such a particle could internally carry electromagnetic energy in the same way as the aton – via the promotion of its internal orbit!

And, remarkably, such a joint particle had been fleetingly observed in the High Energy Tevatron at Fermilab, and named as a positronium! BUT, the researchers using that accelerator found the positronium to be unstable!


Now, even my proposed version would be unstable in that environment, but what about in the supposed to be totally Empty Space? I assumed it would be stable in such and other conducive circumstances, so I renamed a stable version the neutritron

The question was, "How could such neutral particles form any kind of substrate? They have No inter unit attraction!"

Well, further theoretical research has revealed that such a statement as the above is not entirely true! I found that though totally neutral with respect to one another at quite small separations, their neutrality also allowed very extreme proximities to occur, and THERE the situation became very different indeed. In extremely close proximity these particles would indeed suffer electromagnetic interactions – via individual sub particles from different neutritrons getting very close indeed to one another.

What actually occurred was no constant electrical force, but one varying swiftly between attraction and repulsion. It occurred as long as the particles remained extremely close. Outside a certain penumbra the particles would have no effect upon one another, but within that tiny region, they would be alternately attracted and repelled in a sinusoidal fashion: they would oscillate in-place!

Interestingly, I analysed exactly what the ongoing effects would be within this penumbra, and they were identical



PAIR PRODUCTION AND PAIR ANNIHILATION ARE SOLID EVIDENCE FOR A HIDDEN SUBSTRATE MADE OF THESE PARTICLES

with the form of James Clerk Maxwell's Electromagnetic Equations, which, by the way, he predicated upon his conception of the nature of a universal substrate, then termed The Ether. Oh, and those same equations are still used everywhere to this day, in spite of the complete demise of the concept of the Ether.

Maxwell's result was of two sinusoidal oscillations, one electrical and the other magnetic, were exactly what I was able to establish as happening in the penumbras around neutritrons.

Now, taking these, admittedly theoretical, gains into our discussion about how such entities, could, somehow, form a "connected" substrate - it would, now, suddenly, become possible, but it would be formed in a different way to solids, liquids and gases. For, no constant forces would be involved, and no permanent electrical bands would be happening. Once within the penumbra around an individual neutritron, another identical particle, would be likely to oscillate under varying attractive and repulsive effects - thus producing a new kind of extended association. I decided to term it a Paving, because of the gaps between all units in the structure.

Now, the first remarkable property of such a Paving is that its units could hold-or-release quanta of energy, via the promotion and demotion of their internal orbits. Therefore, propagation could be possible in such a substrate via bucket-brigade transfers from unit-to-unit, using quanta, (as happens with atoms), and, in such a means, the Speed of Light would become the inter-unit transfer speed. That was, most certainly, a significant addition to the effects made possible by such a substrate!

And, of course, it also explained how disturbances, perhaps caused by a moving charged particle, could be propagated.

The Double Slit Experiments using these suggestions is moved away from the inventions of the Copenhagen stance, into addressing Wave/Particle Duality appearances, as explicable, in purely physical terms, involving the particle-as-cause, along with the waves propagated-via-a-Paving.

Significantly, with this alternative, ALL the anomalies of the of the prior theory were clearly removed by this new theory. Yes! All of them!

Even the almost magical vanishing of wave-like patterns when measurements were attempted in Double Slit Experiments were simply and physically explained!

Clearly, whether this new theory is totally correct or not, these ideas are certainly worth pursuing! They certainly have more Objective Content!

NOTE: Remember, James Clerk Maxwell's model of The Ether, involving as yet undetected vortices and "electrical particles" managed to produce his still essential Electromagnetic Equations. Even though no evidence whatsoever of Maxwell's assumption were ever achieved his model MUST have had enough Objective Content within it to actually deliver valid equations. So, with similar confidence, and for the same sort of reasons, we should proceed with the proposed Neutritron Paving as far as we can productively take it.

And, with Hegel's remarkable method as basis, we will naturally expect that at some point, the efficacy of our current premises, will themselves also run out of steam. It will, as usual, be indicated by the emergence of Dichotomous Pairs of concepts, and the imperative requirement to make significant changes to our then current premises, to allow the transcendence of such contradictions.

Clearly, this powerful method militates against the all-backs-to-the-wall desperate defending of previous gains, that seems to be the ever resorted to stance in Modern Sub Atomic Physics, and replaces such ego-centric criteria with an openness to new and better ideas, and regular checks on rarely revealed premises! It also allows speculative models (as with Maxwell's version of The Ether), as long as they have more Objective Content than those that they replace!

Indeed, the next impasse is already upon us. For, in spite of the significant gains made possible by the concept of a Neutritron Paving, it has already failed to explain Fields: It, as defined thus far, can in no way, deliver active force-delivering Fields of any kind.

So, our definition of a universal substrate cannot be taken as sufficient: there has to be other possible "components" around in a more complex substrate that can deliver such things, Clearly, the neutritron, being neutral in all respects, is not going to be able to do it: it will need a particle (or more likely particles) that can deliver what is

required. Our first move must be to extend the premises, with respect to components of the Universal Substrate! But, they too would have to be undetectable (as was the neutritron) YET allow the presence of a source for forces to be generated. Initially, such particles seemed impossible.

How could there be active, forcing particles that also cannot be detected? Somehow, they have to be as similarly masked as the Neutritron, but carrying the wherewithall to deliver a punch.

The current solution is to have two mirror-image gas-like particles in constant random movement. And, these will carry detectable properties in individual particles, yet be totally maskable by the mirror image, second type of particle. These two, occurring in equal numbers, would then give NO overall charge, or magnetic effect, or even detectable matter effects.

These have been devised (initially in the work of Mohan Tambe, and later by this theorist), but still require a great deal of further work to deliver a fully comprehensive theory.

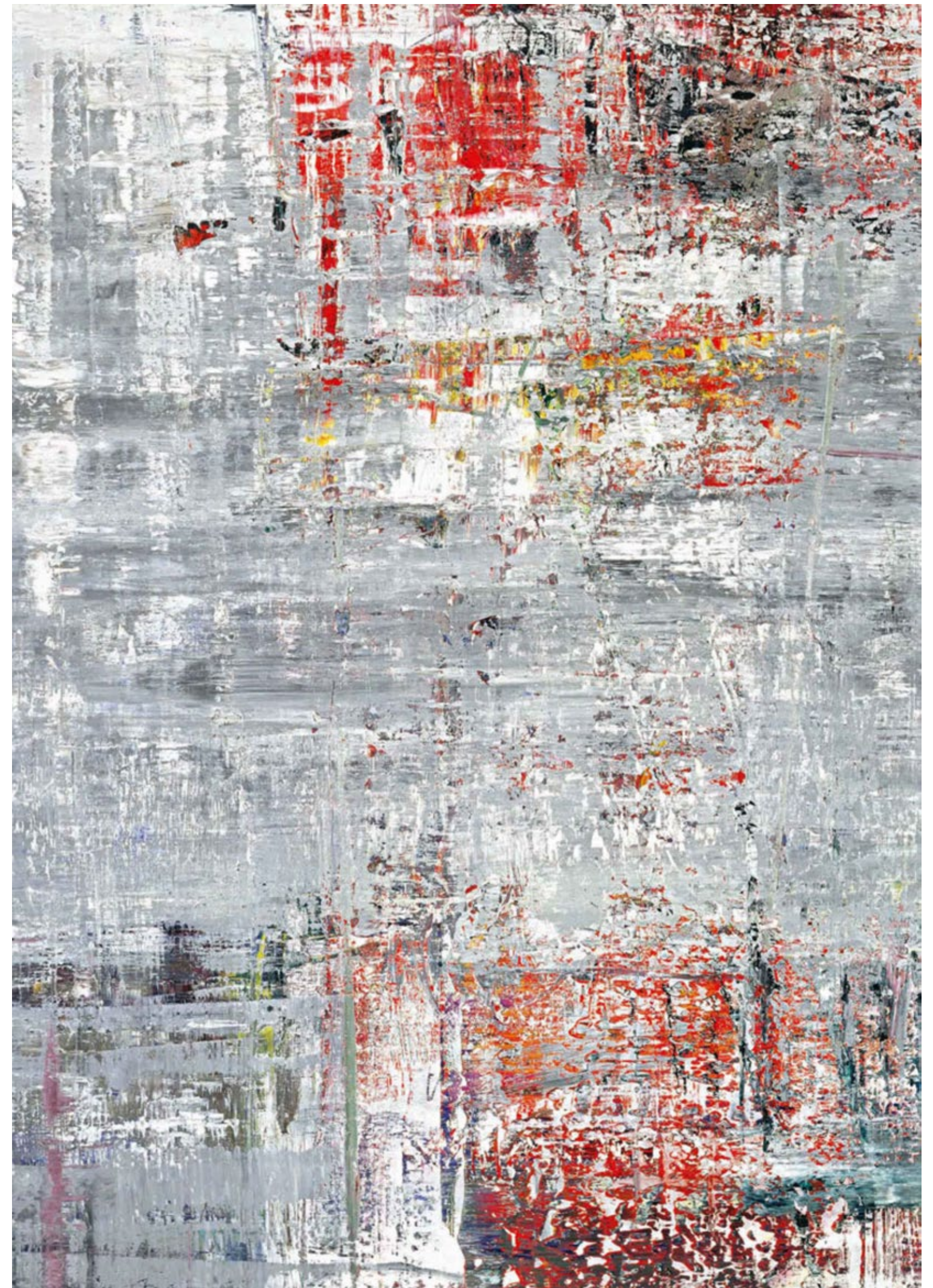
Nevertheless, the fact that they are free-moving and have the required properties, allow them to gather around, say, a charged particle in aligned sequences outwards from a first shell surrounding the causing particle.

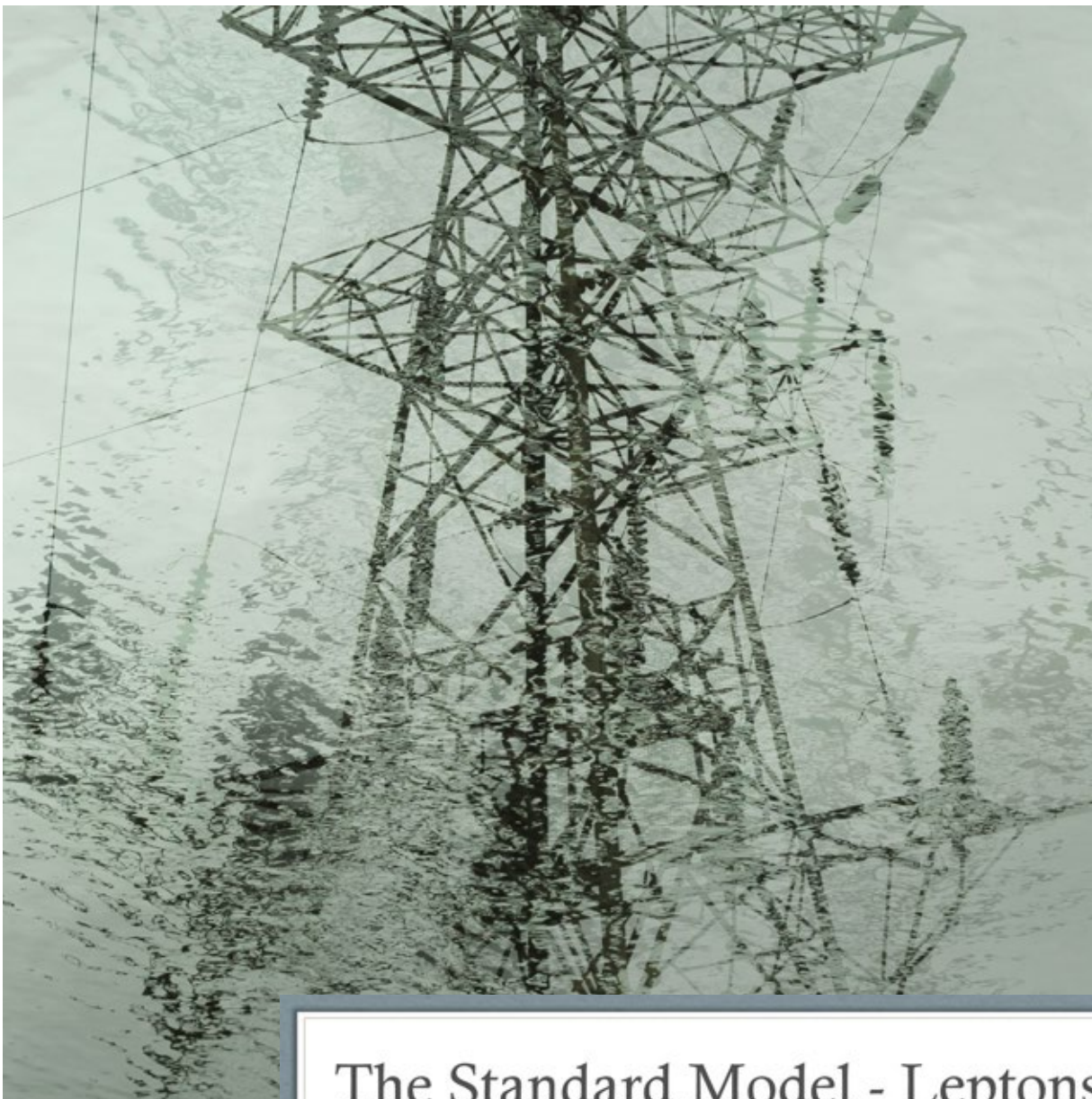
Now, for the biggy!

To complete the rout, we must explain exactly why the Copenhagen formulae actually deliver the exact overall results, which we observe, but clearly, completely without any Wave/Particle Duality, Superposition. Quantum Entanglement and the rest!

Also, the quantisation of electron orbits within all atoms, as well as those involved in Yves Couder's Walker Experiments must be fully described and explained.

All these are, indeed, underway, and most are getting towards a full and successful non-Copenhagen definition.





Thoughts on Substrate Magnetons
& The Necessary Revolution in Physics I

The original particles devised (by this theorist) to “effectively begin” to deliver a totally undetectable Universal Substrate - the so-called neutritrons, though they were successful in several very important ways, they did not deliver either Electrical or Magnetic Fields in response to the presence there of charged particles or permanent magnets.

The nature of the neutritrons - as mutually-orbiting-pairs, each one consisting of both a negatively-charged electron, and a positively-charged positron, seemed to be sound, for they would, indeed, be undetectable, while delivering several necessary properties required by that Substrate.

So, three things were clear:

- 1: New additional particles with a similar mutually-orbiting form - that would enable a similar cancelling of opposing properties, and
- 2: that these would have to consist of two mirror-image pairs (in equal numbers) and moving with a constant “random motion”, so that, overall, they would appear undetectable too, and
- 3: the two new joint-particles would, separately, also have to be capable of delivering electromagnetic effects if aligned around either charged particles, or involved in delivering magnetic “lines-of-force”.

Now, these are, clearly, contradictory features, and initially seemed impossible to simultaneously deliver. Until, that is the mutually-orbiting pairs were considered to be of differently-sized sub-particles, with exactly opposite properties across the two proposed new Substrate units.

The neutritron had been devised via two diametrically opposite sub particles of the same size: so the task seemed-to-be to find other Leptons that would fit the bill. Other, already-known joint-entities, such as a “mock atom”,

consisting of a Proton and a Muon, indicated what these necessary extra particles might well be possible.

By using oppositely-charged pairs consisting of Muons, Taus and anti-Muons and anti-Taus, the required joint-particles seemed possible.

And, whenever they were in constant random movement, involving equal numbers of each kind, they would be undetectable - overall!

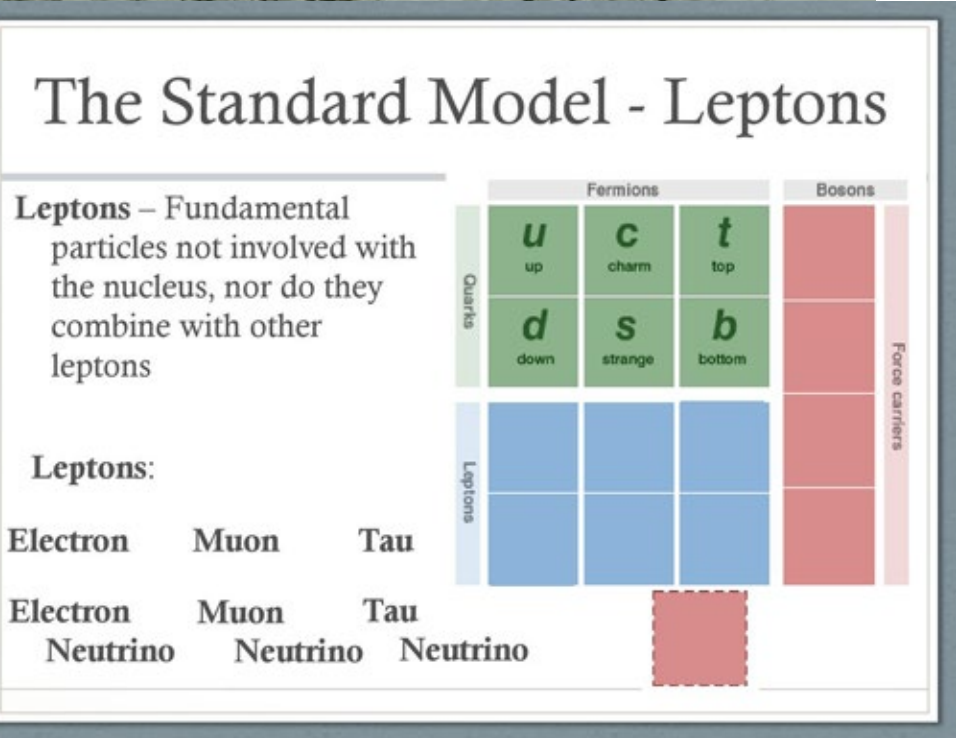
But, their unavoidable magnetic moments (due to the differing sizes of the sub particles involved) would create the necessary electromagnetic effects if they were both immobilised-and-aligned around charged particles, or linked in static aligned chains, by their magnetic moments, in magnetic situations.

Now, all this has been published elsewhere, but such a Universal Substrate - available absolutely everywhere, presents all kinds of possibilities in special situations.

The so-far-assumed situations do seem to cover crucial phenomena in the most commonly occurring situations. But anomalies have been mounting in unusual areas of study - such as very low temperature environments and thin film situations..

Indeed, the 2016 Nobel Prize in Physics was awarded for work successfully carried out in precisely these areas, by a trio of British-born scientists (commencing 40 years ago). Also a group at Princeton in the USA have produced “examples” of the fabled Majorana particles where a single “string” of iron atoms are closely associated with a lead substrate in a superconducting state.

Such evidence cries out for an explanation involving an undetectable Universal Substrate - composed, as this theorist’s version does, of “Majorana-type” joint-particles, involving both matter and antimatter sub-units.



OR DO THEY?

The positronium suggests
this isn't a hard and fast rule.
And if they did combine in substrates
could we even see them?

But, attempts to address these objectives has been hopelessly stymied by the “formulae-first” approach being employed, along with the Copenhagen standpoint. Crucial explanatory aspects are simply never dealt with.

Frankly - “the tail always wags the dog”, so attempts to pull together some sort of explanation are made impossible, for what is needed to attempt to do that, is simply never addressed!

Now, this theorist was, in the past, confronted by the very same problems in addressing the anomalies in the famed Double Slit Experiments, until, that is, he included a Universal undetectable Substrate, that played an enabling role. And, when all the posed-questions of such a Substrate were fully addressed, all of those anomalies were solved, without any recourse whatsoever to the premises of the Copenhagen approach.

But, a great deal of experimental work was available for the many different versions of the Double Slit phenomena, but here, in these investigations, that isn't the case.

The language used in all the accounts I have read is ambiguous - the Princeton example is characteristic. They seem to be seeking Majorana particles at all costs (and with purely pragmatic reasons - associated with Quantum Computers). Accounts switch from talking about electrons of the iron atoms - to locating them in the underlying superconductor.

You can see the problem!

If, as I assume, a Universal Substrate (composed of Majorana particles) is literally everywhere, yet undetectable:-

- 1: In the surrounding Space
- 2: In the Superconductor
- 3: Inside the Iron atoms

Then, as with the changing conditions that have become apparent, in Fields and elsewhere, in such a Substrate, it seems evident that in the very special conditions of the Princeton set-up, all sorts of unique circumstances will be inevitable.

And, this isn't a small matter.

The Crisis in Physics, which precipitated the Formalist Retreat that culminated in the Copenhagen Stance, had been building up for centuries, and meant that physicists were forced to switch their stance, constantly, to enable the addressing of different objectives.

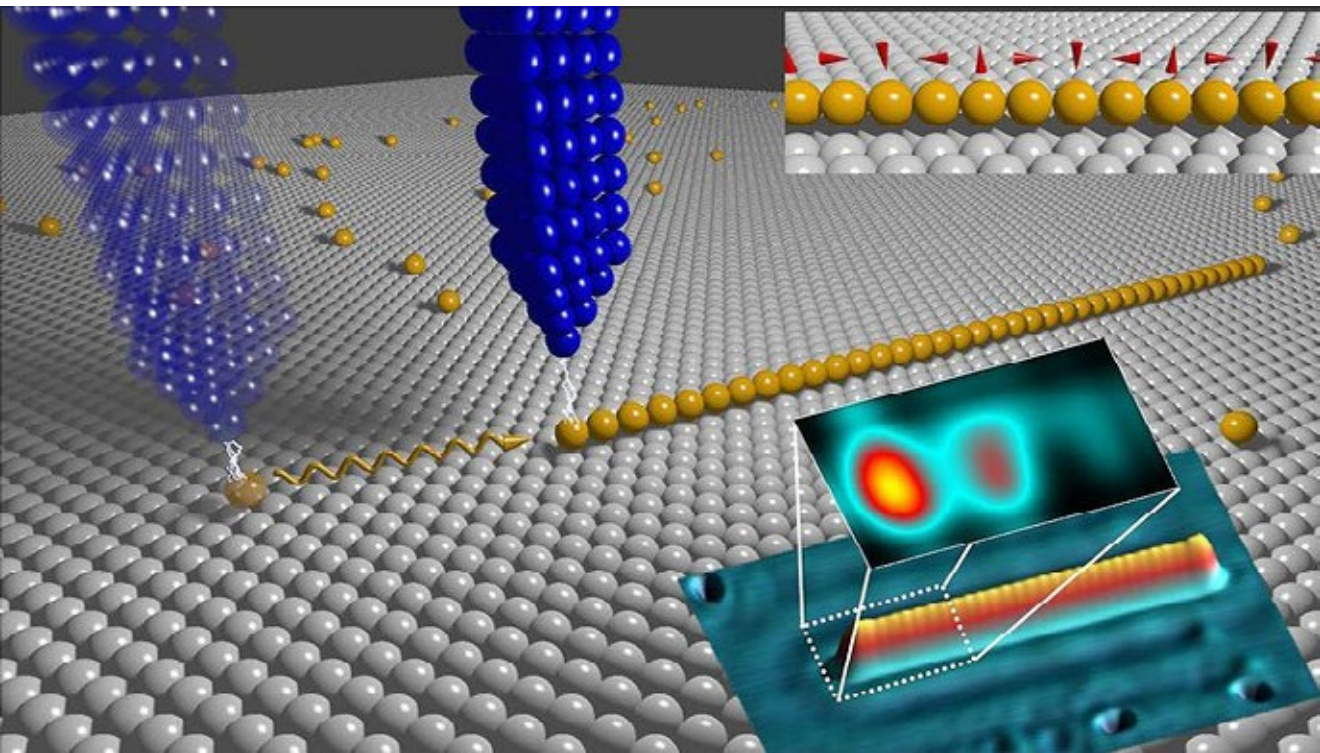
The finally, assumed-to-be, over-riding one was both purely formal representation, along with a long-established, deep-seated and effective Pragmatism - concerning both Prediction and Production as the primary purposes in studying Reality, and its Explanation as, at first secondary, and finally an inconvenient luxury that could be totally dispensed with!

The inevitable anomalies and impasses that naturally arose from the involved contradictory premises, were avoided by dealing only with observed patterns, and depending upon the “assumed Consistency” of Mathematics, in dealing with such things, as the real underlying determinators of all phenomena.

It was of course, not only mistaken, but also entirely an idealist stance.

Now, this whole philosophical problem has been addressed elsewhere, and is available for those who wish a fuller investigation, but clearly it cannot be fully re-addressed here. Suffice it to say that just such a comprehensive investigation has been carried out over many years, and has also recently focussed its attention upon a revolutionary, new approach in the Sciences, and particularly in Physics, with a strictly Materialist - Holist stance, which can finally address the idealist-pragmatist cul de sac that is Copenhagen, and allow a major advance in Explanations of Reality. But, when the attention of literally all physicists is solely focussed upon Forms and Formulae, and their pragmatic use, the important questions are never addressed.

Any break-through will have to be of a similar impact to Darwin's Origin of Species in Biology, but, this time, necessarily involving a major philosophical revolution, and will not be given the credence it requires until it totally buries Copenhagen, once and for all.



EDITOR'S NOTE:

MAJORANAS ??

At one point everyone seemed to be searching for Majorana particles - they had their own motives for looking for particles that are their own antiparticles. Jim Schofield was fascinated by these as they might mirror something needed in order to make Neutrinos and other pairs undetectable - matter and antimatter canceling each other out in terms of mass.

Whether or not the Substrate units count is still unresolved - but perhaps it doesn't matter if these units are Majoranas or not. Neutrinos are still considered mutually orbiting particles of matter and antimatter but this name might not be appropriate for what we now hypothesize in the substrate.

Thoughts on Substrate Magnetons
& The Necessary Revolution in Physics II

Now, perhaps, a start can be made in explaining the experiment achieved at Princeton - supposedly involving the emergence of Majorana Particles, via this theorist's (Jim Schofield) definition of a Universal Substrate, and the role of some of its Units in delivering both Electrical fields around charged particles, and Magnetic fields, with "Lines-of-Force" - associated with the presence of permanent magnets.

As it happened, the Neutritron - the first-devised Universal Substrate particle, was originally conceived-of to explain the anomalies of the Double Slit Experiments, as well as many other phenomena - such as Pair Productions and Pair Annihilations, and, of course, Electromagnetic Energy Propagation via quanta: but they, I'm afraid, could not explain Fields.

Each Neutritron consists of a mutually-orbiting pair of one ordinary-matter electron, and one antimatter positron - in other words like a Majorana particle.

So, the extra particles that needed to be added to the Universal Substrate, to possibly deliver Fields, were also devised as Majorana particles, but this time of differently sized components to endow them with magnetic moments.

Once again, the components used were Leptons.

In this form, either a mutually-orbiting pair of one Tau and one anti Muon, or, alternatively, of an anti Tau with a Muon.

These two joint particles were effectively mirror images of one another, and their magnetic moments cancelled each other out via their existence as a randomly-moving population of equal numbers of each kind.

So, these two were normally also undetectable, but only as long as they maintained their random, and hence cancelling, movements.

But, in addition to this commonest case, there were other situations, in which that existence would be radically transformed.

The presence of an alien Charged Particle, within such a Substrate, caused these magnetons (as they came to be called) to gather around the charged particle in magnetic-moment-aligned, concentric shells - thus producing an associated Field.

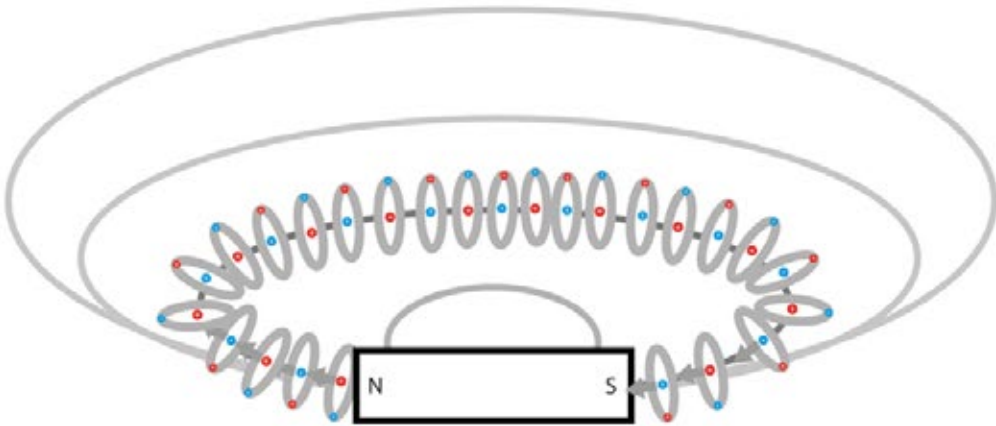
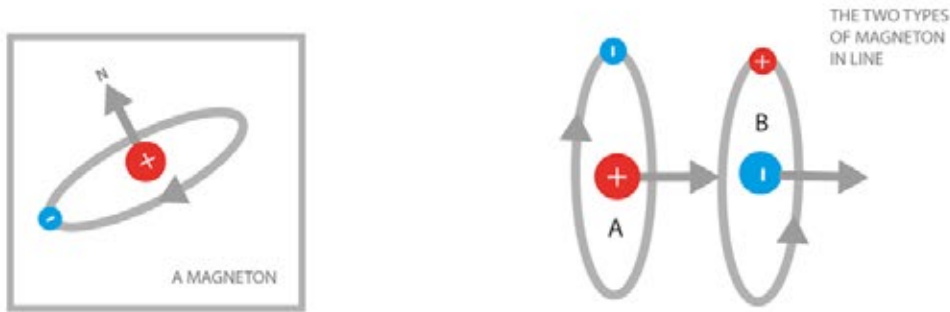
While, when something like a permanent magnet was present, the magnetons formed aligned chains - continuing the pole given by aligned atoms within the magnet, as lines-of-force outside of it, and carrying on around to return to the magnet's opposite pole.

What had been eminently neutral, overall, as a population of randomly-moving-entities, became Fields when statically-aligned via their magnetic moments to other affecting entities.

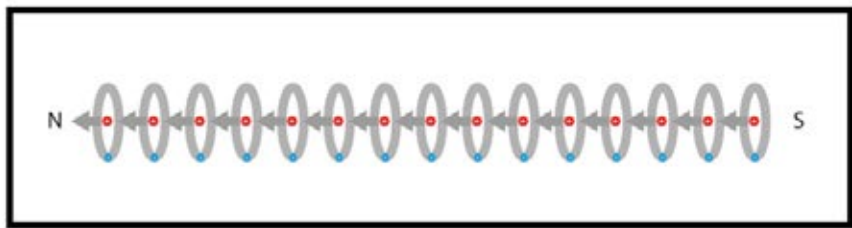
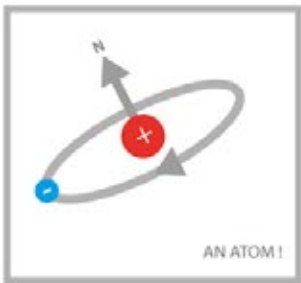
Now, what this theorist intends to attempt, is address all these new researches in an "Explanatory Way" - that is using the properties of what are involved to give causal reasons for why things happen in the way that they do.

Such an approach is very different from the usually applied approach for three different reasons.

First, it will not assume the Principle of Plurality, which, though it admits of a multiplicity of affecting factors, in any natural investigated situation, always only targets a single factor at a time, and achieves this by greatly tailoring the investigated context, to make the targeted factor dominant, and then assuming that what is then extractable by this method is exactly the same as that factor when occurring naturally, without any of that revealing tailoring. That is, most certainly, not true: for the extracted factor is always definitely changed by its context. It will be different in different contexts.



Magnetons line up to create lines of force



Atoms lining up in the same way, inside the magnet

Second, it will not be assumed that the natural context can be achieved by merely adding together all the separately extracted factors achieved when applying different farming for each and every one.

Third, the purely quantitative relations achieved by the above means will NOT be considered as Causing Laws, but only as mere descriptions of what occurs in the farmed, arranged-for context. Causes are qualitative, and require the revelation of all the mutually-affecting properties involved.

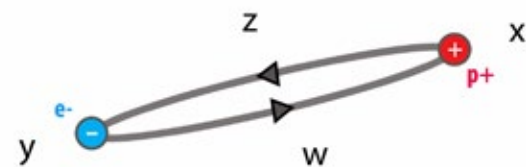
Now, up until the victory of the Copenhagen Interpretation of Quantum Theory in 1927, physicists always followed the quantitative formulation of relations between the variables involved, with an attempt to explain WHY things behaved as they did, and did so in terms of the various substances involved and their properties.

The initially acquired formal description was always completed by the explanation of the causes involved. Indeed, this final stage was regarded as the most important one, for it alone could be extrapolated as a contributed cause from there to new areas involving common substances and conditions.

Mere quantitative forms are indeed Universal - cropping up all over the place, but they DO NOT infer identical causes!

“Scientific Understanding” resides only in this last and crucial stage in investigating Reality.

It is there, and there alone, that the Objective Content - that revealable part or aspect of the Truth actually resides.



An Explanation?

Now, perhaps we have enough to attempt to explain the discoveries at Princeton - concerning the emergent Majorana particles.

Clearly the presence of a usually undetectable, yet ever-present Universal Substrate - composed entirely of different Majorana particles, which can behave very differently depending upon circumstances, the odd arrangements set up for the Princeton investigation, must be guaranteed to deliver remarkable outcomes.

For, what are regularly proving to be “outside-the-box” situations abound here, namely:-

1. Extremely Low Temperature Physics
2. Superconductivity
3. Extremely meagre traces of substances

And all these occurring in an ever-present, multi-particle and multi-mode Substrate, that is totally undetectable by the usual means. Clearly, in such circumstances, unusual situations will not only arise, but produce individual and detectable phenomena, normally swamped (and hence missed) in more abundant conditions!

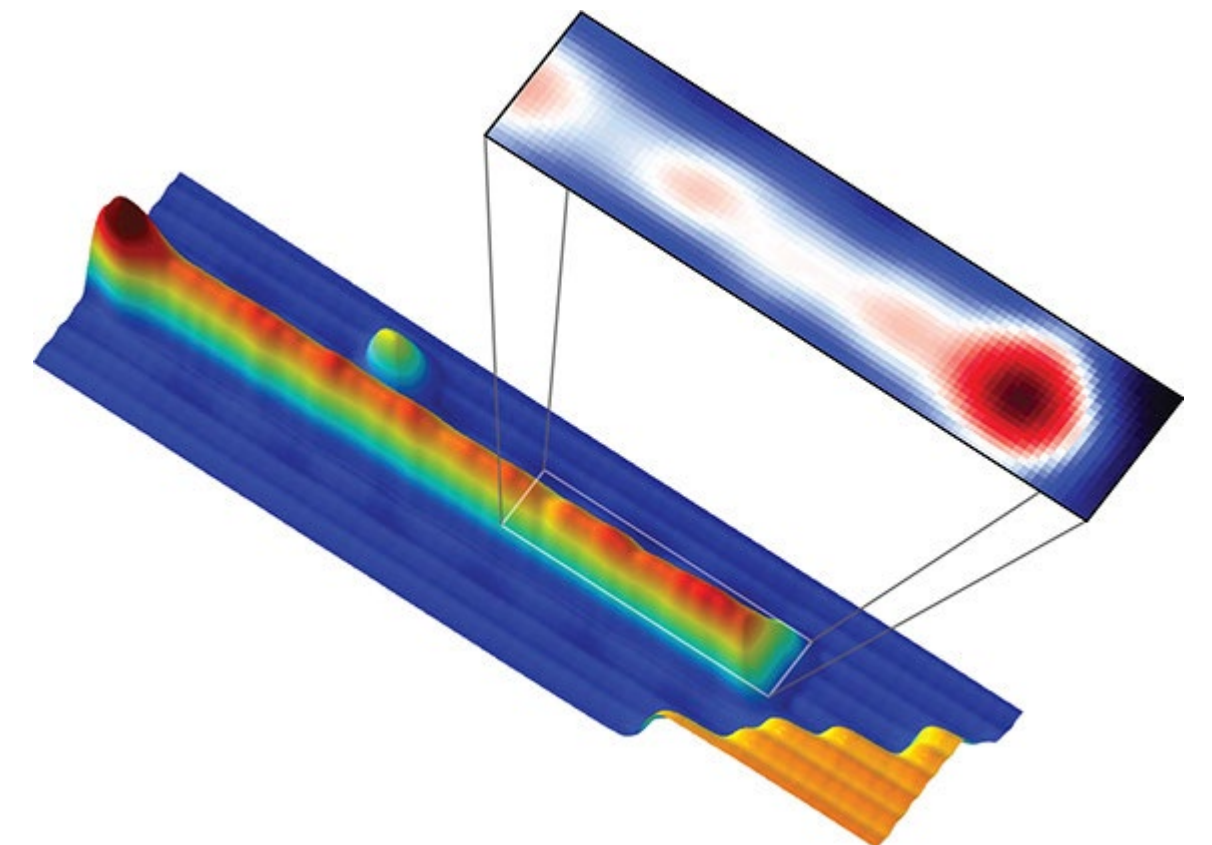
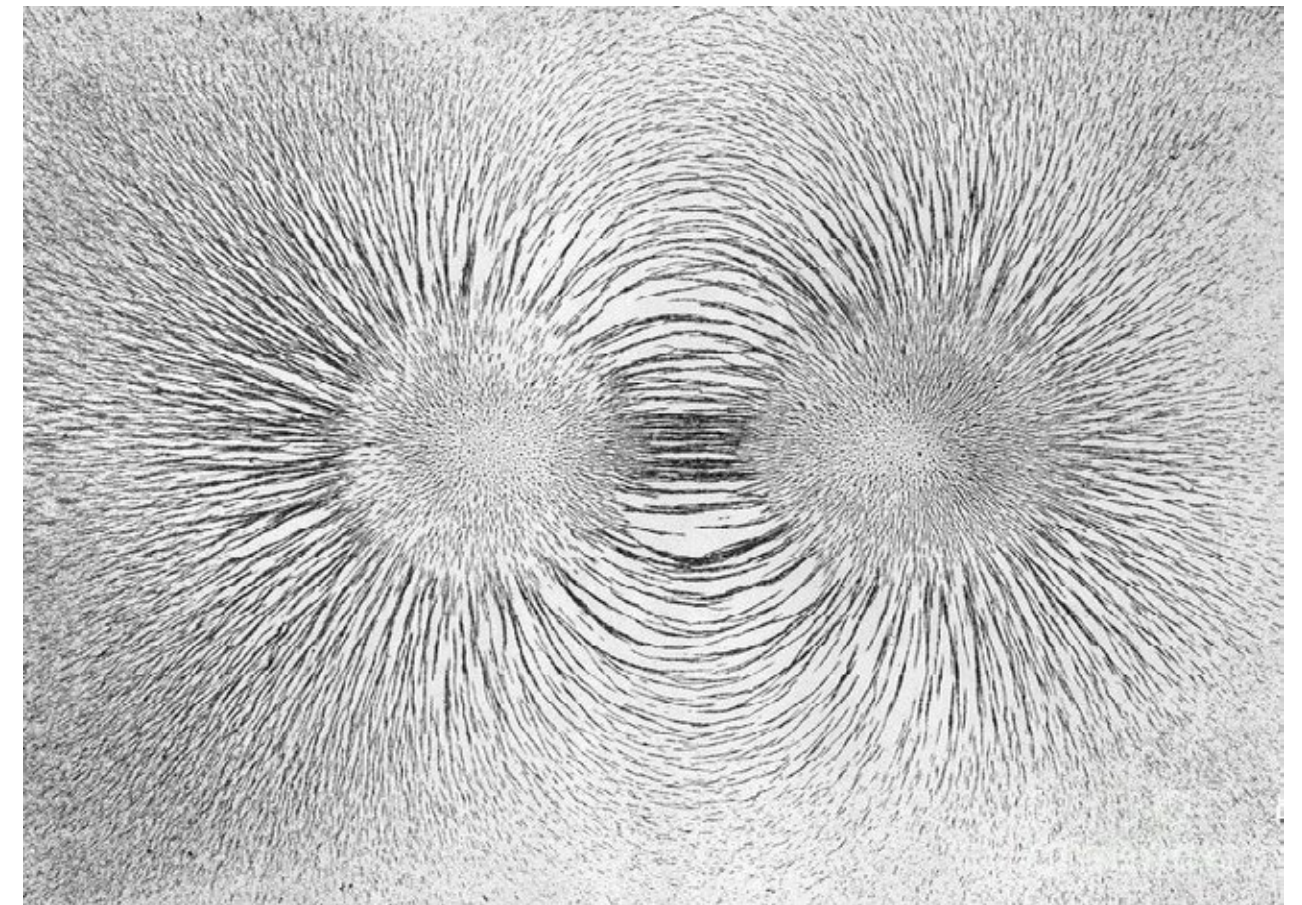
The problem will boil down to just how the Substrate Units will interact with these unusual conditions, AND affect those conditions.

After all, this involves a single strand of Iron atoms (with its magnetic potentials), closely involved, both with the complex Substrate and the unusual superconductivity of the lead too.

It seems to me that the two kinds of Magnetron particles (both of which are Majoranas), are certain to react to the Iron atom strand, by aligning their magnetic moments with those of the Iron atoms - and particularly at the ends of the strand!

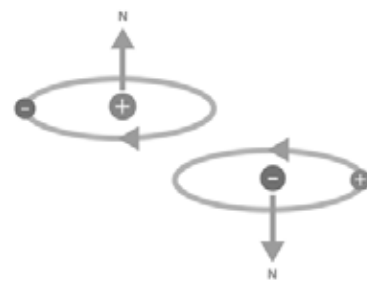
For that is what is assumed to happen with Lines-of-Force around permanent magnets.

Clearly, in this set-up, the presence of the superconducting Lead upon which this occurs, must play a role.



The Majorana fermion at end of superconducting wire ...

Thoughts on Substrate Magnetons & The Necessary Revolution in Physics III



To really address the interaction of phenomena of any kind assuming a Universal Substrate of the kind suggested by this theorist, we will, first, have to conquer the internal relationships between the different particles of this Substrate, as they have so far been devised.

For, though they are all dual, mutually-orbiting particles with only Lepton components, they constitute two very different sizes.

The Neutritrons

The initially devised Neutritron is considered to be composed of a mutually-orbiting pair - consisting of one electron and one positron. So, this is a very tiny particle, even as a mutually-orbiting pair. For, compared even with the smallest atom - Hydrogen, it is extremely tiny - each of its components being only one two-thousandth the size of the proton nucleus of that atom, and a very much smaller proportion of the size of the Hydrogen atom as a whole.

It is so small that it will, without any difficulty, completely-occupy the “insides” of both that and indeed all other atoms - there will be piles of room. So, there will be a set-of-different-relations between the components of the Atom and these included Neutritron units of the Substrate.

The MOST Substrate-affecting part of such an atom will undoubtedly be the orbiting-electron. Indeed, any established Paving, of the neutritrons, will certainly be, at least temporarily dissociated by the oft-repeated passage of this particle, around its orbit.

And, once so dissociated, collections of these now freely-moving substrate-units could also be turned into associated vortices. And these would be of a special type, as the repeated orbiting would allow energy transfers

BOTH WAYS - that is TO the vortices from the orbiting electron, and also FROM the vortices back to the orbiting electron.

Indeed, elsewhere, this has been suggested an alternative Theory of Quantized Orbits (within the Atom).

The Magnetons

Now the two magneton units of the Substrate, though also mutually-orbiting, Majorana-type pairs of Leptons, are both different in size and in properties.

The larger sub-unit in each of the two magnetons involved - either of the Tau or the anti Tau, are TWICE as big as the Proton, while the smaller units - the Muon and anti Muon, though smaller than the Taus are still much bigger than the electron and the positron.

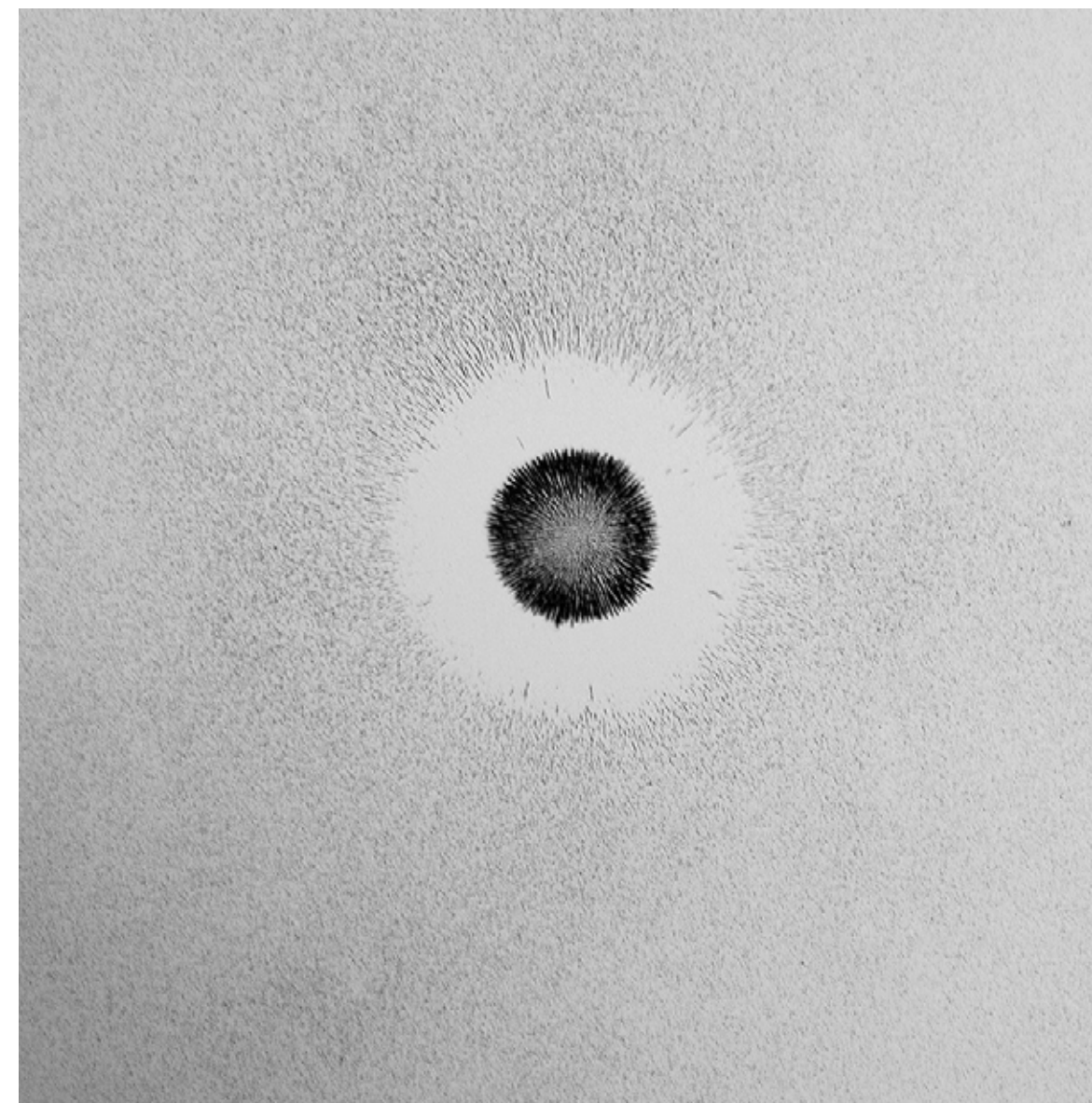
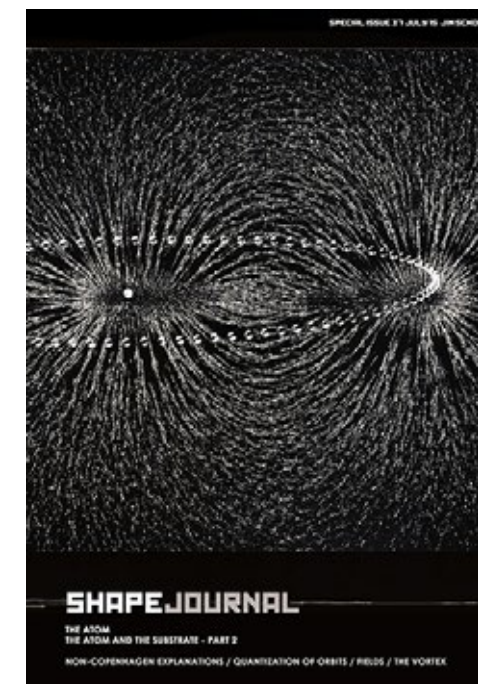
These much-larger joint-particles, because of their differently-sized components, also have magnetic moments. So, both these features limit the presence of these substrate particles within to the Atoms. They are simply too big, and too individually-active (both in their movements and their magnetic effects) to exist, in a stable manner, within atoms. But, as described in their definitions, they can cease their normally-mobile existence, if attracted by Charged Particles, or by magnets, when they form either static Fields or linked as “Lines-of-Force”.

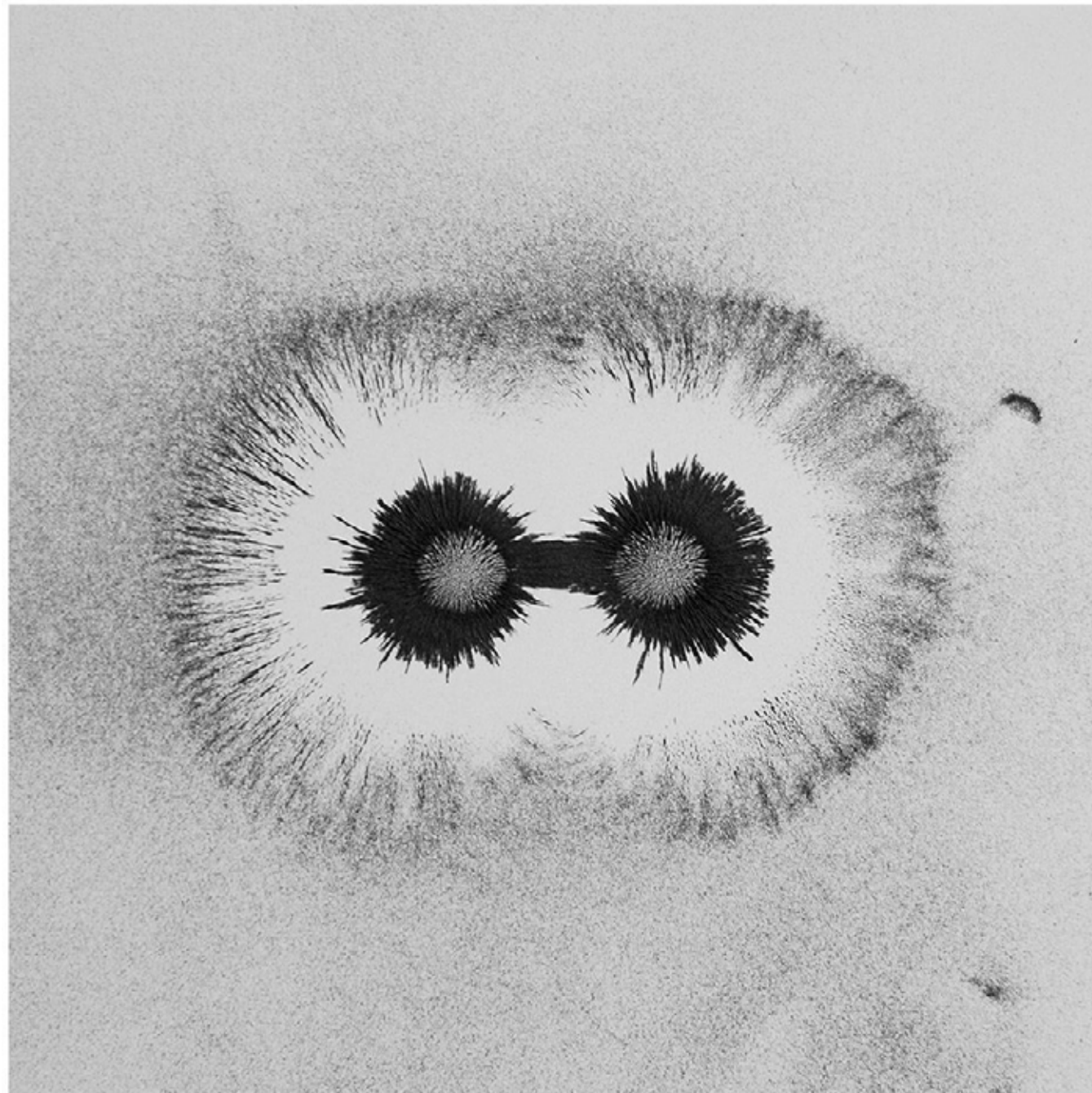
Now clearly, whatever the undisturbed nature of all these Substrate Particles, they will be significantly affected by, say, the energetic passage through them by a Charged Particle. [Indeed, the above reference to the affect on neutritrons by the orbiting electron within an atom,

EDITOR'S NOTE:

QUANTISED ORBITS AND THE SUBSTRATE

This aspect of Substrate Theory is addressed in more detail in Special Issue 37 called The Atom (2015)





Photograph by Ling Meng

already gives an idea of how they will be affected in a quiescent part of the Substrate]

Certainly, the always weak interconnections of neutritrons in a Paving, will be dissociated, and the forming into vortices will then be possible. Yet once the disturbance has passed, there will be a slow, reformation back into their prior stable Paving-arrangement.

Indeed, though, in spite of these local-and-temporary effects, the Paving-pattern will still dominate, across vast areas of what used to be called Empty Space, while, elsewhere, a patchwork of paving-areas with temporary dissociated areas, involving both Streams and Vortices, will also occur.

NOTE: There will always be relatively straight propagations via these neutritron units, as continuously-connected regions of Paving, which will always be available too.

The magnetons, with their normally random movements, and no available stable structure, will be merely be given extra Kinetic Energy by the disturbing passage of a traversing particle, but they will be significantly-structured by gathering around a charged particle - to deliver "its Field", or reformed into linked "Lines-of-Force" strings, by the presence of a strong magnetic effect.

Let us briefly recapitulate the performance of this complex Substrate. When undisturbed it is undetectable!

All its units, either singly in the case of neutritrons, or over-populations, in the case of randomly-moving magnetons, are neutral in every way, and hence are undetectable by the usual means.

But, they can both affect things, and be affected-by things, that can interact with their various features.

For example, the Propagation of Electromagnetic Energy in Quanta is possible by the bucket-brigade, temporary promotion of the internal orbits, in sequence, across adjacent units. While, the presence of a charged particle will allow magnetons to gather around them, in concentric, aligned shells, to produce a field, and a magnetic presence will line up magnetons into Lines-of-Force continuous with the physical cause of the magnetic effect.

In special circumstances, such as within atoms, neutritron Paving can be dissociated, allowing them to move freely, and be turned into separate vortices by orbiting electrons, and via the repeated interactions, thereafter, will only allow quantized orbits to be possible.

Lepton Substrates

It is, seemingly, increasingly-likely, that a single-component, homogeneous Universal Substrate cannot deliver the evident phenomena already known for the final-ground of supposed “Empty Space”!

Too many features seem essential, and no single Substrate Unit can deliver them all! And, the wide range of potential Substrate Units with the necessary qualities to actually deliver what is needed, is so spread-out in sizes, that a Hierarchy of Substrates seems the most likely delivering situation.

What I am moving towards is a sequence of Substrates with the “bottommost” (or least-wide-ranging) one possessing the smallest units, then a substrate on top of this with larger units, and so on with other layers and bigger units as we go!

The following table shows FOUR Levels, each with different functionalities due to the currently involved Units’ Natures and Sizes. But, their individuation WILL NOT be as layers one above another, but rather all together, yet separated, by functional and size differences.

They will effectively all exist in the same space, but acting only with their own level partners.

EDITOR’S NOTE:



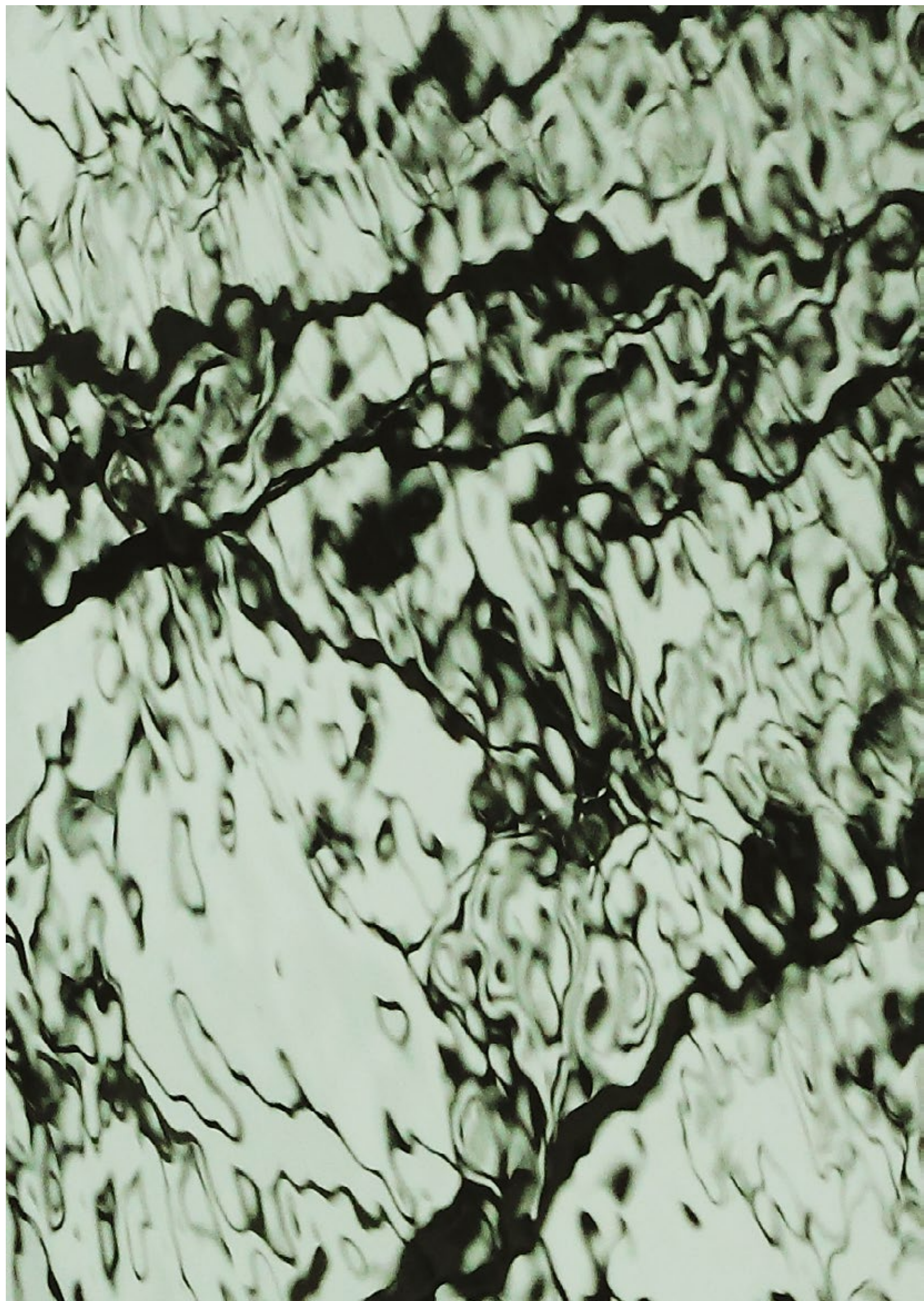
A SUBSTRATE FOR GRAVITY TOO?

As we shall see later these basic ideas have been expanded upon greatly , but here we see the real beginnings of a new theory of physics, where different levels of substrate, composed of known Lepton particles, could deliver EM propagation, magnetic fields and even gravity.

Quarks	mass→ charge→ spin→ name→	2.4 MeV $\frac{2}{3}$ $\frac{1}{2}$ u up	1.27 GeV $\frac{2}{3}$ $\frac{1}{2}$ c charm	171.2 GeV $\frac{2}{3}$ $\frac{1}{2}$ t top	0 0 1 Y photon
		4.8 MeV $-\frac{1}{3}$ $\frac{1}{2}$ d down	104 MeV $-\frac{1}{3}$ $\frac{1}{2}$ s strange	4.2 GeV $-\frac{1}{3}$ $\frac{1}{2}$ b bottom	0 0 1 g gluon
		<2.2 eV 0 $\frac{1}{2}$ ν_e electron neutrino	<0.17 MeV 0 $\frac{1}{2}$ ν_μ muon neutrino	<15.5 MeV 0 $\frac{1}{2}$ ν_τ tau neutrino	91.2 GeV 0 1 Z^0 weak force
	Leptons	0.511 MeV -1 $\frac{1}{2}$ e electron	105.7 MeV -1 $\frac{1}{2}$ μ muon	1.777 GeV -1 $\frac{1}{2}$ τ tau	80.4 GeV ± 1 1 W^\pm weak force
					Bosons (Forces)

TABLE OF SUBSTRATES

	Level	Likely Units	Size
Substrate A:	Bottommost	Electron Neutrino	3 ev
Substrate B:	Propagatons	Neutritron	1 Mev
Substrate C:	Gravity	Larger Neutrinos	18 Mev
Substrate D:	Electromagnetic	Magnetons	1882 Mev



Abstracting the Unknown

A constructivist alternative - constructing the Lepton Substrates

Important note: This paper from 2014 has recieved several much later insertions (August 2017 & May 2018), which certainly seem to come from nowhere. But, I decided that they had to be here, as they confirm many of the assumptions made in 2014. But though much of this is now well out of date in its details, it nevertheless shows from where we came to ultimately arrive at today's Theory!

Now, the considerations of this theorist (Jim Schofield) do, to some extent, mirror those of the Copenhagenists in both historical and present day Sub Atomic Physics, but with vital, and, indeed, fundamental, differences. In the current, universally-accepted model of Elementary Particles, particularly with respect to its many unresolved anomalies, it appears that they could NOT be explained by merely manipulating only Protons, Neutrons and Electrons, along with disembodied Photons of electromagnetic energy, as was the initial simplified position of the early theorists.

So, faced with this, they turned to the "always dependable and productive" weapons, usually termed The Accelerators (or more properly – The Colliders), to attempt to smash these "fundamental particles" into smaller "components", and this, very quickly, caused the appearance of many new, and as yet unknown, entities in relative abundance. This sophisticated method of "Smashing to Smithereens", was, to say the least, unusual, but, always, reliably produced various sets of "even more fundamental" fragments, so it naturally became the standard experimental technique, and produced an extensive set in diverse situations.

But, as you might have guessed, they were almost entirely consisting of tiny entities, with only minute life spans, before they turned into, or became part of, something else. [So, very clearly indeed, the term "fragments" is a far superior designation, than calling them "Elementary Particles"] And, to make any sort of sense of these, they had to be given un-describable, yet quantifiable, properties such as "charm" and "Quantum Spin" (as well as many others).

This quickly turned into a separate(?) Science of Fundamental Particle Debris! For, all of these were characterised by their transient and even partial natures – for they seemed to come in pairs, which appeared to be opposite, contributing pieces of what they had been produced from. Indeed, a fruitful diversion seemed to be to consider neutral combinatons as possible precursors, and here are some candidate pairs and their possible sources:-

The Electron	e^-
&	
The Positron	e^+
=	
The Neutritron	e^0

The Neutrित्रon (originally called the Positronium) which is neutral in every way, is also both tiny and literally undetectable, but, because of its structure as a mutually orbting pair of sub-particles, it theoretically could both carry-internally and release-externally quanta of energy in a similar way to an atom.

Clearly on decanting such a load it would seem to come from nowhere!

Other possible examples are the magnetons:-

The Tau	τ
&	
The anti-Muon	μ^+
=	
The n-Magneton	mⁿ

The anti-Tau	τ^+
&	
The Muon	μ^-
=	
The s-Magneton	m^s

Now, these two are somewhat different as the composing sub-particles are of different sizes, so they are not neutral in every way, so, in addition, deliver opposite Magnetic Dipole Moments too. But, they are exact mirror images of one another, so, if moving randomly in equal numbers, as a gas, they too would be undetectable, unless alternatively-organised on the basis of their still-extant properties into different-and-revealing structures -such as Fields.

Finally, also conjured out of the same set are the potential Gravitons:-

The Electron Neutrित्रino	ν_e^0
&	
Anti Electron Neutrित्रino	$\bar{\nu}_e^0$
=	
The o-Graviton	g_o

The Tau Neutrित्रino	ν_τ^0
&	
Anti Muon Neutrित्रino	$\bar{\nu}_\mu^0$
=	
The a-Graviton	g_a

Anti Tau Neutrित्रino	$\bar{\nu}_\tau^0$
&	
The Muon Neutrित्रino	ν_μ^0
=	
The b-Graviton	g_b

These latter two also constitute mirror images of one another, so in a random-gas mode might also be undetectable.

Clearly, their various names and characterisations betray their origins, in a theoretical attempt to deliver a totally undetectable Universal Substrate, though here they also seem invert the usual Evolution of Matter Paradigm!

For, it has to be said, that analysis-by-smashing-to-pieces, should never be recommended as the only source for precursors!

Can you imagine trying to determine the nature of a flying machine from another World, or even an Earth-bound human being, by smashing them to bits, and looking at the transient results, before they vanish almost immediately? And, consequently, cannot display their relationships in a higher order entity, as they will most certainly no longer be present!

And, you would most certainly NOT choose to do that using incredibly high energies (as they certainly do). For, the results you inevitably get are very unlikely to be prior, stable components, and much more likely to be either short-lived fragments or even wholly *new* temporary creations, or even BOTH!

They seem to be the methods of the sub-human hominid, allied to the highest and most powerful technology, and indeed some form of “creative destruction”, which, of course, bears absolutely zero relationship to the scientific study of the undoubted Development of Reality throughout its History, the contents of which are never the consequences of innumerable minor changes, but clearly, as with all known developments, involving significant Qualitative Changes via Emergent Interludes, which though they do involve major dissolutions, are also only completed by final creative phases of progressive construction delivering the entirely new, within a Stable New Level!

And studies, of these Interludes, bear absolutely no relation to the consequential reasoning of the detritus

investigators. For, their single major tool has no in-feeding, historical sequences, nor any consequential turmoil, which finally produce wholly New Stabilities. They really only deal in the detailed Classification of Debris!

So, getting back to those deliberations, it is inevitable that what is noticed is almost entirely formal, and hence relatable via concepts like Symmetry. Indeed, as the debris piled up, this became a Principle of the fundamental nature of these many fragments of Matter!

Let us contrast these to the suggestions of this theorist (Schofield). For clearly, he too was investigating the structure of identifiable and known particles, but from an entirely different standpoint. Instead of a destructive methodology, he assumed a constructive alternative, by purposely turning, primarily, to address the unknown-and-currently-undetectable possible contents of Empty Space, in order to physically explain the Propagation of Electromagnetic Energy composed of two oscillating vectors - one electrical, and the other magnetic, somehow traversing a seemingly totally empty void. He, quite simply, didn’t believe it. He could, though, see why they did it!

With their long-established, pluralist-seeking for eternal Natural Laws, via formal manipulations of data, taken from purposely-farmed contexts, they were well-versed, if blinkeredly so, in seeking formal patterns and relationships.

So, in contrast, his task became one of discovering what evidently must be filling that void. His only assumptions, were what was known, along with the clear undetectability, of what was delivering all those things. It all seemed to boil down to an attempt to construct a stable, but invisible and undetectable Particle, that had the necessary properties, due to its composition, from already known and stable sub particles. He considered that he clearly needed a resultant joint particle that would have a net zero charge, zero magnetic effects and even a “cancelling” of its content of different kinds of matter itself.

So, he conceived of a mutually orbiting pair of two known and stable particles – one of matter, with one of a negative unit charge, and the other of of exactly the same size, but consisting of antimatter, with a positive charge. And, if such could be achieved, it would also have NO

magnetic effects either, as these too would be cancelled out. But, such a union had long been dismissed by the evidence from accelerators that these would mutually annihilate one another on coming together, and produce totally disembodied Pure Energy.

The particle-smashers were adamant. “We’ve seen it!” was their attitude. But, such an imperative, did not say why they couldn’t be kept apart by taking their relative velocities into the creation of a mutually-orbiting state. Nor, did they explain where in so-called Pair Production, an electron and a positron could be so easily produced out of what they assumed to be Pure Energy!

Now, if, as assumed by this researcher, such a mutually-orbiting union could be formed, the resulting particle would have exactly the properties required to be undetectable in Empty Space.

And, most determining of all evidence, in this discussion, was the fact that this precise joint particle had already been observed in the Tevatron at Fermilab, and even been named by the discoverers as the positronium. Yet, though it certainly immediately dissociated as soon as it was discovered, that was in a very high speed Accelerator, and even the suggested particle by this theorist would have dissociated in such an environment. But, what about in “Empty Space”? It was considered likely to be stable there, and in that state was re-named a Neutrित्रon. The die was cast!

This researcher was committed to investigating (initially entirely theoretically) the exact opposite World to that of the atom smashers. He would investigate the stable, yet invisible, World of Empty Space, and assuming his intrinsically neutral and undetectable particles, would attempt to explain the intriguing, but certainly real, properties of the “seeming void”!

He started by considering how such particles, which he had renamed as the stable Neutrित्रons, could indeed propagate electromagnetic energy across such a space

Now, he had chosen (devised?) particles involving internal orbits, because apart from conferring undetectability, they could also hold energy via the promotion of these orbits, and they would accomplish this in quanta. But, how would they actually propagate such quanta at the Speed of Light? Now, as these entities definitely included matter within their structures, they could most certainly

NOT do it by moving, for they could not move at the Speed of Light.

But, they could do it, by staying relatively still, and passing on their quanta, bucket-brigade fashion, from unit to unit in a stationary-universal-paving or substrate. The, the vast speed of light would then merely be the speed of transfer of one quantum between adjacent units of the paving.

So, having got the bare bones of a theory, it then had to be used to solve anomalous situations delivered by the Copenhagen Interpretation of Quantum Theory, and by far the most obvious were the discoveries in the famed Double Slit Experiments, starting with the case of using moving electrons.

The current consensus standpoint of Wave/Particle Duality, which was used to explain(?) these experiments, was truly amazing! For it demolished the concepts of Waves and Particles as quite different things, and, instead, had entities, which could switch between these as if they were alternative states of the same thing. But, in “explaining” the observed anomalies, this stance abandoned materialism for a version of idealism, and effectively abandoned physical explanation in favour of formal equations, as the driving essences of Truth.

Yet, the new concepts involving a universal substrate of neutritrons torpedoed all that! All the anomalies were fully explained without any recourse to Copenhagen whatsoever. The initial ideas certainly seemed to have legs!

Now, this theorist has had a long history of seriously studying Emergences – those interludes occurring with all kinds of internally-generated developments, wherein a past, seemingly-eternal stability finally, and inexplicably, comes to grief.

What was evident in cases, across the whole spectrum of possibilities, was that any such Qualitative Transformation would never be incrementally achieved or explained. To make any sort of real explanatory progress, the current self-maintaining stability would have to be completely dissociated, and, indeed, via a mounting series of crises, the stability would finally collapse. Yet, the amazing thing that was revealed in these studies, was that only then in what seemed to be a resulting and irredeemable Chaos, a new phase emerged, in which all the Qualitative

changes happened, and then surprisingly self-terminated in a wholly new, and higher, Stability.

Such researches revealed that the poetic “Phoenix arising from the Flames” was, in fact, true, and was not magic, but a concrete Emergent Event, which occur throughout all developments, and at all levels! Now, somehow, our strictly-pluralist physicists did not, could not, and indeed will not, study such Events. They accept dissolution, but only as a means of exposing hidden components - conceiving of only incremental, pluralist changes. So, they were incapable of ever explaining the Emergence of the wholly NEW.

Their whole approach and methods were strictly analytic. They were never transformative. Absolutely everything was just multiple different summations of the very same eternal Natural Laws! But, the outstanding difficulty – Action at a Distance, was not so easy!

Try as he might, this theorist could not explain either Electrostatic or Magnetic fields, in terms of a purely Neutritron paving: it just wasn't possible! So, in the same constructivist vein, he attempted to devise, once again theoretically, other possible joint-particles, that would also inhabit so-called Empty Space, that could actually deliver these things, while, in themselves, being undetectable in all the usual ways.

Once again, these particles too had to be undetectable, but, and this was a major difficulty; for the particles would have to possess non-internally-cancelled magnetic properties, while somehow remaining undetectable! For, if this possession of magnetic properties were the case, they would surely be easily detected.

So, once more, he had to construct a contradictory environment – effectively undetectable, yet possessing these crucial, clearly-evident properties of magnetism.

The solution was to have equal numbers of two diametrically opposite composite particles, which this time had to be able to move about, but would en-masse be neutral, in all the ways necessary in joint particles similar to the Neutritron, by being composed of different sub particles.

A new pair of composite particles, with equal and opposite magnetic effects would be required, which normally would be totally free-moving and deliver NO resultant

overall magnetic effects, BUT in special circumstances could both self-aggregate and self-orientate to produce Fields!

Once again the model of a pair of mutually-orbiting sub particles of opposite types of both matter and charge would be involved, but this time of differently sized components. This would make the individual particles charge neutral (like the atom), but not magnetically neutral, nor matter neutral either. But, in a population composed of randomly moving and equal numbers of diametrically opposite particles, the overall effect would be neutral, except where actual Fields were subtended around their “seeming sources”.

Now, the objective of devising these particles, theoretically, was to see if such could indeed subtend fields seemingly out of nothing!

And, with a great deal of investigation, the answer seemed to be, “Yes!”

For, though usually randomly mixed and moving constantly, so in normal conditions they would be undetectable, while in the presence of something like a charged particle, however, they would contrastingly organise-themselves surrounding the charged particle, in concentric, motionless shells to deliver the required field. Simple geometry would make it an Inverse Square Law. And crucially, as it would have internal orbits, these could be promoted to provide the energy required for the field to actually move things in accordance with this law.

For, as with the explanations in the Double Slit explanations, the substrate could contain energy, throughout, as slight promotions of the Units' orbits, and it would be increased appropriately in the units, when part of of the Field, to enable them, so that this that could do the work. And, once used, it would then be immediately replenished from further afield in the Universal Substrate.

And this theory explained the fact that the supposed source of the Field – an electric charge, was never diminished by the work done in such a field. This can only be explained by this provision of energy by the field itself (and hence the Universal Substrate).

Now, this work is, as yet, incomplete, but so far, it has been incomparably better than the Copenhagen version, and successful in the following areas:-

1. The propagation of electromagnetic energy through Space.
2. Solving all the anomalies of the Double Slit Experiments
3. Solving how electrostatic fields can be subtending in Space.
4. Explaining where the energy comes from to cause forces to be applied by such fields and perform work.

And, all these are consistent with an entirely materialist, constructivist standpoint and method, and as an alternative to Collider-based smithereens and the formal idealist rules of the usual Copenhagen stance.

Postscript: As most of this was written in 2014, it falls short of a comprehensive Theory, but such in 2017 is finally close to completion, as a comprehensive, though purely theoretical, model! Elsewhere, other developments mainly directed against the idealist Copenhagen Interpretation of Quantum Theory, have also developed markedly of late, and we are close to formulating a New Holist Theory of Physics!

Jim Schofield
August 2017

Postscript 2: Current work on Gravity has also been solved in a similar way using Gravitons (May 2018).



EDITOR'S NOTE:

These additions were made when this paper was republished in 2018 in Issue 59 of SHAPE on the theme of “Meta Forces”

Universal Substrate Units

What would be needed to deliver such a Substrate?

If we are to assume an undetectable Universal Substrate, it must have been a very early creation in the History of the Universe, and not only conducive to supporting all the subsequent colossal developments, but also, somehow, actually positively-encouraging their stability and persistence.

And, in addition, therefore, it must have been composed of extremely early embodiments of matter, occurring in remarkably facilitating ways.

After all, the mammoth extent of the Universe was possible, and definitely occurred, with this Substrate as the necessary understory of absolutely everything that was going on, particularly in actually enabling fast and almost lossless communications, particularly of Energy, across increasingly vast distances.

So, one aspect of our considerations, into this crucial basis, must be its actual composition, and, clearly, the place we must initially look in, for likely components, has to be in the simplest-possible-forms that could deliver all these things, AND, at the same time be totally either unavailable or undetectable, by all the current means known to an eager-and-investigating Mankind.

The first place that anyone would look, is likely to be the current Standard List of what are deemed to be the most Elementary Particles of Matter.

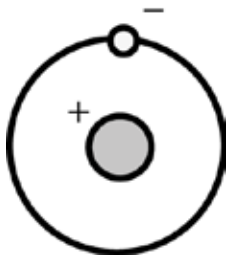
But, right away, there has to be flagged up an important danger in doing this. For, this List is almost solely the product of very High Speed Accelerator Experiments, where a very small number of elementary particles, known from other means, are smashed to smithereens, at ever higher speeds and energies, to see what can be produced, and most of the achieved products last only for extremely tiny fractions of time.

Complete experiments only last a fraction of a second, in these accelerators, so any development trajectory, or time-requiring, recursive effects will have been totally excluded.

Conclusions, from such a limited area, MUST be taken with a mighty “pinch of salt”, as has been proved by the remarkable alternative macro experiments conducted by Yves Couder, in which he produced his so-called Walker entities - entirely composed from a single substrate, and absolutely nothing else. And, he even managed to produce their quantized orbits.

Nevertheless, it is with the results of the Particle Smashers that we must, at least initially, look for candidate components for our possible Universal Substrate.

Some candidates, known about prior to the Accelerator Experiments, are the electron and the proton. And an early combination of these two - the Hydrogen Atom, also provides, and extremely early, a significant model for further joint-particles that are, generally, remarkably stable.



And, as can be seen, this involves the mutual orbiting of these two entities, but, because of a vast difference in their sizes, it appears as if it is the electron orbiting the proton.



EDITOR'S NOTE:
The next two articles and other important papers in the evolution of Substrate Theory were originally published in Issue 49 of SHAPE Journal entitled "At the Bottom"



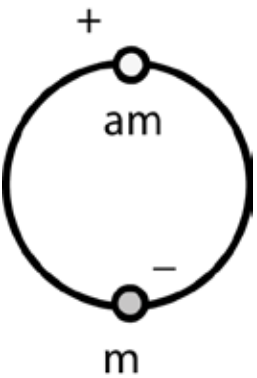


EDITOR'S NOTE:

THE LEPTON SUBSTRATES

This is a fitting name for the Universal Substrate as it not only signifies multiple layers of different Lepton particle pairs, but it was also devised in the village of Lepton, where theorist Jim Schofield lives!

And, this immediately suggested another possibility, not least for its simplicity and form, which is the positronium (neutritron), which is composed of a mutually-orbiting pair of one electron and one positron.



But, as the components are of exactly equal size, (as well as having direct mirror-image properties), these two, instead, shared the very same orbit.

Now, an important feature of this particle is that it is undetectable - it is "dark" matter!

It has no net charge, no magnetic properties and has one particle of matter, and the other of antimatter. It is also invisible, and hence a great candidate for our Substrate. In addition, like the atom, its orbit can be promoted to a higher energy level, so that it can take in, hold and then release energy.

You can imagine how it could be the crucial substrate communicator.

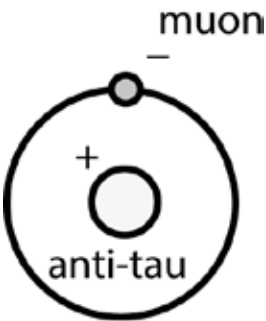
Now, elsewhere, (primarily upon SHAPE Journal on the Web) this candidate, for the Universal Substrate, has staked the strongest possible claim, not only by delivering the Propagation of Electromagnetic Energy across Space in quanta, but also by explaining both Pair Productions and Pair Annihilations, and even delivering a comprehensive, purely-physical explanation of all the many anomalies of the ill-famed Double Slit Experiments.

But, it couldn't deliver *Fields*!

Clearly, there had to be other units comprising the Universal Substrate that could deliver this crucial feature.

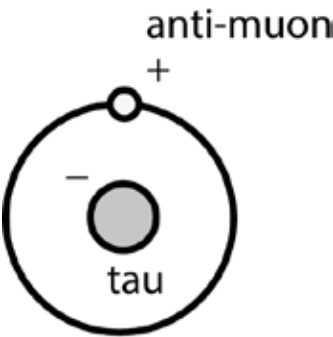
Returning to the List of Elementary Particles, the search began for other compound units that could do this. And, they would have to be composed of sub-particles of different sizes, so that the resulting joint-particle would have a magnetic dipole moment.

Indeed, a mutually orbiting pair, consisting of particular Muon and anti Tau particles would deliver exactly that!



But, this would make it very easily detectable!

So, another joint-particle with exactly-opposite properties was sought. And, this was revealed as a mutually orbiting pair consisting of different Muon and Tau particles.



But, how could these two cancel out each other's properties, to deliver undetectability, on the one hand, while re-organising to deliver fields, on the other?

The answer was as a randomly-moving-population of equal numbers of each of these two particles, for, as such, these would, indeed, become undetectable as such a mixed, randomly-moving population. But, if gathered-together statically, and appropriately-orientated, around a charged particle, it could, indeed, deliver that particle's required Field.

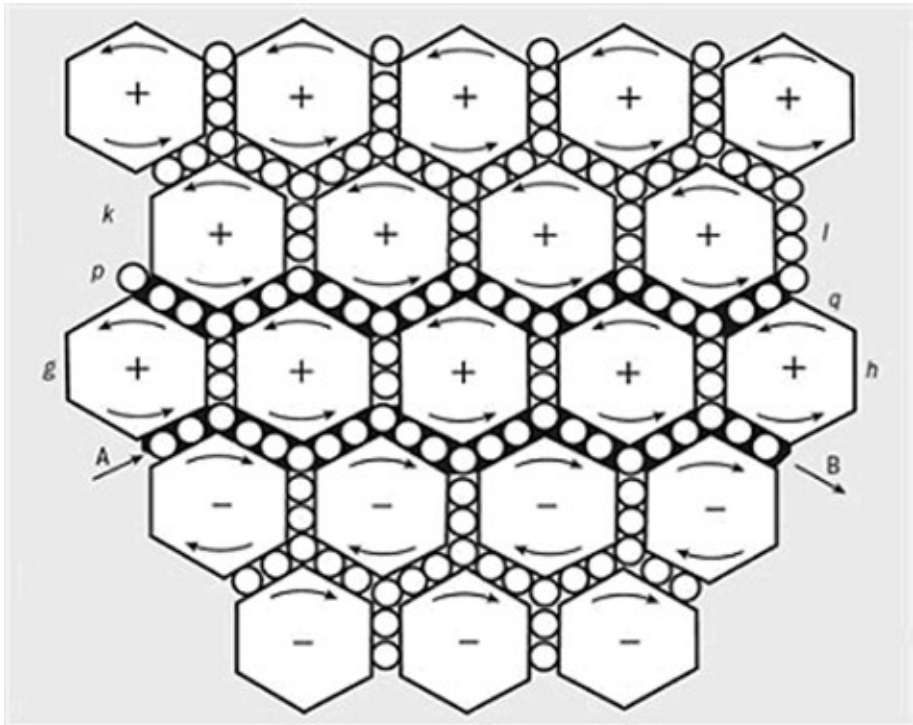
Now, even this purely theoretical breakthrough is still highly significant.

The Universal Substrate with these components, interestingly, strongly echoes James Clerk Maxwell’s model of The Ether, by being composed of a relatively static Paving of neutrtrons, along with a population of randomly moving particles - the magnetons.

In this case, it is the neutrtrons that form a loose, but relatively static, Paving, while the two others, termed magneton A and magneton B, would usually be the randomly moving other components, weaving about in the gaps between the loosely-linked neutrtrons.

The presence of a charged particle would “effectively-capture” magnetons in concentric shells of magnetically-aligned units around it, thus building a Field, and the energy for “actions” of that field would be gathered entirely from around the Substrate-in-general, as ALL the units are capable of having their orbits both promoted and demoted.

This would make the substrate both a universal Sink, and an ever-available Source of energy for Field Effects. The actual supposedly-causing charged particle would need to deliver NOTHING but their initiating, charged presence!





Second Generation Material Particles

A speculative alternative origin

Let us assume that matter and antimatter are not equal and opposite forms of matter, and positive and negative are not equal and opposite forms of charge. Instead, we consider another form, which is naturally neutral.

To get the above seemingly Dichotomous Pairs of properties such as matter-types and charges, we can see both matter and antimatter as linked properties of incomplete parts of an original neutral form of matter. And, this being so, those fragments will also display the also linked fragmentary versions which seem to have opposite charges.

After all, opposite charges attract one another - as if to regain that original whole form. And, the current stance on matter and antimatter is that they too vanish in what is assumed to be mutual annihilation, but could be mutual cancellation by a re-association of some kind.

Now, if such suppositions are true, a trajectory of development that could have been produced from something which preceded it, that was a neutral matter form. And, it would then be the splitting of that form which delivered the oppositely-charged fragments, each also consisting of one of the associated different forms of matter, which, apparently, link indissolubly to the two opposite charges too. Opposite kinds of matter are believed to deliver opposite charges - the classical example being the electron and the positron!

These are actually mirror images of one another in every conceivable sense. One is negative-and-matter, while the other is positive-and-antimatter: clearly these properties are not totally independent of one another, but in the way we are considering them connected features produced by the splitting of the original form! They are created properties along with the created fragments.

Let us push the boat out even further, the re-association of matter and antimatter fragments which is said to

produce mutual annihilation, becomes, with this alternative set of premises, merely the reconstitution of the original neutral-in-every-respect form: it has been annihilated in its previous incarnations, but still exists though it cannot be detected!

It will, of course, keep the Kinetic Energies of the two fragments internally.

[See the work by this theorist on the neutritron - a mutually orbiting pair, consisting of one electron and one positron, with the capability of holding energy both in the constitution of their joint orbit, and in its potential promotion {like with the atom}. but, indeed, producing a wholly NEW association of these two fragments into a different product (or maybe it is that original source from which they both emerged), but it is always possible that they do not join with their original partner pieces, but with fragments from a quite different source, which displays these same properties in its pieces.The neutritron is perhaps a particular example, which was conceived as a wholly new entity, when first produced.]

We have no idea of how we got to that stage, for enough other combinations could occur due to other dissociated forms, and recombinations would be possible between non-original bedfellows. It was long ago, but once it began to be rent asunder into what we see now, there was no easy causal way back to deliver the actual trajectory of evolutionary events.

Let me clarify what I mean by all this, with a much later revelatory example! When plants arose based upon photosynthesis, they began to release Oxygen as a waste product. In time that Oxygen became so abundant in the Earth's atmosphere, that it transformed the environment from the very conditions that had made the producers of that change possible. Indeed, the abundance of Oxygen allowed animals to emerge - an entirely new form of life, and allowed many things to be able to burn for

the first time, Even what are now considered the most inflammable substances, like Hydrogen, could not burn without Oxygen. The point is clearly that there are always such recursive-and-revolutionary effects of evolution, which are transforming the context, regularly, in short emergent interludes, that change the game profoundly. And, as research into such Events have shown, it happens in totally non predictable ways, so that future possibilities are never solely defined merely by knowing what a situation was at a certain time!

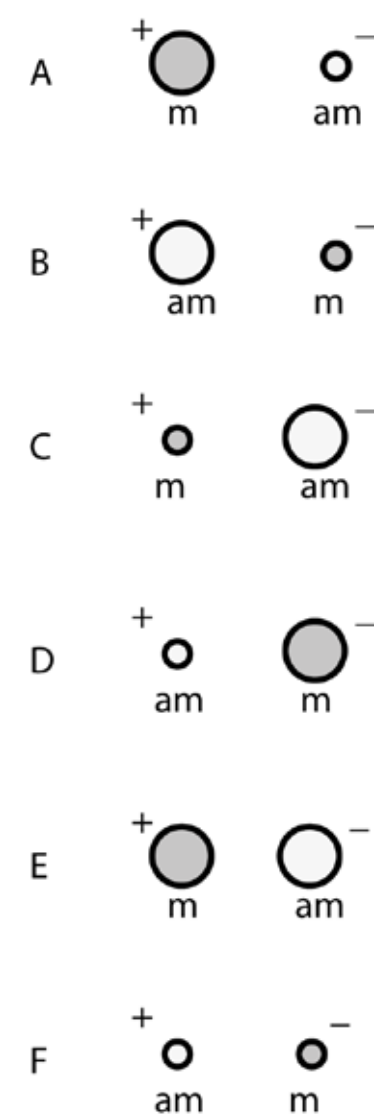
Under new neutralities that could be produced that would also be stable, a new era with new possibilities could be set in train.

Indeed, the atom is a perfect example of this. It is stable and persists Universe-wide, in spite of originating as a new kind of association. And, that same atomic structure allowed many more such associations, but with each possibility possessing a wholly new set of properties - inconceivable from the point of view of their prior level.

For such to occur, it is certain that our so-far considered example of originally neutral matter would not have been alone. Other different neutral entities also involving both matter and antimatter, as well as negatively and positively charged potential fragments will have existed. But, the original entities could be of different sizes, so any dissociations would deliver charged fragments of different sizes, which could re-associate not to simply deliver the same thing again, but with compatible charged fragments of other prior forms to produce something entirely new.

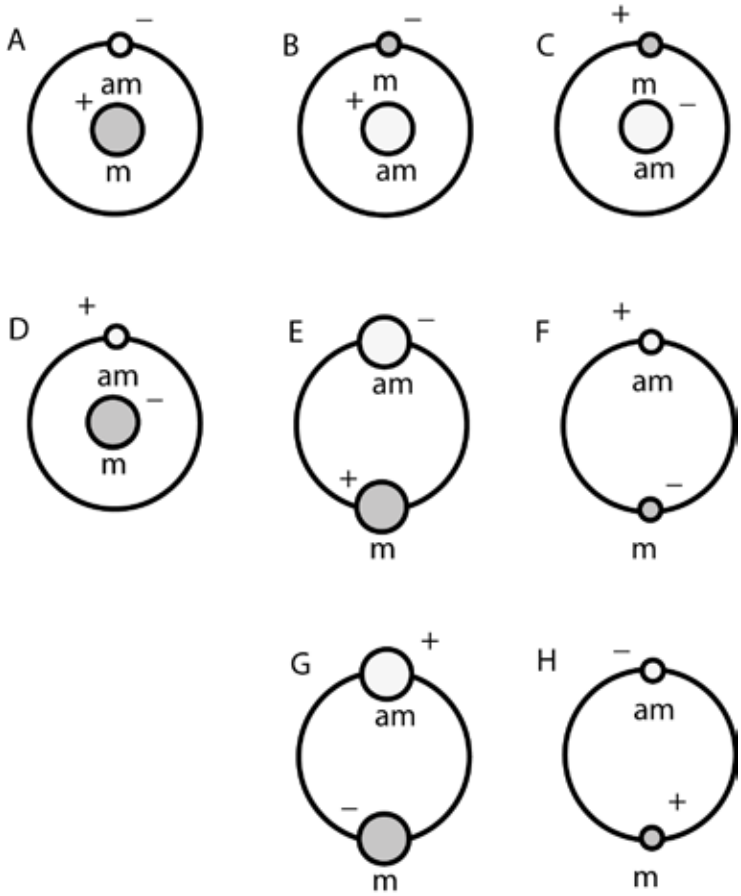
Now, clearly, so much of this is supposition that an initial set of formal possibilities must be fully considered.

We could have the following, if there were two neutral entities of different sizes for the initial content. Then splits, to produce positive and negative, and matter and antimatter components, could then form the following possibilities:-



All these would link electrostatically, that is by charge, and could, by mutually orbiting one another (on the model of the simplest atom).

Clearly, with two sizes Big(B) and Small(s), matter(m) and antimatter(am), and finally positive(+) and negative(-), there would be 8 different products when different sizes are involved, and 4 when same-size components are involved.



Directional Fields and Forces

Action-at-a-distance Explained?

The theory developed by this theoretical physicist concerning Magnetron particles in a physically-present Universal Substrate, involves a crucially important feature, which now demands further elaboration.

The magneton-A (mN) and magneton-B (mS) particles, are effectively mirror-images of one another in both their contents and their properties. But, though they were both individually wholly charge-neutral, nevertheless, because of the differences in size between their component sub-units, each of the two magnetons possesses an opposite and still-active, magnetic dipole effect, which always involves a single, precisely-defined direction, due to the orientation of the determining plane of the internal-orbit involved, of which that direction was the axis of that internal orbit.

The directions of neither electrostatic, nor any gravitational, effects could ever be so accurately and physically defined, with the usual theories!

We could, in those prior theories, only define those directions involved, in both Electrical and Gravitational fields, in terms of the relative positions of both the particular field's Source and its affected Object.

But, to be able to define this direction, would require, and hence infer, a precise-and-simultaneous "knowledge" of both of these vital positions - in other words, one has to know where the other one is, precisely, to effect its subsequent caused-movement in terms of that precise, connecting-direction.

But, how could this really be known? The ill-famed Action-at-a-Distance anomaly once more raises its problematic head!

Of course, we, therefore, naturally devised the idea of a physically-existing, and, therefore, material Field, surrounding every affecting-object. But, within what is such a Field established, and what would have to be

the properties involved to deliver the required influence, AND for it to be in its precise necessary direction?

Historically, Mankind HAD to invent the idea of a totally space-filling substrate-or-medium to both support and deliver the means for such extended effects. BUT, "How could the correct directions be involved throughout such a field?"

Clearly, the Substrate had to be material too, though undetectable, as no-one has ever detected one! And, it would require properties of its own to deliver all its necessary functions.

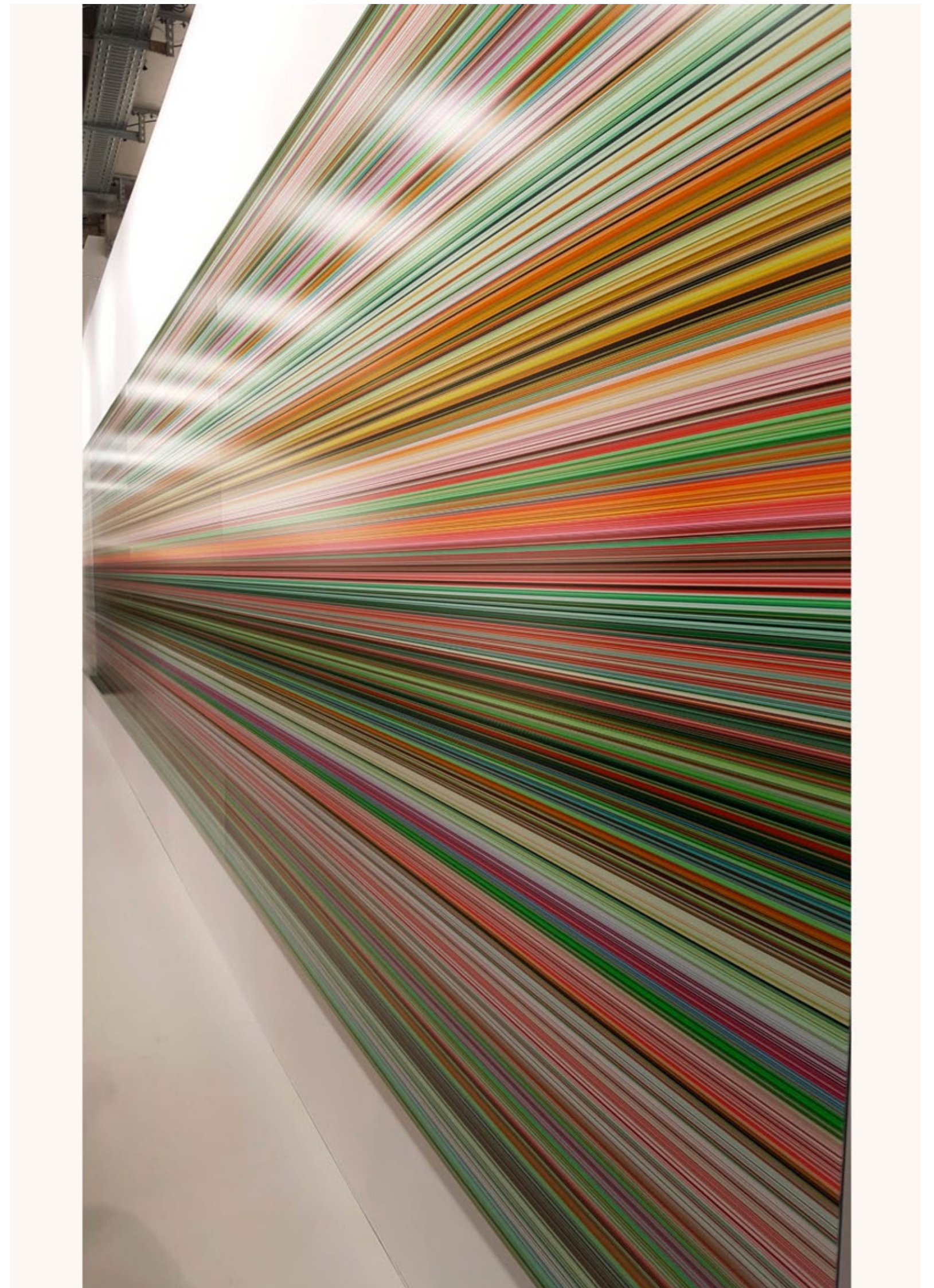
So, is there a property which could be imposed throughout such a field, which had to involve precise-directions, essential for the required actions? For these would have to be directed precisely to the supposed sources of such fields, at every single position throughout that field?

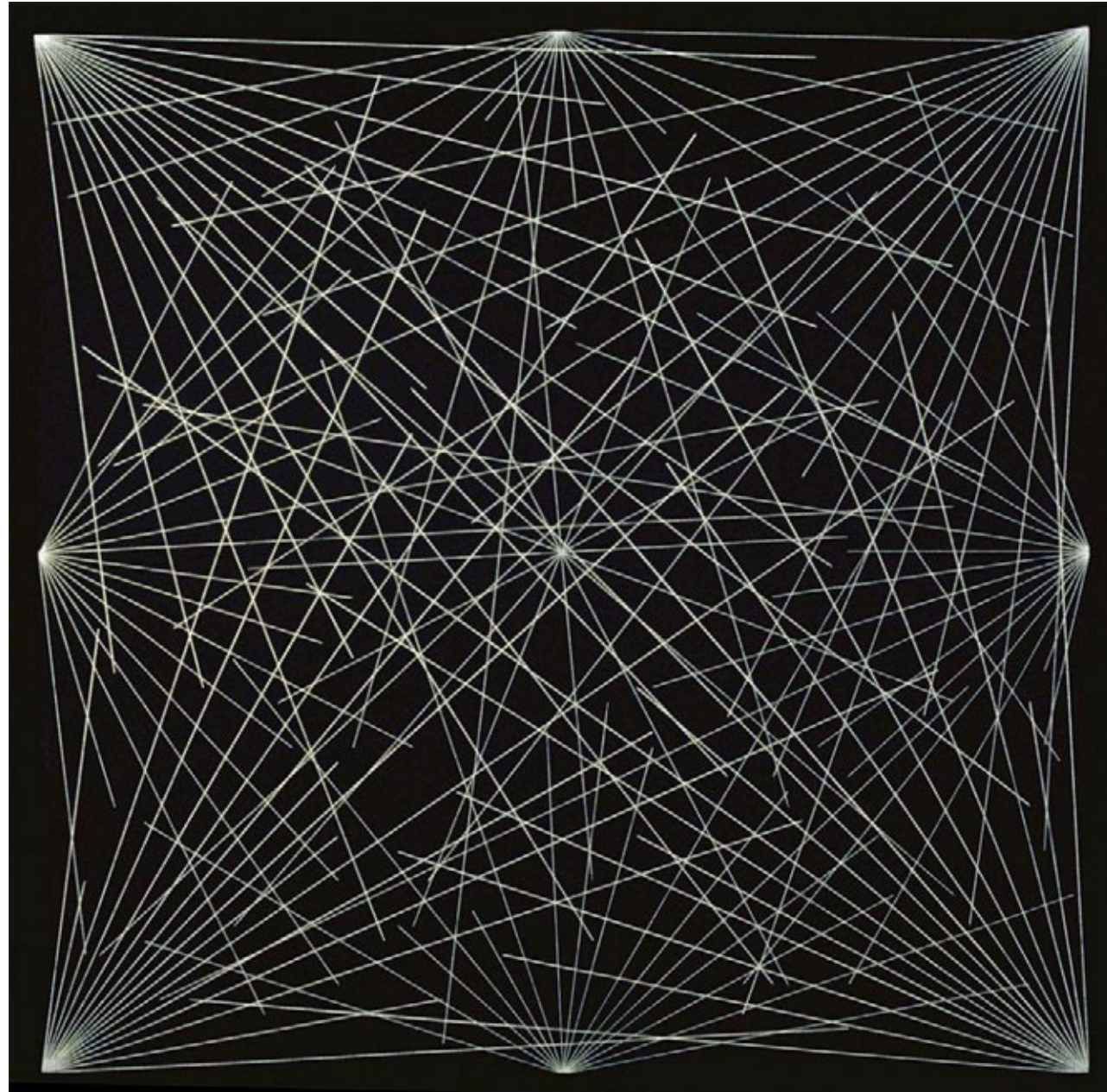
With this theoretician's research on magnetons, an answer has finally been delivered. It is "Yes!"

A magneton, with its magnetic dipole, gives just such a precise direction!

And, as an initial magneton, immediately adjacent to the source, will always align its magnetic dipole to point to that source, and, thereafter, itself-in-turn would cause the next magneton to align with it, that is in the very same direction, this would happen repeatedly until, a completely singly-aligned-line of its field-components will be delivered all the way to any affected object's position.

In fact, all around the source there will be such an aligned field pointing inwards-to-the-"source" from all affected positions. And, this would not only deliver the appropriate directions to every single point in that field, but also the means to act upon that object.





Lines from the Corner, Sides and the Center to Points on a Grid
1977 by Sol LeWitt

The directions throughout such fields will have been built up from the source outwards imposing the “direction to the source” on each and every field unit.

So, with this explanation, a usually undetectable population of randomly-moving and randomly-orientated magnetons, gradually settle into series of concentric shells around the source, composed of all these directionally aligned field-units.

Now, as there will be more units in each succeeding shell, due to its increasing radius, so the alignment will be delivered, but the amount of effect will be shared between more units as we move away from the source, in a consequent inverse square determination.

So, it must also be the case that there will be energy (presumably drawn from elsewhere in the Substrate) within these field-units, but also in proportion to the shared influence in each unit of the line passed outwards via each succeeding shell.

Clearly, if that unit’s energy is used in affecting an interloping object, then the field, thereafter, will have to have its used-up energy replenished from elsewhere in that Substrate.

For, absolutely nothing is extracted from the supposedly-causing Source: it remains exactly the same. And, similarly, absolutely nothing is extracted from the supposedly-affected object: it too remains exactly the same.

All the active effects of a field, therefore, can be due ONLY to that field. It alone supplies both the direction and the energy to affect an interloper.

This theory removes Action-at-a-Distance, and replaces it with an actually-existing Field within an actually-existing Universal Substrate, composed of appropriate units.

And, perhaps the most surprising feature of this Theory is that a supposedly Electric Field, can only be, in fact, a Magnetic Field, which gives exactly the same effects as the previously assumed Electric Field.

The clearly evident relationship between Electricity and Magnetism, should, perhaps, be seen as merely two views of the very same and intrinsically-linked phenomena, which we initially treated as separate, and

only later revealed their close and clearly natural relations - not least as are clear from the integrating Maxwell Electromagnetic Equations, and the whole technology that has been developed involving both together in both natural and productive technologies.

But, what has made this possible is not only the premise of a Universal Substrate, but also its composition, not only of undetectable neutritrons, but also of equal numbers of mirror image magnetons, usually in constant random motion to make them also undetectable, but which can, in the presence of a charged particle, align themselves, statically, around that charge thus subtending a Field. Clearly, these units (the magnetons) must be capable of the properties suggested here, but also capable of both communicating and holding energy in a given pattern determined by the causing charge, but NOT supplied by it.

As with the corresponding theory based upon the neutritron, all the magneton components of the Substrate must also have internal orbits - similar to the atom, and in a similar way capable of being promoted and demoted. Such units, in a Universal Substrate, must therefore be capable of acting as both a Sink and a Source of energy, the distribution of which will be normally equally shared, but reorganised by influencing sources - like charged particles.

Of course the above theory is, possibly, only about Electromagnetic Fields, and to deliver it, the composition of the Universal Substrate had to include Magnetons as well as Neutritrons, and yet remain undetectable when sought without interactions.

It seems to suggest that even this composition is still incomplete, and another category of Substrate particles, namely Gravitons, will have to be theoretically devised to deliver the actual Gravitational field as well.

Let us use the same principles, as delivered neutritrons and gravitons, to get the undetectable component(s) to allow this.

Meta Forces II

Comparing secondary forces: both Electrical and Gravitational

Elsewhere, the requirement for a directional feature, in the Universal Substrate Units actually delivering Fields, has been explored functionally, but, it must also be admitted, only speculatively, by this theorist.

But, though the magnetic effects due to orbiting electrically-charged particles are well-established in Physics, and must surely be involved in these fields, exactly how the very-same Substrate Units also come to deliver both electrical and magnetic effects has not yet been sufficiently spelled-out.

And, this turns out to be absolutely crucial, in establishing Fields as being entirely due to features of particular Universal Substrate Units, primarily, if not exclusively, by delivering a *directional* content as the active sole agents of field effects within such units.

The Units involved here are termed Magnetons, and as with all the currently defined Units of my suggested undetectable Universal Substrate, they consist of mutually-orbiting pairs of Leptons - in the Magnetons case, each one consists of one Tau and one Muon - sub-particles, of opposite cancelling-type properties. But, as these are also of differing sizes they will also deliver a Magnetic Dipole Moment, perpendicular to the orbital plane of the smaller sub-unit (the Muon) around the larger (the Tau).

Now, this directional feature was indeed vital, because without it there could be NO caused direction-of-action, for the field when affecting a susceptible interloper. And, without the mutually-orbiting form of such Units, there would also be no means (via the promotion and demotion of the orbit) of that field unit both holding and delivering the energy to implement that action!

The interesting thing about Magnetons is that normally they will be moving about randomly, but as soon as they encounter either a charged particle or a magnet of some kind, they re-organise themselves into statically-linked fields - either electrical or magnetic, depending upon the form of organisation instituted.

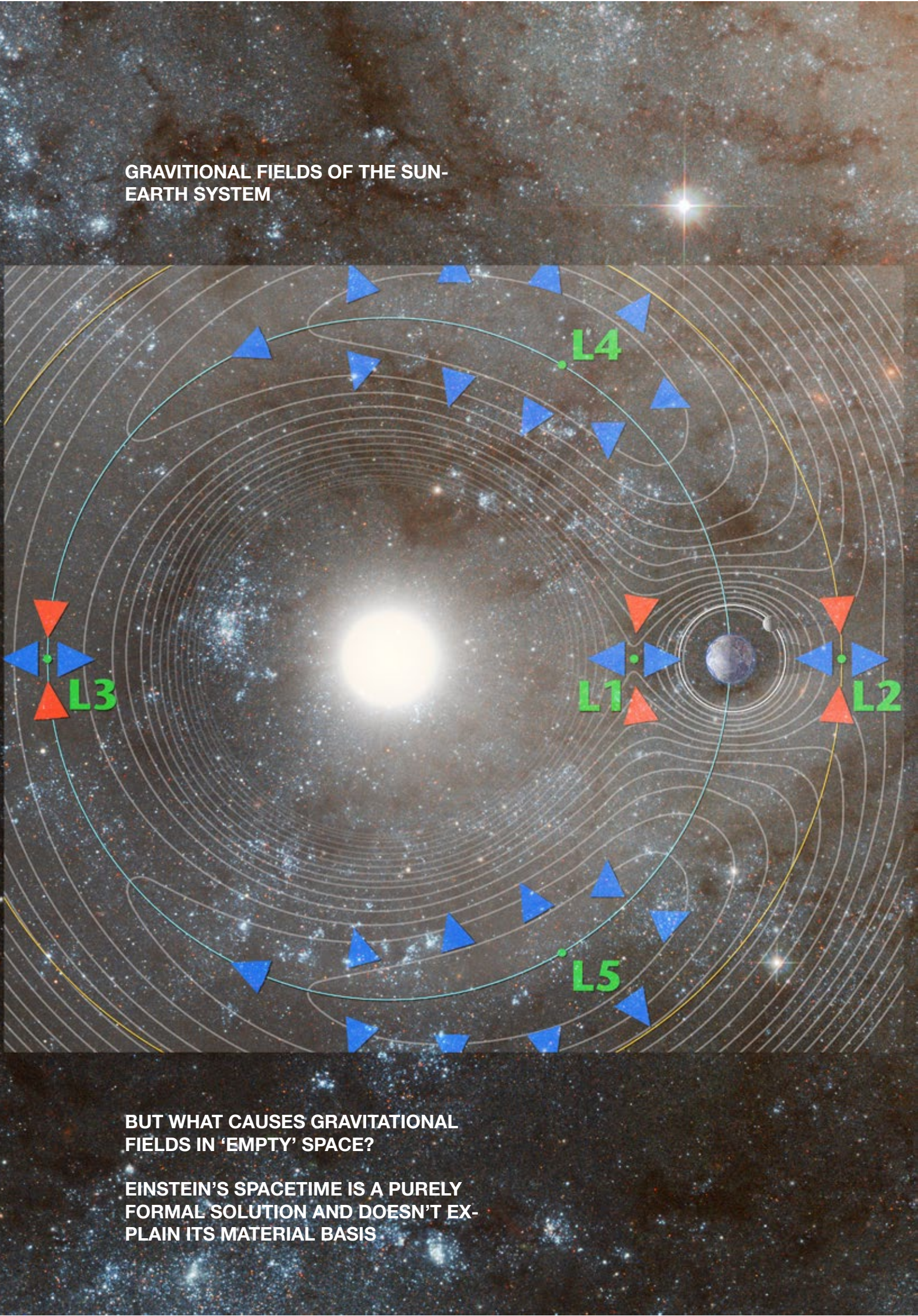
The Electric Field is composed of multiple, concentric shells, around the charged initiator, with all field units (the Magnetons) orientated with their Magnetic Dipole Moments orientated axially around that initiator, and with the required field-energy garnered from elsewhere in the Substrate, and situated within every field unit, according to an Inverse Square Relation, as a promotion of that orbit.

The Magnetic Field is also composed of the very-same Magnetons, but here organised head-to-tail of the Magnetic Dipole Moments to deliver Magnetic lines of Force. And, once again, equipped with field-energy garnered from elsewhere in the Substrate.

Now, though this delivered a model with sufficient Objective Content for the Electric and Magnetic Fields, it also demanded that something very similar would be necessary for delivering a Gravitational Field around an initiating Material Entity, but there was a problem!

How could a directional feature be supplied, in a Field Unit of the Substrate, without something equivalent to the Magnetic Dipole Moment to provide it?

The question was posed:-
Could a mutually-orbiting pair of uncharged Sub-particles, produce an equivalent Gravitational Dipole Effect?





Now, we are so used to treating Electrical and Magnetic Effects as different, that we have only fairly recently finally seen them as being caused by exactly-the-same entities - the Magnetons, as revealed in current research on a possible Universal Substrate, where the very-same-units in different organisational structures deliver the different Fields.

This being the case, could we not in a similar way, have a Graviton Substrate Unit with the same kind of mutually-orbiting pair form. But, this time having a Gravitational Dipole moment acting perpendicular to the plane of the smaller orbiting sub-unit of that mutually orbiting pair?

Well, as this is totally-unashamed physical-theoretical research, let us assume that such is the case!

But, nevertheless, there will, unavoidably, be important differences, as these perpendicular effects will be exactly the same (attractive) in both opposite directions, as distinct from the opposite attraction and repulsion with Magnetic Dipole Moments!

But, such a situation, would at-the-same-time, also explain why that field has not been detected. For, if the joint-mutually-orbiting pair consists of a very large relatively static one and a tiny orbiting one - both the field effects of which will be attractive, and the effects from the tiny perpendicular one will be lost within the Large, all-directions, radial effect: yet it would still be sufficient to deliver a direction, to re-orient the whole unit, and the consequent direction of its effect.

But note, that will be *minutely* small: for full Gravity of itself is a tiny effect, and this will be similarly limited as was the magnetic effect of the Magne-ton.

Now the significance of of this secondary effect, is that it will supply a direction for the field, and will again, via energy stored in the orbit direct an affected body with a small push from each oriented unit, in the required direction.

But, of course we have yet to devise this particular Gravitational Field Unit - the Graviton.

But, first we have the problem of there always being TWO initiators involved in all such Fields!

We will have the field-creator as well as the susceptible-entity.

We usually think of the Field as being entirely due to a main, and great Centre of Mass affecting some very much smaller entity, but BOTH will be required in the orientation of any active, force-delivering Gravitational Field.

We can think first of a “potentially-active” field set up in all directions in the Substrate, around every massive entity, but for it to actually ACT, it must encounter the “potentially-active” field of another susceptible entity, and only then will the direction be defined, by a line joining the two, and then be activated to apply Field-forces of attraction in both opposite directions.

Empty Space is suddenly a very busy place indeed!

F I E L D S

and lines of force

The ideas delivered so far, concerning the assumption of an undetectable but concretely-existing Universal Substrate, particularly concerned with Electrical and Magnetic fields, but also deemed applicable in Gravitational effects too, certainly require considerable further elaboration.

For example, the very-same Substrate Units - the Magnetons, could deliver two significantly conceptually-different fields, which though they offered more Objective Content than previous attempts at a physical explanation, also involve somewhat dissimilar and even contradictory forms for arrangements of the same delivering Units.

And these, upon further consideration, do not gel with concrete experience in every respect.

Let us compare Electrical Fields with Magnetic Lines of Force! Both of these re-structurings within the Universal Substrate are concerned solely with Magnetons - mutually orbiting Pairs of oppositely-propertyed Taus and Muons, so as to deliver an electrically neutral particle, but with a Magnetic Dipole Moment. Now, in their dual uses they carried differently-derived energy loads in their promoted internal orbits.

In Magnetic lines of Force, the Magnetic Dipole Moments linked head-to-tail (North Pole to South Pole) in continuous lines, providing an uninterrupted looped "pathway" (with no free ends). But, when giving a Magnetic Field, having the very same energy content in every unit in each individual Line. Their only connection with the supposed cause of the field was directly to it, along the Line of Force, where the completion of its

loop always resided in that supposed source. Such a connection was obviously, therefore, also a transparent energy pathway!

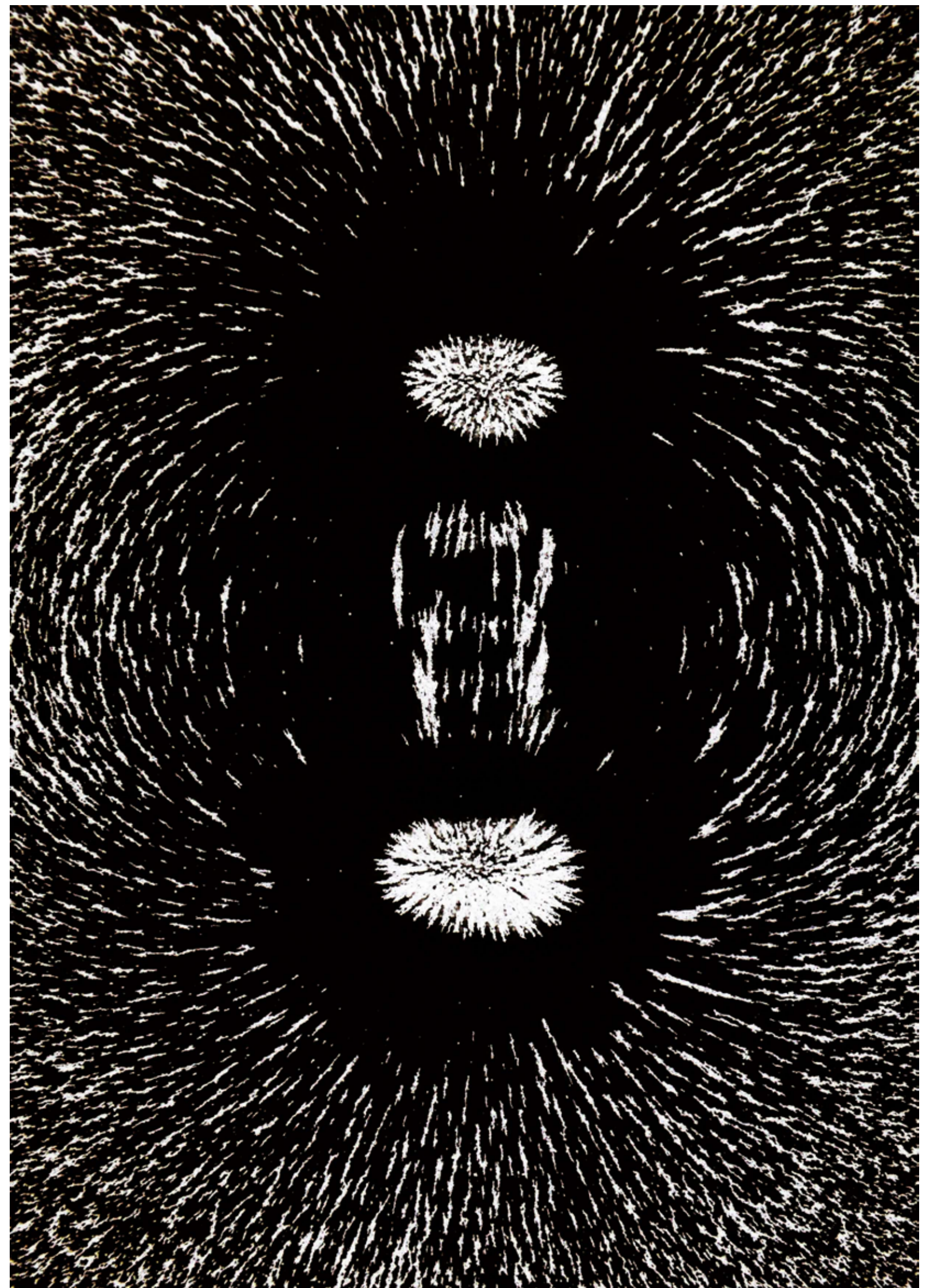
But Electrical fields were different, for as the main form is in complete shells gathered concentrically around the supposed source of the Field, the same energy content was within each and every non-interlinked Magneton, comprising a particular shell. But, the individual units were also transparently-linked to the source by that magnetic Dipole moment, but NOT to each other.

In consequence they, together in a shell, effectively became a slightly larger "source" as its linked prior shell. The next shell was, therefore, added like the first, but now back to the "bigger source", but again NOT to each other. Absolutely NO continuous pathways, were formed in the shells, as had been in Lines of Magnetic Force. And the mismatch in numbers of units between the shells, made NO continuing direct outward linkages possible.

The Dipoles were clearly The Links energetically as well as delivering purely local attachments physically!

In Magnetic Lines of Force the connections were from unit to unit, as well as ultimately, both forwards and backwards to the "source".

In Electrical fields the connections were always back to the real source, or to a "virtual source" in the form of a prior shell: so the effect was shared between all the members of a Shell, and as there were more units in each succeeding shell, the amount in each unit would be less, while still delivering the same total.





MAGNETIC FIELD LINES AROUND THE SUN

Now, it appears to be important that there are NO continuously-linked lines outwards-from or inwards-to the “source” in the Electrical Field, for as every shell has a different number of units AND, of course, no continuous dipole links between shells, which seems vital for transmission processes.

For example, the major transmissions of energy through so-called Empty Space occur via Birkeland Currents which are a different kind of “magnetic line of Force” involving what are termed Plasmas, even connecting stars and planets.

Now, clearly, we have many questions to answer, following these conclusions!

Why should a particular kind of substrate unit deliver effects that were so distinct as to be considered as very different natural forces for extended periods of time. And, why are they not only very different in the Sun and on the Earth, but also, in their usual forms, so extremely local as to be excluded as such in so-called “Empty Space”?

The Magnetic lines of force, as we are aware of them on Earth, are LOOPS: the lines of force of linked Magnetons via their Magnetic Dipole Moments, clearly build outwards from opposite ends of a “magnetised Source” until they find one another and link up.

But, any movie of such activities above the surface of the Sun, clearly show them occasionally failing to find one another, and either falling back into the Sun, or, rarely, linking up with another amenable form, and with the overall conclusion (above) that such Lines of Force are pathways for energy, the belief that the usual kinds of magnetic fields stretch across space seems highly unlikely. And, this is surely confirmed by such phenomena as the Solar Wind consisting of ejected charged particles, and Birkeland Currents of Plasma, which do indeed find their powerful way across Space and therefore infer something there to guide them.

Also the evidently entirely static nature of Electrical Fields, guarantees their very limited extensions as the sharing effect of contained over an individual shell, means that they very quickly get vanishingly small as such fields get bigger and bigger.

It's far too early to say as yet, but clearly Magnetons in “Space” - that is without the usual initiating sources, can be conceived of as forming chains, but without the usual initiators it seems there is nothing obvious to elicit the gathering of energy into such structures, though stray energy, and the self linking of ends of such chains does seem at least possible! While fragments of chains might channel Birkeland Currents, at least to the next fragment.

Interestingly, the current partial (as yet incomplete) definition of Gravitons, also suggests some kind of Gravitational Dipole moment that would disable the possibility of chains to form in “Space”, because both ends of that dipole will be repulsive as evidenced, on a very different scale, by Halton Arp's observations of dwarf Galaxies budded-off (ejected) on both sides the the galaxy's perpendicular axis. So, not only will any chain forming be inhibited, but also the dipoles will not be able to link as energy pathways either.

In spite of similarities in form, the potentiality for similar alternative structures in “space” by Gravitons and Magnetons appears to be impossible.

These suggested mutually-orbiting-pair Substrate Units are producing an interesting variety, if even prohibition, of possible extended structures in “Space”.

Postscript: Clearly we are just approaching the peripheral edges of this topic both Sub Atomically and Cosmologically, for even the directions between cosmic objects must be “pre-established” for a Birkeland Current of Plasma to hit its target!



Gravity

An intrinsic property of a universal substrate

Problems abound with the classical concepts and principles of Gravity.

And, this is because though it can force a change in the behaviour of an influenced object, by, for example changing its trajectory, (due presumably towards another “causing object”), neither one of the two interacting bodies involved is, in any way, intrinsically diminished by the loss of the expended energy that was necessary to cause the effects that we quite clearly see.

Now, as with the considerations applied to other kinds of Fields, the conclusions must be as follows: -

1. The required energy must come from the field itself (which infers a physical substrate!)
2. The Field must be caused to happen by changes in units of the Paving (the currently suggested form of a Universal Substrate) – initially immediately adjacent to the supposed “causing” body. And, the changes must be provided entirely by those Substrate units themselves, in response to the proximity of the supposedly causing body!

Thereafter, such a “field” is built outwards from that first immediate shell of distorted units, which explains why it is effected as the standard Inverse Square Law, for the numbers of units in each succeeding shell will be governed by $4\pi r^2$ – the surface area of a sphere of radius r .

Now this, and many other conclusions about Fields, is undermined by their clearly apparent transparency, with regard to other separately generated fields.

For, several different fields can overlay one another, and this fact has consequences for our conceptions of how such fields are constructed, and put into question what we have so far developed.

YET, simultaneously present Fields could co-exist if they do not have to be “complete” – that is each field having to occupying all the units of the affected substrate, is not

an unavoidable premise! Those carrying the field can be only a subset of those present in any affected situation.

It only needs connectivity outwards from the supposed cause, to gradually propagate that field. Remember that the units of the substrate are very small, and literally colossal numbers surround an object like a particle.

Thus, it only needs a proportion of them, with a continuous sequence of “contacts”, back to the “source”. Each next shell out from that “source” will allow a propagation of the field. BUT, this means that any unaffected substrate units, in a way, can be affected by another, different field.

Then, the overall effect would be of two fields – seemingly caused by two different “causes” (though really initiators), seemingly occupying the same spaces.

Yet with no apparent source of the energy within such a field, we have to explain how the field affects interlopers and changes their direction.

It must be that the energy was always in the substrate units, but uncoordinated and unable to act upon an interloper, until that volume of the substrate was transformed into a field.

And, in addition, we have to explain how, and from where that used up energy is replenished – for it must be to leave things the same after the interaction.

Clearly, the rearrangement of the inactive, but energy carrying units into a field, involved a link up of all of them throughout the field, in such a way that they all, locally contribute to any affected object that it encounters. The area is changed from a neutral one to a re-arranged formation, which can affect the interloper by summing such dispersed energy in a coordinated way.

So, the answer has to be the clear possibility of the units of the substrate being both capable of holding energy internally – and in a similar way to how it occurs in the

atom – in orbiting sub-particles within the unit. The suggested unit of the substrate – the neutritron, has two internal sub particles mutually orbiting one another. One is an electron of ordinary matter and with a negative charge, while the other is a positron of antimatter and a positive charge.

Thus, for any such promotion of orbits to remain, the condition will have to be that all local units are similarly promoted, so no demotion and propagation can happen. That will surely be the state of the substrate without any imposed field.

All units of the substrate must have resident energy, which can be marshalled into a source of Gravitational force. But, when used, in delivering gravitational effects, it will leave a series of units with demoted levels, surrounded by others still promoted, and these holes will be filled first from locally and then successively further afield to re-institute the units, and their Fields, as before.

Thus, the Universal Substrate both supplies all the energy, and implements the effects upon any interloping bodies, which are usually considered to be the “causes”!

Now, I’m afraid that even these ideas are insufficient to explain Gravitation. The affecting bodies can be at vast distances away, and still “seem” to be affecting things, where we are, immediately. So, what can be said about the delays inevitable in the propagation of such influences? We, usually, conceive of the constantly varying forces pulling an affected body into a different trajectory, or even into an orbit, and we never consider any delays. But, they are bound to happen. Yet to see a continually varying change of direction, and to treat the whole thing as a static problem, but though that isn’t true either: both will be moving relative to each other, but also differently relative to further possibly influencing bodies, elsewhere.

Now, we are insisting upon considering the case where the influencing body is simply too far away to deliver such signals *immediately*.

Yet the effect, even with our incorrect assumptions, will still work if the bodies involved are moving, and hence adjust their adjacent substrate units, which then propagate the changes outwards to every succeeding shell of those substrate units.

Now, this process will take time to change the field everywhere, including the region near the influenced object.

But, it may not invalidate the resultant Cause & Effect. For, if the influenced body is in an orbit, and has been round the loop before, THAT path will be the default, and will be followed once more. Crucial changes can only be from extra influencing objects – not relevant earlier!

In stable arrangements, even though the causes reaching our susceptible body are old, they will do the same as those acting NOW!

NOTE: the argument often put forwards that the delay will swing the influenced body into the wrong place isn’t valid, for the next influencing force will have taken the same amount of time to get there and will be CORRECT for its current position.

The affected body will be in the right trajectory, but always and constantly suffering a delay: it should work fine! None of the consequent effects would be undermined: they will act as if the affecting was happening instantaneously, but the arriving effects, in a coherent sequence, would be from an earlier time.

Now, we have, I’m afraid, to change the situation around to consider another important factor.

On a much smaller scale, perhaps with a different kind of field, such things as orbits (like oscillations too) can be seen as similar basically to what we considered above. But, they can also involve Resonance too!

A vibrating source can involve the same vibrations happening in a different recipient object, if the conditions were right!

And, if we are to remain true to a holist approach, the recipient object, when vibrating, will most certainly, in return, send resonance effects back to what had been regarded only as the source!

Perhaps, the same could happen with Gravitation. After all the substrate would be there too, and its movement could send back a return influence of its gravitational effects.

Now, such things as orbits and vibrations are special, because both will go through a repeated cycle of signals out.

Let us restate what will happen, when such effects occur!! It is precisely such reciprocity, which causes a resonant effect. And, this will be so in such cases with no diminution of the “causing bodies”, and, at least, a significant proportion of the energy actually amplifying the resonance above the initial activated source. It must come from the substrate itself!

So, it seems, planetary orbits are not merely the interaction of a moving body with a standing field through which it passes, but a resonant interaction of the two bodies mediated and even powered by the connecting substrate.

And here’s the biggy! The two propagations will involve delays, yet resonance is very common: it seems that the two vibrations will change to bring the two vibrations into a more exact resonance, in spite of the delays. The cyclic nature of the phenomena will allow this synchronisation to happen.

NOTE: Important work elsewhere, on the macro level, could, in the right conditions, impose quantisation upon the orbit radii involved. Also, the orbit of the electron in an atom, considered with a substrate, having vortices caused by the passage of the electron, and the result again is a self modifying adjustment so that the radii are again quantized.

NOTE: More work has to be carried out concerning the data from Halton Arp (and mentioned also by Professor Meyl). About the suggested budding off of new, sub-galaxies, from the hubs of old, mature galaxies. For he considers that the observed Red Shifts of these new galaxies decrease , and in a seemingly quantised way, as they get older.

So, clearly, if our undetectable Universal Substrate exists absolutely everywhere, within the Universe. So, the rotations of the parent galaxy, and its effects upon that substrate could again communicate resonant effects with the main galaxies to actually produce the new ones like the vortices we see with passages through water at the everyday level on Earth.

The budding off of such newly created mini galaxies considered this way might allow a coherent explanation of what was going on.

As the Galaxy itself rotates, and internal entities orbit within, we might be able to crack that one too – especially if the Spiral Arms are NOT paths for continually moving entities, but for the inwards tracks towards the Hubs. For then the Hub would regularly become so crowded as to spin off mini galaxies!

Detailed study of Arp’s data seems essential!

Directed Meta-Level Gravity

The construction of a directed gravitational field within the Universal Substrate

Clearly, if we drop the frankly-magical varying-active-and-directed gravitational “field-happening-in-totally-nothing” - somehow subtended across vast volumes of completely Empty Space, we not only have to consider the presence of a Universal Substrate as its necessary means of a propagation, but also such a field’s own self-erection within such a Substrate, and delivered solely by the Substrate’s own special Units, as responding-and-active parts of that only possible intermediary.

And, it is also clear that such a field is merely only initiated, rather than caused, by the presence and properties of both-of-the-Masses involved. For they are certainly not intrinsically altered in any way by the fields they apparently subtend!

So that, instead, we must have a self-built Substrate-Field, actively constructed by the implicit properties of that Substrate.#, but located outwards from each initiating Mass, by each-and-every Substrate Unit that is involved in both moving-to the initiator, and equipping-itself both with an appropriate(?) energy deposit, plus a crucial directional-indicator pointing back directly towards that initiator.

How else could that field cause movements of the right size and direction to any affected bodies?

We can only assume that particular gravity-field-versions of the Universal Substrate set of Units, or Gravitons, were, in the prior absence of any massive initiator, both just randomly-moving-about (like a gas), and, because of this, also cancelling-out any of their resident properties, so as to be totally-undetectable.

NOTE: the parallel problem of Electromagnetic Fields has also been solved in a very similar way, by involving two exact mirror image units in equal quantities, the

Magnetons, which also required detectable properties in order to actively function as they certainly must, but also needed to be undetectable when inactive. Clearly, a similar solution will be necessary for Gravitons also.

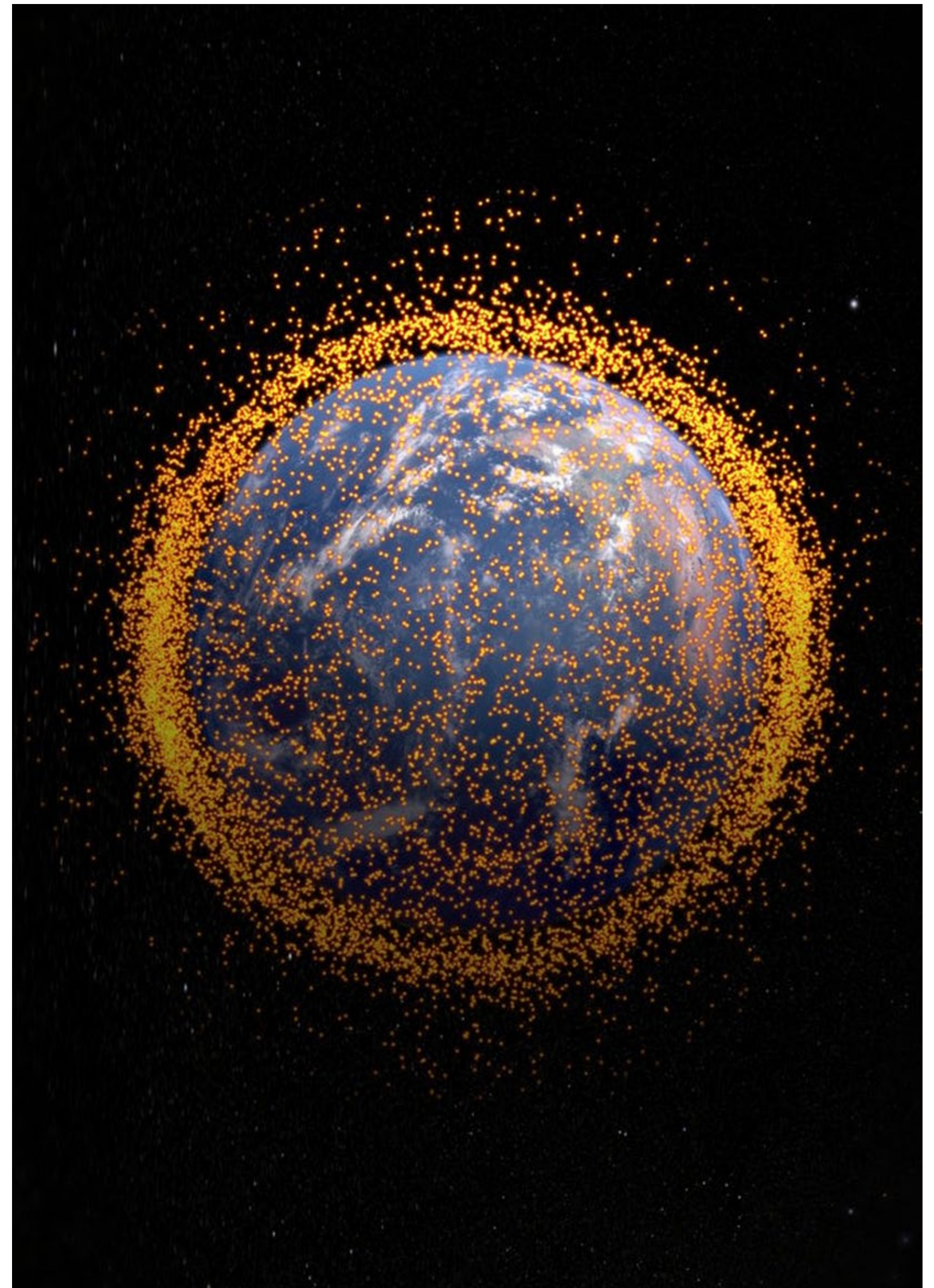
But then, with the arrival of a massive object, into such a Substrate, it would seemingly effectively “capture” those previously randomly-moving Units into a series of static concentric shells surrounding that material object, with all their directional features pointing exclusively towards (and directly-away from it, in a dipole manner), and filled with enough energy (dredged from elsewhere in the substrate) to be available, in an inverse-square-law manner, to deliver a gravitational impulse, when encountering a another material intruder coming into its aegis.

NOTE: the directional element within each Unit must be “dipolar” in a different way to the similar directional elements in electromagnetic Substrate Units (the magnetons). For, it does not have dissimilar opposite directions - such as the magneton’s North & South, but here presenting the same effect in both directions.

The reason for this is that the aligning of gravitational substrate units around the initiator, will on the one hand to balance the gravitational mass of the initiator, but also to transmit that same effect outwards via the dipoles of the units of the field.

Clearly, such “gravitational field Units” of the Substrate could, at this stage, only be influenced by the size of the initiating Mass, as no other interacting Mass is yet on the scene, as currently that aspect of any possible future interaction is yet to be addressed.

Clearly, nothing will then happen, until another material entity’s own gravitational field, building-out-from-it, as



initiator, encounters the prior gravitational field of the first-considered Mass.

Clearly, when the two material objects are still very far apart, a reasonable “simplification” might be to consider the fields as wholly independent of one another - established around each, but not yet acting upon anything else.

But, the situation, which must be addressed, is when that is no longer the case, and two such bodies, both depending upon their own individual total Masses, will apparently begin to mutually affect each other.

The major question must be, “Will both initiators then produce joint field units, combining effects from both Masses, or will the fields continue to exist, separate-but-interleaved with one another?”

Once again, the reasonable initial simplification must be to assume the latter, because of the implications of the former, for the then clearly much more complicated Gravitational field Substrate Units will be too much to deal with just yet!

Now, with these assumptions, each Mass is affected by the other in proportion to that other Mass’s size, and, via the involved, connecting line of field units, is forcibly-directed towards that other - all the time suffering changing effects as the distances between decline. It is concerning the amount of this movement, where each body’s own mass also becomes involved.

NOTICE, how the Equations, derived for these processes, hide the actual contributions-and-dynamics, as well as their reasons, in a purely quantitative, simplified and idealised pure mathematical form!

In contrast, what is being attempted here is primarily a Physical Understanding and Explanation!

Also, it is important that because of any prior in-process movements of the two bodies, they may well only be merely re-directed by this gravitational interaction, and will, having passed one another, carry on upon new paths, taking their separate fields with them!

Apart from possible collisions and even merging, the only other possibility, will undoubtedly be the capture of one body by the other, resulting in an orbit of the lesser

around the greater, and, a complex interaction of the two fields in some stable situation.

These fields may well, in fact, actually merge, but be then transformed into a two-ways-facing joint-field-unit, transmitting attractive influences back to both masses and causing them to move towards one another.

But, is much-too-soon to address such complexities: we will stay with our simplification as long as it suffices in delivering increased understanding of what is going on. The two “interleaved” fields will change in contained energy to always reflect their varying, current distances apart. Only when these changes are instituted will any consequent field actions occur.

Then, both the masses involved will use the gathered-in energy in its adjacent field units to be pulled towards the other! The changes in both fields will, themselves be modified by the changing positions of the initiating Masses, so propagations of field energies will be changing due to two simultaneous effects:-

1. the using up of field energy to move the affected Masses
2. the moving-in of energy from elsewhere in the Substrate to replenish depleted Units back to the appropriate, currently-required levels

NOTE: In the actual, here-unaddressed situation of merged fields, there would also be a third constant adjustment to even the un-used field energies, to reflect the changing distances away of the initiating Masses.

Of course, such descriptions do not say either “how” or “why” these things happen, for instead of simple “cause-and-result” situation, we have, instead, each seen as both cause-and-result of each other, while the whole thing is actually entirely due to an affected-and-effecting Substrate, actually delivering everything involved.

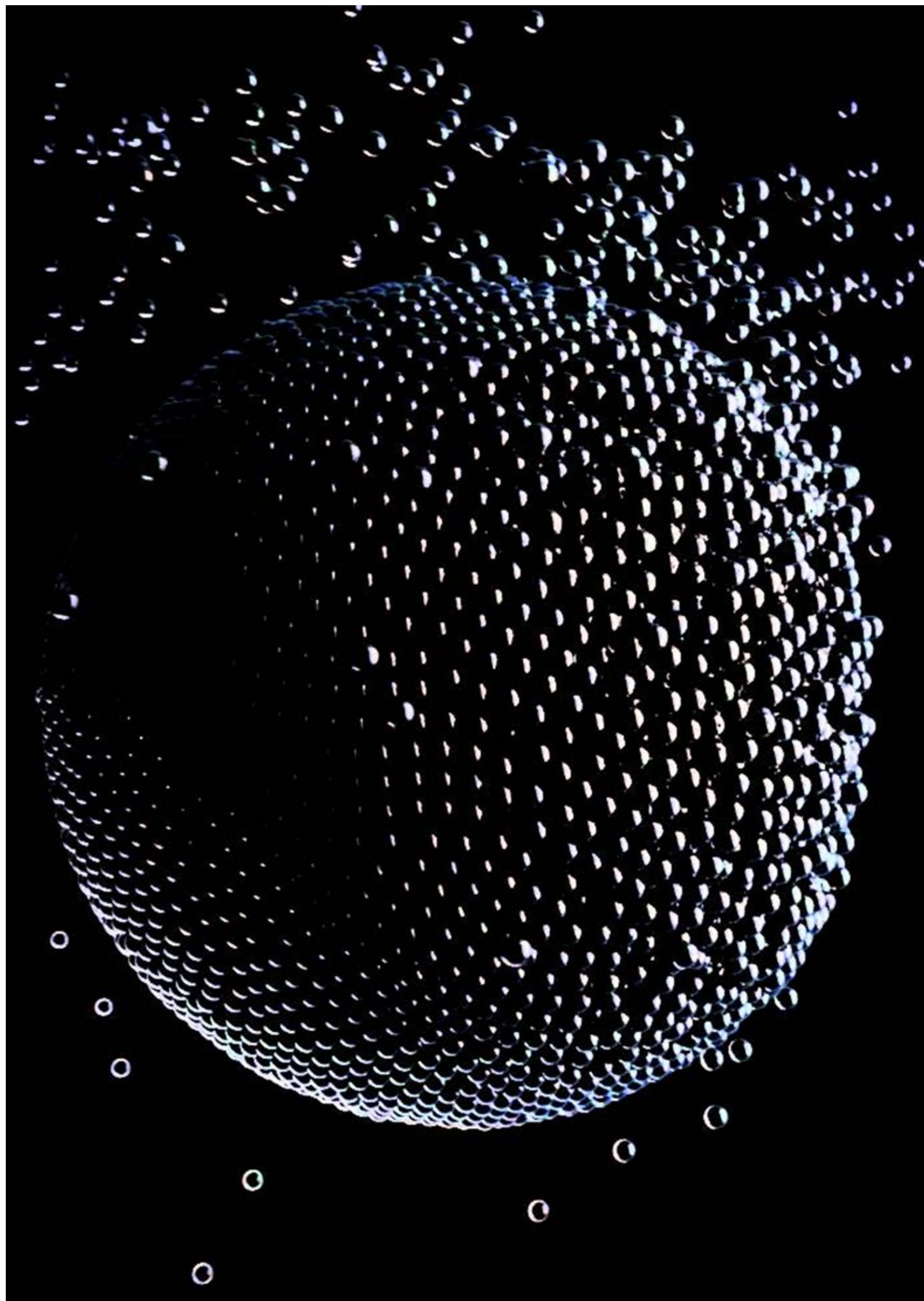
We can, and indeed do, simplify, by usually taking a relative-to-one-mass standpoint (as most of our experiences are of vastly-differently-sized entities), but the real situation is usually more complicated than that.

The problem, as it was with Electromagnetic Fields, also within the same Universal substrate, is surely Movement. For, it was the Movement of charged, orbiting particles

that activated Magnetic Dipole Effects, and, in so doing, also delivered the necessary capabilities of built-in Direction.

So, it looks highly likely that such Movements could also be responsible for similar effects in Gravity: indeed something like a dipole-direction-effect, related to ordinary Gravity - in the same way that Magnetism is related to moving electrical charge effects.

Just as magnetons, when moving, also deliver a Magnetic effect, and when in orbits define an orbital plane with a directed magnetic effect perpendicular to that plane, so, it is here postulated that when gravitons move they too deliver a Meta-Gravity Effect, when in orbits, also defining an orbital plane, with the directed Meta-Gravity Effect perpendicular to that, in the same way!



The Gravitational Units of the Universal Substrate

For several years now, in spite of significant progress in this area, with regard to the mutually-orbiting nature of the Neutritron Substrate Units, and thereby supplying a truly-propagational Medium of a new sort, which was then followed by the Magnetons (also joint-particles), but this time delivering both the full set of Electrical and Magnetic Fields and their Effects - Substrate Theory still had a crucial gap. The outstanding problem was the seemingly unsolvable difficulty of defining a Unit to deliver Gravity.

The basic Principle normally used, in all of the usual achievements at this level, was that of maintaining a reductionist-and-pluralist stance, in order to seek answers within the bottommost fragments of Matter. For, it was surely there, like all prior bottommost entities have been found, where any and all of the possible components of a Universal Substrate, would as usual be revealed, by Accelerators and Colliders like the LHC!

But that wasn't possible at all, and, instead, an alternative had to, somehow, be via a constructivist-and-holist approach. And, in addition, via instead seeking *combined*-entities, with just the appropriate properties required to deliver what was evidently happening in supposedly Empty Space.

The approach that had been so fruitful with Neutritrons and Magnetons was obviously the place to start, but I should have known it wouldn't be straightforward!

For, the first discovery, The Neutritron, not only delivered an undetectable joint-particle that could both hold-and-pass-on energy, via the promotion and demotion of its internal orbit, but, for it to deliver anything else, it had to behave in various very-different ways, to enable it to produce not only a close-but-loosely-linked Paving - to

allow a bucket-brigade version of the propagation of quanta of Energy: but also, at the same time, be very-easily dissociated into free-moving individual Units, which could be driven by moving material interlopers, both into Streams, and even Vortices, yet, very-swiftly, reform into a Paving, when the causing disturbances had departed.

Clearly, to get such a variety of properties would be impossible by the prior methodology and delivered components. This Constructivist Approach was no simple panacea, but, on the contrary, it turned out to be the door to a rich, hidden and complicated World.

And, crucially, the Neutritron could never deliver energetically-endowed Fields! We had merely revealed one distinct Level within the Substrate, and other very-different, compound particles (that also were currently undetectable) would be necessary to deliver Fields, and the obvious place to start was clearly with the already highly-demanding Electrical/Magnetic area of Properties and Fields.

Now, though the mutually-orbiting tactic of constructing such entities, especially with opposite properties to be cancelled-out, was still appropriate, there was a series of major contradictions that had also to be overcome. For, undetectability along with Field effects and actions, seemed to constitute totally contradictory requirements - so they most certainly could never be delivered by a Single Unit!

The Key delivering feature had to be the same as in the Hydrogen atom - that is the production of a Magnetic Dipole Moment caused by a smaller charged-unit orbiting around a larger, oppositely-charged unit, and thus delivering that crucial Moment in a direction

perpendicular to the plane of that orbit. For though this enabled, in different ways, all the electrical and magnetic effects, it also made such a unit vert clearly detectable too!

So, to ensure undetectability, when no field was involved, there had to be TWO mirror-image Magnetons, present with equal numbers of each, that moved about randomly like a gas - and because of this being undetectable: but in the appropriate initiating conditions, localising into static positions when forming fields.

Now, both magnetons were remarkable in being able to form static fields by re-organising themselves into structures that delivered either electrical or magnetic fields depending upon what initiators were present.

If a charged particle was encountered by a randomly-moving magneton, it would attach itself adjacent to that initiator, with its Magnetic Moment directed towards that entity. And, it would rapidly be joined by many others to deliver a complete shell, and by a propagation of energy from elsewhere in the substrate, the effect of the shell would exactly balance the enclosed charge. But also, in addition, the outwards pointing sides of each Dipole, would then be encountered by further free-moving magnetons, to complete another, and, thereafter, a series of concentric shells, all replete with the appropriate gathered in energy to deliver a Full Electric Field! But, if the initiator was, instead, some kind of magnet, then the randomly moving magnetons would encounter something equivalent to an unaccompanied Dipole, and would attach onto that “head-to-tail” (north-to-south) as the first link in awhole series of added magnetonsm forming a Line-of-Force Chain, which would gather in appropriate energy propagated from elsewhere in the Substrate, and, thereafter, continue to grow, ultimately linking up with a line from the other end of the initiating Magnet to complete the Loop.

Now, all of the above was absolutely necessary, to actually prepare for addressing the next difficult problem - the possibility of Gravitational Fields via Substrate Units termed Gravitons: for these both require an understanding of Magnetons, AND, at the same time, require sn awareness of the significant differences of Gravitons, to even begin to arrive at an explanation of how Gravitational Fields could be delivered. The similarities between an Electric Field and a Gravitational Field are indeed significant!

For, they are both “inverse Square Relations” and directional, in the forces they deliver, so it will be highly likely that they will either share-identical or possess-similarly-delivered features. But, at the same time, though Magnetons have Magnetic Dipole Moments with both attractive and repulsive properties, Gravitons, seemingly, require only attractive features. And, that presents a major problem, for it is the Magnetic Dipole Moment - generated perpendicular to the plane of the lesser sub-particle’s orbit, that delivers a specific Direction.

But then how does the Graviton deliver a Direction? For, no charges are involved in the Graviton, so how can a Dipole Moment be generated and a direction be delivered? Clearly, the detailed nature of a Graviton must be addressed in a similar way to how we defined the other Substrate Units. But, the various Leptons, in mutually-orbiting pairs, including the Electron, the Positron and various Taus and Muons are not appropriate for making Gravitons, so, all that seem to remain, are the entirely-neutral Neutrinos!

So, finally, also theoretically conjured out of the same set, are the theoretically-possible, and similarly-constructed Gravitons:-

The Electron Neutrino	ν_o^o
&	
Anti Electron Neutrino	$\bar{\nu}_o^o$
=	
The o-Graviton	g_o
The Tau Neutrino	ν_τ^o
&	
Anti Muon Neutrino	$\bar{\nu}_\mu^o$
=	
The a-Graviton	g_a
Anti Tau Neutrino	$\bar{\nu}_\tau^o$
&	
The Muon Neutrino	ν_μ^o
=	
The b-Graviton	g_b

[ASIDE: The o-Graviton should be seen as a mich tinier version of the Neutritron, as it could do similar things upon an immensely smaller scale.]

Now, the latter two Gravitons (described above) are the only ones likely to be able to deliver some sort of Dipole, as they are composed of very differently-sized partners in their mutually-orbiting pairs, so the smaller would effectively orbit around the larger.

Now, this is unashamedly a purely theoretical investigation, so, I have no qualms about assuming a Gravitational Dipole Moment (of sorts) acting perpendicular to the plane of that orbit, and delivering, thereby, a directionally-and-energetically-equipped unit, out of which concentric shells around a neutral matter initiator, could deliver a Gravitational Field, in a similar structural way to that provided by Magnetons, in delivering an Electric Field around a charged particle. But such a field will be almost vanishingly minute!

Indeed, the factors diminishing it as compared with electrical and magnetic effects are enormous; and, it would certainly be drowned-out by the other much larger forces in any mixture of all such effects. Indeed, apart from the obvious, everyday examples, the phenomena apparently emanating from Black Holes, at the centres of Mature Galaxies seem to confound all our usual explanations.

So, with this miniaturised Gravitational Dipole Moment, we seem to have a directional feature, to orient the required Field, and because of the included orbit, the same sort of means of both gathering-and-delivering field-forces entirely within the Universal Substrate will be available too.

And, finally, at this point, I must not only defend, but also extol the virtues of this kind of theorising. It never ever pretends to be the Absolute Truth of the given area of study, because such is totally impossible anyway! It follows James Clerk Maxwell’s approach of marshalling known features, and assuming others of commonly occurring natures, to attempt to explain phenomena, as best as possible at that current moment, with the validating Principle of providing the maximum Objective Content achievable, while being very well aware that something better would inevitably replace it in the future. And, crucially, with a firm conviction that such an Explanation is always incomparably more important than any Form-Only Description, in the form of an *idealised* Equation.

Further Reading

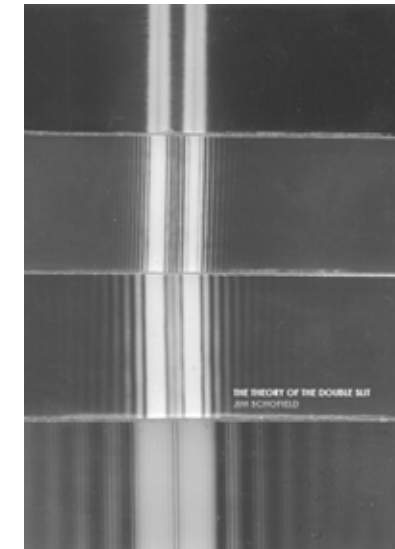
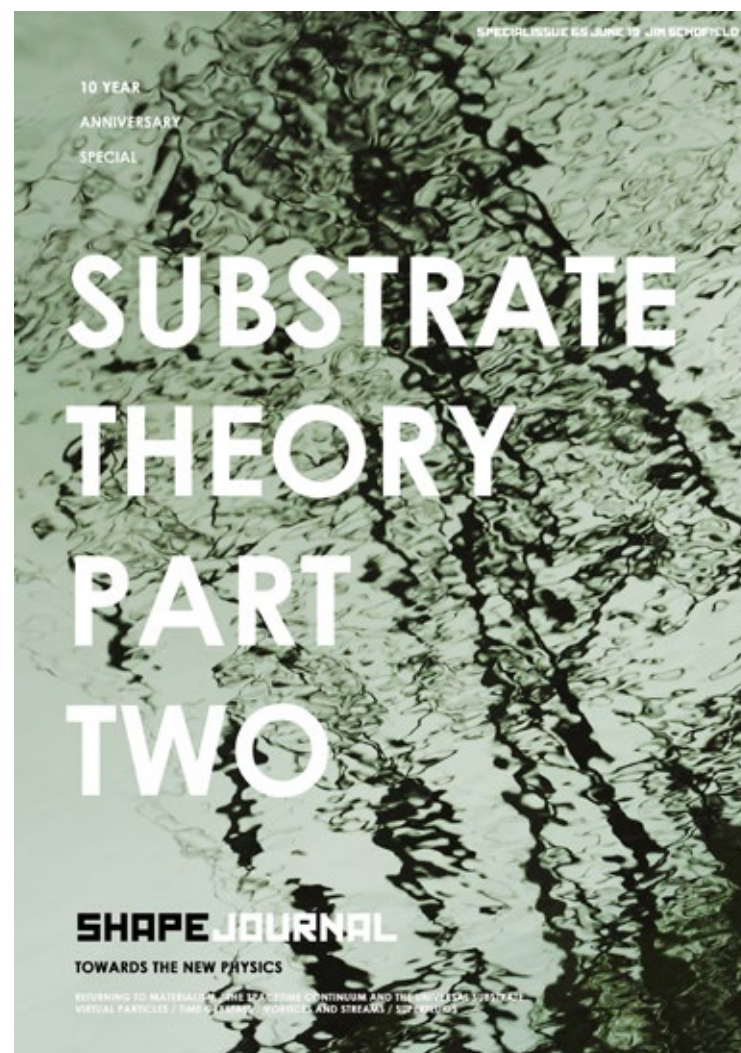
Where to find more on Substrate Theory.

This issue has attempted to bring together and republish the key papers from SHAPE Journal that contributed to the formation of Jim Schofield's new approach to Physics. Despite the large body of work contained here, we certainly haven't been able to include everything necessary to this theory.

If you want to explore these ideas further please see the previous issues of SHAPE included on the right, all of which had a part to play in the evolution of these new ideas.

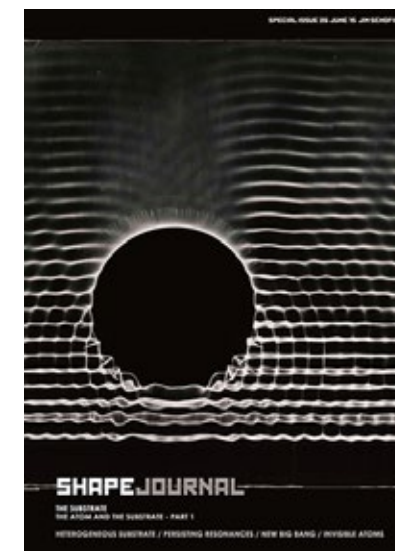
For the latest developments in Substrate Theory, all you have to do is wait until the next Special Issue of SHAPE in June 2019. *Towards the New Physics* begins to show how the substrate really is the missing premise in almost all aspects of the discipline.

The next set of essays explores many themes including Einstein's spacetime continuum, virtual particles and Heisenberg's Uncertainty Principle.



[*THE THEORY OF THE DOUBLE SLIT* SPECIAL ISSUE 3 \(2011\)](#)

This work was a very important precursor to the development of Substrate Theory, using a hidden backdrop of hypothetical 'empty photons' to solve all anomalies of the seminal Double-slit experiments



[*THE ATOM AND THE SUBSTRATE* SPECIAL ISSUE 36 & 37 \(2015\)](#)

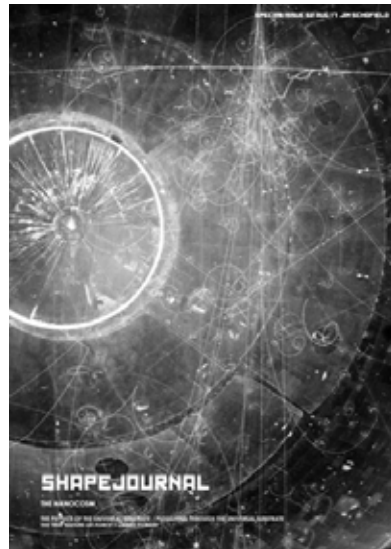
The Atom and the Substrate specials were the first attempt to outline a comprehensive physical theory. While there were certainly some errata in these early models, the fundamental components have remained the same. Features lots of helpful diagrams!

The second part focuses on how a Neutritron Substrate would also penetrate the atom, and could constitute a material explanation for quantised electron orbits.



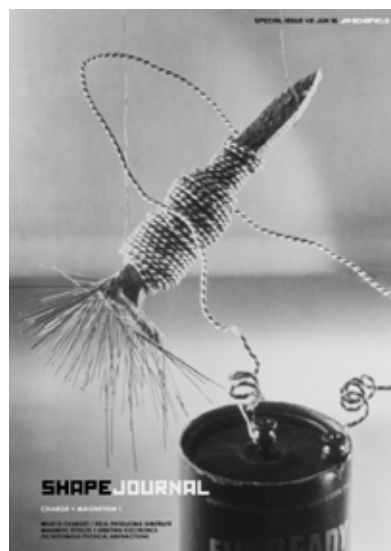
[*THE NATURAL MEDIUM* SPECIAL ISSUE 42 \(2016\)](#)

How might a Universal Substrate of common neutral particles come to form across the whole of Empty Space, within the Universe?



THE NANOCOSM
[SPECIAL ISSUE 52 \(2017\)](#)

The different layers of the Lepton Substrates are explored revealing very different “Worlds of the Underlying Cosmos”, below the macrocosm of the everyday world.



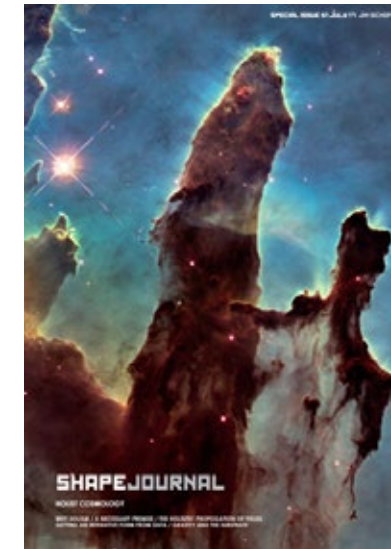
CHARGE AND MAGNETISM I & II
[SPECIAL ISSUE 43 / 44 \(2016\)](#)

Two issues on magnetism (Special Issues 43 and 44) deal with Substrate explanations for magnetic phenomena, and later also things like Quantum Entanglement



AT THE BOTTOM
[SPECIAL ISSUE 49 \(2017\)](#)

Several of the papers on the various units of the Substrate, published here, appeared first in Special Issue 49. Look here for more on Taus and Muons.



HOLIST COSMOLOGY
[SPECIAL ISSUE 51 \(2017\)](#)

Material on the Lepton Substrates and gravity republished as part of a wider collection on how to look at physics and cosmology from a holist philosophical standpoint



SUBSTRATE
[ISSUE 56 \(2018\)](#)

This issue goes into much greater detail, looking at the importance of resonances in the substrate and how this ushers in a wholly new interpretation of Electromagnetism



META FORCES
[ISSUE 59 \(2018\)](#)

This collection of essays looks at the wider implications for Substrate Theory, from re-evaluating cosmic redshift to the vast influence of the humble neutrino on the Universe.

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