



**WHAT ARE EMPTY PHOTONS?
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What are Empty Photons?

Special Issue 6

1. Empty Photons: A New Concept
2. Contending Concepts & Transcendent Resolutions
3. The Significance of Empty Photons
4. Emergences and their Created Levels of Reality
5. Interacting Photons
6. Photon Directions
7. The Nature of the Photon
8. Oscillation as a Property of Stable Balanced Systems
9. Could it be a Neutriron?
10. Other Papers on Empty Photons

Empty Photons: *A New Concept!*

A whole nexus of imponderables seem to have been, to some extent at least, solved by the inclusion of so-called Empty Photons into a series of new theories. And, as with all new ideas, they will have to prove their worth by replacing older theories with something demonstrably better.

The question in Science is never about **Absolute Truth**, but always about the measure of **Objective Content** in a theory. If the Objective Content is increased noticeably, then a new theory should replace its predecessor. Now, such a process for Empty Photons is by no means complete, and they may ultimately display damning inadequacies, and be abandoned for something better. But, rather than the common reaction to such ideas, which is invariably to condemn them out of hand, we, as scientists, must be more disinterested, and give the idea some thought.

To this end, this **SHAPE Special** has been compiled.

It is, of course, an arrived-at position of the author, and hence not a comprehensive account of all possible opinions as to the validity of their postulated existence. But, it will, hopefully, give a more comprehensive account of the positive arguments for these entities, and the many processes, in which they are conceived to be involved.

Clearly, the most useful result of delivering this account will be the generation of both supporting and contrary positions, which **SHAPE Journal** will gladly publish, either as papers on the Journal itself, or as short articles on the associated **SHAPE Blog** site. We look forward to your comments and your criticisms.

Most of the uses of Empty Photons are already available in prior Papers and Special Issues of the Journal.

Jim Schofield June 2011

(286 words)

Contending Concepts & Transcendent Resolutions

The Demise & Replacement of the current ideas in Sub Atomic Physics

With the introduction of the idea of the whole of Space “paved” with Empty Photons, each and every one of which has the necessary E-M properties to be induced into oscillation by any incoming E-M disturbance, and which can subsequently be similarly passed on from one Empty Photon to another, the philosophical assumptions of the Copenhagen School and their consequences become increasingly unnecessary and are indeed unsound.

Instead of entities having **both particle and wave** characteristics, which are said to be selected out by the actions of different kinds of measurements, we actually have **particles**, and quite **separately waves**, which occur in the Empty Photon pavings of Space itself. And it was also asserted that the **position** or **momentum** of their **combined** entities could **only** be determined by use of the appropriate “**wave equations**”, which could **only** give **probabilities** and **never** certainties for these important properties.

Such surprising “Rules”, **radically** transformed the situation **away from** what had always been the basic standpoint of Science.

Now, the supporters of the “new” approach always insist that it is a great step forwards, away from hopeful self-kid, towards the real nature of Reality which is based upon random chance rather than strict Laplacian determinism, though laced throughout with the **primal essence** of equations.

But let us clearly indicate the proposed alternative.

1. Waves of E-M disturbances are NOT propagated by moving particle-like photons, or by the prior assumption of “waves of nothing”, but by sequences of E-M inductances via static Empty Photons, which effectively “pave” Space everywhere.
2. In addition this necessary ground can also be affected by the passage of charged particles, such as electrons, by the imposing of consequent (indeed unavoidable) E-M disturbances in those Empty Photons.
3. The Single Slit and Double Slit experiments demonstrate how differing phenomena occur depending on how different circumstances affect those E-M disturbances as they come across various kinds of obstructions in their paths.
4. Clearly with a **Single Slit** NO interference of these induced waves can possibly happen, and hence NO reciprocal effect on the moving electrons will be involved.
5. But, in the case of the **Double Slit** the passage of the E-M disturbances through BOTH apertures will result in them interfering on the other side, and the resultant pattern will indeed affect the following stream of electrons, and divert some (but not others) to produce exactly the correct pattern on the final detection screen.

But, we should not be surprised at this radical switchover in Theory.

Throughout the History of Science, situations invariably occur in which two conceptions (models) come into direct and seemingly irresolvable conflict. The ideas can be quite reasonable models each developed in their own appropriate circumstances, and are usually more than adequate there, but they can, and often do, **fail** when BOTH seem to be appropriate and yet are clearly **mutually exclusive**. NO integration appears remotely possible!

The reasons for such impasses are always the same.

Our assumptions can work to produce models for fairly straightforward cases, and even allow reasonably accurate predictions to be both made and used, but these can also lead into many cul de sacs, where our assumptions are inadequate to the given situation. Generally, if the offending assumptions are replaced by more appropriate alternatives, then the failures can often be overcome, and Science marches on.



But, here, in the most critical situations, our assumptions mislead us into a place, from which a switch to another assumption cannot extricate us.

The alternatives also don't work too!

We have painted ourselves into a corner, because we can't simply get around it by switching to another of our capacious bag of alternate Forms. The resort to the much older discipline of Mathematics has finally run out of appropriate forms.

The crisis turns out to be much more fundamental, and the Set of assumptions involved, which are the cause of the seemingly permanent dead end, are clearly much more fundamental and basic.

The changes in assumptions that will be necessary to solve the situation will be profoundly significant, yet unavoidable if we are to proceed.

In these cases our usual step-up to a better set of conceptions with more *objective content* is not at all immediately evident.

Now, such crises will occur when our most unassailable assumptions are the ones causing the problems: when basic ideas that have provided the philosophical ground for centuries, if not millennia are **the problem**.

The trajectory of Mankind's slow ascent towards some profound understanding of the World can be no other. We do NOT ascend direct ladders to Absolute Truth, but always build passable, and indeed useable, falsities, which contain enough *objective content* to lead us forwards. And every fruitful current route along this required road will always be inadequate for the full journey. And the bigger the impasses encountered, the more profound and well buried, and certainly hard to unearth, will be our incorrect assumptions.

Here it is the two **banker** assumptions **Plurality** and **Reductionism** that turn out to be wrong. But, to put it that way is both too abstract and much too judgemental!

These are NOT total myths.

In stable situations, particularly when that stability has been specially constructed and maintained, these assumptions have proved their worth millions of times.

But, they turn out to be applicable ONLY within a given, stable Level of Reality (remember the insisted upon advice, "Wait for equilibrium before measuring!"). But when we attempt to traverse the evident gaps between such Levels they always and inevitably fail. They are NOT *about* such significant Qualitative Transformations at all!

For example, in attempting to explain Life in terms of only non-living entities and processes we invariably fail (and will continue to do so with our present assumptions).

Likewise, the incessant attempts to explain Consciousness in terms of the complexes of neurons are also bound to be entirely unsuccessful.

It is not that there is no route through from one Level to the next. There obviously has been, for they actually happened!

But, our methods, assumptions and even most of our concepts are totally inadequate to deal with these world-shattering Revolutions.

Yet, such Events as these, termed **Emergences** *can* be studied, and something learned from them. To start with we can take some very everyday occurrences that involve "emergence-like" qualitative changes in the area, which used to be called Changes of State, but is now more usually referred to as Phase Changes.

These are, of course, the transformations from Solid-to-Liquid, and Liquid-to-Gas. These are NOT Emergences, but they are certainly related to them, though of much lesser import.

For it is in such general States that though we cannot explain phenomena directly in terms of individual contributing events, we can deal with the actual changes *overall*.

Mathematically it is done with statistics and probabilities, but much more importantly, the ONLY *explanations* for these transitions involved much more physical and qualitative accounts about how the individual participants (the atoms) move from one relatively stable mode, into another, with qualitatively different properties.

Indeed, alongside most of our pluralistically based equations there is invariably a necessary *holistic narrative*, which makes sense of it.

In all these accounts are the things we are looking to reveal and develop into overt new assumptions.

They will be the assumptions of true Qualitative Change!

Now, it has to be made absolutely clear, that the statistical and probabilistic methods involved in the various equations derived do NOT (as is often claimed) reveal a basic **random nature** of Reality, but merely reveal situations in which a higher level Form is much easier to find than could be achieved by adding together millions of individual events none of which we can actually observe, and which could **never** theoretically deliver the new overall properties anyway.

We bypass that route by experiments, which deliver the higher-level properties **directly**.

Our holistic explanations can deliver meaningful causes and results but NOT via the usual methods involving equations.

Even many of our dearest and measureable "properties" don't mean anything when applied to the *single* contributing entities, which deliver them *en masse*.

Pressure is not a property of a single gas molecule, but only of all of these entities acting together in confined spaces.

And **Volume** gets us into major difficulties when considering an individual contributing atom, as they seem to be mostly composed of space themselves. Volume is therefore yet another mass property.

The claimed Advanced Philosophy of the Copenhagen School's Interpretation of Quantum Theory is in fact **no such thing**.

It is, indeed, a huge step backwards, for it not only turns statistics and probabilities into something which they are certainly not, but it also abandons the *materialist* position of Science, for a purely *idealist* alternative. To dump **Explanation** for *mere* Equations alone constitutes this major backwards step. For if it is equations, which are the true Essence of all natural phenomena, then we have an abstract (formal) and wholly disembodied relation, which is supposed, all by itself, to *drive* everything in concrete Reality.

What is that but a return to **Idealism**, where the Thought precedes the Object: the Word precedes Reality itself, and we deal only with idealised essences as actual "reasons" instead of finding concrete, physical causes in real entities and their properties.

Now, the successes of the idea of **Empty Photons** in explaining the **Double Slit Experiment** must be extended into the entire *key establishing areas*, which were the bases of the decided switch to the interpretations of the Copenhagen School of Quantum Theory. Not, as may be thought, as a correct alternative, but as a significant philosophical retreat, which is the true content of the so called "revolution" of the Copenhagen School.

And these seem to be

1. **The Ultra Violet Catastrophe!**
2. **The Photo Electric Effect**
3. **Compton Scattering** of Light by Electrons
4. **The Double Slit Experiments.**
5. **Pair Creation & Annihilation** involving Energetic Photons.

And already a rough idea of how to do this has been devised and exists in another paper.

But, of course, each and every extension to address these areas in turn will only be the first step, and may not at this juncture be convincing in all cases.

Each of the above areas will undoubtedly generate its own problems; the application of the idea of **Empty Photons** is highly unlikely to be sufficient by itself.

But, even in these first moves, the way forwards is beginning to look decidedly more fruitful than that offered by the methods and conceptions of the Copenhagen School.

Of course, if all these areas are only subjected to our current assumptions and methodologies, the gains will still only be small if any.

What has to be addressed is the Total Demise of both the assumptions of

Plurality - (*the Whole and its defining Parts*) and

Reductionism - (*the Total Continuity of Cause both within and indeed between all Levels.*)

And, also, of course, their **replacement** by new and better holistic alternatives.

The **Classical Holism** of the Buddha, though much more true of a developing Reality than Plurality, is not, as it presently stands, sufficient to replace the well-tried and (even better) well-used methods based upon these two banker assumptions of Science to date.

The philosophical Holism of the Buddha must be further developed to become **Holistic Science**, including a whole new and effective methodology and corresponding techniques for the necessary new forms of experimentation.

This is not, however, to be created entirely from scratch.

Holism has always been important even in classical Science, for its narratives of **causal explanation**, which were always much broader and more profound than the individual equations of **Pluralist Science**.

We do know where to start!

Darwin's Natural Selection and **Wegener's Plate Tectonics** are holistic theories, and the crucial area of the most important studies will have to be into Emergences, such as that which brought about the Origin of Life on Earth.

NOTE: Now, clearly no one will be satisfied with mere "plans for future developments", and quite right too. And this author has in fact been studying Emergences for many decades, and published many papers on the topic, including *The Theory of Emergences* published as a Special issue of the SHAPE Journal. Clearly, we cannot include everything everywhere. JS.

(2,052 words)

THE SIGNIFICANCE OF EMPTY PHOTONS

The Significance of Empty Photons *And their Role in the Necessary Defeat of the Copenhagen Interpretation*

At this point in my increasing reliance upon the conception of Empty Photons, it seems absolutely necessary to bring all the various applications of these proposed entities together into an extensive definition of what these “so far *placeholder*” entities might actually be, and to weigh the various arguments both for and against their existence, by bringing all the various suggested roles for them together, so as to reveal inconsistencies or maybe deepen the definition to include all applied occurrences.

Now this cannot become any sort of sectional interest supporting this author’s own invention against all alternatives. Indeed, any such formulations as this are clearly **never** the Whole Truth. They can though be an attempt to maximise the **Objective Content** in our models to bring them as close as is **currently** possible to the real situation.

For that is always legitimate, because it is not only the only way we have to solidify a whole variety of cases into some sort of coherent and indeed comprehensive overall Theory, but it also allows that achievement to be criticised via specially designed testing experiments, as well as by other sources of new evidence.

Indeed, the true scientist is proud of his **Disinterestedness**, which demands absolutely NO sectional interest for personal status, but only the honest struggling for Truth. In fact, such an objective would never be possible without speculative hypotheses based on what is already known, and attempting to understand that core of Knowledge. It is only in the sound disproving of such ideas that real progress proceeds.

The uncovering of new and damning evidence against a current Theory is always **pure gold** to the real scientist, for it delivers new and constructive evidence that will allow progress to be made.

And in addition to this basic imperative, there is another more pernicious factor to be addressed. Physical Science in the last 100 years has suffered a major retrenchment!

At first the clear failures of prior theories, such as those concerning Black Body Radiation, had brought about the **Ultra Violet Catastrophe**, and **Planck**’s revolutionary suggestions as to the necessary presence of **Quanta**, where energy seemed to come in **descrete gobbits**, rather than as an infinite continuity of quantities. But, this time, the physicists found themselves ill equipped to solve the increasing number of problems precipitated by this new conception. Instead of allowing a greater coherence and comprehensiveness to the phenomena involved, the mixture of the new concepts AND the old assumptions and methodologies proved wholly inadequate to the task.

It just couldn’t be done! The multiple contradictions seemed so profound and unanswerable, that there was an increasingly general conclusion that human beings were congenitally ill equipped to conceptually grasp this level of Reality.

In spite of Darwin and his breaching of the old assumptions and methodology in his area, with his new conceptions on the Origin of Species, that was “just” Biology, and not considered relevant to the Primary Science of Physics.

For many centuries, no means of dealing with Qualitative Change had been necessary in Physics and hence none were available. Also physicists believed that all other Sciences depended entirely on the most basic of all the Science – Physics, which had to be totally deterministic right down to fundamental particles and basic and eternal Laws. It was the final link in the universal causal chain. Indeed, questions involving the creation of entirely new possibilities (such as Life itself, for example) were unanswerable by physicists. Their belief in Mathematics and Formal Logic and their version of totally continuous causality embodied in the principle of **Reductionism**, totally prevented them from addressing the conundrums rapidly propagating the Sub-Atomic realm. So, instead of the usual historical solution involving a complete revision in the assumptions involved, an initially small group around **Bohr** and **Heisenberg** suggested that all theory was invention, and the only reliable products of Physical Science were **Equations**. They insisted upon a new idealist philosophical standpoint for

Physics, which jettisoned what had always, in the past, been called **Theory**, for a new definition, which linked extracted equations **directly** to Natural Law. The World was conceived of as being determined by underlying Laws, which though they formed a dependant hierarchy, were at base soundly grounded upon fundamental particles obeying eternal Laws. But, that would NOT be Science!

To insist that Reality was determined solely by disembodied and indeed abstract relations (even if you called them Laws) was clearly a retrenchment to an older, idealist position, whereas it had always since its modern form was settled upon been a totally materialist view of Reality.

So, thereafter, Physics began the dive into terminal decline, though you might be excused for not noticing. The pragmatic principles based upon Prediction via Equations within highly constrained Domains may have led to this termination of Understanding and Explanatory Theory, but it had **not** affected Technology, which didn’t care “Why?”, and insisted that the only worthwhile question was “How?”

So, in order to retrieve the situation in Physics and debunk the so-called Copenhagen **Interpretation of Quantum Theory**, which was the basis for the general retreat, the task had to be to address Qualitative Change: to not only study relations within Stability as in the past, but for the first time in Physics to also address the dramatic revolutionary transformations, which had become known as **Emergences**, and which in the Modern Day were even becoming crucial in the most mechanist of the major Science – Physics. Itself.

[For those who disagree with this let them take a look at Modern Cosmology, which though bound head and foot with idealist Physics, still cannot escape from the Fact of the actual **Evolution** of the Universe, and the certain occurrences of many crucial Emergences, at which never-before-in-existence entities and relations of all kinds inescapably came-into-being to bring us to its present state.]

For the first time in its History Physics has had to consider Development and Creation, and not only stable mechanistically treatable areas.

In Sub-Atomic Physics these old-school scientists were trying to span just such an Emergence with their purely formal equations. It meant that the usual predictive forms of equation and even theory couldn’t deliver many particular events. Instead they increasingly depended more and more upon Statistics and Probabilities. It was no longer the old kind of prediction for it could never deliver individual concrete predictions, but **only** probabilities over many, many cases. Only overall patterns could be found and never individual trajectories of the assumed components. It could be used to get results, but it was more like a blind man following a tape, than anything approaching a seen-and-understood causality. They now don’t explain anything, because they no longer have any explanations, and, of course, such a position always was, and still is, untenable as Real Science. So, they did what used to be the case, before the advent of Science, when the truth was unobtainable because of our then wholly inadequate methodology: they began to **speculate**.

And as they couldn’t trust the usual “old-fashioned” methodology, they looked FIRST not at Reality for solutions, but only at disembodied Form – The **Equations**.

Like Einstein had done in addressing Gravity, they believed that Form was in fact **Primary**, and could explain everything.

The modern sub-atomic physicist therefore studies his **equations**, and finding certain recurring sub forms, he “concretises” them into “new entities” with indescribable “properties”.

“What else could we do, it is beyond our ability to conceptualise!”, he might well insist).

Yet, the task for today’s real scientists is NOT to merely return to the inadequate theories of the pre-Copenhagen methods and assumptions, but to revolutionise Physics, root and branch, by attempting to develop a **holistic** (rather than the pluralist) standpoint and develop new methods that are based upon a study and understanding of Emergences, and the creation of the wholly **new**!

As a contribution to that crucial task, this author proffers the following ideas of **Empty Photons as a start**, but has also already published **The Theory of Emergences** in the **SHAPE Journal** (online) as a contribution to the New Science.

(1,355 words)

Emergences and their Creative Levels of Reality (as they began to affect Physics)

Though such concepts as the existence of Empty Photons may seem to be mere add-ons to prior theories, that is **not** how they came to be considered. They arose out of the conundrums of the **Double Slit Experiment**, which the Copenhagen School consider to be a main plank of their major revision of the philosophy and methodology of Physics in the Sub-Atomic realm.

Indeed, these new entities were by no means sufficient to *alone* initiate the necessary revolution required to overturn this now universally subscribed to consensus. But they did open up a crack in that supposedly untouchable edifice, and once they were conceived of and began to actually *explain* many other related phenomena, the whole basis of the Copenhagen approach could be attacked. For, correct or not, these were *physical* attempts to solve the impasses, while the restrictions imposed by the Copenhagen approach were not only philosophical, but idealist to boot.

Let us begin by tracing the origins in some of the oldest contradictions know to Man.

Let us consider a very different aspect of the **Continuity/Discreteness Dichotomy**.

We have, with justice, looked at this conundrum in the past from the point of view of how we conceive of both entities and phenomena, and hence how we attempt to deal with them. We analyse them with assumptions that they are entirely continuous at base, or alternatively ultimately composed of discrete components.

To criticise these dichotomies therefore becomes a critique of conceptions and models, and the break down of such “ideas” began to undermine our methods and suggest that as we could use both alternatives at different times for the very same contents, so that **both** must therefore be obviously wrong – mere artificial constructs of our own making as observers, and “something other” must actually constitute the *really existing* truth.

Or alternatively, as has been the case in Sub-Atomic Physics, we could decide to abandon Explanatory Science completely, and instead limit our studies to well defined and maintained **Domains** and their reliable and extractable **Equations** as the ONLY real content – the increasingly common *pragmatic* retreat!

Yet, could it be that though we do indeed attempt to use models derived successfully in one area in other similar situations, so are we likely to, sometimes, be either “shoe-horning” to some extent, or we might also be reflecting a real ambiguity in Reality itself?

By this I obviously do not mean that Reality arbitrarily changes its nature, and forces us to switch to relevant models when it does. That would indeed be ridiculous!

But, I do mean that Reality may well function at different Levels, with very different results, and if this is so, what determines each relevant Level? That is crucial!

For example, when studying a Living Entity, we can find Laws, which exist only at that Level - that of the contents of the Lifeform itself. If we were to delve deeper, we would find laws, which occur everywhere – even outside of Life – Chemical Laws for example!

And even deeper studies would certainly bring us down to what we term Physical Laws - which again are universal!

Now, there could be, and often is, a grave mistake with respect to these Levels and their regimes. We cannot but conceive of them as *directly determined* by the Levels below.

We consider that we will explain Life in terms of Chemistry, and Chemistry in terms of Physics. We expect a **Continuity of Cause** throughout, and this leads us to many conceptual, and therefore also explanatory, problems.

We can, in the modern era, even give these assumptions some quite sophisticated ground, for we can indeed argue the case for temporal precedence in this hierarchy. We can certainly conceive of a time when NO Life existed anywhere on Earth, and hence it must have emerged in a World where Chemical substances and their inter-reactions already existed and simply MUST have been the necessary components involved when Life did finally appear.

Similarly, we can conceive of an Early Cosmos, where even the vast majority of chemical elements had not yet formed, and MUST have been created “out of” lower, purely physical components. Indeed, how else could we explain this very modern (and current) conception of the **Evolution of Matter**?

But, we did, and still do, reduce this development into something that it most certainly isn't! We see all these stages as linked by a continuous chain of causes, and hence work to reveal those causes, and thus explain things as part of one continuous (that is uninterrupted) system.

And as a crucial part of this we invariably assume **Plurality**, which is the idea that every **Whole** is composed of, and determined by, its component **Parts**. And thereafter that each and every one of these component Parts can themselves be similarly analysed. We expect that this delivers a continuous series of causes (we call it **Reductionism**), which will be the case throughout Reality, and throughout its History and Development.

And, conversely, we also expect that as these causal chains are exposed, we will be increasingly able to *use* them to replicate the natural processes that occur throughout Reality: and we will then be equipped to do these things *to order*, with our own objectives in mind.

And such is not a total myth.

Within limits (that is inside constructed and maintained Domains) it is certainly possible, and the whole of human devised Technology is based upon this assumption.

“It must be correct, because we built our World using it!” is the usual argument. Or more prosaically we have, *“It works, so it must be right!”* – the credo of Pragmatism!

But, our assumptions in this regard are our modern secular equivalent of the God-of-the-Gaps position of the religionists, in that we expose individual, reductionist sequences, and in the many clear Gaps in between we assume that the very same regime persists continuously there as well.

The truth is that it doesn't!

Reductionism is clearly local, and is always terminated by important boundaries, which are certainly not crossable in this direct way. For example, we cannot explain **Life** solely in terms of the chemistry from which it appears to be composed. Neither can we reduce all of Chemistry to purely physical precursor laws.

Such straight-through determinism across these Levels of Reality is never possible! It simply is not valid in those different circumstances.

But, this leaves us (using our standard and presumed to be universal assumptions) in NO position to *explain* these crucial transitions in any way.

They simply cannot deliver, because The Emergences that occurred *between* these Levels constitute major breaks. They are, in effect Revolutions and are not continuous either backwards or forwards with the situations outside a Level. Indeed, conundrums of Level abound, and if we are to transcend these impasses with something approaching the true transforming and multi-Phased Events which deliver these new Levels, we will never do it our strictly, Laplacian, determinist and continuous bottom-up version of causality. For it is clearly inadequate to the task!

The main problem is that Reality is no complex jigsaw puzzle, built entirely out of elementary pieces (Plurality). The trouble with such a conception is that all that can ever be achieved is **Complication**, which is the inversion of the pluralist standpoint of everything being “analysable into Parts”.

It does not effectively address Systems!

Now, we may think of Systems as mere complication, but that is never true. A real System is not dependent upon only separable contributing components: it invariably *changes them* into something different to how they are when existing independently.

And that is not all; a System also often transforms its own forming context too. Causality becomes not only bottom-up, but also top-down, and even side-to-side.

And, in such, both entirely new entities and new relations with new properties can appear.

Now long before we leave a Level and consider an **Emergence**, we already have Systems within each and every such stable Level. Indeed, the existence of such things totally topples Plurality as an adequate assumption for Reality, and replaces that limited idea with its opposite one of **Holism**. And as soon as we leave the cosy accessibility of constructed Domains and enter Reality-as-is, it is clearly not pluralistic but holistic in nature. Everything affects everything else, and not merely as components. Even if the original components that made the First-Ever Life were seen as outside of Life, they were immediately *changed* within that forming Emergence into something different right away. They will be Part of new living systems, and will perform in new ways that could rarely have existed before Life, and would never have persisted, which is what occurs in the new realm. Thus they will now have evident new properties and be involved in new processes that they were not part of before the transformation. Their integration into the forms of the new persisting Life Level will have *changed them profoundly*. The old entity can do many new things within its new determining realm.

Now, such considerations can be seen as fodder for philosophers, who will weave ever more imaginative logical patterns out of these multiple areas of Reality. But though they may be primarily exercising their intellect, the fact remains that the task is necessary.

If systems deliver more than their components, we have to understand why. We have to explain why such systems actually come-to-be, and most important of all, why they persist.

We have to replace a basically mechanist approach using only complication, with a developmental approach which involve **Evolution**.

Life is not just complicated Matter!

Now all the above considerations were necessary, for without them we would merely continue to bang up against the same impasses and dichotomies, getting nowhere, and, like the sub-atomic physicists, give up and settle for Pragmatism, Post Modernism and Mathematics instead of the Evolving Reality-as-it-actually-is.

Therefore, let us take a particular area to throw light upon the significance of the ideas outlined so far. Let us consider molecules in a liquid and waves propagated in such a medium.

Two seemingly contradictory views of the movements of the molecules of water become immediately evident.

First, we consider the movement of waves across the surface of the water and find that it does not involve the molecules also travelling along with the waves. Instead they stay approximately in the same place where they pick up the wave as an up and down movement, but then via the elasticity of the water, based on the attractions between molecules, this allows it to be immediately passed on to the next and following molecules in the direction of the wave motion.

It is the disturbance up and down, that moves *with* the waves and **not** the individual molecules.

Now, from another point of view we see that liquids are special in that their individual molecules, though kept within the liquid by inter-molecular attractions, nevertheless can move about relatively freely. Indeed, given time molecules can move quite considerable distances in a continuous body of water. So, in these movements, the molecules are thus in constant and random movement produced by thermal agitation and multiple collisions.

The question is, “How can we integrate these two seemingly contrary ideas of molecular movements in a liquid?” For they do not, at first consideration, seem entirely compatible. One, concerned with the propagation of waves considers only localised up and down movements, which via inter-molecular attractions communicates those movements elastically, without any translational movement in the direction of the wave. While the other, we have the relative freedom and considerable random movements of all molecules in all directions within the body of the liquid.

How can we integrate the two, for they seem to be somewhat contradictory?

The answer seems to be that they are indeed both true, but that they happen on different scales and at different tempos, and because of this the two kinds of movement can be *relatively independent* of one another. We can conceive of the co-ordinated wave motions happening to many molecules simultaneously, so whole volumes of the liquid are involved, while down at the single molecule level we have much smaller scale random movements happening **within** the wave directed volumes. Clearly, such modal differences mean that they do not majorly modify one another.

Now because of this, though in Reality they are both happening simultaneously, we can **model** them *separately* and *differently*, and get useable results when we do.

Now this principle of Relative independence of simultaneous processes will turn out not only to be very common, but certainly has allowed Mankind to separate out, conceptually and via models, simultaneously occurring processes in all sorts of situations.

Indeed, very similar arguments can be applied to Sound Waves in air, and a consideration of the different kinds of movement for quite different reasons that occur there too.

Indeed, the more you think about such things, you realise that even more simultaneous processes can be occurring with the same relative independence.

For in the Atmosphere we don't only have molecular (Brownian) motions, and Sound Wave propagations, but indeed the massive movement of vast blocks of air in what we call Winds. Though, of course a larger element of interference can be carried over from one process to another. The effect of wind of the carrying of Sound is very well known.

Now, a rather more significant transfer of these considerations could also be applied to the idea of Empty Photons as the units, which together allow the propagation of E-M waves through all conceived-of Empty Space.

So, let us consider Empty Photons in the light of the discussion on molecules in liquids and the relative independence of several of their simultaneous motions.

Indeed, the propagation of E-M radiation by induction, and the seemingly "stationary" nature of the individual Empty Photons in these circumstances seem to "stop" these entities from actually moving about. For they must deliver a close-knit unity of elements for the inductions to take place and thus deliver the propagation. But from recent considerations it does seem possible that this restriction will not be necessary, as long as both the propagation and any Empty Photon movements allow the relative independence of these two forms of movement – that is that the propagation of E-M oscillations passing from Photon to Photon can proceed simultaneously with a certain form of individual movements of the units. So, as with our earlier diversion into the roles of water molecules both in the propagation of surface waves AND of incessant random movements, the relative independence found there might also be applicable to Empty Photons too.

So, if true, we will be able to say that though the Empty Photons do not have to move to *deliver* the propagation of E-M radiation, this does not prohibit their actual movements as long as they are so different in scale and tempo that they (as with water molecules) can also have the property of relative independence of these two phenomena. It seems likely that even with incessant random movement of the Empty Photons and even incessant collisions, this is quite likely to be the case.

Now, as with the water molecules, any "overall" (and in the long run) considerable movements of individual Photons, they will not affect the wave propagation in normal circumstances, though these may indeed deliver other phenomena, or indeed, themselves be affected by other phenomena.

The area recently suggested by Michael Schofield was in the supposed gravitational distortion of Space itself, which is said to have the effect of bending light propagation near immensely massive objects.

Now, this is perplexing as Gravity and E-M radiation are not supposed to be related, and the classical idea of Gravity bending light would never be allowed. But Einstein makes the curvature of the fabric of *Space itself* the cause for this bending of Light: it merely takes the shortest distance between two points – normally a "straight line", but here a curve, and it is this which is bent and NOT the E-M radiation. But then you have to ask, "What is it in the fabric of Space, which can be so affected by the proximity of Mass?"

Clearly, if the idea of Empty Photons is true, it could be *these* that are affected.

Michael Schofield's suggestion was that this could be seen in terms of overall effects on the "paving" (or indeed the "sea") of Empty Photons, so that a general movement of all Photons in a given direction would even impart this same deviation onto the Light propagation itself.

Now, we must be clear, it still doesn't explain everything, but then neither does Einstein's purely formal idea. He says that Space itself is distorted, and he can model it mathematically, but the question still hangs there **unanswered**, "How does this occur?" It still requires a physical explanation. For Einstein "explains" a physical result with a formal effect, can you do that?

Now, when we attempt to make it physical by bringing in the Empty Photons, we do return to a physical rather than a purely formal reason, but we have to answer the question, "What and how does some force influence the Empty Photons?"

Indeed, it implies that Empty Photons must have some **vestigial Mass** to be affected by Gravity, but we are still not there yet!

So, let us consider this possible aspect of Empty Photons.

Empty Gravitons?

Now, there is always a major problem with the concept of Empty Photons – for they seem, at first glance, to be "**particles of nothing**". They, when full, can hold E-M oscillations, but when they have been transferred away via induction, we have to ask what is left behind? We conceive of an Empty Photon as some kind of receptacle, yet possessing (in some way) full E-M capabilities, but either such a conception is either a misnomer for empty Space, OR it **is** "something" physical, and hence must have some internal structure in order to accommodate an E-M oscillation.

For, if we use the usual standard models of oscillations, we always look for a **balance between contentions**, which when it is not agitated into an oscillation, is in a so-called "rest state" (a balanced, stable state), which displays NO evident oscillations at all – indeed it has **zero** detectable features. But, when energy is applied, the balance becomes an oscillation about zero – NOT, it must be emphasized, a physical movement type of oscillation, but an oscillation of linked electrostatic and magnetic properties related in a very particular way. Now, it is usually totally inconceivable *physically* for such to be the case without some internal, physical structures to accommodate such behaviour. Though, at the same time, it must be mentioned that such is quite conceivable *formally* – it can be encapsulated with an equation! And, of course, those who make the formal representation the "essence" of a phenomenon believe that they have explained such a situation, as soon as they can deliver an equation.

But as scientists, and not mathematicians, we are looking always for *physical* explanations, and so the **zero rest state** implies some physical content, even when **at rest** and actually *displaying* NO evident and measurable content – we have to deliver some balanced physical system within the unit!

We could, therefore, conceive of vestiges of material components within the unit delivering this balanced system, which might therefore involve a very tiny amount of Matter, which in turn could conceivably be affected by affected by colossal amounts of Mass in close proximity – they could therefore, be affected by Gravity, but **only** very close to a great concentration of Mass.

Thus, it would be the Empty Photons that pave our Universe that could be affected by Giant Masses and hence distort the trajectories of E-M radiation passing through in via Empty Photon-to-Empty Photon inductances.

If Empty Photons do literally pave the Universe, AND have residual mass themselves, it would endow so called Empty Space with certain very important properties. First, even when only Empty Photons are around, they could indeed **aggregate under Gravity**, so the concept of the tightly packed paving would be a reasonable consequent assumption.


In addition, the effects at the very edges of the Universe would be significant. With each tiny residual attraction between Empty Photons inside the Universe, and absolutely Nothing outside, there would be a **surface effect** – like surface tension in liquids, and also, as in liquids, the possibility of Totally Internal Reflections of E-M

radiation at these boundaries is hence highly likely.

Finally, in this host of fragmentary muses, we have the problem of action at a distance with Gravity. With resident, if residual, mass in empty Photons, they could carry gravitational waves. But also the absence of such Empty Photons outside of our Universe may prohibit gravitational attraction “between Universes”. Thus with the idea (explained elsewhere) about the impossibility of the propagation of Light beyond an Empty Photon paved Universe, we also have the absence of gravity between Universes too.

To have E-M capabilities, surely the Empty Photons must also have **Charge** as well as Mass, but it would have to be neutralised. There would have to be “equivalent to an Atom” as the structure of the unit, with a balance of positive and negative charges in some stable neutral state, but which could, very easily absorb E-M oscillations and release it (by induction). On absorbing the energy from a nearby “filled” Empty Photon, it would itself become “filled” and, as a receptacle, it may well define the ubiquitous **Quantum**. It could be that it is the Empty Photon that imposes quanta of energy into everything and for the same sort of reasons.

(3,606 words)



INTERACTING PHOTONS

Interacting Photons

The replacement of the classical infinite and continuous, elastic and weightless medium (**The Ether**), by discrete and static Photons carrying gobbets of energy with, perhaps, different frequencies of oscillation and at varying phases begets the important question, “How would these interact?”

Well, if such are the actually occurring forms of E-M radiation, then we know that they **must** interfere, because that is observed *everywhere*, when the right conditions are present, so there can be no doubt at all, Photons *must* indeed interact!

Now, we must simplify somewhat to address what is going on, so we will assume that two such radiations originated from a single source, so they will be “the same”, and if we also limit this to a single involved frequency, we can consider that by traversing different routes since their origin, they could, at some point and time, meet again and be exactly 90° out of phase.

The question then arises will the two discrete, out of phase Photons, meet and cancel out their joint contents, and if so, how?

Will they merge into a single Empty Photon for example?

Now, the difficulty with that supposition comes to the fore if two *beams* of such radiation are made to intersect. For though both adding and cancelling will take place at their joint area of intersection, the beams will, when *beyond that area*, continue as before. Thus we cannot actually have a cancellation event resulting in a single Empty Photon – for how would each contributing component re-appear to continue the propagation beyond the intersection?

So, what other form of interaction could there be?

How could the two beams be maintained even after significant parts of them have cancelled each other out?

The only possibility would have to be that the two contributing oscillations would be somehow fully maintained in their separate (and, of course, temporary) Photons, but locally (i.e. in closely adjacent positions) the two Photons would *effectively* cancel out – almost as if the two could have actually combined, but do, in fact, continue to exist as opposite (out of phase) oscillations each in its own separate photon, and capable after being passed on to continue as before.

With such an arrangement, each Photon (activated by each beam) could carry on inducing new contents in adjacent Empty Photons in their original, and, of course, different directions. By this means the disturbance would carry on as observed, beyond the interference region.

We also have to explain the opposite effect, when two disturbances from separate beams arrive together **exactly IN phase**.

An observer will certainly “see” a doubling of the effect (just as before he would see in cancellations). Now, if the contents of Photons were **hν** - that is entirely governed by the frequency, and a **fixed** quantum, then two such quanta could not end up within a single Photon.

It would break the rules and double the size of the quantum involved.

So, once again, we **have** to maintain the separateness of the two contributions, but observe that “position” as having twice the content. Once more the consideration of the beams continuing after the intersection, will not allow double-sized Photon loads either, so by keeping the two incident photons separate and still governed by the original direction of their respective beams, the two gobbets will continue upon their original way and re-constitute the two separate beams.

Now, this poses the seemingly unanswerable question, “If the carrying Empty Photons are stationary, how can the propagations have a maintainable direction?”

They could if they were moving “particles”, but also if they were, how could they possibly interfere?

But, even with this correction” we are forgetting an important fact! How could a weightless particle have a direction anyway?

We can assume it for a particle with weight in terms of the contained **momentum**. But, with a weightless and hence momentum-less photon, surely there is nothing having direction to pass on and maintain that direction.

So, we haven’t solved the situation by returning to moving Photons, but only blurred the discussion by hiding the conception of a real particle within our conception of a photon “particle”

(690 words)

Photon Directions?

Can we presume that *directions* can be somehow contained *within* the oscillations inside the Photons?

We certainly could if they were physical displacements, but surely NOT, if they are merely the amplitudes of the two properties – *electrical* and *magnetic*.

Yet, in most macro appearances of such qualities, there is *always direction* involved, for example, in the electric field around a charge.

Now in a continuous E-M wave in a continuous medium, there is also always a direction, yet both components are perpendicular to the direction of propagation, which therefore defines directions very precisely. Also, with moving charges (as in a current) the magnetic effect is always “sideways”, which is why we need a coil to make that effect “add up” to give a significantly powerful Electromagnet.

So, somehow, we have to find the source of these directions, within the Photon. So, while they spend decades smashing up nuclei to find out what they are composed of, surely an even more important question must be, “What is the internal structure of a Photon?”

Is a “Wave Packet” composed of many contributing oscillations (as with Fourier analysis) to give a natural form, with a given frequency and both initial gradual amplification and final gradual diminution, or is it simply an oscillator, which *starts*, and after a requisite time determined by frequency and energy, then *stops* (and hence must be embodied in the Planck’s constant **h**).

And, most importantly, for our musings on the Empty Photon, what remains when the oscillation is stopped? What is it that oscillates?

Now, of course, if you are a Copenhagen-type physicist, you will not ask such a question. You would find it entirely pointless! Instead, you ask **only** for a “fitting Form”, with which you could make predictions and (along with determining conditions, of course) organise productive use.

But, surely the question of the Form and Content of a Photon, and whether it can still exist when “empty” are crucial questions.

I would be the first to admit the inadequacies of the concept of Empty Photons, as employed in many of the theories I have described, but what else can a human scientist do? We cannot have a Royal Road directly to Truth, so we have to devise models that get closer and closer to the “real thing” – knowing *throughout* that, not only will they fail at some point, but will inhibit a break-through once their temporary helpfulness has been finally exhausted.

NO theory is sacred – though you would think that some were, when listening to both “scientists” and even “Marxists”. All Science, and all Marxism, surely must be constantly “renewed” and “extended” as past theories are shown to be inadequate. The process must be both continuous and infinite!

(458 words)

PHOTON DIRECTIONS

The Nature of the Photon

In the same way that a taut guitar string at rest has no oscillations, seems also to be wholly quiescent, and yet can be set off into oscillation, at a given natural frequency, by merely picking up undirected and even mixed vibrations and *resonating* with that natural frequency, cannot we make a similar analogy with an Empty Photon?

In the guitar, the elasticity of the string allows it to “contain” a resident force, when put under suitable tension. Yet, this is exactly balanced by the rigidity of the structure of the guitar. The result is not immediately evident, as this balance gives the appearance of complete quiescence. Now, does this not suggest that a similar balance must exist within an Empty Photon? For any particular frequency disturbance can be very easily communicated to that entity, as long as the requirements of $h\nu$ for sufficient energy to supply a quantum is fulfilled. And even mixed and non-specific disturbances (again like resonance) can set up an oscillation, as long as the same conditions are fulfilled. Surely, we cannot continue with the “empty” concept of an oscillation of Nothing – for on every count it is clearly meaningless, and acts merely as a placeholder for what is really going on.

We have to consider a real structure that can have such properties. For example in Pair Production, we are asked to accept that “Energy” can somehow convert into a **positron** (+ve ly charged) and an **electron** (-ve ly charged), which then move off in different directions with

1. a different charge in each
2. A mass in each
3. a directed momentum in each

And yet we don’t really know the source of such a phenomenon.

We assume, because no trace was left in our detection devices, that it must be some sort of very high energy Photon, but frankly, we are guessing!

Is it really so easy to create Matter?

Or are the two products already there inside the undetectable source, and in some sort of balance (internal to the combined entity), which gives the impression of NO Mass, and NO charge. Could we therefore actually have some form, which delivers zero contents in both these areas because they are somehow balanced to give zero effects in these areas?

There is an implicit nod in such a direction by the idea of Matter and anti Matter, which would give them this apparent zero effect, if they could be somehow integrated into a single balanced form. The alternative of making the positron – anti Matter, and the electron – Matter, also includes the possible balance of +ve and –ve to again deliver a zero charge.

NOTE: Space is supposed to be alternatively creating such pairs, and then immediately annihilating them. With this new idea they actually *exist throughout*, but don’t affect anything.

Now, consider the possibilities of such an entity!

It could be kicked into oscillation about zero – as happens in the Photon.

It could be “persuaded” to decompose into opposite components under the right circumstances.

Now, all this is speculation. But are not all our current placeholders just as speculative?

(524 words)

Initial Speed of Light (prior to an Empty Photon-filled Space)

With the supposition that currently Empty Space is “paved” with a medium of Empty Photons, which don’t actually move in propagation, but stay roughly where they are, and actually pass-on E-M disturbances by induction from Empty Photon to Empty Photon, THEN the constant Speed of Light becomes entirely explicable. It is the speed by which Empty Photons pass on such disturbances by induction **only**.

Such a constant is therefore entirely a property of these Empty Photons, and if we can conceive of a Universe **without** (indeed prior to) these entities, we then have a new problem.

With *really-empty* Space (i.e. that **not** containing any Empty Photons – indeed actual *Nothingness*) then NO E-M radiation could be transmitted as waves!

But, there would be no reason why entities could not be shot out through that nothingness at *any speed at all* What indeed would limit it?

The question arises though as to what is the effect in today’s Space (now presumably filled with Empty Photons by the Big Bang) on such speeding projectiles?

The Limit (imposed by Einstein’s Theory of Relativity) – that NO material object could ever even reach the Speed of Light, may well get modified with these new ideas. (Was the *mathematical* tail wagging the *real* dog?) Indeed, if the Speed of Light is determined as I have suggested above, then the Empty Photons must also, somehow, be the source of its other properties too.

NOTE: If, as I assume, the consequences such as the ones concerning Mass and its increase as the Speed of Light is approached is totally derived from the constancy of that speed, then these may not be true in the Early Universe.

Instead of presenting NO measureable barrier to traversing particles, the situation changes at high speeds, and the Empty Photons “pile-up” in some way and in this way limit the speeds involved. If this is the real reason for Einstein’s upper limit, then in truly Empty Space, with NO Empty Photons present, there should be no such limit to initial above C speeds. [Might this explain the fabled **Inflation period** at the beginning of the Big Bang?]

Now these ideas will be pushing the boat out to a perhaps insupportable extent, let us nevertheless DO it, and see where it might take us!

Initially then, before the laying down of a “paved-with-Empty Photons Space, the Big Bang would be powering outwards ONLY Energy into Total Nothingness. The speed could well at that stage be truly colossal – well in excess of the Speed of Light, C. (I have already mentioned Inflation!) this might not only deliver what today’s theorists require for the first stages of the Big Bang, but would also *pave* empty Space with Photons (as projectiles, which would constantly share out the initial Energy until each receptacle (the Photon) would be “effectively empty”.

Of course, to “pave” empty nothingness with a “space” consisting of Photons, these would have to “divide”, both as entities and as resepectacles of the available energy. Thus, the availability of nothingness ahead, might cause the reproduction and the continuing sharing out of Energy over a constantly and vastly increasing volume of “space” consisting of sufficient Empty Photons. Also, we have to seperate out the then nature of these early entities, from what we are used to nowadays. Most features of Light today can be traced back to an origin within Atoms, and NO Atoms are believed to have existed at the time we are considering.

If this is not too much of a muse, we could have initial Inflation AND the Big Bang defined Space paved with Empty Photons. This would remove the conundrums that plague Physics, explaining Wave propagation directly, but also involving Empty Photons, capable of carrying individual Quanta of E-M energy. The limit of C would be explained, not as some magic Constant of Reality, but a common or garden value for the speed of inductive transfer from Empty Photon to Empty Photon.

NOTE: The idea on the Elasticity of Space papers, of each particle of mass having an associated infinite gravitational Field associated with it, could give us another way of dealing with Wave/particle Duality. Both would always be present but be differently activated by our methods.



**OSCILLATION AS A PROPERTY
OF A STABLE, BALANCED SYSTEM**

Oscillation as a property of Stable, Balanced systems!

In my frequent attempts to deal with the nature of Space and its undoubted ability to propagate E-M wave disturbances, I always seem to find myself coming back to situations wherein there is a stable, balance of forces, which result in such a form of stability that it appears, in normal quiescent conditions, to result in nothing at all being there. No measurable forces *seem* to be present: the position appears to be totally empty without active elements of any kind. Yet, in this case as in many others, as soon as even the tiniest disturbance is introduced, it immediately causes an oscillation to occur. It doesn't (which it would if it was really empty of all forces) cause only some sort of translational movements of any static elements present, but, instead, it produces *only* this ubiquitous oscillation.

Clearly, opposing forces are involved, but in some sort of balance, and a disturbance, though insufficient to move anything permanently off into a new position, *does cause a temporary displacement*, which, in turn, then triggers an equal and opposite returning force, to move it once again back towards its original position. Overshooting then results in another reversal of direction and an oscillation ensues.

Thus, such oscillations are features of negative feedback, equilibrium situations, where all changes cause responses, which invariably pull the situation back towards its usual stability position. These cases simply *have* to be a feature of some natural and maintained equilibrium (or Stable State),

If two particles carrying no discernable implicit forces career directly towards one another, they do not end up in an oscillation. They most likely bounce off one another and then continue off in new directions. Except, of course, if forces of electrostatic or gravitational attraction are involved. Then these can come into a sort of balance with the centripetal forces caused by curved motion, and can result in a capture orbit of one around the other (or some reciprocal alternative). THEN, as elsewhere, we do get oscillation: this time as an orbit!

Similar oscillations also take place in taut strings under tension, in suspended springs, and even in matrix – structures of atoms within solids. So, anything, which can set into oscillation, must be in some sort of active, balanced equilibrium. Now, it also appears that Space can be similarly affected. There can be no doubt about that! An E-M disturbance delivered to, what seems to be absolutely, Empty Space is immediately and very easily propagated as a continuing E-M disturbance literally for ever! Yet this same Space appears to be absolutely and totally Empty!

[Now, any suggestion of mine must be judged against the current consensus position on this question of the Copenhagen School. And, odd as my suggestion may seem to be, it is nowhere near as cockeyed as their suggestion of pairs of matter and ant matter particles popping into existence, *only* to mutually annihilate each other immediately, and do this continually???

Now, we have observed that equilibrium situations **do not** advertise their presence *except* by such responses to introduced disturbances. So, it seems more than likely that *Empty* Space can be no such thing! It **must** be composed of some things, which with associated forces, are held in some sort of equilibrium!

But, the question has to be, “*What are these things and forces?*”
And even more difficult to address, “*How did the situation come to be?*”

Now, musing cosmologists on one of their many unavoidable(?) flights of fancy, could, and indeed have, conjured up “explanations”, none of which are entirely satisfactory. And none of which describe or explain any involved balance of forces. Even Einstein sidestepped the problem by first making Space *elastic* (distortable) without any explanations, and then fitting the phenomenon up with formal equations, which “delivered” the necessary accurate predictions. And, of course, the incipient idealism of many *mathematical* scientists, and

who believed that the real World was actually driven by disembodied relations, jumped at this alternative “explanation”. And to cap it all, all attempts to investigate Space and reveal any involved entities and forces have revealed precisely nothing new. Even Einstein's predicted Gravity Waves still await confirmation. If we were to return to much easier cases in Reality, we would usually find the factors that produce a given equilibrium. We extract evidence for forces in balance without too much difficulty in most everyday cases.

But Space is different!

For one thing, it appears infinite! Light – an E-M disturbance, can set Space into oscillation, which is then propagated from one side of the Universe to the other.

How can we have an infinite structure everywhere, and also locked into this necessary kind of equilibrium, but capable of responding to the tiniest disturbance?

Well, it would help if it were finite, produced by the Big Bang itself and was **not empty!**

It is, of course, no easy problem, and throughout my deliberations upon this conundrum, I found myself in one or another cul de sac many, many times.

But, I do have a suggestion!

It is a way out suggestion, without confirmations.

Except, it can *explain* many phenomena!

Imagine that the Big Bang, delivering initially ONLY energy into a really empty space, but see it as a flooding out of photons, which though they originally carried prodigious quantities of energy in sum, have by now been spread out (like spilled hot milk), so that their energy has been diminished to such an extent that they appear totally empty (like completely cold milk) No vestige of energy appears to remain in each individual **Empty Photon**. Now, from our earlier discussion we can turn this concept upon its head, and insist that they are not really empty: they are in a stable equilibrium of forces, with NO extractable energy of their own, but with the full capability of reaction to any E-M disturbance, no matter how small!

The justification for staying with this idea is that it has several major successes to its attempts at explaining phenomena, Various problems in Cosmology have been addressed, as has the “problem” of the propagation of E-M radiation through Empty Space, and the constant Speed of Light, But the clincher has to be in this author's *Theory of the Double Slit Experiment*, wherein the phenomenon is explained without resorting to the Copenhagen School's idealist philosophy at all.

It may not yet be an established Theory, but, let's face it, it is considerably better than the usual apologies for “explanations” At the very least it will turn out to be a very effective didactic model that will enable researchers to see much further and better.

True Science has never been about Absolute Truth (leave that to the inhabitants of Ideality – the Mathematicians), but about *objective content*, which leads us ever onwards.

NOTE: In answering why an electron in orbit within an atom does not produce an E-M disturbance in Space, we are usually in deep trouble, *unless* the atom does not *include* Space – that is Empty Photons! Though these do fill Space itself, if they are not present within the atom, then the energy involved is sealed off from propagation via Empty Photons. The orbiting electrons are indeed in a sort of stable equilibrium. And to communicate with surrounding space that equilibrium has to be first “jacked up” to a higher and unstable level, which will quite naturally give up what makes it unstable as E-M radiation to the surrounding Empty Photons, and by which it returns to its usual base-state equilibrium. Yet in an area of Space full of E-M radiation the process can go both ways, and electrons are constantly being lifted up to higher levels only to cascade down again with characteristic emissions of E-M energy. Indeed, each type of atom has its own characteristic frequencies of the emitted Radiation, which can be used (in both spectroscopy on Earth and of light from Space) for diagnostic purposes.

The True Nature of the Empty Photon (Could it be a Neutrित्रon?)

In the famed phenomenon of *Pair Production*, we get a **positron** (+ve charge) and an **electron** (-ve charge) produced, and it is usually assumed that they came from the transformation of a very high energy Photon, triggered into this surprisingly **material** product out of a **pure energy** entity.

As this sounds very much like a conceptual/formal frig, let us muse on the idea!

Consider some sort of neutral, stable arrangement of a positron and an electron, somewhat like the usually accepted model of a Hydrogen Atom, where a negatively charged electron “orbits” around a positively charged proton. Now, in that universally accepted case, the proton is vastly more massive than the electron, so its complementary movements are small compared to those of the electron, so that the orbiting seems to be solely concerned with the electron alone.

But, if some sort of similar arrangement were involved with the positron and the electron, which are the same size and have the same amount of Mass, the question arises, “*How might they establish a stable orbital form?*”

It could not be exactly the same as the Atom, but surely some alternative sort of *mutual orbiting* might well be possible, wherein **both** their initial translational energies could oppose their mutual electrostatic attractions, and thereby allow a relatively stable and electrostatically neutral entity to exist.

NOTE: Now I am aware of the Standard Model, along with its “symmetry principles” and equations, but I must admit to considering the Copenhagen position gravely flawed and will **not** succumb to convincing arguments based solely upon their precious equations, no matter how consistent they have been made.

I will stick to Physics, for I believe equations to be *idealised* and **formal** relations, while I must base all I propose entirely on the concrete.

The produced entity would have NO overall resultant charge, but its mass would surely be noticeable? [Though whether such would be detectable with a matter/anti matter, mutually orbiting pair is perhaps debateable]

NOTE: I am forced to bring up the case of the **neutrित्रon**, which was supposed to have neither charge nor mass (but could have a spin?).

Even as a student I had refused to believe it and, many, many years after its revelation, it was found to have a mass. I wonder where that was hiding in all those definitive experiments?

So, I will admit to some sort of a mass for this combined entity. It should be something like twice the Mass of an electron. Now, presumably, it could also, like the atom, have the capacity to be raised to a temporarily higher energy level, if somehow, the energy absorbed from outside the entity could widen the involved orbits to include that extra energy. But, of course, this entity is interesting because it contains both +ve and -ve charges **and** mutual orbiting. Yet it is not inconceivable that the form of a **base level** energy (the so-called Empty Photon) could be raised to carry higher levels of energy, and could also release it to other base level versions. These could be the receptacles for E-M radiation propagations as we have suggested for Empty Photons.

Indeed, the almost inexplicable nature of E-M radiation in totally Empty Space is perhaps better delivered by this entity? For such radiation has both electrical and magnetic oscillations **locked together** with the same amplitude and exactly 90° out of phase, as if they are products of the same process or entity. And, as has been dealt with elsewhere, oscillations tend to occur naturally in highly stable, **balanced** situations, so this proposed entity seems to fit that conception ideally. For it not only has +ve and -ve components in mutual orbits, but could also have energy levels above a minimal Rest State to accommodate inflated repositories of energy. And in a direct comparison with the properties of the atom, we know that in metals the alignments of the electron orbits can deliver a magnetisation of the whole piece of metal.

There may be conceptual difficulties, of course, but the new entity, which we consider to be identical with our hypothetical Empty Photon, would explain many phenomena, if they constituted a “paving” of Empty Space within the Universe.

COULD IT BE
A NEUTRित्रON?

As this author has demonstrated, in addition to **physical vehicles** for E-M radiation propagation, they would also deal with all the phenomena involving Quanta, including both the **Double Slit Experiment** and the **Photo Electric Effect** [see the appropriate papers published by this author in the **SHAPE Journal** on the web].

The main problem that such entities would involve a mass, would also actually allow them to also explain Einstein's purely formal distortion of Space by the presence of all concentrations of Mass, It would turn into a distortion of the Empty Photon "pavement" of Space – a **physical** explanation rather than a *purely formal* construction (as with the Master himself).

NOTE: according to this author, *formal explanations* are a contradiction in terms. For a formal cause to physical phenomena is surely **Idealism**, is it not?

But notice that our so-called Empty Photons (with this new idea) become merely a minimal energy version of the new positron/electron joint entity.

In their stable and universally present state, they will be at their Rest State, but could be: -

1. agitated by the inclusion of extra energy to actually propagate E-M disturbances by means of induction transfers to similar adjacent entities in their Rest State.
2. With sufficient disturbance energy, the unity of the entity could be wholly undermined and a positron/electron Pair could be released with translational energy as in Pair Production).

Now, if this were the case, the inclusion of more and more energy would explain **both** suggested phenomena of the new joint entities. When limited to the involvement of extra energy, the orbits of the two components would merely widen, but if that increase was too big, it would instead bring about Pair Production and the entity as such would vanish. These would career off in different directions to one another, where all the energy from the prior entity would be returned to the Pair as pure translational K.E.

Theoretically there would be some **fixed threshold** – a maximum capacity for the energy that the entity could contain, above which it would dissociate into its "components". Now, I admit that there must be many loose ends, and opponents of this supposition will either bury it under their holy equations, or they just might attempt to solve the problems involved.

Now, continually referring to this new form as either an Empty (or a Filled) Photon) or a positron/electron entity seems a little long-winded, so why don't we call it a **Neutriron** (for obvious reasons)?

Clearly, if this were the case, the E-M radiation in its entirely disembodied form would *never* exist, all that we now deliver using our current model of disembodied waves, would have to be re-cast using the new entity.

There is, of course, another possibility!

The Atom has a very heavyweight nucleus, which involves very different nuclear forces that can hold such fused nuclear components together.

Indeed, it was not only in Stars, but also, to a certain extent, even before the very first star came into being, that protons were known to have fused to produce Helium nuclei, so such "fusing" may(?) occur between our positrons and electrons very early in the History of our Universe.

Now, we are told that these are different kinds of Matter: one is normal everyday Matter, while the other is said to be composed of Anti-Matter, and it is insisted that such opposites, when they come together are certain to mutually annihilate leaving only vast quantities of energy in their place.

But, there is a problem here. Why is the positron considered to be anti-Matter?

I am convinced that they can deal with most inexplicable phenomena formally – via available mathematical Forms, and hence that formal tail wags the concrete dog of Reality. They trust their equations *implicitly*: their consistency matters above all else. If the positron were not anti-Matter but indeed ordinary Matter carrying a positive charge, then surely the sort of combined entity of a positron and an electron would be immediately accepted, as it too delivers the same phenomena, with a less mystical explanation.

And, of course, these proposed entities are very much smaller than the nuclei of Atoms. The interaction of a normal Matter positron and an electron seems entirely conceivable by one method or the other resulting in a new stable particle with important properties.

And all the above descriptions would be eminently acceptable.

Now because the energy involved would be locked-in energy, it is not seen as a particle because its translational energy has "disappeared". But so has that translational movement energy disappeared in the ordinary Atoms when organised as a solid (and even that is mostly "Empty Space" and its solidity is due to its macro properties and stemming from its heavy nucleons).

The question as yet unanswered must be to do with the nature that was originally posited upon the Empty Photons, and therefore would have to be true for the **neutrions** too. For the power of the Empty Photons was in their "paving" of empty Space, and thereby being the medium of propagation of E-M disturbances *without* any movement of the individual units. And even all those phenomena that were usually explained via moving photons could be equally well explained via that paving, including, it must be emphasized, the phenomena involving Quanta of Energy.

Let us see if we can take this conception even further.

If an electron and a positron passed one another at identical speeds at a particular distance apart, indeed, at the precisely correct speed to allow capture into mutual orbits at the closest possible approach without collision, then surely the result would be a lowest level mutually orbiting entity? Transfers of energy *into* this entity might well be on a similar basis to the energy levels in an Atom, so a range of such, above rest state, levels in defined quanta could be involved.

Now in the case of the Atom there are several ways of holding energy. Not only in the orbits of the electrons around the nucleus, but also (in solids) in the oscillations of the Atom as a whole about its balanced position in the matrix, and (in liquids and gases) in the translational Kinetic Energy of the individual atoms as they move about.

But, we actually assume that the orbital energies are more intrinsic, and will have a minimum energy rest state, to which it naturally returns, if it is not continually maintained in its inflated level – with sufficient available energy, any return to rest level, will be immediately reversed by the absorption of energy to re-inflate it.

And, of course, the major feature of the model is that returns to rest level *cause* the emission of quanta of E-M radiation to be emitted, which are either "shot like particles" across Empty Space, or, as in the new explanation, propagated away by Empty Photon-to-Empty Photon inductances, giving the almost undisputable trajectory of a "quantum" across space, but actually being a string of inductances between *non-moving* Empty Photons.

Now the usual rejection of this alternative is that it requires the total paving of the Universe with these packed entities, and this is considered to be far too much of a requirement. **Yet** the agreed consensus explanations are, if anything, even more "way out", where every single point in totally Empty Space is capable of delivering Pair productions *out* of Nothing (or whatever is there when **not** a pair of particles), and then Pair Annihilations *into* that very same Nothing.

Now, if the Empty Photons were in fact mutually orbiting positron/electron entities OR **neutrions**, all phenomena could be delivered. The universality and persistence of these entities should make them as stable as Hydrogen Atoms, which are by far the commonest pieces of Matter in the Universe. Perhaps the **neutrions** are as common, if not a great deal commoner!

There are still many questions.

With two orbits involved, how would incoming energy be distributed between the two orbits? Even if initially the distribution were very asymmetrical, it would seem quite likely that this would soon be converted into the maximally stable configuration, wherein the energy was equally shared. But this could be wrong!

The crucial transfers of E-M energy from one entity to the next would require conformity in both the **donor** and the **recipient**, to enable the smoothest transitions, but the actual situation would have to be established in some way.

And, returning to the High Energy Photon that is said to be the source of a positron/electron Pair Production, might an extra large influx of energy give both components sufficient energy to break their mutual attraction and be released as independent particles once again. The seemingly symmetric divergence of the Pair Pathways seems to indicate a completely equal share of the energy involved at the dissociation.

(2,172 words)

Empty Photon Papers

A Word on Background

This special is, of course, only part of the research carried out into the idea of Empty Photons.. The subset included in this publication was selected as a brief introduction to the topic, but some idea of what has been completed over the last few years on this topic is provided here as a list of completed papers
It amounts to some 76 papers at present, but I am sure that others are as yet unearthed.

Jim Schofield July 2011

No.	Title	Filename	Date	size
1	At The Slits	<i>attheslits.doc</i>	23/10/10	246
2.	Oscillation as a Property of Stable, Balanced Systems	<i>Balancedoscill.doc</i>	28/10/10	1324
3	Does It Really Explode?	<i>BBexplode.doc</i>	30/03/09	1412
4	A Muse on the Bohmian Pilot Wave	<i>bohemian.doc</i>	19/03/08	1899
5	Can Photons Move, and If So, When?	<i>canphotonsmove.doc</i>	22/11/10	614
6	The Casimir Effect	<i>casimirI.doc</i>	14/07/08	4094
7	Cause & Effect at the Double Slit	<i>causeeffectlight.doc</i>	04/01/11	830
8	A Closer Look at Bohmian Pilot Waves	<i>cloderbohman.doc</i>	15/09/10	1135
9	Contending Concepts or Transcendant Resolutions	<i>contendortranscend.doc</i>	03/12/10	2052
10	Continuity Implications of Empty Photons	<i>contimplicsEPs.doc</i>	22/11/10	793
11	Have We Arrived at the Demise of Copenhagen?	<i>copenhagendemise.doc</i>	17/11/10	2380
12	Pair Creation & Annihilation	<i>createannihilation.doc</i>	16/11/10	1423
13	Direction of Propagation with Empty Photons	<i>directpropag.doc</i>	07/11/10	570
14	Dispersed or Focussed?	<i>dispersfocus.doc</i>	14/04/08	1045
15	Showers of Disturbances	<i>distshowers.doc</i>	16/11/10	961
16	Do Photons Move?	<i>dophotonsmove.doc</i>	24/02/09	1425
17	The Double Slit Field Once More	<i>double slitfield2.doc</i>	23/02/09	1468
18	Double Slit, Photons ^ Cosmology	<i>DSpoints.doc</i>	30/11/10	295
19	Electrical & Magnetic Aspects – Double Slit	<i>EandMaspects.doc</i>	22/10/10	1233
20	Einstein's Distortion: Paper II	<i>einsteindistortII.doc</i>	29/06/09	996
21	Elasticated Space Paper I	<i>elasticpaceI.doc</i>	16/06/09	1068
22	Elasticated Space Paper II	<i>elasticpaceII.doc</i>	16/06/09	934
23	Elasticated Space Paper III	<i>elasticpaceIII.doc</i>	16/06/09	955
24	Repulsion of Electrons	<i>electricpulse.doc</i>	03/11/10	261
25	Fields of Coherently Moving Electrons	<i>electronfields.doc</i>	25/10/10	830
26	Emergences & Their Creative Levels of Reality	<i>emergcreation.doc</i>	13/05/11	3606
27	Empty Photon in Theory of Double Slit	<i>emptiesandDS.doc</i>	01/12/10	810
28	The Empty Photon & the Filled Photon	<i>emptyandfilled.doc</i>	08/12/10	1664
29	How are Empty Photons Emptied?	<i>emptyingphotons.doc</i>	06/10/10	1042
30	Disturbances in Empty Photon Fields	<i>emptyphotonfield.doc</i>	01/09/10	612
31	Oscillation of a Single Empty Photon?	<i>emptyphotonsoscill.doc</i>	02/11/10	818
32	Empty Photons & Speed of Light	<i>emptyphotons.doc</i>	23/01/08	644
33	Empty Photons & Double Slit Experiment	<i>emptyphotonsDB002.doc</i>	01/08/10	1058
34	The Idea of Empty Photons	<i>emptyphotonsidea.doc</i>	21/01/11	1272
35	Empty Photons & the Double Slit	<i>emptyphotonsdobslit.doc</i>	05/10/10	791
36	Electro-Magnetic Space	<i>Emspace.doc</i>	19/06/07	604
37	Theories of Everything	<i>everythingcomment.doc</i>	03/05/08	458
38	Fields & Waves in the Double Slit	<i>fieldwavesDS.doc</i>	21/10/10	180
39	Gravity Again?	<i>gravityagain.doc</i>	23/03/11	1698
40	Heat Energy	<i>H=heatenergy.doc</i>	21/02/08	1833
41	The Initial Creation of Matter	<i>initcreatematter.doc</i>	10/09/10	1695
42	Initial Speed of Light	<i>initspeedolight.doc</i>	14/06/09	556
43	In the Interstices of Space?	<i>interstices.doc</i>	05/02/08	2075
44	The Dynamic of the Journal Launch	<i>launchdynam.doc</i>	16/05/09	1404
45	Massless Entities	<i>masslessentities.doc</i>	16/08/09	2881
46	Muse on Movement of Empty Photons	<i>movementphotons.doc</i>	04/09/10	306
47	Muse on Creation of Matter	<i>museonmatter.doc</i>	10/09/10	1243
48	One at a Time?	<i>oneatatime.doc</i>	05/01/11	772
49	Oscillating & Ordinary Energies	<i>oscilandordenergy.doc</i>	02/01/11	362
50	Oscillating Photons?	<i>oscilldphotons.doc</i>	05/01/11	771
51	Particulate Light	<i>particulatelight.doc</i>	23/10/10	974
52	Letter to Peter	<i>peter031110.doc</i>	03/11/10	608
53	Letter to Peter	<i>Peter060309.doc</i>	06/03/09	225
54	Letter to Peter	<i>Peter171110.doc</i>	17/11/10	285
55	Letter to Peter	<i>Peter270209.doc</i>	27/02/09	225
56	Letter to Peter	<i>Peter291210</i>	29/12/10	649
57	Empty Photons Role in Fields	<i>photonfields.doc</i>	27/02/09	414
58	Interacting Photons	<i>photoninteracts.doc</i>	22/01/11	690
59	Nature of the Primary Cataclysmic Event	<i>primcataevent.doc</i>	08/12/10	2234
60	Really Empty Space?	<i>reallyemptyspace.doc</i>	10/11/10	890
61	Transcendent Results of a Single Blow!	<i>resoablowlow.doc</i>	21/10/10	582
62	Can We See the Edge II	<i>seeedgeII.doc</i>	07/12/10	1237
63	Self Deflecting Electrons	<i>selfdeflectelect.doc</i>	15/10/10	1868

64.	Shared Inductions	<i>shareinducts.doc</i>	03/03/08	876
65.	Ships in Harbour	<i>shipsinharbour.doc</i>	05/10/10	551
66.	Shock Waves, Bow Waves & Wakes	<i>shockswaveswakes.doc</i>	30/11/10	1056
67.	The Significance of Empty Photons	<i>signifemptyphotons.doc</i>	15/05/11	1355
68.	Small-Field E-M Disturbance	<i>smallfielddist.doc</i>	02/09/10	821
69.	The Creation & Expansion of Space	<i>spaceexpands.doc</i>	18/04/09	1295
70.	The True Nature of Space	<i>spacenature2.doc</i>	17/01/10	396
71.	The Double Slit	<i>standdeflect.doc</i>	13/04/08	1808
72.	Of Synchrony & Forced SHM	<i>synchrforced_SHM.doc</i>	02/11/10	452
73.	The Origin	<i>univorigins.doc</i>	29/12/10	7635
74.	Collision of Unseen Universes	<i>unseenunivshit.doc</i>	11/12/10	1574
75.	The Ground for Waves	<i>wavegrounds.doc</i>	22/02/08	1365
76.	Why Empty Photons?	<i>whyemptyphotons.doc</i>	04/01/11	909