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THE NANOCOSM

THE PHYSICS OF THE UNIVERSAL SUBSTRATE / PLOUGHING THROUGH THE UNIVERSAL SUBSTRATE
THE TRUE NATURE OF FORCE / LINKED FORCES



The Nanocosm

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The Physics of the Universal Substrate

The sub-atomic realm must be divided into various levels, at colossally different scales...

The time has come to address the Internal Worlds of The Universal Substrate - that is the inter-relationships of the suggested different Substrate Units both with-each-other, and also with any macrocosmic events happening within that sub-macrocosmic Substrate as Universal Ground.

Now, from the outset, it must be made clear that these Various Units, though of the same basic mutually-orbiting, bi-particle construction, are, nevertheless, related to others of the very same kind in very different ways, and via diverse properties. AND, crucially, they are also of vastly different sizes.

The biggest ones, the:-

Magnetons being some 100 times bigger than the

Gravitons, and some 2,000 times bigger than the

Neutrinos.

While the lowly Electron Neutrino is some 600,000,000 times smaller than the Magnetons at the other end of this colossal scale!

My contention is that these effectively constitute very different “Worlds of the Underlying Cosmos”, below the macrocosm of the everyday world. The various Sub-macrocosms (or Omnicosmic Levels) involved in the overall, composite Universal Substrate are the:-

Microcosm of Atoms & Magnetons

[Electromagnetism]

Nanocosm of Gravitons

[Gravity]

Picocosm of Neutrinos

[Propagation].

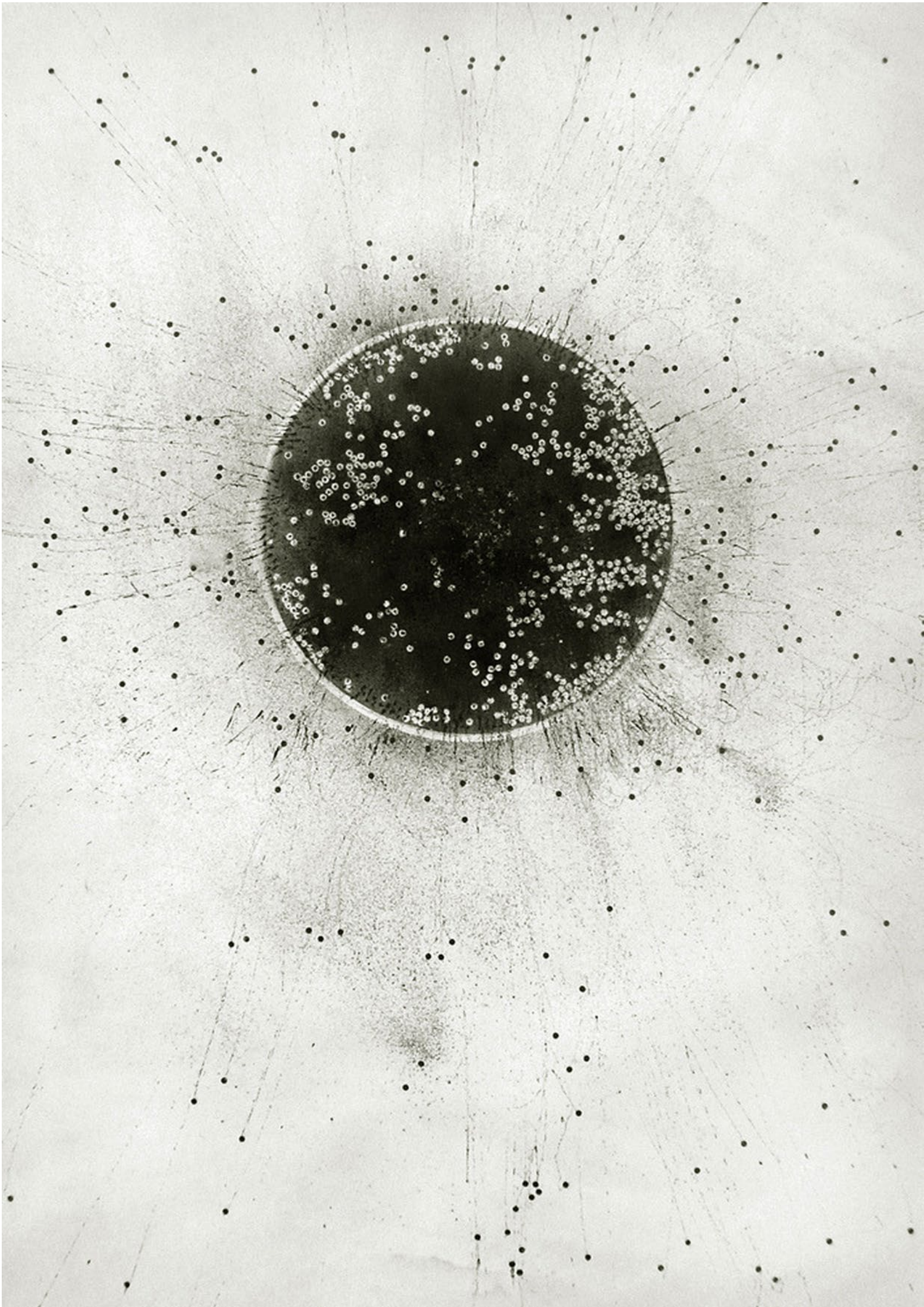
Now, having formally established these clearly very-widely-separated Levels, within our proposed Universal Substrate, and the attribution of all the appropriate components involved, being both easily-effectible, by events taking place within hem, and also, their undoubted ability to, themselves-in-turn, then affect those initial causing-events, in an entirely Holist and recursive way, it is also an unavoidable conclusion that such events must-also include all the interactions both with-and-within these Levels of Substrates, and the necessity of these contributions in following-causal-explanations of the outcomes observed and measured.

The Picocosm

Already, the important, bottommost Picocosm consisting of Neutrino Units, has been crucially involved in a wholly physical Explanation of all the anomalies in the ill-famed Double Slit series of experiments, which succeeded entirely without the need of any recourse to the Copenhagen Interpretation of Quantum Theory - with its Superposition and Wave/Particle Duality, and its Idealist/Pragmatism Stance and Pluralist methods.

And, by the very same means also has achieved the physical-explanation of the Propagation of Electromagnetic Energy across supposed “Empty Space”, and even a physical-substrate-involved explanation of both Pair Productions and Pair Annihilations, was equally possible too!

Now, in addition, this Picocosmic level has been investigated much further, with consideration of a natural, if only loosely-linked, connected-structure termed the Paving of those Neutrino Substrate Units, thus giving a full physical account of propagation via unit-to-unit, bucket-brigade transfers of individual quanta, at the “Speed of Light”. But, as such a Paving is both easily dissociated (and just as easily re-assembled-





automatically), it could often have small regions forcibly dissociated into free-moving neutritrons, often still-carrying individual quanta-of-energy, and hence actually being the imagined Photons. Indeed, the key phenomenon of the passage of charged particle through this lowest Substrate Level, has immediately revealed the possibility of multi-phase modes of the Substrate, at this level, caused by such a passage.

Clearly, along the path of the intruding charged-particle, there would inevitably be multiple dissociations of the Paving, and even a forced-flow of numbers of these now free-moving units, in the same direction as the driving particle.

It has even been suggested that a consequent trail of Vortices, caused by that stream, and composed of these freed particles could also be produced.

And, crucially, in situations of repeatedly-traversed passages, such as in orbits, the maintenance of an energy-transfer mechanism, between an orbiting particle and these vortices could alternatively be used as a non-Copenhagen explanation of quantized orbits in atoms.

The Microcosm

Now this level, already subscribed-to by the consensus, as the level of Atoms and all Sub Atomic Elementary Particles - though, is, with this new theory, losing some of its usually allocated functions (currently acknowledged, but usually ascribed to totally Empty Space), to other levels within the omnicosm that together delivers the complex Universal Substrate.

Yet, it will still contain, entirely due to their large size, the Magnetons of that Substrate, delivering all the effects of Electromagnetic Fields, and their remarkably energetic forces upon any intruding, effectible particles.

The Magneton units involved consist of joint, mutually-orbiting, pairs of leptons, involving Muons, Taus and their antiparticles, yet appearing as two mirror-image-forms, occurring in equal numbers. And, because of the different sizes of their oppositely charged components, they end up as neutral-in-charge, but, due to the lesser sub-unit orbiting around the greater sub-unit, the two types will produce opposite Magnetic Dipole Moments, which, when not forming fields, will all move about randomly, somewhat like a gas, thus making them

undetectable by mutual cancellation of those Magnetic effects.

But, if ever individual units, of either type, encounter an intruding charged-particle, they will attach themselves to that object via their magnetic moment, gradually forming a complete shell, with one of their dipoles pointing-inwards towards the charged particle, to oppose the particle's charge effect.

A full shell will be built up, which will gradually bring in sufficient energy from other still free-moving magnetons to entirely cancel the charge effect.

And, thereafter, the charged-particle-core, acting through the collected shell, will, as they are dipoles also replicate the same effect pointing-outwards, by their other uncanceled-ends, adding subsequent further concentric shells, each of which, when complete, will effectively replicate the charged particle's effect.

And, all the time, these shells will be gathering in sufficient propagated energy from elsewhere in the Magneton Substrate to cancel the effect from within it.

And as each shell will requires more magnetons due to their increasing $4\pi r^2$ surface area for each shell, so, the individual magnetons will each require less energy, so, thereafter, as further shells are added, the erected Field will deliver an Inverse Square Law.

And, of course, any susceptible entity encountering such a Field magneton, will be given the correct size impulse and in the exactly right direction delivered from the energy it contains.

And, thereafter, having done its job, the field magneton unit will replenish that required energy by propagation from elsewhere in the Microcosm Substrate.

NOTE: Before describing the other levels within the Omnicosm, which together constitute the Universal Substrate, it is important to explain how different kinds of fields and processes can be happening simultaneously using different Substrate Units.

The obvious problem would seem to be that they would get in each other's way and destroy the necessary Continuity to enable bucket-brigade type propagations of individual quanta of energy. Yet, in fact, the significant

differences in sizes of the various level's units, get around this apparent problem, for each step-down significantly in size, allows the smaller units to exist in the interstices between the larger units, so a required identical carrier will always be adjacent to others of its kind, to guarantee that continuity.

The Nanocosm

This level is perhaps the most contentious, for it resides between the bottommost Propagation Level [The Picocosm] and the Fields Level [The Microcosm], where it delivers Gravitational Fields, concretely via its differing complement of Substrate Units.

The problem is, of course, the nature of a materially existing Substrate Level of Units that can concretely set up Gravitational Fields across the vastness of Space. It has to deliver the Physical Explanation of Einstein's Theory of Gravitation - a purely formal (mathematical) description, based upon his Space-Time, four-dimensional Continuum.

Let us resort to an extensive quote from the recent paper *Directed Meta-Level Gravity* by this theorist, Jim Schofield.

QUOTE:

Clearly, if we drop the frankly-magical varying-active-and-directed gravitational field "actually-considered-as-happening-in-totally-nothing", which is 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 the Masses involved. For, they are certainly not intrinsically altered, in any way, by the fields they apparently subtend!

So, instead, we must have a Self-Built Material 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 (as well as 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 need 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.

The gravitational effects must be effectively delivered by this Substrate!

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! But, it will be possible to effectively consider the separate -gravitational effects via two continuous connected "lines-of-substrate-units", from its mass, each delivering its effect upon the other mass!

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 field levels

NOTE: In the actual, here-as-yet-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 here have 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.

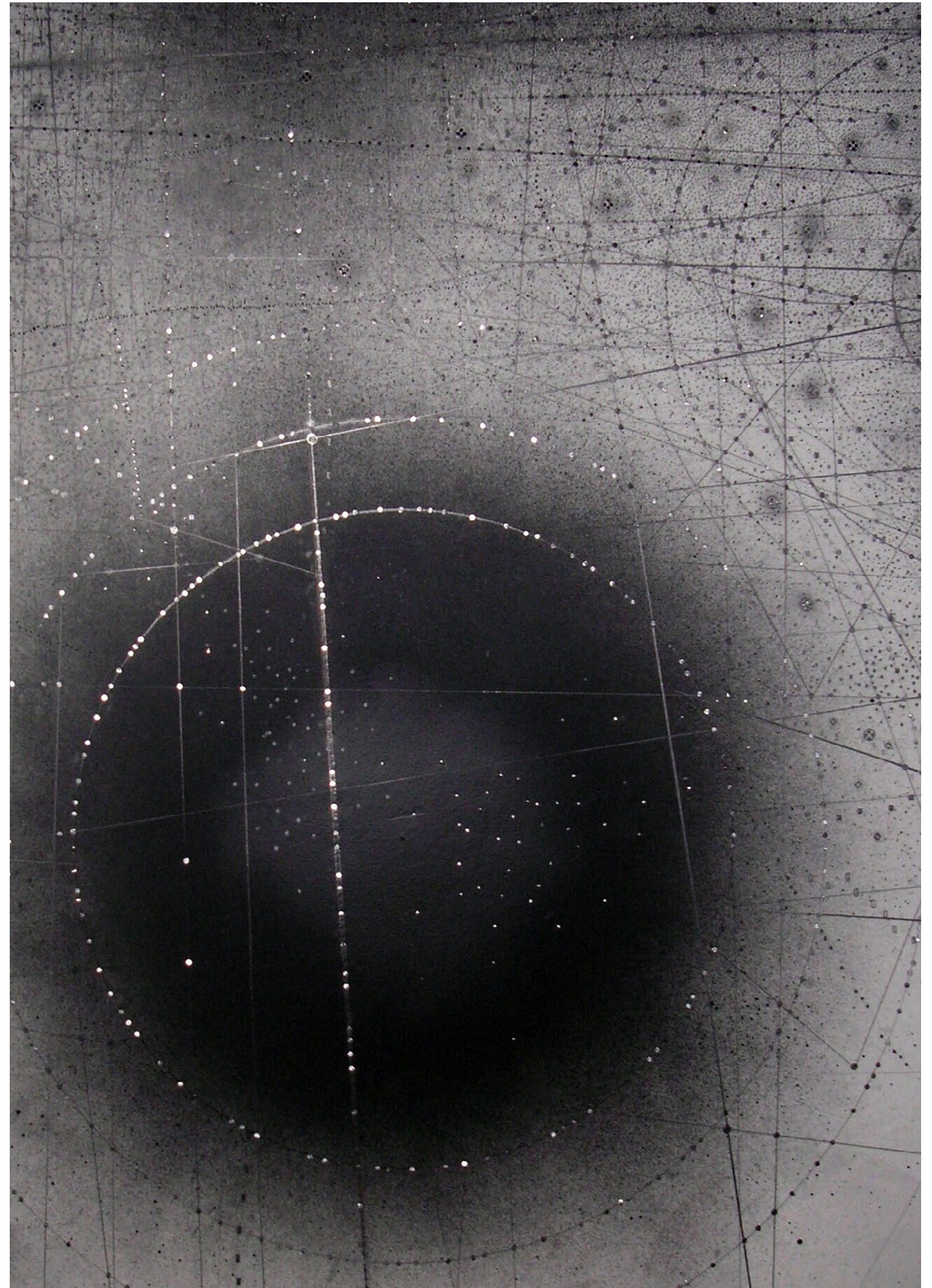
We can, and indeed do, simplify, by usually taking a relative-to-one-mass standpoint (as most of our experiences are of vastly-differently-sized entities), but the real situation is usually more complicated than that.

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, with internal moving, also deliver a Magnetic effect, and in such involved orbits define an orbital plane with a directed magnetic effect perpendicular to that plane, so, it is here postulated that gravitons with their internal orbiting movements, they too deliver a Meta-Gravity Effect, also defining an orbital plane, with the directed Meta-Gravity Effect perpendicular to that, in the same way!

END-OF-QUOTE:





Ploughing through The Universal Substrate

(based upon Substrate Theory thus far)

We must now relate the effects caused by a moving charged particle, to the Universal Substrate, through which it is both passing, and also radically affecting!

And, though we have already made some small-steps in this direction, the time has come, now we have defined enough of such a Substrate, for us to now consider concretely exactly what might be caused by such interactions in a variety of different situations.

The full definition of that set of behaviours, is still by no means entirely available, but enough aspects have been dealt with, for us to, finally, ask of its definitions a comprehensible set of explanations of at least some of the commonest of these kinds of transforming transits.

But, clearly, NO real progress would be possible, without a reasonable idea of the Contents-and-properties of that Substrate, both due to the natures of the kinds of particles involved, and, in any Substrate-level re-arrangements of them, which will necessarily deliver whole sets of both consequent phenomena, and also, crucially-recursive-effects back onto the original causing interloper.

BUT, not only will our Substrate be neither a straightforward Gas, a Liquid or a Solid, as would be structures composed only of atoms and molecules.

But here, instead, they are certain to deliver various very different structures, that can be very easily changed-to other, quite different modes or phases, as situations develop.

And, most important of all, the effects involved will necessarily be reciprocal - for the moving entities will distort the nature of parts of the substrate, and such distortions could then propagate themselves over

considerable distances, via elements of the Substrate, and could. when they have been further-changed, by other very different kinds of encounter, react-back significantly upon their original modifying interlopers.

This is, after all, the research of a scientist, consciously attempting to re-cast Physics, from its current wholly Pluralist Stance, into one which is very definitely and qualitatively Holist!

Indeed, "Everything affects everything else!" - as The Buddha suggested 2,500 years ago - very differently, indeed, to the pluralist stance of eternal Laws, totally independent-of-Context, and hence capable of producing only predictable-complexity, and never-ever creating anything entirely new!

Now, what complicates the whole explanatory exercise, has to be the current total undetectability of this suggested Substrate.

Not only must its sub-components be such as to keep it undetectable in all circumstances, but that must determine a major feature of its composing units, while, also, we will never be able to simply-observe the behaviours that we seek.

Nevertheless, what we seek IS kind of a substrate or medium, so, we can start by assuming, at least, some of the behaviours that we are already aware of, for clearly detectable and observable media, such as with water or air.

BUT NOTE: The French physicist Yves Couder had worrying questions about Substrates, and devised drvrral experiments, at the macro level, involving only a single-substrate-and-energy, and began to discover properties

and structures previously undetected, which are relevant to the questions being addressed here.

So, it appeared to be a sound place to start, if we considered a ship ploughing through water. Clearly, there will be some analogies! So, what are the main effects upon that water by the ship's passage?

We certainly get Bow-waves constantly attending the moving front of the ship, and always a following Wake, but though moving in the same direction, is, increasingly left behind, often also causing multiple vortices too, until both aspects gradually disperse back into the usual movements of the water.

The problem of these being purely Surface phenomena, is probably remedied by also considering fast-moving cars, which certainly also show similar effects in 3D air! And aircraft too show similar effects but at much higher speeds!

O.K! So, we can consider something similar for our Universal Substrate, but on what will these effects be imposed?

As mentioned earlier, whatever the units of our substrate are, they must be undetectable, yet able to both propagate Electromagnetic Energy, such as Light, and facilitate the subtending of active Electromagnetic and Gravitational Fields, and, finally, also deliver Action-at-a-Distance over truly vast distances. In addition phenomena such as Pair Productions and Pair Annihilations must be explained too.

This physicist decided upon a theoretical construction, using only already-known particles which could be joined together in well-known ways, so as to deliver all these requirements in full.

What, therefore, would be the likely contents and form of a joint particle to deliver all these requirements? And, the first vital property had to be the unit's total undetectability!

It had to have

- zero overall charge
- zero magnetic features
- ability to carry a quantum of energy
- involve equal Matter & Antimatter

and, the first suggestion, theoretically, was a mutually orbiting pair consisting of one Electron and one Positron, which was given the name The Neutrित्रon!

It would be undetectable, yet could absorb a quantum of E.M. energy by the promotion of its internal orbit, and move about, carrying such a load: it would then be a Photon. It could also pass on its internal load to another "Empty Photon", by demoting its own orbit, and promoting that of an adjacent recipient unit. It could, therefore, in appropriate circumstances, propagate energy.

And, if too much energy was inserted, the joint-particle would dissociate into one electron and one positron - a Pair Production? While an appropriate encounter involving a free-moving electron with a free-moving positron, could result in their mutual capture into an undetectable Neutrित्रon - a Pair Annihilation?

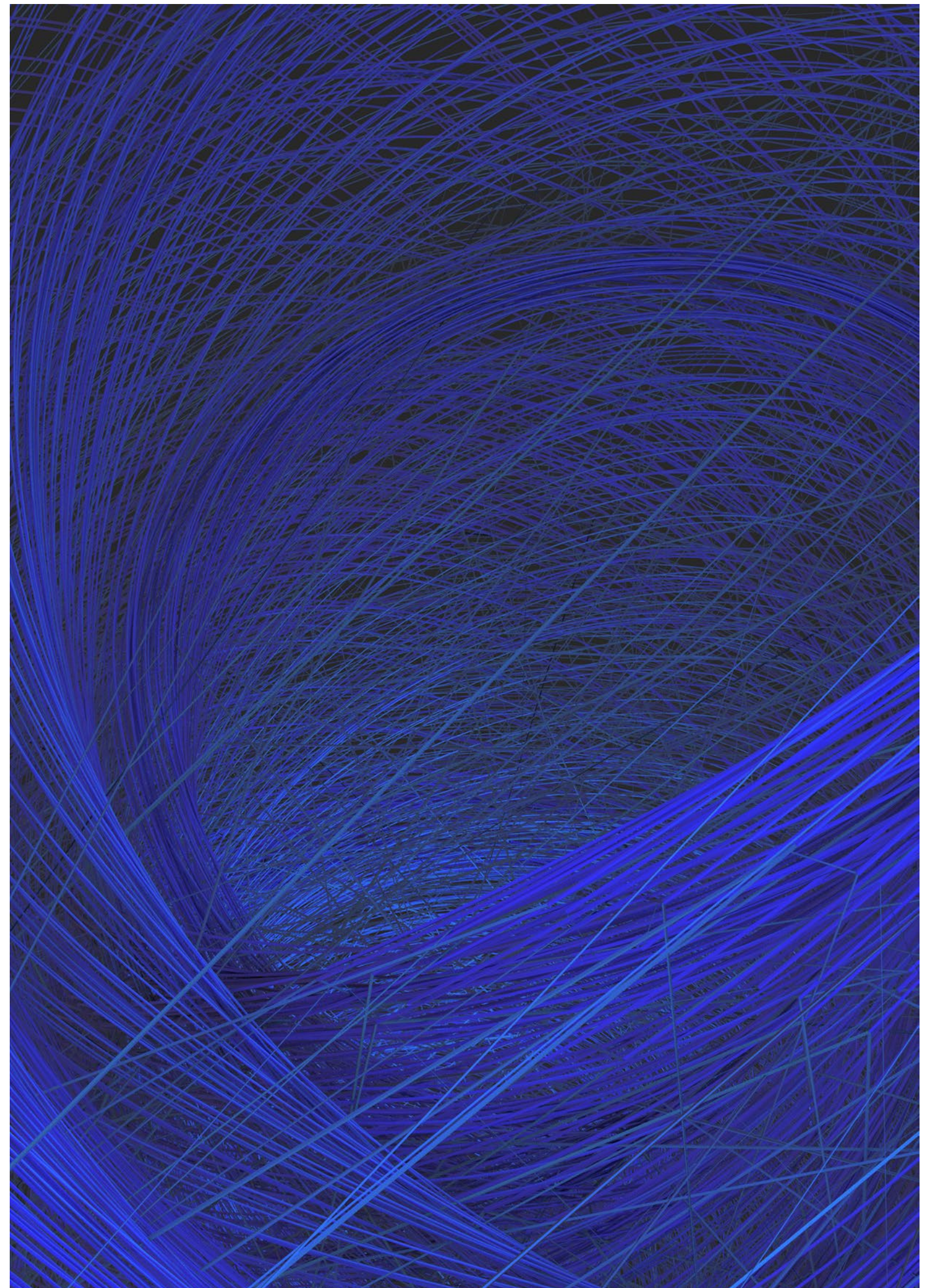
Clearly, this is NOT a Proof, but it is a legitimate, speculative and physical theorising about what sort of nature such proposed particles might need to deliver.

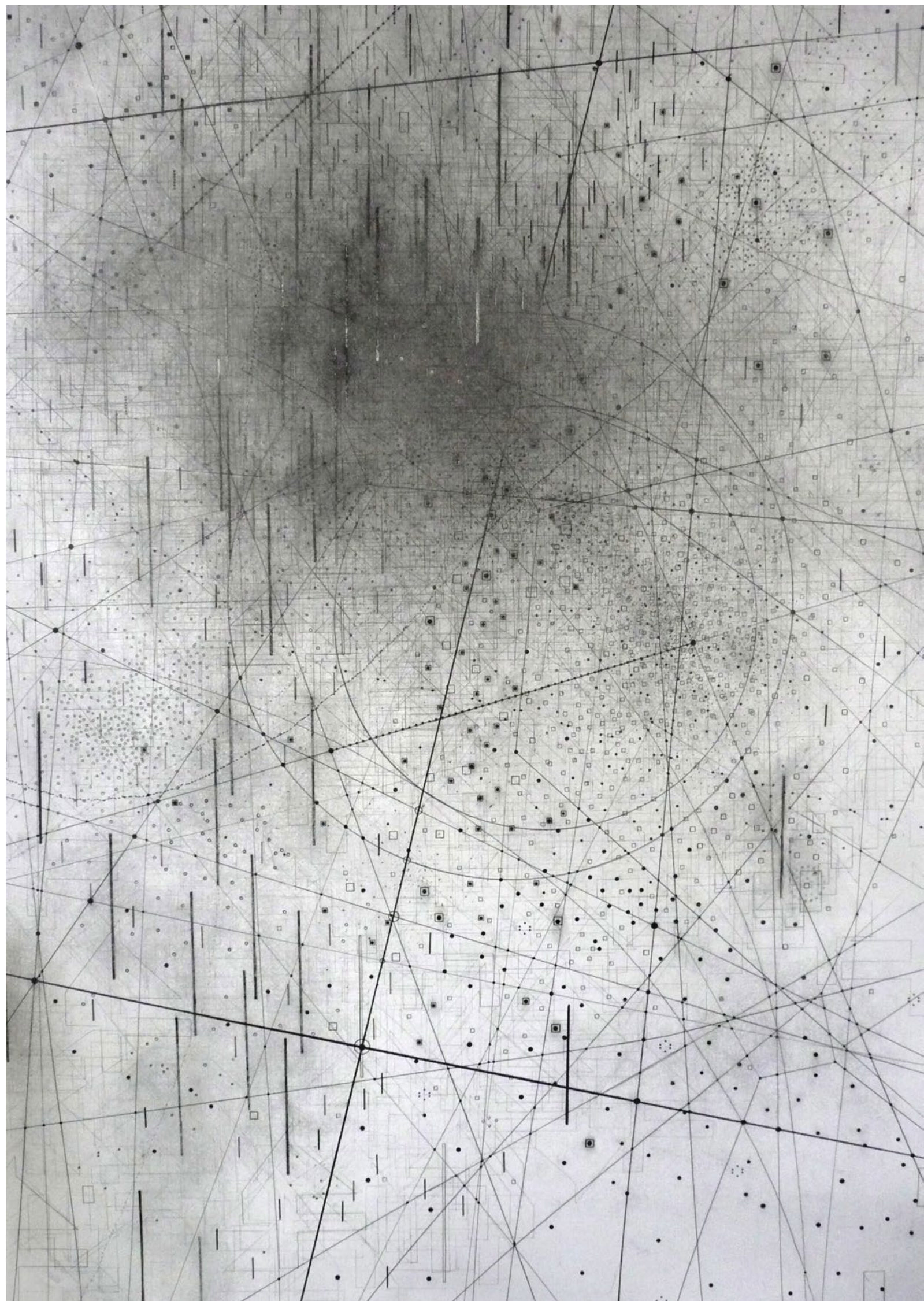
The other determining source of evidence, which has been brought to bear on revealing the nature of an assumed Universal Substrate, is that made possible by the ill-famed Double Slit Experiments, beloved of the Copenhagenists.

For, if the full range of behaviours found in those experiments were completely explained by an appropriately-defined Substrate, then we would be effectively "killing two birds with one stone", that is actually defining our proposed Substrate, while also undermining the main foundation-stone of the Copenhagenist stance too!

Clearly, with definitely NO substrate, as is the currently-received wisdom, not only can the observed phenomena in those experiments not be adequately-explained by classical Physics, but, in addition, they also cannot validly be explained by the Copenhagenists either.

Indeed, they can only describe what occurred by an invalid juxtaposing of formal equations and Probability Theory. And, at that significant point, also abandoned all Physical explanations, forever, and replaced them with Complex formal descriptions alone.





clearly, if a Substrate-based, physical explanation succeeds here, then the retreat embarked upon by Bohr, Heisenberg and their followers at Solvay in 1927, will at last be reversed, and Physics returned to its prior primary purpose - to physically explain Reality!

The theoretical assault upon the Double Slit Experiments did indeed deliver “physical explanations” of all the anomalies apparent therein, via the inclusion of a solely-Neutritron Substrate, but though a major success, the proposition could not be proved solely by such an exercise, for it failed to also deliver ANY answers upon the subtending of active fields. So, even the purely theoretical objectives were not yet fully addressed.

But, sticking to the same approach, now to address Fields, it was soon evident that another, different component of the Universal Substrate would be required, which could somehow deliver the seemingly totally contradictory objectives of undetectability on the one hand, and clearly Detectable Fields on the other.

Similar properties and forms were likely to be employed, but active fields delivering movements of influenced bodes in specific directions p[resented the main difficulty. So, it was “back to the Leptons”, this time seeking mutually-orbiting pairs of particles, which delivered just such a Direction. All it needed were particles of different sizes, so that then like with the Hydrogen Atom, a magnetic dipole would be unavoidable!

The Taus and Muons, along with their antimatter versions, would deliver what was required, but the undetectability, when not delivering fields, was still the problem

It was solved by having two exactly-mirror-image particles always present in equal numbers, and alsomin constant random motion. This mode of existence would cancel out their opposing properties an make them undetectable, over all sizes ofpopulation.

But, how would they form Fields, in the presence of a charged particle?

They would have to, individually “find-and-stay-with”, a charged particle, aligning the dipole of each, to point directly at the initiating charged particle. And thereafter quickly build up complete spherical shells around it!

Their mutually-orbiting form also enabled a holding and passing on of energy, so such static, but now also active aligned, forms would accept just enough energy from elsewhere in the substrate to balance the charged particle in a completed shell. Yet, these were dipoles, so, outwardly, the collection of further magnetons, as they were now called, proceeded in building further shells, with more necessary units, outside of those already in place, but of course requiring less gathered in energy for each involved unit. The effect would be an Inverse Square Law Field, surrounding the initiating Charged Particle.

Finally, could this approach also deliver Gravity, with yet another Substrate component? The same problem of requiring both undetectable, but also active-and-directed units would be required to deliver gravitational Inverse Square Law Fields by similar means to those initiated by Charge. And it was the relationship between Charge and Magnetism via orbital movement that had made that possible.

Could gravitational effects also generate Meta-Gravity effects, analogous to Magnetism, but here involving Movement of only inter-mass Gravity at the particle level? Clearly, this would solve it! But, what could that involved substrate-particle (a graviton?) be? And, if it too was to take the so far ubiquitous mutually-orbiting pair, what could the combined gravitons be composed of? The Leptons have all been taken! Could they be Neutrinos?

Work is underway in this last area, but problems still remain!

Clearly, the specific questions, posed by this essay, are by no means fully dealt with as yet. But, one thing becomes clearer with every step forward - the existence of a Universal Substrate is absolutely certain.

It has become the only physical area of study, via which Physics can be rescued from the idealist Copenhageners. Even without the necessary “Chapter and Verse”, what is fragmentally revealed delivers MORE with each step, than the purely formal equations, and idealist philosophy of the Copenhageners.

Indeed, the Study of the Universal Substrate must be not only the necessary future of this Science, but also via its absolutely essential Holistic Approach, it opens

The True Nature of Force

Action-at-a-Distance in a Universal Substrate

up an all encompassing general view - the exact opposite of the pluralist constrained and maintained pathways through it, which throw away not only Reality's natural Dynamism and qualitative Creativity, but its unavoidable Recursiveness and the study of our World upon an ever changing Ground.

Plurality can only reveal straight-picketed-paths through tightly-maintained Stabilities. What is required is the means of seeing, following and understanding Reality as it both flowers and fades, and most crucially of all how it Evolves!

Believe it or not the question of the passage of a charged particle through an affected and effecting Universal Substrate is the only clear way through!

No matter how we describe Disembodied Force, or how we formulate its effects, or even attempt to "explain" it, we always leave unanswered the explanation of Action-at-a-Distance.

There is inevitably involved an almost magical communication, across "totally Empty Space", that is never ever actually addressed.

Earlier scientists immediately saw the problem, and, fairly quickly, suggested that some, currently invisible, but definitely-present-everywhere Substrate or Medium, simply must be the actual means by which such effects were communicated.

Indeed, the roles of Water in lakes, ponds and seas, as well as that of our gaseous Atmosphere, actually do a "similar job" literally everywhere.

So, those experiences were simply extrapolated onto an as yet unrevealed Universal Substrate - termed The Ether.

But, in spite of many complex efforts to detect that Substrate, it was not only never found, but, finally, those investigations also achieved results that even torpedoed the idea of it being a stationary elastically-connected entity as well.

The whole concept of the Ether was abandoned, and, almost immediately, new and various problems began to arise, which could no longer be "explained" by that prior, "solve-all" conception.

It, or, at least, something very similar, was, thereafter, sorely needed, but the final "nail-in-that-concept's-coffin, was the discovery of the Quantum.

Electromagnetic Energy (like Light) was no longer considered to be propagated in infinitely extended Waves in a Medium, but, only in discrete gobbets, or Quanta! Not only was Light propagation through Empty Space scuppered, but also literally all the other main forms of Electromagnetic Radiation too.

Physics had shot itself in the foot, and no longer knew how to cope theoreticaaly!

The consequent decline following these discoveries, was extremely rapid, and in no time at all, first via the Positivism of Henri Poincaré and Ernst Mach, and then by Sub Atomic Physics beginning to abandon physical explanations altogether, and, instead, call their purely descriptive and idealised Equations "Causative Theories" instead!

They weren't of course!

For, such a belief would be out-and-out Idealism!" But, the New Sub Atomic Physics was able to both predict and produce, within its new narrow aegis, without an explanatory Theory, by not only depending upon Equations alone, but also, by actually, in so doing, also inevitably switching from a Materialist stance to an Idealist one, and considering that their discovered Equations actually determined Reality all by themselves!

Worrying about Action-at-a-Distance ceased to be a problem, and Einstein's Space/Time Continuum, transferred waves into his four-dimensional-Abstraction, determined by - "you've guessed it" sophisticated Purely Formal Equations.

So, with, in addition, a large dose of miss-appropriated Probability Theory (maths of course), and an even larger dose of old-fashioned Speculation, the outstanding

Physical Questions were dispensed with for ever! But, of course, not only wasn't it true, but it also left things hanging in an unsubstantiated form: they just had to excuse their retreat "philosophically" too!

So, arguments were introduced "quite naturally" limiting the investigation of Reality at the Sub Atomic Level via Heisenberg's Uncertainty Principle and other similar constructs.

The necessary consistency of physical theories was now replaced by the consistency of Mathematical Rules embodied in formal Equations, and their supposed entirely legitimate manipulations.

But, that wasn't true either. For, Mathematics is only an idealised description of Reality, and, its purely formal rules position-it-entirely in an incomplete, reflected version of Reality termed Ideality!

And, consequently, Sub Atomic Physics, theoretically, had to cope with a never-ending series of increasingly Major Crises!

While those few, remaining physicists who rejected the now dominant Copenhagen Interpretation of Quantum Theory, had to go back to basics, and commence with a thorough-going critique of all past premises in Physics - to first find, and then once again feel the solid ground of concrete Reality beneath their feet, and re-build their Most Basic of the Sciences once more!

Now, this is exactly where the writer of this paper has been working for many years, and, elsewhere, in his writings, the track of this development is available in full. But here, that course has taken me, once again, back to Action-at-a-Distance, so, I will be outlining current developments associated with that perpetual conundrum!

The philosophical premises will not be laid out in full here, as they will involve an almighty, but absolutely essential philosophical detour, going back to the Ancient Greeks, and the 2,500 years of developments and wrong turnings ever since.

So, here, I will concentrate upon a purely physical approach, coupled with the author's own suggestion of a currently undetectable, but definitely-existing Universal Substrate.

Now, the old assumptions for the discredited Ether, as a continuous, elastic Medium, simply won't do here, because of the Quantum. So, the new conception of a Universal Substrate, will have to be very different in its composing Units to deliver not only all its already known functions, but crucially also to deliver its total undetectability too.

These are major questions, and have initiated a whole new branch of theoretical investigations in Physics, which are already at an advanced stage (currently addressing Gravity), but still on-going, and available as far as they have reached currently, in other publications by the writer of this paper.

Here, in order to begin to consider Action-at-a-Distance, we will take that research and use it to tackle this long unexplained problem.

Let us pose the key questions to be solved! They are, on the one hand, the Propagation of scalar quanta of Electromagnetic Radiation, while, on the other, the subtending of vector quanta in Fields over extensive volumes surround initiating "supposed causes"!

But, in both cases, it has to be wholly handled-and-delivered by the actual physical components of a Universal Substrate.

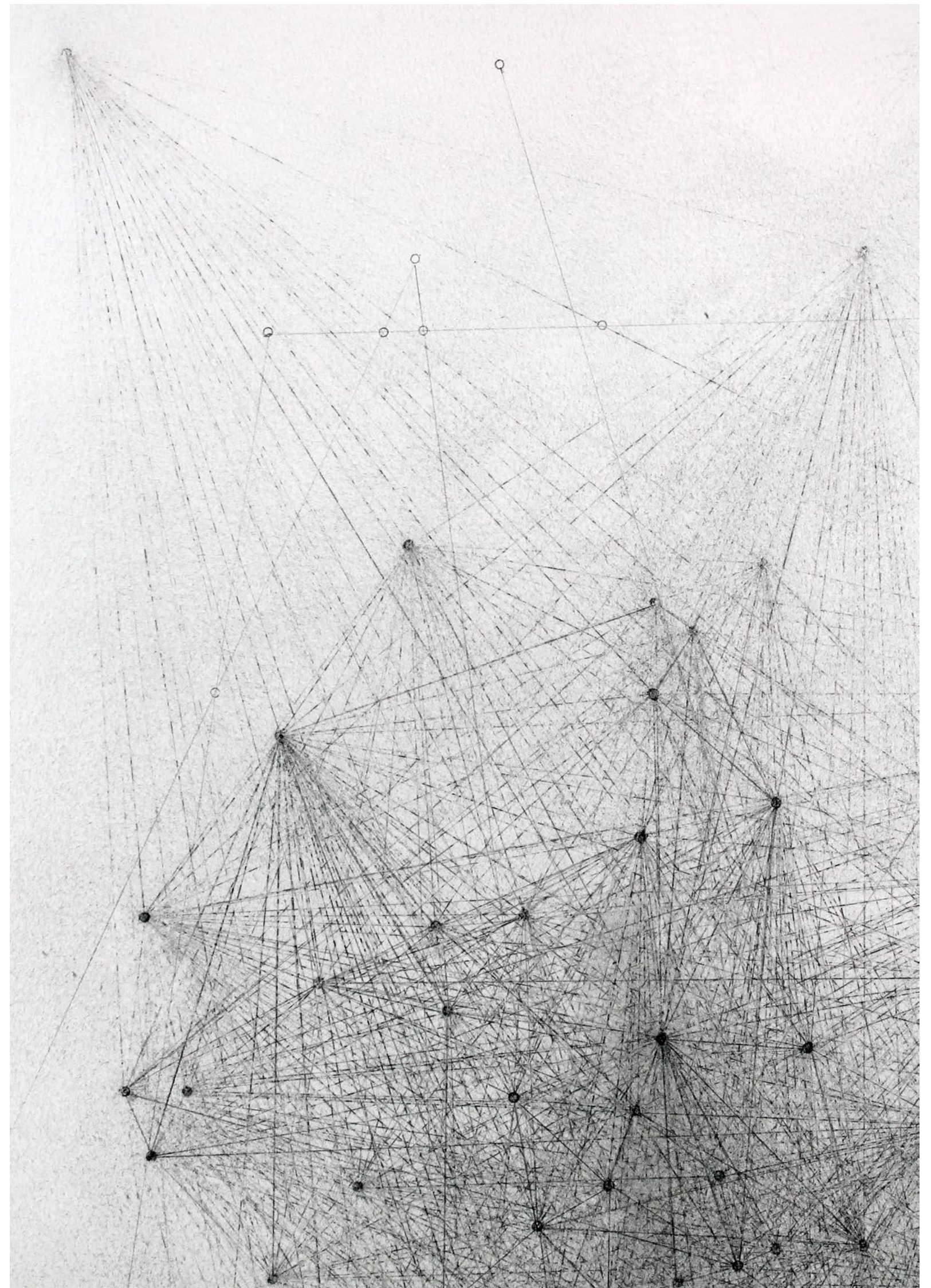
Now, these two functions have very different objectives!

Propagation is to deliver merely scalar energy of electromagnetic form to ultimately promote orbits in receiving atoms, while

Fields will set up an extended volume of Substrate Units carrying differing amounts of vector quantities of energy to ultimately impel susceptible entities in particular directions with consequent Kinetic Energy.

NOTE: though as yet unaddressed, the Low Temperature properties of Superconductors in presenting zero resistance to electron currents may also be relevant here too.

Clearly, no easy, elastic means can be employed in either of these necessary functions, even though both involve propagations.



Instead, both must involve automatic mechanisms for bucket-brigade-like transfers between adjacent discrete units, serviced by both the handling of scalar energy in quanta, and also, and very differently, vector energy delivering energy that has both quantity-and-direction with very different ultimate recipients and effects.

Clearly, the perennial problem of carrying Quanta of electromagnetic energy at specific frequency and energy, seems to demand a very similar carrier to that of the atom - with differently-sized components, delivering an internal orbit which can be both promoted and demoted. And that same model also "suggests" how a direction can also be involved, via the orientation of such a joint Substrate entity's internal Orbital Plane and consequent axis. Though here, each receiving Substrate Unit will also have its own internal orbit re-orientated by the transfer too! And, crucially, that propagated-orientation will be part of what is transferred ultimately to a final affected recipient.

Clearly, these two sets of functions cannot be from the exact same Units for both. Indeed, a major part of the on-going research has been in defining a set of Substrate Units to deliver all the known functions, currently supposedly delivered by totally Empty Space!

Now, the propagation of electromagnetic scalar quanta is not the purpose of this paper, and has been dealt with elsewhere, on an identical basis to all atom-to-atom transfers of the same type, so it will not be repeated here.

On the other hand, the subtending of vector fields around "apparently-causing" active sources, is, indeed, the task of this contribution, not least because it is wholly carried out and achieved by different Substrate Units to those involved in E.M. propagation.

For, that "apparent" source is only ever acting as the initiator, and it is the Substrate, itself, reacting to that presence, and actively surrounding the initiator in concentric, spherical shells of appropriate activated-and-orientated substrate units - also equipped with the correct amount of vector energies throughout the Field, delivered from elsewhere in the Substrate. And, indeed, replenished from that same source when quanta have left the Units to impel other entities in their appropriate necessary directions.

The crucial processes involved are:-

First - the establishment of the required contents for certain adjacent elements of the field, and

Second - the propagation of both energy amounts and their directions to all points in the field, and

Third - how the amount of energy, and its direction are delivered to a finally affected body

Now, the above divisions-of-labour are by no means yet Explanations, because the natural assumption is always to assume the "Causing entity" the sole active source of everything involved. But, that cannot be so, for that entity is totally unaffected by all the to-be-described and subsequently active features.

It doesn't even attract the Substrate Units to it, to form the start of the field.

Indeed, randomly moving, specially-endowed substrate units "come across" the initiator, in their normal random perambulations, and move to positions immediately adjacent to it. In addition, they orientate their internal orbits, via those orbits' Magnetic or Gravitational effects, with their axes towards the initiator, and gather just enough energy (from elsewhere in the Substrate) to balance the initiator's property via a complete shell around it.

Then, the outwards pointing other ends of the dipoles, then collect further shells, each with appropriate dipole orientations, but with less gathered energy per unit, due to increasing numbers of in all succeeding shells.

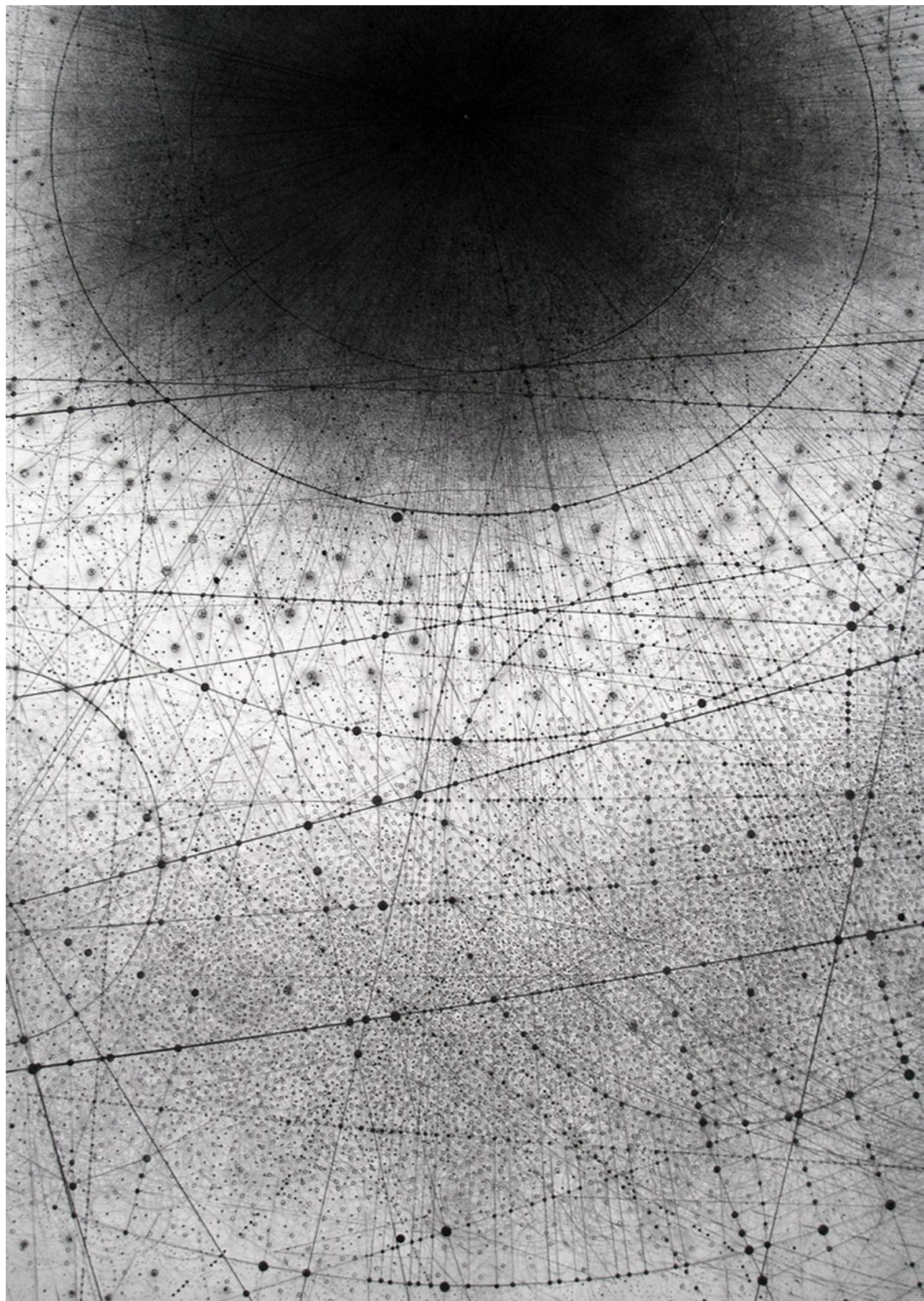
Such a process hence delivers an Inverse Square Law Field surrounding the initiator.

But, though such Fields are products of the Substrate, when influenced by the presence of certain propertied entities, they can, and indeed do, affect any other susceptible entities entering their aegis. They can move such interlopers either directly towards, or directly away-from, the Field's initiator.

And, to do this each unit of the Field. suitably organised and correctly equipped with available energy linked to a single direction within that affecting Unit. What it means is that such an encounter with an interloper

triggers the discharge of that unit's energy, precisely in the direction of the axis of its internal orbit, thus impelling the encountered entity in that direction.

Of course, that Unit has then lost its field charge of energy, so, by the exact same means as when it was originally charged, it will be replenished from elsewhere in the substrate, by successive propagations, to repair the Field at that point.



Linked Forces

Electrostatic & Magnetic

Without any doubt, due to my extensive and detailed theoretical researches into the possibilities of an existing, though currently undetectable effectible and affecting Universal Substrate, the undoubted role of Movement of the charged particles, point directly to recursive effects, initially upon elements of that Substrate, and consequently involving return-effects from a changed Substrate, back onto the original cause.

And, the proof has to be the stabilities possible with repeatedly-traverse-paths, such as occur with stable orbits.

For then, the transitory and left-behind effects, upon the Substrate, are, thereafter, regularly re-emphasised by the oft returning initiator - the orbiting-charged-particle.

Now, when previously considering only the effects on the initially defined Neutritron-Substrate-Units, such regularly-traversing charged particles have been shown to not only to dissociate such a Paving, but also to cause the Units to be driven into both directed-Streams and even Vortices, and then, via two-way energy-transfers being established between harmonically-related orbital speeds and the rotation-speeds of the Vortices, that, somehow, seem to have found stable quantised orbits along with appropriately re-organised Substrate states, clearly occurring within Atoms.

Now, these investigations are admittedly entirely speculative at this stage! But, nevertheless, they are entirely physically-arrived-at, rather than purely formally-derived, as is, most definitely, the case with the alternative Copenhagen Interpretations!

There is, admittedly, still a great deal more yet to be successfully addressed in the same way, if the overall theory is to stand!!

A Necessary Aside:

But, if we can temporarily address the usually adopted alternative stance in this area - notice that there is absolutely nothing of this nature still outstanding for the Copenhagenists in this area: for they have, long ago, completely dispensed with Explanatory Physical Theory, and replaced it with purely Formal Descriptions, that can be made to work within suitably-organised-Farming of isolated parts of Reality.

They consider that a “Proof” is when the results of an experiment “fit” their formulae. Sorry. NO! All that has been achieved, by such, is merely the reverse of the old pluralist methodology, where carefully farmed contexts are constructed-and-maintained precisely to enable the display and extraction of purely formal descriptions.

Indeed, all such Formulae are NOT what pertain in Reality-as-is, but only exist-as-such in artificially-designed and constructed contexts, AND in Ideality - the World of Pure Form alone, where only Mathematics involving only idealised forms exist. Current Physicists really do need to learn some Philosophy, to dig themselves out of their self-created hole!

Returning to our theoretical researches - the theories-so-far have been considering theoretically-defined Units of the Substrate, and have to be both justified by experiment, and then extended, to cover ever more of the actually occurring phenomena, by means of a further set of more and different Substrate Units.

Current achievements point not only to more Substrate Units (beyond the neutritron), but also even more new levels, occurring even below that of the so-called Universal Substrate - for there are still things to explain!

Let us investigate the main problems!

A linearly moving charged particle also subtends a magnetic effect, perpendicular to the direction of its motion, which sounds very like some sort of effect upon an underlying Substrate.

But, in addition, if the charged particle is performing a closed orbit, that accompanying magnetic effect effectively acts in directions perpendicular to the plane of that orbit.

The question has to be, “Why?”

It still sounds like an effect upon a Substrate, so let us consider an analogy to start us off. Let us assume similar effects to the passage of a moving boat through water. In those circumstances, we get Trailing-wake disturbances, and even Vortices left behind, and even a moving Bow-wave, staying with the causing particle. We have already considered dissociations of a neutritron Paving, both separating temporarily, and also leading to trailing Vortices too.

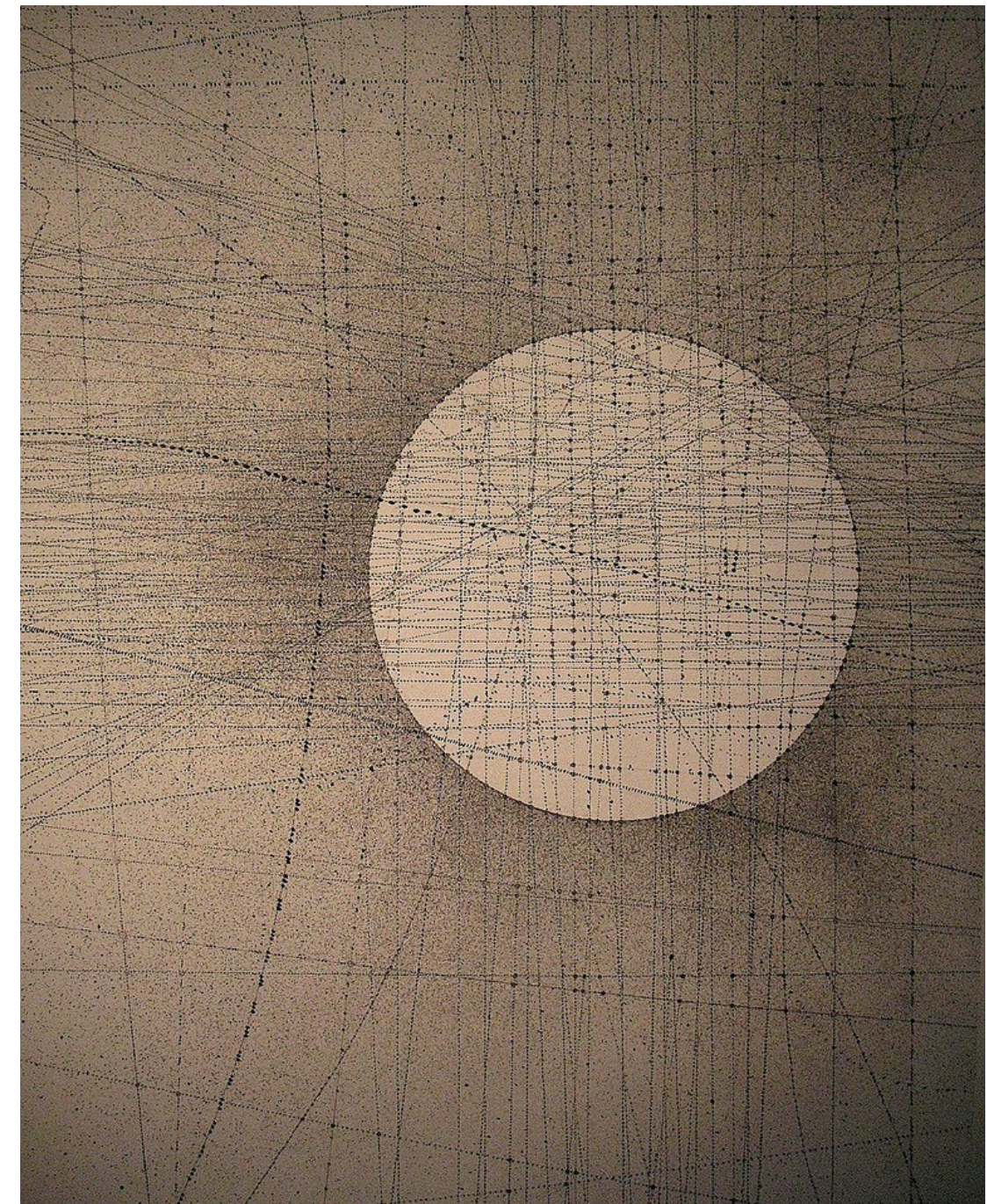
Can we assume other dissociations and changes, this time happening-to and caused-by, Field-Carrying-Units of the Substrate?

Prior achievements with Neutritrons seem to indicate that we can!

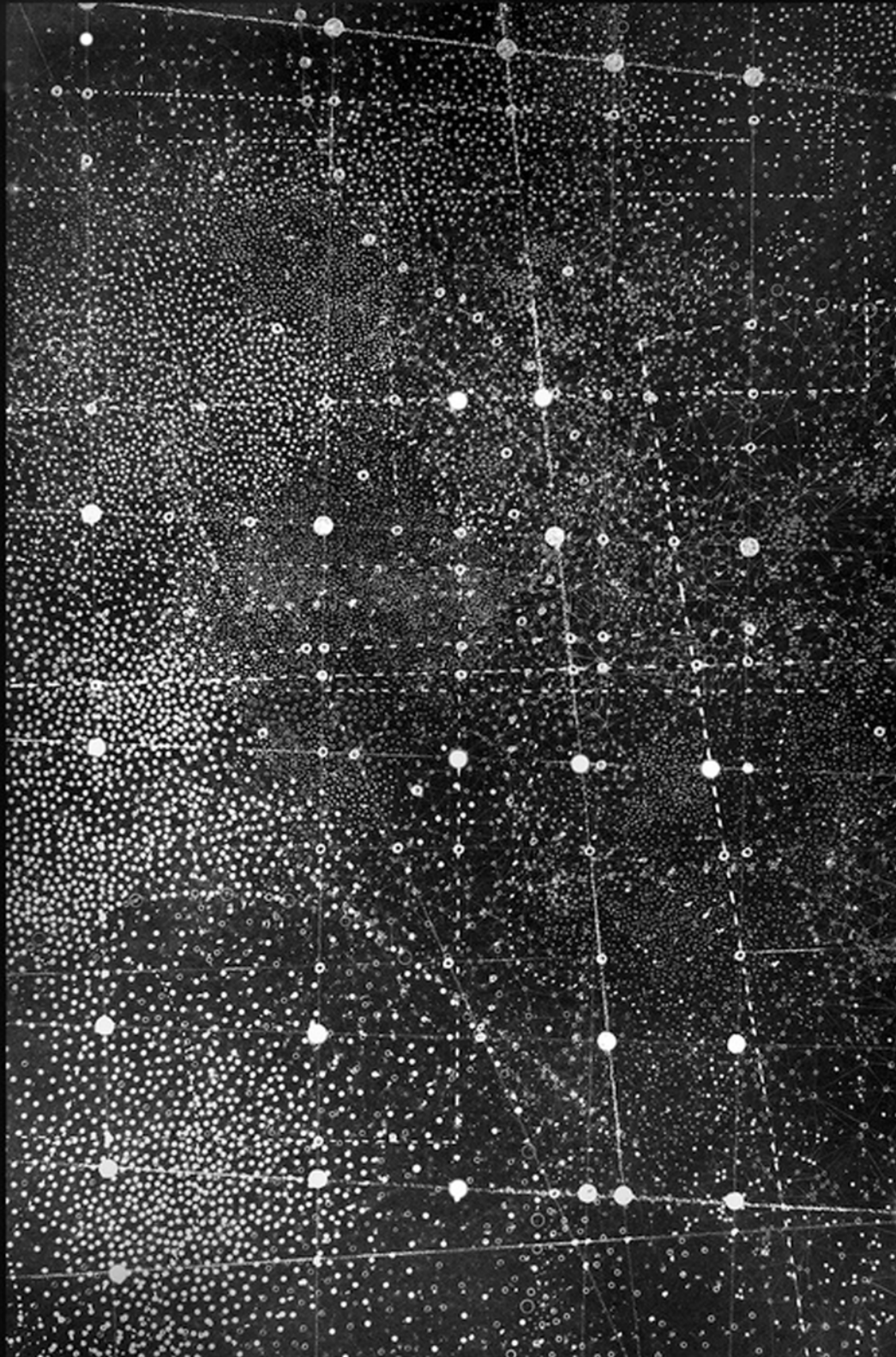
It would seem that the magnetic-effects are produced by a kind of Bow Wave disturbance in the Substrate, which would be sideways, perpendicular to the moving particle's direction.

For, when we go onto the orbiting-charged-Particle, these “bow waves” going perpendicular to the particle's track, on the inside of the orbit, all move towards the centre of the orbit, and then MUST either go one way or the other perpendicular to the plane of that orbit - JUST as the caused Magnetic Dipole Moment does! This fitting is remarkable, and at the very least means that in this current reasoning, there must be a real measure of Objective Content!

Clearly, this kind of reasoning is still proceeding, even without a definition of the Substrate Units involved: but, nevertheless, has a measure of Reality about it. That is, of course, because it is physical: that is why we insist upon physical explanations, as both primary, and absolutely essential, and vigorously condemn purely formal descriptions alone à la Copenhagen!



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