



SHAPE JOURNAL

SPACE : WHAT IS IT?

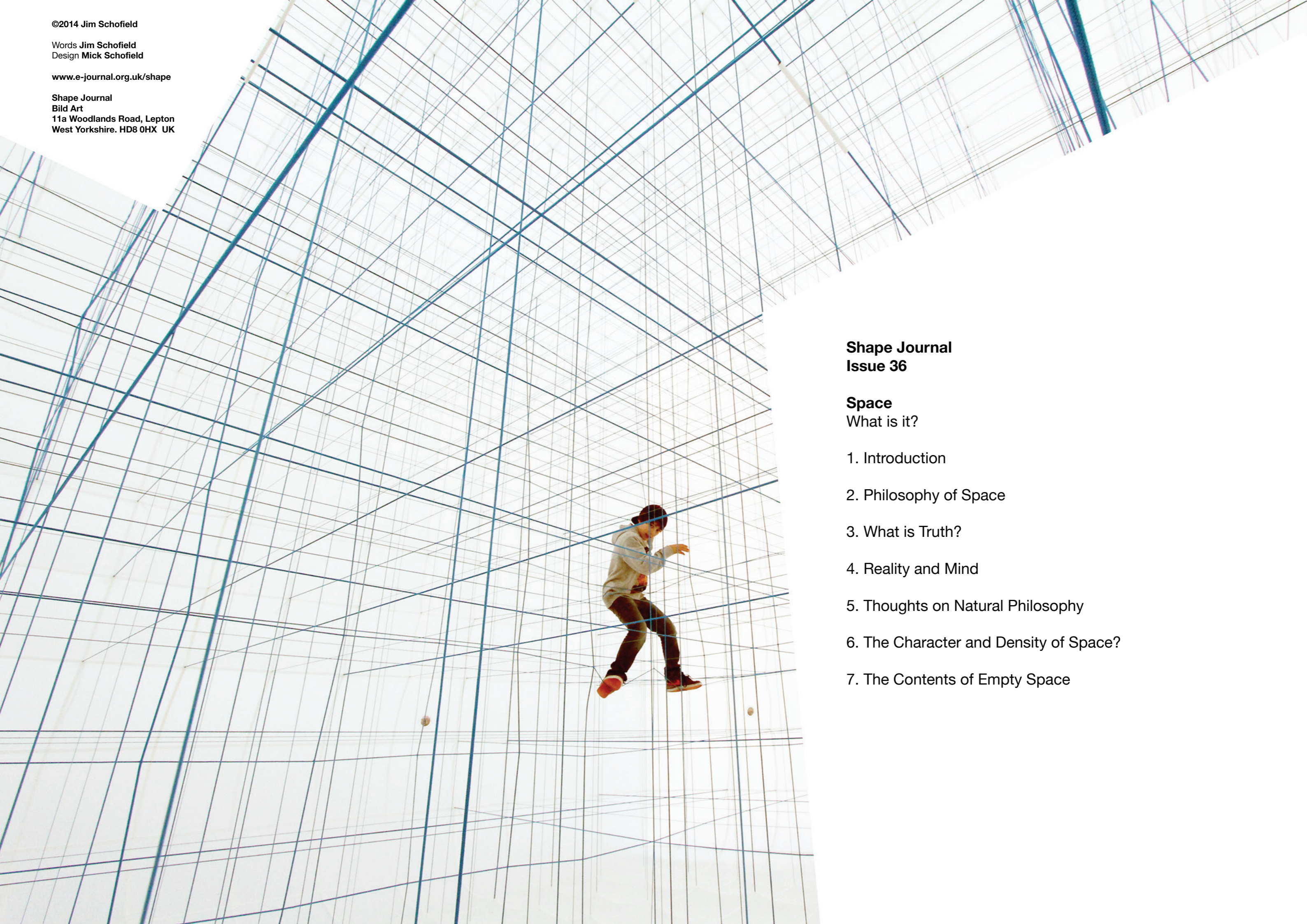
THE PHILOSOPHY OF SPACE / WHAT IS TRUTH / REALITY & MIND
NATURAL PHILOSOPHY / THE CHARACTER & CONTENTS OF EMPTY SPACE

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Issue 36

Space
What is it?

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Introduction

What is Space?



Welcome to Issue 36 of the **SHAPE Journal**.

What exactly is Space?

This is a fundamental area. As soon as we attempt to address such a question, and get beyond simplistic “Nothingness”, we find ourselves in serious trouble – for nowhere can we find a total absence of everything – the Ultimate Void!

Perhaps the place we usually consider to deliver it must be so-called Outer Space –the “empty” gaps between the heavenly bodies, but we cannot even be sure of that. Can we say that every single morsel of anywhere (even in that Outer Space) contains absolutely Nothing?

And, the reason for this is surely the very fact of Light Propagation! There can be no doubt that Light is coming in to us from literally every direction, and the more our telescopes improve, the more previously invisible sources are found to exist and can be seen

Such ideas beg the question “Doesn’t Light need something to propagate it though Space – must it not have some form of vehicle or medium to transmit it?” As you can see, the question isn’t entirely trivial, is it?

Our assumption that it is totally empty is a useable simplification, in many circumstances, but it surely is not the last word?

And these questions are not only concerning its nature. For as soon as we get into such questions, other problems arise, for whatever we consider, we have to “ensure” (if that is possible) that what we extract from Reality, and consider and manipulate are valid concepts, and are dealt with via valid methods.

Yes, Space is quite a subject. So, let us proceed!

Jim Schofield Oct 2014





Philosophy of Space

Not only is there Space stretching across the Cosmos, but also, on closer inspection, Space actually dominates the interiors of all atoms – the constituents of Matter, so it is NOT a minor component of Reality! To merely dismiss it as “Nothingness” has to be a trifle premature. Indeed, does inactive Empty Space exist anywhere at all?

So, how did we get to such an “empty” definition, and how does that conception of Space underpin our ideas of everything else?

Space is considered to be the inactive Stage upon which everything else occurs. We even impose a passive reference system upon it, so that its only contribution to what occurs therein is the pinpointing of position alone! And, literally everything else is assumed to be embodied in the various entities, which perform upon that passive stage.

To this philosopher, who it must be insisted, is also a scientist, it is clear that such a conception has to be a mistaken placeholder for what Space actually consists of, and, to instead allocate qualities and properties to Space is vital. Even the great Einstein did this, but in a very form-only way, while somehow he smuggled-in via an effect upon it due to Matter. [The fact that he allied it with Time doesn't change that crucial addition]

And, the suggested additions by this researcher (as a physicist) have enabled him to debunk the Copenhagen Interpretation of Quantum Theory in its most vulnerable area – the ill-famed Double Slit Experiments. For, by defining an actually-possible, space-filling substrate, all the anomalies of these experiments were explained.

Now, such a revolutionary position must be substantiated. For, scientists have been seeking such a substrate (usually a medium termed *The Ether*) for centuries, and have found zero concrete evidence for it. So, it was abandoned as pure invention, and the unexplained phenomena that had demanded such a substrate were just left hanging, without a real explanation.

But, the new approach by this researcher, defines component entities that will be undetectable by all the usual means, and they not only exist, but also can, and will, effectively propagate Electromagnetic Radiation across the entire Cosmos. So, whatever your standpoint, it is surely worth a dip into this virgin pool, don't you think?

What is Truth?

And how can Mankind Reveal it?

Now, I am aware that the ideas presented in the accompanying set of papers will be vigorously condemned. In fact, I am certain if it! But, I have to ask, on what criteria will that be based? For, there is no current body of theories, particularly in this precise area, which aren't full of major anomalies – that are as yet unresolved. So, merely pointing out shortcomings will not be a sufficient and final put-down!

Indeed, let's think about it! Can any part of Reality, directly and comprehensively, understand any other part? And, most particularly tackle an involved entity (indeed itself) as the interpreter? The answer has to be “No!”

For, we all admit that most of Reality is both inanimate and unthinking, and even Homo Sapiens is but a product of the Evolution of Reality, where the determinations of its evolved abilities were selected for to enable Man to survive, and certainly NOT to understand the nature of anything, never mind *Everything*! So, in this objective, “Thinking Man” will be most certainly inadequately equipped to naturally plumb the Absolute Truth of Everything.

Mankind, in such endeavours, has had to pull itself up by its own bootlaces, and even actually create itself, in its effective methods of thought. And, this can only mean that, at every level addressed, those means will always be, initially at least, totally inadequate to the profound and difficult tasks involved.

Every achieved gain will be, at best, only a reasonable and partial analogy of what is really happening, so what we extract will never be the Absolute Truth. It will only be what is called Objective Content – constructed ideas that contain only some aspects or parts of the Truth - but always carried in invented concepts, that are based upon abstracted views into generalised assumptions. They can never be the Absolute Truth.

Nevertheless, Mankind manages to relate aspects of concrete Reality to a parallel, cut-down World, which was conceived of by thinkers to relate these in various ways. But, that derived World is essentially a collection of Pure Forms and absolutely nothing else! The earliest contributions to this abstract World were in what became known as Mathematics, where naturally occurring patterns were both simplified and idealised into their purest formal elements, and these abstract Forms were gradually inter-related into what appeared to be a coherent, all-encompassing and consistent World.

The first glimpses of that World do occasionally recur in appropriately-equipped school pupils, when they are introduced to the methods of Mathematics, and begin the first steps in applying logical Proofs.

The step required to go further was to make the content of this Purely Formal World into the actual Driving Essences of the real, concrete World. For then, Reality would be seen to be entirely produced by these formal relations, which were actually situated and revealed in that parallel, but only Formal World.

Clearly, this move thereafter began to see them as the very absolute truths that were sought in Science, and consequently, the attention switched from studying Reality-as-is (and in its terms), to instead studying extracted and idealised Forms (in their own terms alone).

But then, the World being investigated was no longer ours! It was the World of Pure Form alone – not Reality, but that termed Ideality!

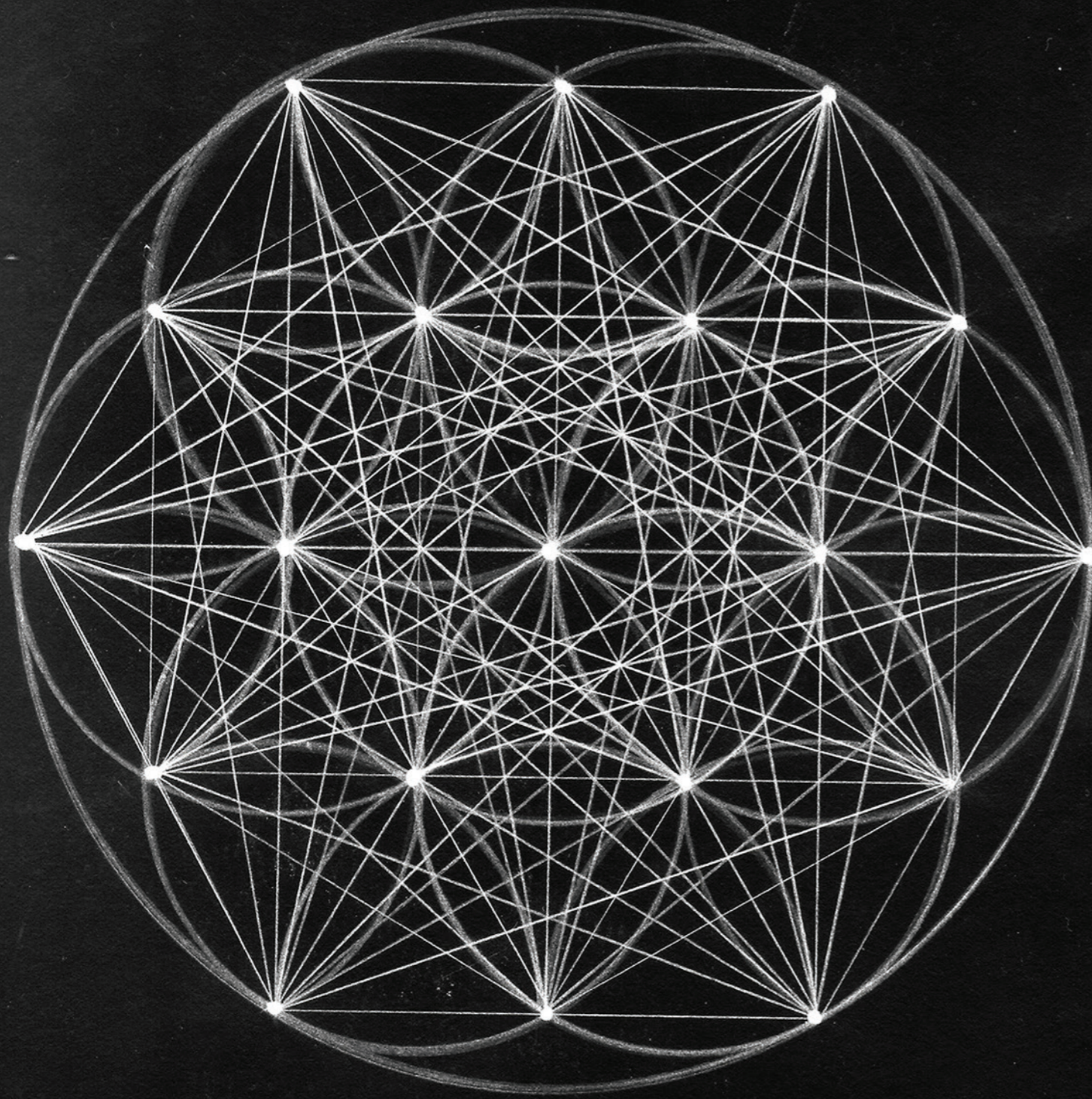
Now, perhaps surprisingly, this World is not pure speculation, Indeed, it is both extracted from Reality, and can be very useful, if sections of the real, concrete World can be isolated, filtered and then maintained as such to approximate as closely as possible to the Ideal Forms in Ideality. For, it turns out that steadfastly-stable situations, especially when walled off from any disturbances from without, can be close to the situations in that Formal World. But, still, what is being investigated is NOT Reality-as-is, but a farmed, abstracted and idealised version of it.

Now, this is a crucial change of direction, and though it simplifies our investigations, it also and inevitably incurs major restrictions and incorrect assumptions and principles, which are then attempted to be applied generally in the real World

The study of Reality-as-is is effectively abandoned in favour of the easier task, in a contained and controlled set of “realities”, which were only defined, maintained and developed as a coherent system in Ideality by mathematicians!

Yet, we call them eternal Natural Laws, in spite of the fact that nature was determined entirely by where they were forcibly situated in carefully designed Domains (that were only proxies for Ideality)! For, it is only in that parallel World that they really are both purely formal and eternal!





The scientists' sought-for eternal Laws of Nature, turn out to be the formal, eternal laws of Ideality! Our conceived-of experiments no longer deliver Reality-as-is, but so constrained as to conform to Ideality, and hence confirm the laws found there.

Now, if all this sounds pessimistic, you are quite right: it has certainly scuppered many concepts of what Reality is, and particularly, how we investigate it! It sounds dramatically like we are now prevented from making any real progress at all. But, that is NOT entirely true!

Though, not understanding what we have in our hands, as a distortion of Reality, we inflict these upon our investigations, and don't make any real progress in our actual Understanding. Instead idealist descriptions rule OK! Those investigations did not reveal The Truth, they were distorted by our assumptions as to what they really were, and only if we do realise what we have been doing will real progress be made.

But, this involves a set of very different conceptions, assumptions and indeed Methods, to allow things to really progress!

Some quite brilliant thinkers have realised the problems involved, and have attempted to address them - the most important was the German idealist philosopher Frederick Hegel, who studied what he termed "Thinking about Thought", and realised that we make these abstractions and idealisations. But, though they are appropriate and even useful in correctly restrained special circumstances, will STILL, even there, ultimately produce major crises. For, as the bases in our further thinking, they will always lead us to an unavoidable impasse, in which we arrive at a Pair of concepts or principles, which though they will still be useful in appropriate conditions, will, on close inspection, reveal themselves as entirely mutually incompatible. They simply cannot both be true!

They became known as Dichotomous Pairs. Yet, the vast majority of people would, nevertheless, choose to live with their incompatibility, and simply use each where it still applied. Such an accepted defeat prohibits any further real progress, and these contradictory concepts could remain as the "current truth", without ever allowing any further real gains to be made.

So, when taken to the extreme limit, this always leads to the popular standpoint termed Post Modernism, where many, many contradictory concepts are kept as being "more like The Truth" even as a mutually contradictory set, than any attempted "forced" coherence into a consistent system.

NOTE: so confronted with innumerable contradictory conceptions, ALL are kept and the "expert" either "knows" or "discovers" when to use one rather than another. To the outsider, no matter how intelligent and rational, it is handily incomprehensible, so no criticisms will be proffered!

Then, such a standpoint is the final surrender, and "Understanding" is buried in favour of collections of sometimes-appropriate rules.

But, if we could, somehow, find real ways to transcend these many dichotomies, it would be possible to go further, and, understand more, with a clearly evident increase in Objective Content. The trick, of course, would be, of course, exactly how to do it...

Hegel realised that, to tackle these problems, it wasn't the contradictory conceptions that should be analysed, but the *assumptions* and *principles* on which BOTH arms of the dichotomy were based. If these could be found, criticised effectively and replaced, it would be possible to explain the pair, and thus transcend the impasse.

So, in spite of our restrictions to how we have to address Reality, it would still be possible, on reaching these inevitable impasses, to address them to find their common incorrect bases and attempt to correct those.

BUT, it certainly isn't easy! Some major dichotomies in Science have persisted without resolution for centuries, and have been shown to be behind the incorrect Copenhagen Interpretation of Quantum Theory, and the final demolished result of an un-admitted Dichotomous Pair, which are the contradictory Principles of Plurality and Holism. But, that is much too involved to include here, though this writer has indeed cracked it elsewhere!

NOTE: The writer feels that he must point out that he cannot include everything relevant in such a short collection as this. But the important ideas referred to have all been addressed, and the most significant are available at length in the SHAPE Journal – most having complete Special Issues dedicated entirely to themselves.

Reality & Mind

The as-yet-not-totally-defined alternatives for a Philosophical Standpoint

For, perhaps 2,500 years, Mankind has zigzagged, to and fro, between two seemingly mutually exclusive standpoints in their attempts to make sense of both themselves, and the World they inhabit. These are, of course, *Materialism* and *Idealism*!

And though for a time, one or the other would predominate, in those areas where such things are considered, the inadequacies of their current conceptions will always have forced a ready, if temporary, swing over to the opposite stance.

NOTE: Surprisingly, even in this considered-to-be-primary basis, the forms actually dealt with by Man have managed to turn the obvious alternatives – Idealism and Materialism, into a Dichotomous Pair, and the trajectory of their uses has taken the same sort of route as with all such Pairs. Even the definitions of such basic stances will have involved inadequate underlying assumptions: they will mean different things at different times! Of course, these underlying assumptions that cause the uncertainty is NOT the clearly apparent key issue, which is “What is primary – Matter or Mind?” For, we don’t consider these standpoints only from that Primacy Issue alone: they are necessarily also underpinned by a whole set of other assumptions, and these, inevitably, can never be totally objectively defined. They will be, necessarily, coloured by a mutually-defining set of premises, beliefs and principles, which will be primarily determined, and indeed limited, by our then current knowledge and understanding.

Now, if at all possible, this continual switching between these two must finally be terminated, and a real and more profound resolution discovered.

Yet, of course, there has always been the pragmatic “solution”, as there always is with any Dichotomous Pair. The thinker switches between the two alternative standpoints in addressing problems, as their particular circumstances and required solutions dictate, and this seemingly unprincipled stance turns out to have two main advantages.

First, solutions can be found to certain currently significant problems, by simply choosing that stance which has the most easily reached and usable solution. Yet, secondly, the continuing opposition, between the two, does make possible important advances in their attempted resolution. So, such “flexibility” has come to be the norm!

But, logically, of course, it is an insufficient compromise, and the gains that are achieved, come in through the gaps and cracks of the insufficiently defined alternatives, while the monolithic main opposing stances continue to keep most things tidy or is alternatively left completely unaddressed.

Now, before anyone thinks that I will just put yet another (maybe cleverer) gloss upon this – merely sitting on the fence, I should make clear my chosen standpoint. I am most definitely, a Materialist! But, certainly NOT a mechanical materialist as is the usual basic stance in Science.

The basic fact is definitely the certain existence of the “Earth before Life!” How can an idealist standpoint possibly predominate, when NO living things were in existence, let alone *thinking minds*?

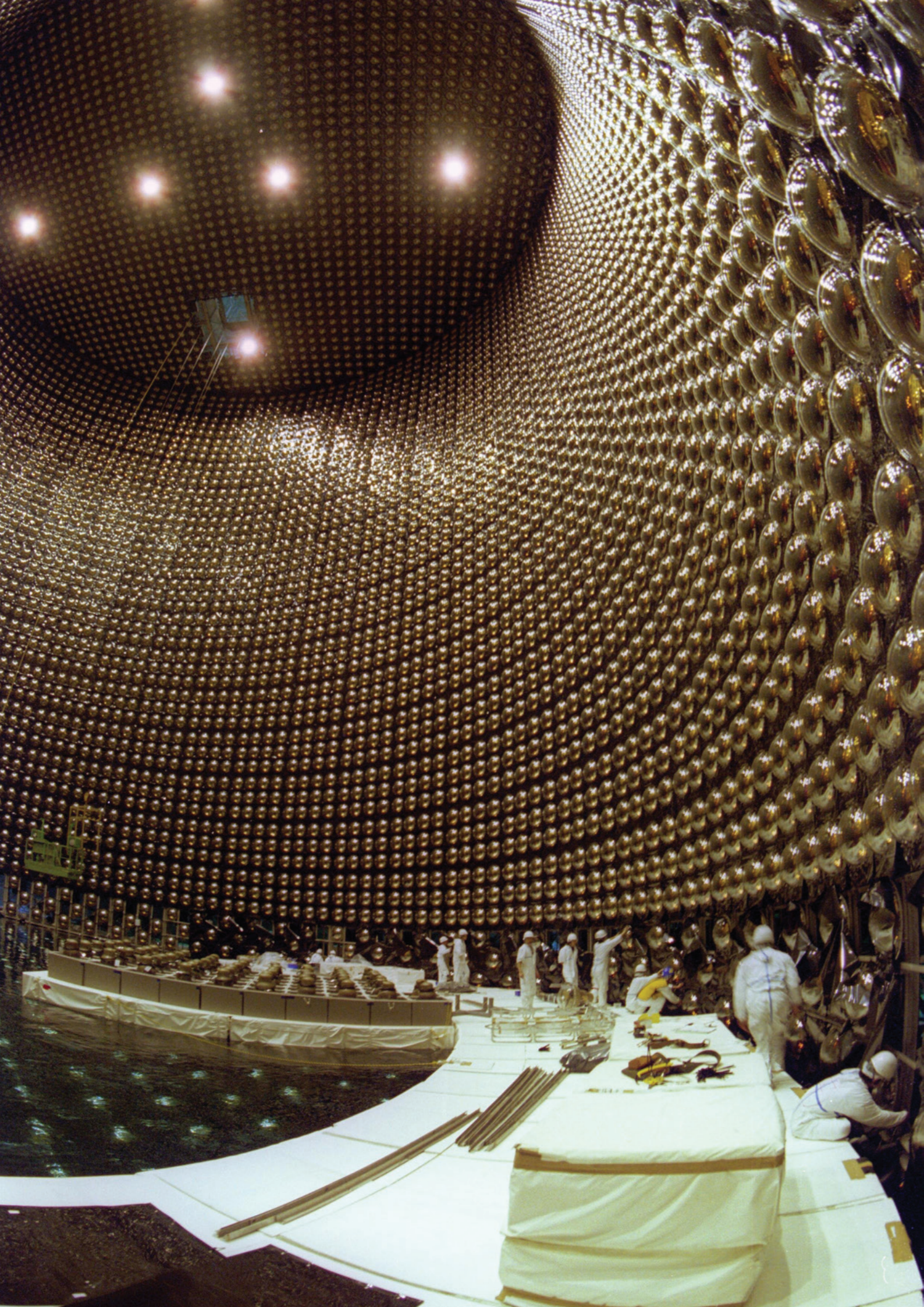
No, Materialism – as the priority of Matter over Ideas is indisputable. And, the various positivist strands (somewhere between the two), like the Empirio-Criticism of Poincaré and Mach, and many other similar positions ever since, are accurately described as either shame-faced Materialism, or *agnostic* Idealism.

But, we must never lose sight of the fact that all these arguments and explanations are, without any doubt, products of human minds, and therefore, inevitably bear the stamp of current capabilities, knowledge and understanding, in addition to the total impossibility of completely delivering such things entirely by such means. Whatever we consider what Idealism and Materialism are, they will always be mistaken in significant ways.

As a Materialist, I have also to list, among my heroes, philosophers who were, quite definitely, Idealists. The three who transformed my thinking were Zeno of Elea, the Buddha and Frederick Hegel, whose concentration upon Human Thinking was a crucial contribution, even to a Materialist. And my primary giant of Materialism has to be Karl Marx – a disciple of Hegel, who took his master’s gains and transferred them wholesale, into the very heart of the Materialist standpoint and approach.

So, is there a non-agnostic stance encapsulating both? The simple answer is quite clearly, “No!” But, what is essential is that the materialist stance must stop dealing in “absolutes”, and admit that every single currently-held materialist conception will always be the product of human minds. NOT, it must be emphasized, as having





inevitably mechanistic consequences, but, on the contrary, as incomplete yet leading-edge extractions from the development of a material Universe, AND capable also of affecting what produced it and even changing that into something different. True materialists do not, and indeed cannot, deal in Absolute Truth!

They are forced to deal only in aspects and parts of actual Reality, which are also deformed by our current lack of sufficient knowledge and understanding to deliver them exactly-as-is! What we achieve may well be taken from Reality, but also distorted not only by our inadequate means, but also by our still-limited mental abilities.

What we achieve, at best, is something with more Objective Content than what it replaces. But, at the same time, they are never pure invention. They always have a source in Reality, yet are never absolutely true. So, there you have it!

The elements of Reality that we manage to extract, are modulated significantly: they are never pure, unaffected Reality-as-is, but forms selected-for, by our means of setting up and controlling our Domains of study, and then simplified and abstracted into purely formal quantitative reflections of what actually exists!

Though Materialism is most definitely the sounder basis for what Reality consists of, it is solely dealt with through the minds of human beings, and therein significantly adjusted to “make sense”, along with all our other current knowledge and understandings - an inevitable idealisation. Clearly, a materialist, who knows nothing of this unavoidable process, will inevitably be some form of mechanist: he will not take into account the changes imposed within human minds.

NOTE: The consequences can be remarkable, for in the 20th century, the current assumptions and principles that underlie all Science, had the effect of causing physicists working in the Sub Atomic Realm to abandon materialism entirely, when they completely failed to deal with the discovery of the Quantum effectively. Their only means of repose, was to abandon explanation entirely, and replace it by the perfect, idealised forms of Mathematics, which, having been transferred from concrete Reality into a World of just such idealised, perfect Form alone, were able to avoid the contradictions of pursuing their still-extent and determining assumptions of Reality.

The concerted attempt to understand Reality, materialistically, was historically deemed to be Science, and, of course, it was indeed a significant development compared with all prior attempts. But, it had to be addressed by real people with their actual knowledge and understanding determined by their histories, experience and social imperatives.

Mankind could NOT leap directly into an accumulation of Absolute Truths. All the bases that were available were unavoidably simplified and abstracted assumptions – so what was interpreted could not but be determined by the current level of those doing the investigating. They had no choice when attempting to pull themselves up by their own bootlaces, but to make essential simplifications to what they had unearthed.

And the first defining basis was to study only *Stable Systems*. Clearly, situations that were all over the place would be impossible to tackle, while things that “kept still” would be much more amenable to study!

So, Formal Logic, with its Identity Relation, $A = A$, set the initial tone for all that followed, and anything that was changing all over the place, was set aside for later study.

So, such a study only of Stabilities, involved a set of assumptions, including what were seen as Eternal Causing Laws. So Science, from its outset, only studied Stability, and Real Qualitative Changes, or Developments, were NOT addressed!

Clearly then, though even this primitive Science was materialist, it was incapable of addressing the ongoing development of Reality. It sought to explain constant things – steady state situations!

It therefore soon became a series of different sciences, and even within these- specialisms, the crucial developments were shelved “for now”! The clear way forward was to study Stability “first”, and indeed, even individual investigations could get nowhere until a stable Domain of investigation had been set up – carefully filtered and controlled to visibly reveal particular possible “laws”. And, if we couldn’t find such a stability in reality we would have to construct one!

Nevertheless, even this enforced limitation was able to reveal a great deal. But, of course, it was a very selected set of features in mostly very non-natural environments that were investigated and theorised about.

So, the question became, “How could this be remedied?” It would certainly require a very different and thorough study at an entirely different level – that of Thinking Minds to correct the always stabilised bases.

A revolution was required in Science! Without it, as has already occurred in Sub Atomic Physics, the whole discipline careers off into very narrowly defined lines of investigation, which prohibit a real critical review. Primarily, the Principle of Plurality, which underpins all scientific experiment and extracted theory, must be replaced by a thoroughly holistic approach.

Thoughts on Natural Philosophy

I have a major difficulty in establishing what I consider to be the correct approach to investigating Reality – that study, which is universally termed Science, but often linked indissolubly with its subordinate handmaidens Technology and Mathematics.

So, in attempting to explain my view, I am constantly involved in arguments as to “What is Science?” and “What is Technology?”, never mind those who insist that the only real laws MUST be encapsulated into pure mathematical forms – usually termed Equations.

So, I have made a decision to, hopefully, bypass such arguments, for they never get anywhere, and I do it by calling what I do *Philosophy!* In the same context as that which the first real scientists considered their investigations – as Natural Philosophy!

Clearly, using a discovery to make a product isn't Philosophy! Neither is being an inventor, and finally even the skills involved in setting up experimental situations to limit what is allowed to happen to simplify investigations, could never be called philosophical investigations, could they? For all of these are merely means to a required end, and cannot be termed as philosophical!

While, the understanding (as far as one is able to do it) of Reality, could very accurately be termed a philosophical investigation, in order to discover the true nature of Reality.

Yet, even with these clarifications, the full problem is still only hinted at! We still need to explain why such a standpoint is important: what is wrong with the usual confusing nomenclature, as long as progress is made?

The real trouble is that the Absolute Truth of Reality is simply, and indeed always, *unavailable* to Mankind! We just cannot reveal such things. No matter what stage in their development we consider, Men are always limited by their own current level of knowledge and understanding, and always has to use inadequate means to both describe and explain what they can find out. But, at the same time, that isn't a fatally disarming disability.

Progress can be made, and in so doing Man both extends his understanding and his vocabulary, and grasps sufficient to make real progress in his understanding.

Though prevented from dealing in Absolute Truth he can extract what is called Objective Content – and these are parts, aspects or views of the Truth, which because of their incomplete nature as always encapsulated in fabrications that manage to deliver those fragments in a useable form. Technically we call these forms Analogistic models, and

they can work in appropriately limited and maintained circumstances. But, in creating them, Man has no choice but to incur mistaken assumptions and even principles, which simplify the actual into these constructed analogues.

Now, this does not facilitate straightforward progress thereafter – for Truth cannot be built directly out of each produced Objective Content: the generalising falsifications will prevent that. Now, let us be as clear as possible here! These extractions are NOT pure inventions that falsely seem to explain things. They are, indeed, explanations, containing a measure of truth, which are limited by the current inadequacies in our concepts and vocabulary. We have revealed something, and we encapsulate it as best as we can. Nevertheless we can use them! It is only when we attempt to go further that our incorrect assumptions and principles begin to lead us astray.

Indeed, a “breakthrough” is only achieved when a new conception has more Objective Content (aspects or parts of the Truth) than what it replaces. And, such gains are never absolutes; neither do they provide a consequent and obvious staircase to Absolute Truth. They can only be simplifications into useable forms that allow some actual gains to be achieved. And, such a basis, inevitably, has profound limitations!

Such a breakthrough is never a door to such an unimpeded ascent to Truth! On the contrary, even the very best realisations will always bring their users to a seemingly impassable halt – an actual impasse! No amount of manipulating and mixing of current concepts and assumptions will ever transcend such a termination.

Indeed, each and every breakthrough, though seemingly continuously extensible, will, on the contrary, always arrive at such a crisis. The edges of the applicable patch of Reality, where this new conception holds, will have been reached: the seemingly general equations will give false zeros, or zoom off in unusable asymptotes!

But, the wisest among us have learned to recognise such an impasse in a surprising way. For, in arriving as such a crisis point, also reveals itself in consequent pairs of concepts, which though each will work in appropriate circumstances, are essentially totally incompatible. Frederick Hegel, the brilliant German philosopher, called these Dichotomous Pairs.

NOTE: Though the Greek Zeno of Elea, had also recognised Continuity and Discreteness as such a mutually contradictory pair around 2,300 years earlier, and constructed his Paradoxes - revealing their true and inadequate natures when applied to Movement.



The then developed method of Hegel (and following him, his student Karl Marx), was to seek out such Dichotomous Pairs, and then attempt to reveal the incorrect assumptions behind them, and thereafter attempt to devise alternatives, with which to replace their limited predecessors.

Now, Hegel was a philosopher, but any good scientist will recognise what he was talking about, for the only real breakthroughs are those, which involve such a radical change in basic assumptions and indeed principles.

The still-pertaining dichotomy between Particles and Waves, applied to the very same things in present day Sub Atomic Physics, is just such an impasse. And, in spite of the then chosen dramatic philosophical retreat in dumping explanations for Equations alone, the impasse has certainly not been transcended!

So, this short preface is considered to be essential to actually ground the papers that follow. For, they are an attempt to address the major impasse in Modern Physics concerning Wave/Particle Duality. But also, and unavoidably, a much wider and even older dichotomy has bedevilled Science since its inception concerning Form and Content, which has shown itself in the opposite bases of Idealism and Materialism! And, with these problems, I describe the only solution that I have been able to deliver, and which have taken things forward, and have been concerning the Nature of Space!

The successful work, referred to above, tackled the assumption used in the famed Double Slit Experiments, which had revealed many seeming inexplicable anomalies, and the approach that solved these problems was predicated upon an alternative conception of the true Nature of the Space, in-and-around all parts of these experiments. Hence, in these papers, it is that revision of the Content of Empty Space, which is addressed.

[See *The Theory of the Double Slit* Special Issue No. 3, of February 2011, available on the SHAPE Journal]

The Character and Density of Space

Is Space totally Empty, or is it filled with a content capable of allowing communications between more evidently massive bodies, such as stars and Galaxies?

Clearly, to answer such a crucial question, we have to take what we know for sure about that seemingly Empty Space, and work back from those undeniable features to arrive at some sort of answer.

For, example, does electromagnetic energy (as Radiation) actually travel through that Space? The answer is “Yes!” And, can effects (such as Gravity) somehow be communicated across Space to affect material bodies situated at some large (and even colossal) distances apart? Again, such Action at a Distance also appears to be “True!”

So, what conclusions can we draw from these undoubted facts! Knowing these, could Space really be totally Empty? The only answer must surely be “No!” For, otherwise, how would both Energy Propagation and Action at a Distance ever occur?

NOTE: Immediately, at this very early juncture, we are aware of a founding assumption, which is, “Totally disembodied Energy and Force can exist without any Matter having to be present”. Our abstractions of these things from Reality have become actually-existing pieces of Reality. The cerebral process of Abstraction, which was developed to aid reasoning, has been turned into producing concrete(?) realities in themselves. I’m sorry – but you can’t do that!

So, the question must be, “What means could there be to enact such undeniable communications? Empty Space cannot be empty! Yet, when we attempt to detect an all-pervasive medium, we invariably fail to find anything there. Whatever enables these certain processes appears to be totally undetectable by all our usual means.

Of course, early scientists immediately concluded that there just had to be something there, even if they could not yet detect it! So, they put forward the idea of *The Ether* – an undetectable, matter-less, invisible and elastic medium that was affected by certain disturbances causing “waves” within it that rippled across Space by oscillations in that invisible fabric. It was, as are all such conceptions, a useful Analogistic Model, for it enabled the seemingly impossible processes across Space to be rationally explained.

Interestingly, James Clerk Maxwell devised a physical model of that Ether involving vortices and electrical particles, which not only made the explanations more believable, but also delivered precisely the correct equations for that propagated electromagnetic radiation,

which are still used to this day, in spite of the Ether having been dumped!

Clerk Maxwell’s work was, of course, another and better Analogistic Model, which though NOT confirmed physically, did bring our conceptions closer to what was actually happening. My point about Objective Content is surely borne out by this sequence of theories.

Yet, in spite of the complete demise of the Ether, absolutely nothing was devised to successfully replace it! You have to be amazed at such blatant and unprincipled pragmatism of today’s scientists! They can cope with such un-integrated ideas – because they work! Yet, the inability to detect anything in so-called Empty Space meant that the only physical models they had devised had to be totally rejected. The trouble then was, of course, that this removed ANY explanation of what was going on and why, and hence returned to considering the reasons for these quite definitely occurring processes as “unknown”!

Of course, such a step backwards to “not known” is just unacceptable! Even if a model has negative features, but also contains enough Objective Content to deliver meaningful explanations, it cannot be just ditched!

Of course, better knowledge of what actually does fill Empty Space must be pursued, and merely saying “I don’t know!” will not suffice! And, the reason why turns out to be vital. This is a classic impasse with contradictory features, the elements of which can be successfully used in certain circumstances, BUT which are incompatible! It means that our assumptions and principles that got us to this impasse are incorrect, and must be replaced! For otherwise more and deeper impassés will mount up, and literally the whole edifice could collapse!

Scientists must say two things. First, is that something MUST be there, and second, the Dichotomous Pairs, occurring at all such impassés, must be investigated to find their major flaws, and be replaced. Now, as soon as these points are accepted, there has to be another set of questions that will require to be answered.

Of course, the conclusion that the filling of Space “must be material” surely cannot be avoided, and we will need to suggest a material filling that could possibly be undetectable by the usual means. But also, we would have to explain its presence throughout Space – “Where did it come from?” and “How is it distributed: is it uniformly spread or not?” Even the basic assumption that something must be there demands other questions too. What actually is it?





How was it originally produced?
Is there an edge to its extent?
What is its density distribution?
Exactly how would it implement the propagation of electromagnetic energy?
Would it, in itself, be entirely energy-neutral, or would it take a proportion of the energy available to it to maintain it as-it-is, not to mention to drive its distribution and extent?

NOTE: Various other known phenomena will demand answers: most particularly the location of as yet undetected Dark Matter and Dark Energy (if, that is, one accepts the reasoning behind their actually existing, of course). While we certainly seem to have both Pair Production and Pair Annihilation from-and-to supposedly Empty Space and the particles an electron and a positron.

In other areas there seems to be a hidden reservoir of energy that can amazingly be available “from nowhere or everywhere”, whenever it is required.

It couldn't be clearer: Space is not only NOT EMPTY, but it is a complex situation that participates in many important phenomena.

NOTE: On considering a particular filling of Empty Space, the question of possible alternative explanations for the Red Shift discernable in distant Galaxies, and its fairly recent indication that the most distant galaxies seem to be accelerating. Clearly, having to “plough through” some sort of “filling” could indeed exact an overhead, energy-wise, and thus affect the light as its journey would be through vast amounts of that intervening filling.

And, perhaps the most important question about any filling of Empty Space must be why it stays there: why doesn't it clump together (under Gravity)? Why should it be relatively independent of the usually universal forces of Nature?

One possible conjecture might be that it is electrostatically neutral externally in its component elements, while internally is in a kind of balance enabling the holding and passing on of gobbets of electrostatic energy.

Yet still to make it totally undetectable it would also have to be Materially neutral externally in its component elements, while internally is in a material kind of balance.

Such ideas have led to the theoretical definition of a joint particle, consisting of two sub units- and these each containing the opposite of the other, and would mutually orbit one another to deliver via both negative and positive components, which were also of matter and anti matter, and delivering a totally neutral joint particle. Surely, such a particle would be undetectable by all the usual means?

The suggestion was that the sub-units could be one electron and one positron, and that the resulting joint particle would involve these sub units mutually orbiting one another.

If such a particle was also extremely stable, it might well fulfil all of the requirements for a filling of Empty Space. It was named the *Neutritron*.

Now, though this was a theoretical definition, it turned out that such a particle did indeed exist! Something remarkably similar had been discovered in the High Energy Accelerator termed the Tevatron, situated at Fermilab. But, there, these particles were extremely unstable, and dissociated at the drop of a hat! The discoverers called them positroniums, so that incarnation did not support the theoretically defined version.

But, of course, these sightings were all in a very high-energy environment, whereas the usual conditions in which we were considering Neutritrons were in Empty Space, and that will almost always be a very low energy situation. In addition, the theoretical neutritron would also dissociate in the very high-energy environments, so it was valid to take this incarnation as far as we could to see whether it would deliver the known properties of Empty Space.

So, in such a situation, no long distance gravitational effects would be noticeable between these particles, because they would be materially neutral. And the very same would be the case with electrical forces due to charge. So, generally these particles would be totally oblivious to the usually cosmic forces, and would neither locally clump together, nor generally drift towards centres of matter.

However, it was determined theoretically that, on very close approaches such particles may be momentarily attracted as the negative sub particle in one of them got close the positive particle in another, but this would very quickly subside and just as quickly turn into a momentary repulsion.

But, these would totally subside at quite moderate separations.

NOTE: Indeed, these considerations enabled an alternative derivation of James Clerk Maxwell's famous equations

So, consider a moving, randomly spread context for these particles, they generally would be subject to no overall effects, though in close encounters these transitory attractive and repulsive effects could be expected when very close together.

Clearly, with such limited interactions, just how these might affect overall populations would most certainly depend upon their local density of distribution. Indeed, the only circumstances in which they would, overall, be affected by these vary local and transitory forces would be when the density was very high.

Of course, for them to be present there at all, there would have to have been a situation in which they were produced in profusion (and in close proximity) in preference to anything else. Such a supposition would suggest a profusion of electron (negative and ordinary matter) and positrons (positive and anti matter), so we would have to speculate that there was a very early stage in the Universe, when this was the case – a kind of overall, neutral population – on the one hand, and perhaps mutual annihilations, on the other, when these elements actually collided. Such a phase would possibly be composed of Electrons, positrons, neutrinos and energy (the latter presumably embodied in the movements of the still extant particles).

NOTE: On further consideration, this idea of all supposedly free energy always being embodied in the energy of movement of matter, does modify some assumptions about totally free, disembodied Energy being possible, and thus eliminates entirely the Photon, replacing it with a neutrino carrying energy ONLY.

Einstein & Energy

I cannot abide totally disembodied energy!

So, how would I re-formulate Einstein's Famous Energy Matter Equation $E = MC^2$, or at least re-contextualise it? The original matter in a Nuclear Fission process would have to be seen as involving three actual matter components – **m1**, **m2** and **m3**! The first two of these would represent the matter of the major products of fission, while the third would have to be turned into associated energy as a result of the process.

But, with my insistence that all energy must be associated with material objects, that last component of the energy involved would have to be embodied in the material objects produced by the fission!

If there were just two, (to keep it simple for now) we should then have:-

$$m_3C^2 \text{ will give } m_1v_1^2/2 + m_2v_2^2/2$$

energy released K.E. of products

Clearly, with more products of the fission, there would simply more Kinetic Energy terms, though the inclusion of Photons of totally disembodied energy would not be allowed. In their place would be something like a positronium (or more likely a neutrino), which would have both matter and anti matter internal components, plus the base level energy necessary in their mutual orbits, and any extra energy if those orbits had also been promoted.

Finally, of course, such "material" entities could also have K.E. of their own if they moved "like a Photon"!

And, of course, when considering Fusion, we would, in the simplest case, be taking two nuclei **M1** and **M2**, which would fuse together and produce the result single particle **M3**, plus all sorts of other subsidiary products. But clearly $M1 + M2 > M3$, as some of the original matter becomes energy. Yet, once again with our principle of NO disembodied energy the consumed mass $M1 + M2 - M3$, will present itself in other scraps of matter, but crucially in the Kinetic Energy of all the resultant material products.

We know that ordinary matter with either positive or negative charges was certainly also have been produced, but those would be involved in another development route, leading to all the ordinary matter and Gravity-affected entities, which would clump and aggregate into many quite different things.

But, these stable joint particles, the neutrinos, would just seem to vanish! Their presence would be revealed indirectly by the propagation of electromagnetic energy (radiation), but their direct detection would be impossible!

Of course, such things have to have been localised initially into a Big Bang origin – ostensibly from the collapse of a whole prior Universe – indeed a collapse and explosion similar to, but completely dwarfing that of a Supernova. Such a collapse, using what we know about Supernovae as a guide, will produce the very smallest particles of matter and antimatter as at least the initial destructive result. And thereafter, it would be how they started to come together into bigger units – both temporary and stable. The positron-electron pairs uniting in mutual orbits would seem to be a particularly short-but-final process, while the other interactions of entities with still active properties, would take a very different and much longer trajectory of developments.

The absolutely crucial Red Shift displayed in the Light from distant Galaxies, may well have to be reconsidered! For, if there were a filling of Space, it would not only deliver that radiation, BUT also may well in some way "colour" it too.

Let us first consider a few possible scenarios.

CASE ONE: Let us here assume a situation involving very-close-together neutrinos. In this scenario, the passing on of quanta of electromagnetic energy would be almost exclusively down to the speed of transfer from one neutrino to a very closely-adjacent other such particle. The Speed of Light would be constant and due entirely to this cause alone.





CASE TWO: In this somewhat different scenario, the neutrinos would not be immediately adjacent to one another, and would actually have to move to encounter another such entity. In such a situation the transfer would include a second, much slower component – the actual movement of the carrying neutrino would continue until it was close enough to another to effect a transfer. Clearly, the overall Speed of Light would be lower.

CASE THREE: In this case the neutrinos would be either totally absent, or alternatively very widely spaced, and no significant propagation would not be possible. In this case it would only be the speed of movement of the carrying neutrino that would be the dominating contribution to the Speed of Light, and literally no coherent propagation would be discerned: it would deliver what seemed to be merely background noise, and from no particular direction.

Of course, between cases TWO & THREE, there could be a whole range of intermediate cases. And, with Light being propagated through such a succession of neutrino transfers, it would appear to accelerate as the density increased to finally arrive at the maximum Speed of Light, C !

Now, clearly, energy would be needed to actually physically move the neutrinos about. It would be minimal in a close packed paving, but would rise with the increasing distance between carriers. There would be an energy overhead in the less dense situations. Some of the energy being carried might be lost. Would this affect the carried energy, reducing it and thus shifting it towards the Red?

It might, therefore, deliver another reason for the famed Red Shift, and so scupper our usual supposition that these sources were moving away. This should be considered, and its effects worked out to give quite different conclusions on what Red Shift could really mean.

NOTE: Further work has been carried out in this area since the completion of this paper, and, yet another suggestion has been proposed. An issue of the journal dedicated to this area of research will be published in the near future.

For example, if the overall density of distribution of a neutrino paving of Space is mostly localised around where the Big Bang occurred, and had a boundary within which all elements of the paving were close enough to give a constant and maximal Speed of Light, namely C , but beyond that boundary the neutrinos would diminish in concentration – getting further and further apart.

Now, this would involve propagation by both the movement of the neutrinos, as well as the much higher speed transfers when close enough to another such carrier, and this movement would definitely require energy,

It could only get it from the carried energy, so that load would be reduced – it would affect the Red Shift?

Thus very distant Galaxies would be seen by light, which initially had been red shifted in proportion to how far beyond the full paving boundary they were. And the usual supposition that this could only be explained by their acceleration away from us would be incorrect.

If, however, the Neutrino paving of Space not only filled Space (The Cosmos), but also filled the inner spaces within substances, and even that within atoms, other phenomena might be differently explained. If Light is being propagated through a substance composed of molecules and their constituent atoms, as well as the neutrino paving everywhere else, then the transmission of Light would also be reduced in speed, as direct neutrino to neutrino transfers, would be slowed by the other objects “in the way” some movement of the neutrinos might be essential to effect such transfers, so these would again effectively reduce the “Speed of Light”.

NOTE: All the ideas in the latter part of this paper are under constant review and development, and the whole picture could well be totally transformed by the work of Yves Couder who has managed to produce “entities” entirely due to various oscillations involving both resonances and recursion. His work has been dealt with in a series of past and proposed future Special Issues of the SHAPE Journal.

The Contents of Empty Space

What delivers propagation and Action at a Distance?

Having finally abandoned Mathematics as providing the driving essences of all of Reality, it is clear that the purely form-based theories of modern physicists and cosmologists cannot adequately deliver ANY real explanations of the key questions still outstanding in Science.

For example, as these mathematical physicists “delve down” through their levels of Form towards their ideas of the Origins of the Universe, which is exceedingly difficult as such a route encounters many asymptotes and singularities along the way, they simply have to end up with the purest thing they can conceive of as being common to all things and all levels - - The Origin of Everything is put down to Pure Energy alone!

And from that “Idea”, they have then to explain the whole Evolution of Reality via Energy and Form only!

And, they must commence with the fabled “Creation of Matter” Of course, no true *materialist* physicist could possibly accept such a starting point. For such an approach is nonsense! It commences with totally disembodied Energy alone, which doesn’t, and indeed cannot, exist as such, so the trajectory that would be pursued would not only be pure speculation, but clearly also pure invention, if not situated totally in that World of Pure Form alone –termed Ideality. The materialist physicist would not address the Origin of Everything, but the more reasonable objective of the start of our corner of the Universe probably following a cataclysmic collapse – somewhat akin to those, which occur in Supernovae, but on a vastly larger scale.

Also, the resulting explosion, could also not be so “pure and uniform, for it would, from the outset, involve Matter, and it may well produce many of the smallest possible bits of the past Universe, but NEVER into just a couple of tidy fundamental entities. It would certainly be uneven and more diverse than that.

And, in arriving at the question from a very different set of today’s problems, such a beginning seems essential to deliver what we finally have now.

Let us be explicit! The search for essential pure driving Forms that alone produce everything that follows is simply an idealist standpoint. Instead of the old-fashioned “God”, we are now seeking the Absolute Purest Formal Essences of Everything. What utter nonsense!

Laws are not primary and produce everything. On the contrary, Reality, including Matter, is primary, and it is that which produces Laws.

That is a materialist scientist’s approach, and in the context of these papers the main problem being addressed is – “What is the Content and History of development of so-called Empty Space?” Without an acceptable answer to this question, most of our assumptions about such important things as The Propagation of Electromagnetic Energy and Action at a Distance become mere speculation.

Clearly, the supposition that Space is Empty does not make sense! It must contain something, for it both propagates electromagnetic radiation, and delivers action at a distance without any doubt at all. The question is “How?”

Rather than concentrating their energies upon the Origin of the Universe, they MUST address this question of the Nature of Empty Space as it is now! But, try as they might the physicists (with their usual idealist standpoint) have been unable to discover anything that occupies this Empty Space. They have, of course, analogistic models such as The Ether, which though rejected as a physically existing medium, STILL is the basis for James Clerk Maxwell’s Electromagnetic Theory, and his set of descriptive equations.

So NOW, totally disembodied “driving” Laws, don’t bother them – they work! And that is considered sufficient! But, to take such a pragmatic route AND with an idealistic stance, is most certainly NOT scientific! Sometimes, it can indeed deliver, but the real imperative of Science (as distinct from Technology) is, and always has been to Understand - not just predict.

To merely describe and effectively use is more accurately termed Technology, and not Science!

Now, starting from the attempt to define what must be the actual contents of Empty Space, as scientists, we can only work back from what that space actually delivers. The Key properties are, clearly, the propagation of energy and the proved action at a distance. Whatever is there must deliver these features: that certainly cannot occur without the presence of something, and the known speeds of communication involved are substantial, namely the Speed of Light, or C .

This fact seems to scupper the usual explanations, for literally nothing material can travel at such speeds, for just the energy consumed in the transportation would be colossal. Somehow these communications must be achieved without the movement of matter across the great distances involved.



So, how can these be addressed? Propagation has to be the Key! For to manage to do this, whatever is there, it must be able to handle electromagnetic energy as oscillations of a pair of vectors, in something: the question is, “What?”

We can start with a brilliant and proved model, which can indeed do precisely this. It is, of course, The Atom!

At its simplest this involves a positively-charged nucleus (a proton), with a single negatively-charged electron orbiting around it. This stable entity, the Hydrogen atom, can absorb energy, which promotes its orbiting electron to a higher energy level, and it can also release it, when the electron moves back down to the lower level again.

But, two things stop the atom doing the job.

First, such entities aren’t there in empty Space, and to have them as moving carriers would demand much too much energy to do it. So, though the Atom suggests an appropriate model, the actual carriers must NOT actually move, if they are in any way similar entities to that!

So, what instead could they be, and how would these processes work?

Indeed, whatever we have looked for in that Empty Space, we have failed to find anything appropriate even if, as seems likely, they will NOT actually have to move!

Nevertheless, our objective has become a great deal clearer. We must look for something, which involves the “pattern of the atom”, but it would have to be another entity, which we cannot detect! Now, first of all, is this feasible? And, secondly, what kind of mechanism could transmit electromagnetic disturbances, without the carriers having to move? What could make such an entity INVISIBLE?

The cancelling out of electrical charge is already achieved in the atom, but what about the matter, which also must be involved? Can the matter involved be cancelled out in a similar way?

Now, even our mathematical physicists admit that apart from ordinary matter, there is something called anti matter. Now, though this means that equal and opposite entities, identical in size, but opposite in both charge and matter type, do indeed exist, they are supposed to mutually annihilate one another when they collide! BUT, what if they mutually orbit one another?

With this additional feature, we may have theoretically defined our sought-for candidate entity. For, these would be invisible by all the usual means of detection, but would have similar properties to the atom. They could absorb energy by the promotion of the orbits, and release it by their subsequent demotion. The always-puzzling transfer from energy held in the electron orbit of an atom, to becoming

a disembodied “gobbet” of pure electromagnetic energy - a Quantum, may be addressed in a different way, which works!

With this new particle, the transfers would be from one example of the model, directly to another example of the very same model. It fits like a glove! Could they be the answer, and could the necessary processes work to deliver propagation?

Oh, and I should have mentioned it – just such a particle involving one electron and one positron ACTUALLY EXISTS! It was found by researchers working on the Tevatron Accelerator at Fermilab, and there named the positronium! But, it was, in those circumstances, extremely unstable, and dissociated immediately it was formed. But, that was in a very high-energy situation in an Accelerator! What about in Empty Space?

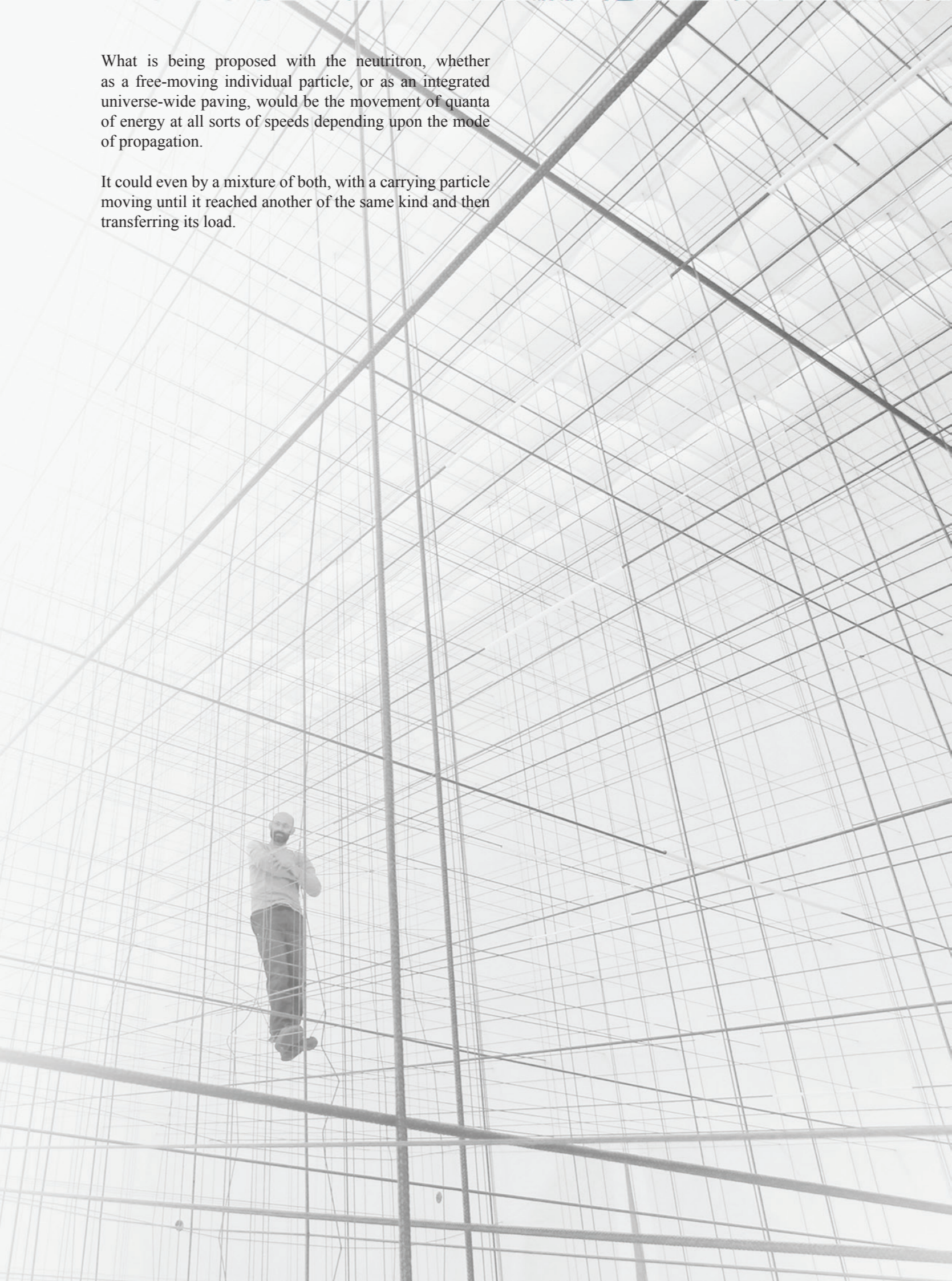
But clearly, the mere suggestion of such a particle would be insufficient to explain the propagation of electromagnetic energy over truly colossal distances, especially as we have established that such particles would have to be stationary. This immediately means that the analogistic model, termed the Photon, could not just become a neutrutron. For the Photo is conceived of as a moving carrier of energy. So, with our candidate, rather than a moving carrier, we would have to consider a stationary substrate, or 3D paving of colossal numbers of these particles. The carriers wouldn’t move, but their contents would!

Propagation would be by the transfer of energy from one element of the paving to an adjacent one. The elements would NOT move, but could deliver gobbits of e.m. energy bucket-brigade fashion. This might well solve the general problem of propagation, at least, in a better analogistic model. In addition in different circumstances the carriers might well be able to move, and effectively “be” Photons! They would also, in very high-energy situations, dissociate to produce a Pair of one electron and one positron. [I believe that it is called Pair Production] And, in other circumstances with a lower ambient energy, free electrons and positrons could mutually capture one another to deliver a neutrutron. [Pair Annihilation]

And such properties could be sought-for to confirm or deny these ideas. The free moving “Photon-like” neutrutrons could still carry quanta of e.m. energy, but they could never travel at the speed of Light, while the propagation via a close-packed substrate could do so, for in those circumstances the speed would actually be the speed of transfer from one element to the next, and there is no reason why this speed could not be achieved – NO movement of Mass would be involved.

What is being proposed with the neutrutron, whether as a free-moving individual particle, or as an integrated universe-wide paving, would be the movement of quanta of energy at all sorts of speeds depending upon the mode of propagation.

It could even be by a mixture of both, with a carrying particle moving until it reached another of the same kind and then transferring its load.



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