The Theory of Field Interaction

An Alternative Approach to the Description of the Ideas behind a Promising New Outlook on Reality

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Authors note:

This is still a work in progress. There is much more to be covered, and it will take time to get it gradually put together, so I will be adding to this document from time to time so long as this note is still included on the title page. I would invite you to check back from time to time to see if there is anything new. Note that, while new material may often be added at the end, there is always a possibility that there will also be parts added elsewhere as well.

I hope you enjoy your reading and find it interesting.

Introduction

The Theory of Field Interaction has arisen out of a rather prolonged series of evaluations and considerations over a period of decades. Nature, or Reality as I prefer to call it, if full of extensive and oftentimes complex interactions, which can make the process of striving to discern what is really going on rather challenging at times. We have approached this effort using a very careful application of what I refer to as "phenomenoscience". To be done correctly, it must all be approached in its full complexity, for to strive to simplify or isolate ideas risks missing some (often unknown) subtle, yet potentially highly crucial aspects of the truth of Reality.

At this point in time, my mind is full of a rather broad range of interacting and interdependent concepts and ideas. The primary problem that I face at this time is one of knowing how to break all of this down sufficiently to make it reasonably intelligible to the reader. Of course, not all readers will have the same interests, backgrounds, or perspectives, which means that there really is not any one "perfect" way to approach the task. Another part of the problem is that throughout this entire effort it has become very clear that there is (unfortunately) a great deal of misinformation out there that is being passed off as solid, verified "fact".

We will be discussing some of the more important background information areas, as least where I feel that they have significant pertinence to the concepts that are presented herein. We will also be discussing phenomenoscience and mathematics a bit, because those topics are so very important to how we need to approach the truths of Reality. Finally, we will be striving to present the more central concepts of The Theory of Field Interaction for the reader to consider.

All of these efforts are the work of one man, so, even though I will be striving to the best that I know how, they will very probably come out as somewhat less than ideal. Please, what is truly important are the ideas themselves, not how they may be presented. I would encourage you to read them carefully and then to consider the potential of what they present.

This work will be an effort in progress for some time, so I will be adding to it from time to time so long as this particular note is still included. It may take me a while to finish, so please be patient. There is also the original treatise on The Theory of Field Interaction, which approaches the topic a bit differently from this one, but I will not be covering all of the points that are covered in that treatise in this one. Thus, that means that the two treatises will complement each other – and you may find it helpful to (at least eventually) read them both.

I wish you all the best in your endeavors,

T. B. Bon

Prolog

My Perspective

Let's start this out with what is really more of an introduction to what will follow, in an attempt to provide some level of context for the rest. If I were to provide a title to give some idea of the general thrust, it would be:

How Did We Get to Where We Now Are?

(Note: that also includes a bit of how I got to the perspective that I now have as well)

I started out a number of decades ago with striving to resolve a number of problems that I had perceived were seriously hampering progress and proper understanding in "modern" physics. My initial focus was very specifically on the troublesome areas of "modern" physics, little did I expect that the quest would eventually take me clear back to some holes in the very foundations of classical physics – but it did! The key, as I see it, is that we need to resolve the problems – regardless of what they are or of where they may lie. Until we do, our forward progress will be greatly curtailed with respect to what it might otherwise be.

IF, as I have already implied, at least some of the problems actually step back to holes in the foundation principles of classical physics, then it should be clear that those principles do not likely present any obvious signals within the realm of classical physics that something is "missing". Likewise, with so very much intervening history fairly loaded with extensive classical physics successes, who would ever expect that at least several of the major problems in "modern" physics would actually stem from unrecognized holes within the foundations of the highly successful classical physics? Moreover, it is also very true that sometimes, no misstep can be harder to discern and then later correct than the one where the very tools and techniques that you were relying on to keep you on-track also fail you at the task. Such concerns should indicate that what we are actually seeking for might very well be essentially like trying to find a needle in a haystack.

Newton found the right math for the classical mechanics, but he did not pursue the full depth of understanding for the concepts. I have even seen some rather applicable quotes in the past, where he indicated that he did not comprehend how some of these systems really worked, but I do not have copies of them that I can present here and now. Even so, my understanding is that he was content to take full advantage of what he had and leave the detailed how and why to someone else to discern at some later time. Given the tremendous mileage that we have been able to gain from his work over the centuries, I would say that he made a rather wise choice. Nonetheless, those open questions have yet to be resolved satisfactorily within mainstream physics.

There is no question that his math was wildly successful – and during his time, good supporting logic and rationality were still expected. However, based on what I have found, neither the nature of, nor the need for further understanding in the areas that have turned out to be in question were evident or even reasonably apparent as possibilities in the environment of the time, let alone today. Thus, it is not at all surprising that they were overlooked. One of the main problems, I feel, is that in the meantime, mathematics has come to be more and more heavily relied upon – almost to exclusion of reason and logic altogether. In the midst of a whole range of seeming mathematical successes, the shortfall in adequate depth in the (what I have come to refer to as) phenomenoscience of the phenomena seemed more and more inconsequential.

More and more math-based "successes" followed – and it got to where it seemed to many that science and physics were on a better, safer track than it had been in millennia. Thus, as time went on, mathematics was effectively enthroned as being the "key" to both present and future successes. More and more, it became the pattern that if the concepts behind any given phenomena did not fit together with everything else, or – even more dramatically – if they did not even make sense, logic and reason would be quietly set aside as irrelevant and "obviously" contrary to the way that nature actually worked.

The oversights were not totally forgotten, but they were not resolved either as science gradually progressed under the banners of mathematics and experimentation.

The real split came when the "successful" mathematics ran full in the face of logic and rationality. With so much seeming success from the agreement between the mathematics and experiment in such new "developments" as relativity and quantum mechanics – logic and reason were subsequently set aside and abandoned as "old-fashioned" and somewhat irrelevant. In the process – "modern" physics was born.

How Shall I Pull This All Together?

While the basic principles of Reality have always proven to be relatively simple and straightforward, the complexity that arises out of the extensive interaction is not. All of this that I am seeking to present herein is a compilation of some rather extended evaluations that have spanned a number of decades. It has not been a matter of just looking at one simplified, isolated concept area and then another, and everything that has eventually come together in my mind is highly complex and interrelated – but I need to figure out some means of trying to present that to others in a reasonably intelligible manner.

I am constantly struggling with how to approach all of this in a somewhat succinct form since there are so very many factors to be considered – many of which I can't very well address even in such a venue as this. This is all kind of cobbled together out of my head as I strive to figure out how to best approach the overall task. I certainly cannot guarantee that I will be able to get everything organized in the very best manner, especially since I cannot really perceive what it would be like for someone else – I already have all of this running around in my head. All I can promise is that I will strive to do the very best that I know how, so as to keep it somewhat understandable. If I don't always manage to do so well, please forgive.

The biggest danger perhaps is that I might miss covering something crucial without realizing it. I had the same problem with my original book, "The Theory of Field Interaction". It has a lot more in it. I also tried to cover it from a bit more basic of a level and spent al lot of time on preliminaries. Even so, there are still a number of areas that I did not cover in an effort to keep it from becoming too voluminous. If at some point, something that I say seems to be too strange or incomprehensible – please do not hesitate to contact me and ask, and I will at least try to provide a suitable answer.

I am striving to make a few points clear for the sake of perspective and understanding. I am in the process of striving to present (in some sort of a comprehensible manner) a whole series of concepts and ideas; in what I hope is a reasonably rational order. Naturally, I must present these concepts and ideas in a nominally serial fashion in order to keep the presentation from jumping around so much that it becomes completely unintelligible. One very possible outgrowth of such a presentation is that the step-by-step presentation may seem to make it appear as though the original development of the overall set of ideas might have been similarly developed in a similarly serial – and possibly haphazardly seeming – jump-around of sometimes-disjointed concepts. If at any point you might be beginning to get such an impression, I am most, most sorry for the confusion – but nothing could possibly be further from the truth of the matter.

Frankly, if someone were to ask me to recount the process that I went through, step-by-step, to get to where I now am in my thinking, I would not be able to do so. That is because it was a highly interactive, recursive process, since I was constantly striving to keep a careful watch to make sure that I wasn't veering off on some sort of detour. I was looking for some critical insights, but I did not really know where to find them – so I kept reviewing a wide variety of "known" concepts in physics to see what clues might surface. My first step in each case was to review carefully whatever principles or concepts that I may have then been reviewing to try to ensure that what I had been taught, or what was generally thought, really appeared to actually have good reason to be accepted as truly valid. That, of course, proved to be a rather daunting and challenging effort – but it became increasingly clearer to me as I went on that it was a task that was absolutely critical to the effort.

As new ideas arose along the way, there followed a similar effort of evaluation with respect to anything and everything that I felt it might apply to, or which possibly might be impacted by, any aspect whatever of that (or

those) new idea (or ideas). Naturally, there were a number of ideas that did not make it very far before being discarded. As this process progressed, there were also various and sundry aspects of the effort that would arise from time to time that kept indicating that there was still something missing – something else that needed to be identified somehow, properly considered, and carefully added to the overall evaluation. Over time, this led to a rather complex and highly interactive series of concepts and ideas. My own personal evaluations did jump around quite a bit as I sought to test and evaluate every idea as thoroughly as possible, for rationality and consistency with any and all "known" concepts with which it might possibly interact in any way.

What I am trying to say is that regardless of how it may (or may not) appear from the current presentation, the original development of these ideas has undergone multiple, complex, and highly interactive crosschecks, and cross-correlations with everything that I could think of. What I am striving to clarify, in as intelligent of a manner as I can, is that the ideas that I am striving to present are a compilation of just those ideas and concepts that actually did work (rather well, I felt) in a somewhat rational and coherent manner. Put another way, there was far more effort and evaluation that went into the development of these ideas and concepts than "meets the eye", or that I will even pretend to present. So, please, do not use the manner in which the ideas are being presented as even a crude indicator of how the concepts were actually developed. The actual process was far too complex to ever reasonably even try to describe.

Chapter 1

Notes on Our Approach

This work is going to be, for a truly theoretical work today, very distinctly non-mathematical. This is not philosophy, but an extremely careful effort based on what I have come to call "phenomenoscience". In an effort to make our approach – and why we have chosen to take it – clearer, we will first have a discussion on mathematics, and then we will cover some introductory aspects of phenomenoscience.

Mathematics

One of the truly major problems today is that modern physics and science, especially in the mainstream – but elsewhere as well, are absolutely enamored with mathematics. The general feeling seems to be that mathematics can somehow keep us from getting off the track from the truth. Mathematics is wonderful and has a great deal of value, but keeping us on track all by itself is something that it is totally incapable of doing. I personally feel that it is actually that very dependence on, and trust in, mathematics that has largely led us to where we now are. What that means is that, we need to do more than just get to where we collectively understand better what we truly do and do not know. While we do need to figure out what the correct (or at least – closer to correct) answers really are and then hopefully help everyone to recognize them for what they are; we also need to realize that we need to make some rather significant changes in our approach to the whole effort. Moreover, somehow we need to manage to accomplish all of those tasks at the same time, when most of them are not even listening because they do not yet accept that there really is a problem.

As for mathematics, its strength (and it is a major one!) is that its highly structured rules and processes can produce absolutely excellent insights to help to guide our logic. However, in order for it to do so properly, we desperately need to manage to get the initial equations correct, AND we must also use great care to keep the very real limitations of Reality in mind as we go through our manipulations. It is a powerful tool that can help us to understand "how much", and even help us to comprehend what is happening better when there are unexpected surprises in the ways that the "how much" works out in complex interactions. In all of my evaluations, I have consistently made use of whatever was available for gaining a better understanding – and that includes mathematics. In fact, some of the most crucial clues in finally helping me to comprehend some of the central ideas were some very specific parallels in mathematical models and equations.

Some of the most serious problems arise when the initial formulations or the subsequent manipulations do not properly reflect Reality because we do not properly understand the HOW or WHY of whatever phenomena we may be striving to model. Another source of problems arises when we ignore the real limits of Reality during our mathematical manipulations, on the mistaken presumption that the rules of mathematics are sufficient to keep us in line. I have never tried to count how extremely many times I have encountered all of these problems as I reviewed what is promoted as fact – and found that much of it really was not (because of the very types of problems that we have just cited). I also do not know how many times that I have seen a scientist or engineer use a formula for the answer to a question of "how" or "why". Unless that question might specifically pertain to a consideration of the sometimes non-obvious interactions of magnitude in an interaction, mathematics absolutely does NOT provide the true "how" or "why".

What I believe is perhaps one of the most key of the insights behind the theory of Field Interaction relates to a concept for which we have had excellent equations and mathematics for centuries! The problem is essentially that those mathematics were presumed by many to correctly reflect the how and why of the phenomenon itself, as well as the "how much" – when they truly, as it turns out, did not. That particular insight has had a major impact on understanding not only the basic classical phenomenon itself, but also a great many other areas such as even relativity and quantum mechanics as well. I am planning to try to cover at least the most salient points later on in this treatise, but I am also hoping to be able to do it in a manner that will not just lead to confusion.

As far as to "why it is that the nature we try to understand lends itself to the use of math in our attempt to describe it as much as it does", I believe that the basic short answer is that Reality is ultimately ALWAYS logical and rational. Since mathematics is based on a number of logical processes and rules, once we get the formulations and equations properly identified and correctly used (and we don't ignore the real-world limitations of Reality) – the outcome is bound to provide a good evaluation of the "how much" with respect to the associated phenomena and interactions.

The bottom line then, as far as mathematics is concerned – is that it is a fabulous, powerful, and absolutely indispensible tool, at least, so long as we use it appropriately. Early on in my efforts, I personally kept going back to mathematics to try to find the answers (just as I had most carefully been taught to do). It took me a while to begin to realize finally the full scope of the ways in which too much dependence has been placed in mathematics, particularly in the absence of adequate phenomenological understanding of the physical workings of Reality. I only reached the position and understanding that I currently have gradually (and with significant consternation), as repeated, careful re-evaluations of what we "thought" that we knew of Reality led me persistently in that direction. Interestingly enough, some of the most important clues actually did come from the mathematics, but they still required some very careful phenomenoscience-based evaluations along the way as well.

"Negative" Proofs

As a further elaboration, let's take a look at one approach that some have used, and also claim that it provides a viable alternative to regular validation, is "negative" proofs. This involves a process of assuming something is true and then calculating it out to show that the result is not correct. Such a process would indeed prove that the false assumption, or at least something associated with the tested model, was not correct. However, it would NOT prove that the "converse", whatever it may be thought to be, was actually true. Mathematics can be extremely useful for proving that something is incorrect – all it has to do is to show that it does not produce answers that are consistent with measurements and observations. On the other hand, however, it is virtually NEVER that mathematics can properly be used to "prove" that something is actually correct! Unfortunately, most of the problems in "modern" physics are excellent examples of that very point. In every one of the widely accepted, but irrational, theories there are mathematics that can be used to produce answers that are in good, and often even excellent, numerical agreement with at least some of the experimental results. Nevertheless, regardless of how good that agreement may be, that does not prove in any way that they are correct – it only demonstrates that the associated equations and approaches produce answers that are at least in numerical agreement with the observed results. I, personally (along with a great many others), maintain that there are major problems with a number of the leading theories of so-called "modern" physics – despite their seeming "confirmation" from the associated mathematics. There are actually multiple examples in physics of where there are actually KNOWN to be two or more totally different conceptual models whose resulting mathematics lead to the exact same set of final answers. They do produce viable numerical agreement, yet – if Reality is anything, it is consistent, thus, they can't all be correct.

Almost never can we truly be certain that whatever set of equations or concepts that we may have or happen to know of are the only combination(s) that would be expected to produce a result that is in good agreement with what we observe in Reality. Just because we do not know of any alternatives does not really mean that they do not exist. That, perhaps, is one of the most significant, yet troubling, problems in physics and science in general. It is certainly one that we will never get away from.

Let me provide a very pertinent example for a moment. We have known much of the mathematics associated with momentum, inertia, and energy quite literally for centuries now. Yet, we have not really recognized and understood the phenomena that lie behind them. Even so, they tended to feel rational and intuitive, so the need for a better understanding did not really seem to be a driving concern. Frankly, I was also quite content with what was available, and thus, I failed to understand that there was a problem or shortcoming in those areas myself – at least, I did so until a series of careful comparisons with other well-known phenomena began to suggest what the

answer might be. Phenomenoscience demands that all ideas must be carefully and thoroughly tested and evaluated against anything and everything possible before any credence is given to them. Thus, what followed thereafter was a process of careful analysis along with a series of careful evaluations – all aimed as discerning whether any of the ideas, along with other questions and ideas that followed, really made good sense. The process ultimately consumed decades, for great care is required to ensure that no potentially pertinent details are even inadvertently overlooked if at all possible. Eventually, the combination of ideas and interactions that came out of it began to grow ever more intertwined and interrelated, and to come together in a rather coherent fashion. I have since come to realize that until we truly do understand the phenomena behind much of what we already know – our ability for true progress is largely arrested. These are among the criteria that we desperately need to get a handle on if we are to get ourselves back on track and moving forward again.

One last comment, lest my position be misunderstood. Mathematics is extremely important and absolutely must not be discarded! It has provided us with a lot that was not available before it became as well developed and extensively used as it is today. The only reason that I feel that I can dare to approach the topics that I am, without a heavy dose of mathematics, is because the mathematics for all of these topics is already rather well developed and verified. The problem is that in our unmitigated glee over all that mathematics has brought to us, we seem to have also lost sight of the fact that there must be an additional adjunct of what I refer to as phenomenoscience, or we eventually and progressively drift away from the critical understandings of why the mathematics work so well. As we do, eventually we find ourselves drifting well off track, unaware that we are doing so, and saddled progressively with a growing number of paradoxes, conundrums, and irrational concepts, while we are also making less progress (despite our more advanced mathematics and technology) because we don't have the deep understanding that we need to help lead our thinking.

Phenomenoscience is an adjunct to our mathematics and experimentation, not a replacement for any of the other tools that we already have. The only reason that we can do as well as we have, is because there is already so very much mathematics out there for us to draw upon for better understanding in our phenomenoscience-related efforts. Much of what we have today to draw upon was not available 100 years ago, thus even the most careful and thorough practice of phenomenoscience back then may not have been able to have produced the same level of understanding as is possible today. In short, now appears to be a very good time to bring in this excellent tool, when there is sufficient background to enable its use in a most effective manner. We have already progressed beyond the capability of our standard bag of tools to lead us to where we need to go. If we hope to be able to progress significantly further, we need to augment our bag of tools with some careful and earnest phenomenoscience. Shall we proceed?

Phenomenoscience

Phenomenoscience involves a concerted effort to understand the specific real world physical "hows" and "whys" behind the various and sundry phenomena in Reality. While the basic principles in Reality have always turned out to be rather simple, straightforward, and logical, the plethora of interactions that are ever-present in Reality turns the overall picture into a highly complex and interactive one. One of the favored practices in tackling complex problems is to separate out one area of consideration and then another – all in an effort to seek to simplify the picture so as to make it more easily comprehendible. While such an approach can sometimes work quite effectively and efficiently, it can also carry with it some well-hidden traps. Those hidden traps have caught us unawares many times in the past. Errors in conceptualization arising from insufficiently careful endeavors have sometimes set science back for centuries and even millennia. It is therefore no wonder that many have sought to focus more heavily on the use other tools such as experimentation and mathematics, largely in a well-meaning effort to avoid those past pitfalls.

The problem with such an approach is that getting the concepts correct and then applying them properly is an absolutely essential requirement for us to get and then stay on-track with the truth of Reality. It absolutely cannot be ignored! If we do not keep our conceptual understanding firmly rooted in Reality, it is an absolute

guarantee that we will eventually veer off-track from the truth. That is, unfortunately, where physics and, as a direct result, much else in science as well, are today. The extremely careful practice of phenomenoscience is the approach that can help us to rectify the current problem and then keep more closely on track with the truth in the future. However, phenomenoscience is not based on as orderly of a set of rules and patters as mathematics is. Thus, it is also not easily taught. In order to avoid the hidden traps that we mentioned earlier, it also needs to focus on the various phenomena and interactions in Reality in all of their complexity to avoid missing some subtle, yet critical clues as to what is truly going on. Thus, phenomenoscience is a highly complex practice to get right.

I have been striving to provide something to think about while still keeping my comments reasonably succinct. I will not even pretend to try to cover a reasonably complete description of all that phenomenoscience entails in this treatise. All that I will strive to do herein is to cover some of the more pertinent points. Of necessity, I will have to leave a great deal of the more extended background out. Forging ahead and summarizing briefly – there are three critical phases to proper phenomenoscience that must be a part of any efforts to try to resolve the problems before us. They are:

1) Carefully review everything that we "think" that we already know to verify which of the laws and principles that are commonly taught are actually valid.

   It is a very sad fact that there is a great deal of what is currently taught as "good" physics and science that is not actually properly supported and verified. There are a great many assumptions as well as outright "wishful" thinking that are scattered throughout. This step (which is a very involved and time-consuming one) is absolutely essential for ensuring that we are building on as solid of a foundation as we possibly can manage (rather than on a house of cards).

2) Next, using the very best knowledge available, use what it appears clear that we actually do know to try to discern clues of what possibly we might need to consider.

   This step simply recognizes that Reality can often provide us with clues of what to consider, based – you guessed it – on what we truly already know. It is also meant to keep us thinking within realistic bounds as we seek to consider a range of possibilities, all in a very specific effort to avoid going off into the "brush".

3) Constantly check, re-check, and double-check, everything, all along the way in a very assiduous effort to keep from going off track.

   This verification effort is an absolutely essential part of ALL aspects of phenomenoscience. Even though the process of reviewing all that we think that we "know" in the first phase can be a rather extensive and involved effort, this phase of repeatedly checking and cross-checking can actually be rather substantially more involved than the first phase. It is in essence a critical part of the definition of phenomenoscience. If such an effort is not included, it cannot properly be called phenomenoscience – it is something else. The whole purpose of phenomenoscience is to get to the truth while simultaneously making every possible effort to avoid getting off-track from the truth. Such is simply not possible without a very persistent series of crosschecks with all that we know of Reality. This is a highly recursive effort, for <u>any</u> paradoxes, conundrums or other problems that might be encountered are considered to be clear indications that something is either "wrong" or "missing" and it then becomes necessary to review as much as may be necessary until it somehow resolves itself. There are no safe shortcuts! That is one of the main reasons why it has literally taken me decades of careful end extensive effort to get to where I am now in my understanding.

Remember, I am only providing a very brief synopsis here. I would strongly suggest that if you want to understand phenomenoscience better that you also read the other discussions pertaining to phenomenoscience on the website. Just remember that even with all of that, the overall discussion is far from complete.

Phenomenoscience – Basic Axioms

Before I go on, let me summarize a few basic principles – axioms, if you will – that are foundation principles of phenomenoscience. These are just a few examples among those which need to be accepted and understood very well before we will ever be able to get to where we can properly understand Reality. They are:

1) All substance requires volume – no exceptions. It is simply not possible to put something into "nothing".

2) If something has no real substance (such as, for example, "time"), it can neither act, nor be acted upon. This particular principle has proven to be key to some very significant and useful insights into understanding Reality. Conversely, this also means that ANYTHING that can act, or be acted upon, absolutely MUST have some sort of substance to it.

3) We cannot draw something out of nothing, neither can we relegate something into "nothing". This is the basic underlying principle behind conservation. This would in turn indicate that anything that has substance MUST be conserved. In turn, it would also mean that anything that exists today has always existed – at least, in some form or another – and, that they will always exist.

These are principles whose rationality should presumably be rather clear.

Chapter 2

A Few Basic Observations from Phenomenoscience

The purpose of this chapter is to provide some summary insights that have arisen out of phenomenoscience. It is a smattering of concepts only, far from comprehensive. Moreover, what is presented here is only summaries of the ideas involved, for a reasonably complete discussion would require too much volume for this treatise.

In essence, this chapter consists of a variety of topics that cover a number of points that have arisen out of some of my efforts. While it could well seem that some of these topics are somewhat random – they actually do have varying degrees of applicability to some of the topics that we will be covering later. In any case, they do provide some potentially useful background, while also providing a smattering of examples of some of the kinds of insight that can arise out of careful phenomenoscience.

General – Net Effects

This first point is one that provides very significant insight into what we can and cannot expect to be able to measure or discern in our experimentation and measurements. It is also one that greatly helps in our efforts to understand the correlation between what we "see" and what is really going on in Reality. It is something that I have not really seen discussed anywhere else, but it is one that has a tremendous impact on our capability to comprehend many of the true possibilities of Reality. It is one that we absolutely cannot afford to ignore. If we ever truly hope to comprehend what is going on all around us, it is critical that we comprehend and fully understand that:

> Just because there may be something out "there" does not necessarily mean that we can detect or sense its presence – even if it may be composed of a type of substance that we can normally detect.

I will use a rather simplistic example to see if I can better illustrate my point before I go on. Our bodies, as well as everything else that we touch, are chock-full of countless electrons and protons. In addition, since those charged particles are always moving, there are a myriad of magnetic fields as well. However, with an almost equal number of protons and electrons, most of their electrical charge fields are balanced out in such a manner that we do not really notice that they are even there. Similarly, the associated magnetic fields are generally quite randomly oriented, so their overall effects are likewise mutually cancelling. If we were to use some sort of instrument to try to measure either the overall electrical or magnetic fields associated with our bodies or most objects, the results that we would be able to measure would be very small – essentially non-existent – when compared to the extremely high number of particles and fields that are actually there. When we set out to turn a piece of iron into a magnet, for example, all we are really doing is to work it in a magnetic field in such a manner as to cause a significant number of the pre-existing, but randomly oriented, microscopic magnetic fields to align. Once we do so, we can then measure a significant external manifestation of a magnetic field. Nonetheless, even then, it is generally quite significantly less than the full measure of what all of the combined magnetic fields that actually reside in the iron bar would be if they were <u>all</u> aligned.

The point that we are striving to illustrate is that: all that we can ever detect, even when we are looking at phenomena that we can readily discern and detect, are the <u>NET</u> differences arising from whatever imbalances may happen to exist at any given location and "time". We <u>NEVER</u> actually measure the total or absolute quantity or influence of all that is there. What this means is that even where we may think that there is "nothing", there could actually be a rather substantial amount of otherwise discernible types of substances which, since they are somehow balanced out, or otherwise distributed in some sort of nondescript manner, we would not even be able to tell that they are there. Moreover, there could also be some other types of substances that we are not yet even capable of detecting directly (neutrinos are an excellent example – for even though we have figured out how to discern certain types of interactions where they "must" have been involved, we cannot actually detect them themselves). Any such undetectable types of substances would only add to the total quantity of total substances

in an indiscernible fashion. [Please – I am not really referring to such ideas as "dark matter" here, so please do not confuse it with such. That would be a completely different discussion.]

Once again, repeating here for clarity – we never actually measure or detect the total quantities or effects of whatever substance that may be in any given location at any given time. We only measure some variable and indefinably sized fraction of whatever total combination of substances may actually be there. That may not be the way that many in physics and science would like it to be. (There appear to be many who want to believe that if it exists we should be able to detect it, or, conversely – if we cannot detect or measure it, we cannot consider that it is truly real, or that such would be a valid part of "science". That could be a rather limiting perspective since, for example, we have not ever really even measured "time"! Which topic we will be covering briefly next.) Even so, we do need to realize that such is the way that it is, and there is nothing that we will ever be able to do to change that significantly.

Time

Time is a very excellent example of a phenomenon or parameter where the extra enlightenment and understanding that can come out of phenomenoscience can lead to some rather significant insight and comprehension. "Time" is certainly a critical parameter that we encounter quite regularly in a wide range of phenomena and interactions. Indeed, there is hardly any interaction or experiment that does not somehow involve time. However, even though we use it regularly and extensively, there seem to be very few who realize that we have never, ever actually measured time. This goes back to the axiom that:

"If something has no real substance, it can neither act, nor be acted upon."

Despite the existence of theories that would imply to the contrary (such as Relativity), in reality, there is no actual evidence whatsoever that there is any sort of substance to what we call "time". If one were to take a very careful look at our systems for keeping time, it should become clear that we have never actually measured time, for we actually have no means for doing so; in truth, we only mark it. Think about it. We find some sort of reasonably consistent and/or predictable process (such as [going way back here] water dripping from a hole in a jug, the swinging of a pendulum or balance wheel, or the vibrations of a quartz crystal or of atoms) – and then we set a system up to count or tally intervals or cycles somehow. It actually works quite well (which is most fortunate since there are so very many processes out there for which good time keeping is critical), but we need to recognize that rather than actually "measuring" time, we are really only "marking" its passage. For most of the ways that we use time on our processes and evaluations, this works just fine and presents no real shortcoming. However, there are other situations and questions where such an understanding can have a significant impact on our thinking and comprehension of what is actually going on.

For example, there are those who have claimed that we have verified "time dilation" via several means. It is true that we have made evaluations or performed experiments wherein the numerical variations predicted by the equations of Relativity were in quantitative concert with the results of those efforts, even though they were based on very different phenomena. However, interpreting that data, and what it means, is an excellent example of why mathematics alone is clearly inadequate.

Let me see if I can help with a few pertinent details. One of the evaluations compared the half-lives of rapidly moving cosmic ray particles with data from equivalent, but relatively slow-moving, particles as evaluated in a more or less earthbound equivalent setting. The implicit assumption, especially since the calculated values that emerged were in concert with the equations associated with Relativity, was that if there was any difference, it could only be explained by a dilation of time as related to the far more rapidly moving cosmic ray particles. The other primary experiment was based on atomic clocks, where one was left on the ground and a second one was flown around for a while, and their timekeeping was compared. Once again, there was good numerical agreement with the equations of Relativity. It would certainly be true that if time could actually "dilate" at high speeds, the numerical results could be expected to come out as they did. However, that is not the only possible or "likely" explanation.

For perspective, let's draw on an example from chemistry. It is well known that if one were to change the temperature of the reactants in most chemical reactions, the rate of reaction will also be modified accordingly. With those chemical experiments, we know enough about what is happening that we can readily comprehend why – and it has nothing whatsoever to do with any changes in "time". The conditions have changed, and as a result, the reaction proceeds at a different rate. With all of our time-keeping systems, including those that were used to try to "verify" time dilation, there is a very tacit, yet completely unsupported or verified, assumption that the actual cycles or processes upon which our time-keeping is based are somehow insensitive to, or unaffected by, velocity changes. Now, even based on our lack of knowledge of how some of those phenomena actually work or might be affected by high velocity (think "relativistic" types of effects here), it would actually be rather unreasonable to assume that the cycle rates associated with whatever timekeeping system that we may be using wouldn't be affected. Whether it was because "time" actually "dilated" or from some other effect upon the cycle rates or other features of the timekeeping system, the numerical outcome would be the same, for numbers are insensitive to the nature of their source.

The bottom line is that so long as we are only marking time, and not actually measuring it, we cannot discern experimentally or by analysis between the effects of a "change" in the actual rate of "time" passage and a corresponding, numerically equivalent, change in the cycle rate or other variation in our timekeeping systems.

When I am able to get around to the ramifications of the Theory of Field Interaction on Relativity, as well as particles and such (that will take a bit more background before we will be prepared to cover that topic herein), I will show that any presumption that we have somehow demonstrated that time is actually changing is simply not valid. I maintain that "time" is, indeed, a very important parameter, but there is no form or substance to it, therefore it can neither act nor be acted upon. All of the "acting" and "being acted upon" in both the phenomena that we see, as well as in our timekeeping systems, are actually a result of interactions occurring between factors or influences that do consist of substance of some form or another. Such critical understandings as this can only come out of careful phenomenoscience.

Momentum vs Mass

Next we will go into some details pertaining to another topic that does not appear to be commonly understood, even though it is another phenomenon whose details are figuratively right there in front of our eyes. I am referring here to whether or not we can actually measure the "mass" of something that is moving at a significant velocity relative to us as we attempt to do so. [I am using the term "significant velocity" since there are limited cases, such as a large truck driving slowly across a scale, where we actually have learned to maintain sufficient stability to measure their true mass while they are still moving – even if only doing so rather slowly – across a rather robust scale.] Of particular interest to our discussion here, is the case of particles moving at extreme velocities – sometimes even approaching the speed of light.

The simple fact is that we have NEVER actually measured the mass of such a particle at such speeds, nor do we have any means of doing so – what we actually do is measure their momentum. (We typically do this either by measuring how much force it takes to turn the object [as in the circular track of a particle accelerator or while it passes through some sort of field – as with a charged particle travelling through an oscillating magnetic field], or we measure the "oomph" that the moving mass delivers when we stop it somehow.) Once we have a value for its momentum, that value for the momentum is then used to calculate the presumed mass of the object using the well-established classical relation for momentum from Newton's second law of motion:

$$p = m * v \qquad (2\text{-}1)$$

Where:

p = momentum
m = mass
v = the velocity of the particle

In doing so, there is, once again, an implicit assumption that this particular relation is ALWAYS valid, regardless of the velocity. Now, as I was originally taught – and also long accepted that it was valid (since I saw no reason to believe otherwise) momentum is considered to be the simple mathematical description of a state of being. This, in essence, means that the "oomph" associated with the condition of any object with mass, moving at any velocity, is a direct, physical result only of the amount of mass that is there, and how fast that it happens to be going. If, indeed, the description that was just given was a correct, accurate, and full description of the whys and hows behind this particular phenomenon, then it would be very reasonable to presume that it would be correct that the classical relation given above would always apply, without modification, regardless of the velocity of the object of interest at any given time.

If , indeed, such were to truly prove to be the case, the act of measuring the momentum of any object with mass would then, in effect and as assumed, truly be equivalent to actually measuring its mass directly. (Although such a case would still not be able to explain how a photon, which has no mass, could also carry momentum.) Now, while I am not ready to go into all of the details behind it yet (since there are some other areas that need to be covered first), I will state this: I believe that there is significantly more to momentum than what is embodied in the above description. (Indeed, this is a major element of the Theory of Field Interaction – one that has provided a great deal of insight into a variety of phenomena, especially those that are heavily beset with paradoxes and conundrums.) The bottom line result of that more complete picture is the understanding that, while the above relation essentially holds for all classical conditions of motion, it is not actually valid – as is – for all conditions, particularly for those approaching the speed of light. This is where we can potentially begin to get some significantly new insight regarding Relativity and what it really and truly means.

As a start (for now) – what has really been confirmed in all of the experiments? All verifications of Relativity with respect to the measurements of moving particles have actually only been confirmations of the relationship with respect to momentum, not mass. In those experiments and evaluations, they have thoroughly confirmed that there is an unequivocal increase in the measured momentum of the test particles – well, well above the values that would be represented by equation 2-1, particularly as they approach the speed of light. The measured values have been in good concert with the equation:

$$p = \Upsilon * m * v \qquad (2\text{-}1)$$

Where:

$\Upsilon = c / (c^2 - v^2)^{1/2}$

c = the speed of light

v = the velocity of the particle

The variable Υ is what is commonly referred to as the Lorentz transformation. This terminology makes good sense when used with the current Theory of Relativity, which essentially treats the entire relativity business as a complex metrology problem (where what we "see" or perceive is essentially interpreted as a result of measurement "artifacts" cause by the extremely high relative velocities), which requires a "transformation" to our frame of reference. I personally prefer to not use such terms for such generalized factors, where the terminology carries with it implications that are specifically tied to one particular theory. I therefore choose to refer to the variable Υ as the "Lorentz Relativity Factor", which does still identify its close association with relativistic effects, but does not imply any specific theory. (That is, other than the fact that it does apply to what are often referred to as "relativistic" speeds. Where, since such speeds are very specifically tied [in the equation for Υ] to the speed of something "relative" to the speed of light, the term ‘’relativistic" is actually generically pertinent and not necessarily tied to the Theory of Relativity only.) Another one of my primary reasons for preferring to use an alternate term is that I believe that the accepted interpretation of this effect, i.e. of it's being a direct result of measurement "effects" (and thus, a "transformation"), is actually incorrect.

At this point in our discussion, I do not believe that I have been able to present enough background yet to provide a more detailed explanation of the detailed "why" behind my next statement, though I do hope to be able to get to that sometime later. Instead, what I will present for your consideration is the conclusion that the relativistic

effects represented by the Lorentz Relativity Factor, Υ, actually should only be properly applied to the momentum (and not to time, distance, and mass separately). The way that I prefer to express this is that the "root" variables (as related to the actual "hows" and "whys" of what is actually happening in Reality) associated with Relativity are actually momentum and relative velocity – NOT time, distance, and mass.

Root Variables

Let me explain what I mean by "root" variables.

I use the term "root" variable to refer to whatever variable(s) actually reflect the proper basis for some given interaction in Reality. In mathematics, we are carefully taught to always reduce some given problem to its simplest terms, particularly when we may not know yet the details of what the equations and values in question really represent in Reality. This generally works rather well; however, there are some cases where those "simplest" terms are NOT the proper terms to represent what is actually happening in Reality. Particularly when such is the case, I refer to the terms that actually properly represent the variables that are truly germane to the physical phenomenon as the "root" variables. Relativity, I maintain, is an excellent example of where the blind breakdown of units to their "simplest", most basic terms (as a result of ignorance of a reasonably full and proper understanding of all of the details of how and why the phenomenon actually works as it does) can become highly misleading in trying to figure out what is actually happening in Reality.

Relative velocity has the exact same units as velocity, which units are distance and time. Both of these particular variables are reflected in the Lorentz Relativity Factor, Υ. Momentum has the units of mass and velocity, where again, velocity breaks down further to the units of distance and time. Thus, if what I claim are the true "root" variables of momentum and relative velocity were to be broken down to their "simplest" terms, the irreducible units that would emerge would indeed be time, distance and mass. These are, of course, the units that are reflected in the currently accepted explanation embodied in the Theory of Relativity.

Yet if, on the other hand, as I have stated, the actual root variables for relativity are actually momentum and relative velocity, then breaking the equations of relativity down to their simplest terms, as was done in the Theory of Relativity, could become extremely misleading and throw the thinking on the matter well off-track from the truth of Reality. I am proposing that this is exactly what happened.

I feel that providing a more complete explanation of what I believe the actual relevant phenomenon is would be a bit premature at this time; however, I would like to note that this insight did NOT come simply from studying the mathematics (although it was very important that it was in total concert with the numerical results). It came instead from a rather involved evaluation based on careful phenomenoscience that suggested a significantly different explanation for momentum, and subsequently for the structure of the photon and particles than is currently conceived. I will try to get to a description of these alternative concepts just as soon as I can.

Repeating – I maintain that the correct and proper root variables for relativity are actually momentum and relativity, NOT time, distance, and mass. Moreover, I also maintain that applying the Lorentz Relativity Factor, Υ, directly to the units of time, distance, and mass constituted a rather significant error of ignorance that has subsequently thrown much of our understanding of Reality well off-track from the truth. Once we have been able to lay enough of a foundation, I will get back to explaining more of what I believe is actually happening, but that will have to be enough for the time being.

Note here that I am not referring in any way to any reasons for concern with respect to the methods that we use to discern what the momentum is, nor am I referring to any sort of "relativistic modifications to Newton's laws of motion" either. Cyclotrons, for example, are but one of the means that we have of discerning the momentum of a rapidly moving particle, although that is a rather good one, where the relationships between the known strength of the fields and the charge on a particle have been amply confirmed across a very wide range of conditions. It is a relationship where we can have very high confidence of its validity. Another general technique is to let that

particle collide with something to determine the momentum – which can be either known free particles or atoms (as in Compton scattering, for example), or other suitably sensitive techniques. With the variety of techniques and the consistent results across the board, I do not believe that there is any valid reason to question our ability to get a very good and fully valid reading on the momentum.

The key understanding – and it is a very significant, though generally overlooked one – is that all that we can actually discern from those techniques is the momentum – NOT the actual mass. The derivation of the mass from such measurements is ultimately based on an unverified assumption – one that, for reasons that I have not yet been able to address fully, I sincerely believe is incorrect. I have tried to indicate that, based on the conceptual background that I was originally taught, it would not be an illogical assumption – so I can well understand why it has not been challenged more than it has. I am not seeking to criticize the way that things are and have developed thus far, I am only striving to highlight that this is an area that warrants a closer look.

I suppose that this is one of the reasons why I am concerned about trying to say too much without adequate background to support some of those statements. Reality is highly integrated and interactive, so it can be rather challenging to figure out how to present the background concepts without introducing too much about other interrelated topics for which there has not been adequate background presented yet. The focus at the moment in this discussion is specifically on relativity as an example of what can happen when we do not properly understand momentum and mass and what we really have and have not measured. That is specifically because a proper understanding of the principles associated with those phenomena has a rather significant bearing on the problems associated with the Theory of Relativity.. From all that I have seen, the actual cause for those problems goes back further than even I would have originally supposed, but I do not want to get to the "punch line" before I first cover some other salient points. Whether or not they will seem salient to someone else, I don't know; but I personally feel that they are. In the next chapter, I will be working on getting back to this particular point through a different line of reasoning, one that is closer to the one that originally led me to the understanding that I now have. I would certainly rather work on that than get all wrapped around the axle on momentum measurement techniques that, by all that I have seen as well as the very best phenomenoscience that I can muster, are rather well substantiated and verified.

Basics - Conservation

As related to the conservation of mass and energy, my position is very basic and simple – anything that has actual substance is always conserved! There are no exceptions. This is not so much something that needs to be proved, as it is something that needs to be recognized and accepted as one of the basic tenets of phenomenoscience. It kind of gets back to the basic question of getting something out of nothing, or conversely, having something turn into nothing. Moreover, nowhere in physics or science have I ever seen any valid evidence to the contrary. In addition, there has been a great deal of good valid evidence to support it as well.

There have been, of course, a variety of different individuals over the years who have proposed a number of very creative schemes that involved the spontaneous "creation" or "obliteration" of a variety of substances, for a whole range of reasons. However, I, for one, have yet to see a single one of them that appeared to have any real merit whatsoever.

What Constitutes Adequately Valid "Proof"?

There is one basic concept that we need to both recognize and ultimately accept. That is the realization that it is extremely probable that there are bound to be some ideas and concepts in physics and science that we will never actually be able to truly "prove", just as (as we have already noted) there are also some parameters and such that we will likely never really be able to even measure as well. True "proof" is nice indeed – at least, when we can find it. It is certainly worthwhile to seek to find such whenever we can. However, it would still also be most, most foolhardy to reject anything and everything that, despite all of our best efforts, may turn out not to actually be "provable". There are many widely accepted aspects of physics and science today, which, even though they are correct – at least, as near as we can tell – have never actually been proven to be so. In such cases, the more

corroboration that we can find, the more logical and consistent that they may prove to be, then the more confidence that we can have that they are at least approaching the truth of Reality. That, in a nutshell, is perhaps one of the most challenging aspects of physics and science.

While it may be a challenge in a variety of ways, there are no truly good reasons to back away from doing all that we can to understand how Reality really and truly works! There is ample evidence to support the position that the better that we can come to understand how everything really does work, then the more value that we can expect to, at least eventually, be able to gain there-from. I sincerely believe that as we continue to strive to do our best, that we will slowly be able to get ever closer to the truth, so long as we do not allow ourselves to get too badly sidetracked (as much of so-called "modern" physics currently is today).

Along the same line, without proper and careful verification with what we truly do actually know, attempts at the evaluations of concepts, such as are made in phenomenoscience, would be totally forfeit and ultimately fruitless. There have been far too many less-than-careful inaccurate or even outright incorrect conclusions adopted as "valid" principles in physics and science today. As a result, a rather major, and absolutely critical, portion of phenomenoscience is, of necessity, related to the very careful evaluation and verification of that which we truly do know (at least, to the best of our ability to discern such). If someone might ever happen to foolishly pursue conceptual investigations and evaluations without bothering to constantly verify them against what we truly already do actually know, it isn't phenomenoscience.

Fields

This is a topic that has a rather lot of history behind it. Sir Isaac Newton did some excellent work in which the existence of forces such as gravity were clearly indicated. Yet, he was also careful to steer clear of trying to settle on how they actually worked. Many have shied away from one of the most seemingly evident explanations – "action-at-a-distance" – typically for very good reasons. Unfortunately, there does not appear to be, as yet, any truly acceptable or rational alternatives out there either. That is a problem, and underscores Newton's wisdom in not trying to address the answer definitively (one could presume that he recognized that he did not really have any suitable answers either).

There have been some rather creative attempts to come up with a reasonably viable alternative. Virtual particles, and their being proposed as the carriers of forces are but one example. Despite the fact that that particular concept appears to have been adopted by at least many in the mainstream as the preferred concept, if one truly believes that you cannot expect to get "something" out of "nothing" – it quickly becomes highly apparent that that particular concept starts out with a fatal flaw.

It is not enough just to criticize any ideas or concepts that we may not agree with or accept. Unless we can somehow find a reasonable alternative, we have no right to complain, regardless of how irrational we may believe some of those alternative ideas and concepts may be. Can phenomenoscience possibly help us on this matter? I would like to review here some of the relevant ideas that have emerged out of phenomenoscience, though there will be some aspects that will need to wait to later, after we have had a chance to cover some additional concepts.

Given the stated axiom that something must actually have substance or it can neither act nor be acted upon, the only conclusion, therefore, that makes any sense from a phenomenoscience perspective is that:

Fields absolutely MUST have substance!

Put another way – there must be something to them; they are not really and truly "empty" space – nor, therefore, are we looking truly at any sort of action-at-a-distance. Now, if such is truly the case, then a highly critical aspect of our critical task becomes the challenge of figuring out what is there, and how does it work? One critical and readily available clue is that, with all that we have ever seen, unless they are artificially disrupted somehow, they also generally have a very evidently continuously varying strength. That would tend to indicate that they are also

continuous (and not "chunky" or quantized). Please do not confuse what I am saying with such items as photons, which are generally thought to be nothing more than electromagnetic fields, and which generally are most often seen as large collections of quantized photons. There is really more to that picture – we will need to get back to them later. No. here we are referring to such fields as electrical charge fields, gravitational fields, and magnetic fields. What we are saying is that they are continuous, but all that we can really see of them are the unbalanced quotients (the "net effects" that we spoke of earlier). They are not empty space, but they have some sort of substance that must fill every nook and cranny of whatever volume that their influence can be discerned within – so there is no action-at-a-distance – it is ALL local. This means that anywhere any influence is felt from that field; it is only a response to whatever the unbalanced characteristics of that field at that particular location may already happen to be. The measureable field characteristics are just a reflection of imbalances or distortions that are already there, at every location in that field, because of influences that have propagated to each location, ultimately because of the influences that trace their cause or origin back to the source of that field. (We will try to cover that point a bit more at a later time.)

Remember – we only see the differences or unbalanced portions of whatever total field may actually be there – we do not, nor will we likely ever will be able to, see the true magnitude of whatever fields or field factors or components may be there. The best example of this that I know of, that should be easy to relate to and reasonably comprehensible to most everyone, are the charges in the body. With all that composes our bodies, there are quite literally countless charged particles, primarily protons and electrons – yet, the total sensible or measurable charge (even on a dry day that tends to yield a great deal of static) is relatively minuscule. That is because most of the positive charges are balanced by an equal number of negative charges. All that we can really sense, or measure either, are the excess charges of either polarity that may be present at any given time.

The example that we just used actually refers to particles, but the same would also apply equally well to whatever field factors might be "out there" – except that we would expect that the distribution of the field factors is continuous rather than quantized. The point that we are striving to make and illustrate is that there appears to be much that we cannot "see" – meaning detect or measure – even though it is posited that there is actually something that is there (meaning filling all of the volume everywhere). In other words, even "empty" space is not nearly as empty as we seem to feel and perceive that it is. Where such substance is not even particulate (meaning quantized in some manner), it becomes even more difficult to truly discern that there is any sort of substance there at all. As a result, it is not at all surprising that such may not have been widely recognized in the past.

Fields are real – but the fields that we are used to seeing are not quantized. The composite "unseen", well-balanced background, which is expected to be composed of additional field factors (for the lack of a better term), would also be expected to be continuous rather than quantized. Thus, this would be expected to be at least a major component of what I have referred to as the "Quessence" (or the "quiescent sea of essence"), which we will get back to in much more detail in Chapter 4. Since everything in it is largely balanced out (except for whatever sensible levels of "fields" may happen to be present), the undisturbed (or quiescent part of the) Quessence does not exert any force upon anything. It is not needed to provide the sort of "medium" for the transmission of the electromagnetic wave fields, as was supposed for the "Aether" concept. I do not believe that such would be needed, but for reasons that I will get to later. Nonetheless, it is a presence that would need to be accommodated (which we will also get to later); and it also provides a very specific (not just "preferred", but very, very significant and real) frame of reference for all of the particles and quanta passing through it everywhere.

I want to take a moment now to cover an important point about fields – this is one that is perhaps more of an observation, but it is something that I have not seen addressed anywhere else before. Nonetheless, it is one that I believe is rather significant and that will make some of the correlations that we will be making later more clear. The heart of it is that is there are two rather generic field types that fit all of those fields with which we are familiar. The generic field forms should be quite familiar, but it is the significance in those differences that has been suggested by phenomenoscience that I believe needs to be addressed.

The first general field type is well exemplified by gravity and charge fields, where the "lines of force", that we typically use to diagram them with, all radiate out from the source body and never return. Because the ends of those field lines are unconnected at their extremities, I like to refer to them generically, from the perspective of form, as "open" fields. The second general field type is exemplified by the magnetic field, where the lines of force, with which we typically diagram them with, always all form closed loops, regardless of how convoluted those lines of force may become in some systems. Because the ends of those field lines always connect back to themselves and do not have any unconnected extremities, I like to refer to them generically, again from the perspective of form, as "closed" fields. I will use those more generic designations to refer to the different general field types where appropriate in our discussions.

Now for some further observations on the apparent nature of open and closed fields that will help to provide some insight to consider and also prove helpful as we get to some additional points later. Open fields, such as charge and gravity, are associated with particles, which have a very consistent tendency to resist motion to varying degrees, depending specifically on how much substance with which they may happen to be associated. In distinct contrast with the closed fields that we will get back to in a moment, they very specifically tend to remain more stationary or static. Moreover, I have gradually come to realize that those characteristics appear to be specifically and directly associated with the fields themselves (that is something that we will have to cover in more detail later) – I have therefore learned to think of them (more or less functionally) as "static" fields. This was something that took me some time to realize, since particles (which have always been treated more or less analogously like "billiard balls) themselves are always moving, while the larger masses with which we are most familiar make inertial seem quite natural. We will be able to support this more as well, as we continue on in some of our future discussions.

Closed fields, on the other hand, as it turns out, are actually persistently associated with motion. This may not seem very obvious since our prime example, the magnetic field, is most often associated with largely stationary magnets. In such systems as bar magnets, the magnetic field is actually the result of the alignment of a significant fraction of the magnetic fields associated with the constituent atoms in the material, so the associated motion is largely hidden – but it is there nonetheless. The other primary source of magnetic fields that we are generally familiar with are generated by electromagnets, where the associated motion is manifest by the electrons in the wire coils of the electromagnet – again, this is not really discernible to the naked eye or our other senses. The critical association here is that charged particles can NEVER move anywhere, in any way, without there being an accompanying magnetic field. Conversely, there is not a single known case of where there is a magnetic field without an associated flow of charged particles. Magnetic fields and moving charges are intimately connected; there is very obviously a very significant correlation between them. We will come back to this more later as well.

One more point for the moment on open/static fields and closed/dynamic fields. If we use the conventional lines of force diagrams as a visual indicator, it can be seen that a static field requires a defined center. When one thinks about it carefully, there needs to be something to define its center and hold it all together. The concept of a particle as being somewhat like a very small billiard ball would seem to fill this role quite nicely, but that depends greatly on what the composition of a particle truly consists of. This is another one of those detail points that in phenomenoscience can become an open question, as well as a possible clue. There really is more to that idea than just the way that we happen to diagram it, but that will need to do for now. Just keep in mind that they have a rather concentrated central concentration of some sort, and diminish with distance from that center.

Once again, in very distinct contrast, because dynamic fields have lines of force that ALWAYS close back on themselves to form a closed loop – and once again, there is a real, discernible physical corollary to that, it is not just a matter of how we diagram them – they are inherently capable of defining their own centers. Thus, conceptually at least, they have the very real potential of being self-stabilizing.

There is really much more that could be said, but there are other points that need to be covered first, so I will not add any more backup to those points here. Please, just think about it and see if you can understand those points. Because dynamic fields have the inherent potential to be self-stabilizing, they can conceptually exist in

isolation – by themselves, and we will get back to that more later. On the other hand, if static fields cannot be stabilized all by themselves – then they must always be associated with a dynamic field or other stabilizing influence of some sort, or they would immediately destabilize and dissipate. I do have more to support that, but what we are striving to do here is to introduce some of the observations that underlie the basic precepts of the theory of Field Interaction.

Chapter 3

Getting Started with the Theory of Field Interaction

I do not know of any better way to introduce some of the most central concepts of the Theory of Field Interaction than to approach it with an overview discussion of some of the very same ideas and clues that led me to those ideas initially. At the time, they seemed to be an enormous leap of faith, for they introduced some possibilities that were unlike anything that I had seen or heard of before. However, over the intervening years and decades, as I have sought to check them out against a wide range of other physics concepts, they have persistently produced ever-greater insights and understanding. As a result, I have gradually come to recognize in them some of the most consistent and coherent conceptual pictures, for what are happening out in Reality, that I have seen anywhere. So, let's get started.

Electrical – Mechanical Analogy

The original kernel of insight for this idea actually came out of the back of one of my physics textbooks at the university. It was a simple and straightforward presentation that showed that all of the basic equations of motion had direct corollaries in the electromagnetic equations – where the equations were essentially identical, but with different variables and constants. It was rather interesting, but at the time, it did not provide any particular enlightenment other than the fact that they were indeed very similar and parallel with each other. Subsequent to that time, there was one particular set of correlations that kept coming up at different times and in different ways and contexts, but still it did not lead me to any significant bit of insight. I will briefly review that particular set of concepts next.

With matter, we have the concepts of momentum and inertia. They are both actually the subject of several of Newton's laws of motion – where any moving object always carries momentum, and all objects will tend to maintain whatever state of motion that they may happen to be in. To change their state of motion, we must exert some sort of force or influence (such as a motive force to get it moving, or friction to help bring it to a halt). When it is moving, we say that it has momentum. The commonly accepted, presumed nature of what the phenomenological cause of what momentum actually arises from – is essentially derived from its equation:

$$p = m * v \qquad (3\text{-}1)$$

Where:

p = momentum
m = mass
v = the velocity of the particle

Essentially, in every discussion that I have ever seen, momentum is simply taken to be a result of the state of motion of the mass, nothing more, and nothing less. Now, this has raised some questions regarding the fact that a massless photon also exhibits momentum (those are questions that I do not believe that I have ever seen adequately answered in the mainstream – but we will get back to that later), nevertheless, that has been the total explanation of the source of the phenomenon. With the inadequately explained exception of the photon, it does have the favorable feature that it is not really counter-intuitive in any way when dealing with matter, so it is generally considered to be quite satisfactory. Even though it originally took me a little while to get my mind around the meaning and significance of inertia and momentum when I first learned about them as a young boy, I did not have any reason to question them and I, too, was also quite satisfied with that explanation.

As a result of, and in line with, those characteristics, if a particle or object is at rest, it tends to stay at rest. If some sort of force is applied, it will begin to speed up gradually in a highly predictable and consistent manner, with a very consistent relationship between the force that is applied and the rate at which it accelerates. Similarly, once it gets going, if the force is removed, it will keep going at a constant velocity so long as there are no other forces

(such as friction) acting upon it. Finally, if we want to slow it down, we must exert an opposing force of some sort upon it and it will then decelerate in a very consistent manner, similar to the acceleration that it took to get it going. That is how matter and the laws of motion work.

I have only ever seen one other system that essentially operates in a manner that is fully equivalent – that other system is well exemplified by the flow of electrons through a wire, and is particularly noticeable when there is a magnetic coil in the system. [Note: the effect is always there, whether there is a coil in the system or not, but the presence of the coil simply amplifies the effect so that it is significantly more noticeable and easier to quantify and measure.] Let's take a quick look at how that system works.

If one were to take an open circuit with a coil in it, the overall (net) motion of the electrons in the wire is zero, and there is no current. That state is directly analogous to a stationary particle or mass. If the ends of that circuit are then connected to a DC voltage source, initially (over some relatively short period of time), there will be no change in the motion of the electrons in the wire. However, the constant voltage of that source will immediately begin to exert a motivating force upon the electrons, one that is very similar to exerting a force on a mass in order to get it to move. As a result, the electrons will begin to accelerate and move in a coordinated fashion, and the current will build within the wire until the total current flow is consistent with the balanced influences of whatever energy level may be provided by the voltage potential in the voltage source and whatever other impeding (resistive) influences may exist in the circuit.

Once the current reaches the level that correlates with the applied voltage and any resistances or other forms of impedance that may be in the circuit, the net accelerating force within the circuit goes to zero, and the current will continue to remain the same so long as the source of voltage is tied into the circuit. This condition corresponds to the constant (unaccelerated) state of a moving mass.

If the power source is then disconnected, the initial state of the current will momentarily remain unchanged and the electrons will continue to flow at the same rate. However, once the power source removed, the motive force on the electrons is no longer there, which, in an electrical circuit, is equivalent to applying a purely decelerating force (essentially provided by the resistances and other impedances that are in the circuit) to the motion of the electrons. The end result is that the net electron motion will begin to diminish, and the current will decrease until there is no more current flowing in the circuit. This is equivalent to bringing a moving mass to a halt.

All of his is basic electricity, and is well known and most amply documented. The main difference is that with the electrical circuit type of situation, we can discern WHY it acts as it does (although, I have found that those reasons "why" are rarely ever elaborated on in most of the discussions that I have ever seen, let alone in textbooks). Let's take a few moments to review those reasons "why" and the persistent phenomena that are directly correlated with them.

One of the most pervasive and prevalent characteristics in physics is that moving charges of any form are ALWAYS associated with an accompanying magnetic field. No one has EVER found one without the other – despite some rather elaborate wishful thinking and a whole lot of concerted effort, no one has ever been able to find and document any exceptions whatsoever. This was also well demonstrated in the above examples, in that the presence of a coil magnifies the observed effects (that is because the coil aligns, and thus, amplifies, the magnetic effects, and thus, in turn, the magnetic influences on the current). In concept, if one could find an electron or other charged particle that was perfectly stationary, in principle, it should be possible to find a charged particle without any associated magnetic field. However, while we can maintain large charge fields without net, externally discernible magnetic fields, at the submicroscopic particle level that is far easier said than done.

The first problem associated with demonstrating that a stationary charge would have no magnetic field is that on the submicroscopic scale of electrons and other charged particles, everything is essentially <u>always</u> moving to some degree or another. This, of course would mean that there would always be associated magnetic fields.

Now, before we go on, let's clarify a crucial point. We mentioned above that if one has an electric circuit, disconnects the power source, and allows it to drop to zero current, then the magnetic field about that circuit's wires would also drop to zero – well, sort of. In reality, while the overall magnetic field associated with the voltage-driven current may drop to zero, there would still be a variety of random electron motions within the wire, they would just be substantially reduced from what they had been (with an applied voltage), and they would now be moving in a wide variety of directions. Each and every one of those motions would still be accompanied by magnetic fields, however, because there would be such a wide variety of motions (and in so very many directions), they would essentially cancel out so that we cannot readily measure them, yet – they would still be there.

The second problem associated with demonstrating that a stationary charge would have no magnetic field is exemplified by the question: "Stationary relative to what?" For many practical purposes, the familiar frame of reference for us, and perhaps for things around us, is effectively stationary relative to the earth (as demonstrated by the Michelson-Morley experiment), and thus to our lab systems. However, we need to realize that, if there is some sort of frame of reference to which particles and forces may respond, it is not necessarily truly uniform or "stationary" and undisturbed relative to anything. The earth is moving through space. It is orbiting about the sun. The moon is orbiting about the earth. The other planets, as well as a wide variety of smaller bodies, are all orbiting about the sun. The sun is part of a very large system that we call a galaxy – and that galaxy is orbiting about its center. There are additional motions that continue out as far as we have been able to observe and document.

When we study the effects of the universe around us on the particles and photons that we strive to study, all that we can ever observe and quantify are the NET effects on them, because our only real feedback are their gross changes of motion and the observable interaction effects as they encounter one another. That is one of the primary reasons why even the presence of any sort of background or frame of reference (which I believe does exist, and have referred to as the Quessence – again, we will cover it in more detail in chapter 4) has been so very hard to discern and identify. In a similar fashion, it would be even more difficult for us ever to discern whatever the details of the relatively minor influences that the motions and orbits of the earth and all of the heavenly bodies might have on the very real distortions and changes and tweaks constantly occurring within even a seemingly "stationary" Quessence.

Thus it is that, even if we could somehow manage to bring something such as an electron to a standstill in a lab apparatus at absolute zero temperature – and thus, also "stationary" with respect to the main part of the local Quessence – there are still the motions of the earth, plus the sun and other Heavenly bodies (which are moving relative to the earth) that might need to be considered and potentially taken into account. Though it would be very difficult, if not impossible, to measure or prove one way or the other, those relative motions could very possibly create at least some level of ongoing disturbance changes within the local Quessence (which could be even less in evidence than the existence of the Quessence itself). As a consequence, whether or not we might be able to measure them, there would also be a very significant question as to whether there must therefore be at least some remnant level of magnetic field associated with that electron (or other charged particle) as a result of hidden disturbances propagating through the local Quessence.

Thus, in reality, it is essentially impossible to actually find any sort of charged particle that does not have an associated magnetic field. Even more significant however, even in principle, based on points that we will yet be covering, it is not possible to EVER find any sort of magnetic field without some sort of moving charge or charges associated with it. [I am fully aware that there have been some "theories" that have predicted the presence of such things as "magnetic monopoles" and such, but no one has ever been successful in finding one, nor will they – for such ideas are pure math-laden fantasy. They have been built up using extensive mathematics, with a whole range of hidden assumptions, to where the final results of the associated mathematics effectively have absolutely NO connection whatsoever with Reality. Perhaps, as I continue on, my reasons for being so very confident that such is the case will eventually become apparent and clear.]

The crucial question in all of this is: WHY is there such a close association between moving electrical charges and magnetic fields? As I approached this question from a careful and thorough phenomenoscience perspective, it eventually became clear to me that the magnetic field appears to function essentially as the driver for pushing (or pulling) the extended charge field disturbance through the Quessence. We have talked before about the differences between "static" and "dynamic" fields – where the static fields are like charge fields or gravity, with diverging "lines of force" and have an overall propensity to resist motion. That resistance to motion is presumably a result of the extended nature of the disturbances associated with the field, and the many minute changes that are associated with relocating it with respect to the Quessence. As a reminder, because of the "open" structure of their nature, they are also inherently incapable of stabilizing themselves – they need some other influence to do so. That is something that we will be addressing more in the near future.

The magnetic field is the most evident example of what I have referred to as a "dynamic" field. That designation is because they are ALWAYS associated with motion. I will simply state at this point that there are absolutely NO known exceptions to that statement. In the case of the magnetic field, the associated motion is that of whatever charge fields with which it may be associated. As we sought to describe earlier, if it were truly possible to bring some sort of charged particle to an absolute and total standstill – then by definition, based on the statements that we have just made, its associated magnetic field would have to disappear. I have personally come to the conclusion that the magnetic field MUST be present whenever any sort of charged particle or charge field is moved relative to the Quessence, because – as stated before – the magnetic field is required to be present to "pull" that charge field through the Quessence. If there is no magnetic field, then the charge field is effectively "stuck in place" by the hidden substance of the Quessence. However, it seems that once an associated magnetic field is created, it will act as a form of "tractor" that will inexorably pull that charge field through the Quessence. That is why the concept of an electromagnetic field is so very important – it is simply not realistically possible to find one (electro-) without the other (-magnetic), especially if there is any sort of associated motion. We have more that we would like to cover on electromagnetic fields, but there are other points that we will need to cover first, so we will have to come back to that at a later time.

Introduction to the Theory of Field Interaction

This next concept, when I first encountered it, largely as an outgrowth of some of the ideas that I have already covered, seemed like an extremely large leap of faith. Yet, if there were to be something basic that we might have been missing – some sort of critical key to a proper understanding of Reality – it would seem that it should be almost certain that it would have to be something that was far less than obvious, even though it might also be smack dab under our noses. I have since tested it against a wide variety of phenomena – both comfortable and familiar ones, as well as those where the currently accepted explanations have been yielding a wide range of paradoxes, conundrums, and totally irrational and otherwise counter-intuitive concepts with respect to how Reality truly works. It has brought some very interesting and enlightening insights to both categories, and I have yet to encounter any unresolvable difficulties. It has also most certainly opened up some new – and as yet, unanswered – questions, which actually would be expected, since it has brought in a whole new range of ideas that we have never even realized that we might need to test and consider.

I have yet to identify any paradoxes or conundrums that have not been resolved and ultimately given way to a more complete understanding over time. It has tied together ideas that I had not anticipated. It has given rise to what I feel is a rational, coherent, and comprehensive picture that I suspect has not even yet revealed all of its secrets. It starts out by explaining the root cause of quantization, and leads to a more comprehensive understanding of the composition of a photon, and what makes them and other quanta (photon-like phenomena) different from particles. It makes it possible to understand how photons and particles can still create interference patterns through dual slits even when they are only encountering those slits one photon or particle at a time. It provides a straightforward explanation for the observed relativistic peculiarities, without having to resort to hocus-pocus (time dilation, length contraction, or mass increase) or mental chicanery (trying to paint it all as illusory effects created by differing perspectives – which are very standard and common metrology considerations!). It eventually leads to an entirely different understanding of redshift, and thus, also of the

cosmic microwave background, the “expansion” of the universe, and thus, of whether or not there ever was a “Big Bang” as well.. There are other effects that I have not yet bothered to list here, and yet others that I have not as yet even tried to document. Certainly, there must also be more secrets that it has yet to reveal, but they will likely need more time, as well as more minds working on the effort.

In the interest of time, as well as in an effort to keep down the overall length of this series of discussions, I will not try to detail out all of the observations, ideas, and subsequent trains of thought that helped me to reach the point of conception. For one, it has been some time since that process occurred, and I am not sure that I could even recall them all. Moreover, I do not believe any longer that such an understanding of how I got to that point is really all that important. What does matter at this time is to carefully evaluate these ideas to confirm whether or not they truly do, in fact, reveal a picture of Reality that ultimately fits better and works better than what is already out there. I personally feel that it does, but this needs to get beyond just me, and it needs to be tested against a wider range of perspectives.

That is perhaps the main reason for this whole exercise. So, without further ado, let’s jump in to our next bit of discussion.

I really and truly do not know of any way to sort of soft-pedal this in order to make it seem more familiar and logical from the outset, so I will just try to state it right out as clearly as I can in a straight-forward fashion.

Momentum is more than just a “state of being” – where it is simply the result of some mass moving as some given speed, as is generally thought. I Have come to the conclusion that it is actually a field, a dynamic field that, just as with the magnetic field when moving a charge field, a momentum field MUST, absolutely MUST be created in order to move a mass (with its associated gravity field) through the Quessence. Likewise, and very similarly – once created, it will keep that mass, and its gravity field, moving until it is somehow dissipated. The very close correlation between the formulas associated with the laws of electromagnetism with those of the classical equations of motion would then be seen to be a very direct and predictable result of the essentially identical phenomenological character of how these two rather different phenomena actually operate in Reality. Even so, if such were to truly be the case, there would also have to be some very critical and significant differences between the basic form and extent of the magnetic field and that of what I have come to refer to as a “momentum field”. To a very large extent, these would have to do with the fact that we have long been able to detect, measure, and rather thoroughly characterize the nature of a magnetic field (for they extend out beyond the charged particles with which they are associated). Meanwhile, we have never seen anything, either obvious or relatively subtle, that would force, or even encourage, us to conclude that such a thing as a “momentum field” even existed.

This realization helped to lead to the conclusion that, even though it is still a dynamic field, it would have some distinctly different characteristics with respect to its overall form. I will not even pretend that I have ferreted out everything, but there are some rather pertinent considerations that do appear to be somewhat clear that I will discuss next. In doing so, I will provide a summary list of the more pertinent ones, and then we will review each of them in a bit more detail. The points that we will cover are as follows:

1) Limited in extent
2) Self-defining
3) Little “bottles” of energy
4) Interact, rather than repel
    4a) Collisions
    4b) Combinations
5) Always moving, and they do have an associated direction
    5a) May or may not have spin

There is a rather critical concern that I feel needs to be emphasized before elaborating on the points that I am planning to cover. We are talking about a totally new idea here (at least, I have not seen it or anything similar covered anywhere else before). The points that I will be covering are ones that I believe would be reasonably evident from other observations and understanding that we already have available to us. However, there has been no effort of any kind, as of yet, to see if we can ferret out any more by careful experimentation. It is extremely important that we be most, most careful about making any assumptions regarding their inner structure or format! If we are not – we could very easily just dig ourselves unwittingly into another hole and possibly lose as much ground as we may be gaining. We are striving to avoid as many delays and detours as we can. With that said, let's look at some critical points that we might be able to infer from what we do already know.

1) Limited in extent

This arises primarily from the fact that we cannot readily look into them, which is the primary reason why we have not previously recognized them for what they really are (or even that they might be there). In essence, the outer extent of the momentum field would be relatively small and clearly delineated. For particles, it is what is felt to define what the apparent size of that particle would be, for it would be the point at which interactions between particles would begin to occur (that is something that we will go into more detail about later). In a sense, in contrast to the magnetic field, it might seem as though it was somehow "inverted" (or turned in upon itself instead of outward – as a magnetic field is), but I feel that the term "self-limited" or "self-limiting" would be more appropriate. From that, I have derived the term "SL dynamic" field (for self-limited dynamic) as a generic term for that sort of a field. At this point, we have only introduced the momentum field as a type example for the SL dynamic field, but there are others that we will be introducing later. [Note: In contra-distinction to the term SL dynamic field, the corresponding term for the more extended form of dynamic field, where we can readily get inside of them and measure, which is exemplified by the magnetic field, is an EX dynamic (for Extended dynamic) field.]

2) Self-defining

This is something that we have discussed earlier with respect to dynamic fields in general, but it appears here again because it is such an important characteristic whose criticality will become more evident as we continue on. As a reminder, because it is self-defining, it can operate alone – and we will provide some very specific examples of what that means later. Moreover, it can also operate in conjunction with, and as stabilizers for, static fields – and we will also be providing information on specific examples of that kind of combination later as well. Both of the cases that we just cited provide for major understanding of the general nature of much of what we have observed for decades (and growing into centuries) in the quantum world.

3) Little "bottles" of energy

This is a conceptual understanding that just gradually became clear out of the whole overall picture as it developed, but it is one that I believe needs to be cited here. I will not attempt to explain all of the details here, but simply put – ALL of the known forms of energy in the universe (as we know of it to be at the present time) end up being intimately associated with some form of dynamic field or another, including (of course) both SL dynamic fields and EX dynamic fields. Of particular note, the Quessence strives always to remain as quiescent and balanced as possible – thus, it will not hold onto anything that we might tend to perceive as energy. This is again something that I hope will become much clearer as we continue tying the whole picture together.

4) Interact, rather than repel

This is an interesting concept that goes back to something that I was taught long ago in some of my physics classes at the university. The point that was taught was that whether one thought of particles as hard little balls that bounced off of each other in a perfectly kinetic fashion similar to billiard balls; or whether one thought of them as somehow combining and then re-separating, with the kinetic energy features appropriately re-divided between them; the external observable result would be identical. The mathematics of the overall observable motion results for either case would be indistinguishable. It was left as somewhat of an open question, for there was no known reason to differentiate between the two cases. However, as the picture developed in the Theory of Field Interaction, it eventually became very clear that there were indeed some rather significant and important reasons

and clues as to which would likely need to be the case. Again, many of the details related to this will need to wait until additional details are discussed sometime in the future.

4a) Definition: "Collisions" – what would result if SL dynamic systems repel each other
"Collisions" would in effect mean that the SL dynamic field systems would not allow themselves to combine with another, but would instead exclude each other, while allowing energy to be transferred in an appropriate manner between the systems.

4b) Definition: "Combinations" – what would result if SL dynamic systems interact with each other
"Combinations" would mean that as they encounter each other, SL dynamic systems, and in particular, their SL dynamic fields would instead actually merge to some degree or another, but then re-separate with the kinetic characteristics redistributed and reconfigured in such a manner that they would exhibit post-interaction properties that were seemingly identical to those that would result from a collision.

The clues as to which is actually occurring ultimately arises out of a consideration of some of the more complex systems that are already known (we will have to get back to that later).

5) Always moving, and they do have an associated direction
We have already mentioned that the whole concept behind calling them dynamic fields is that they are intimately associated with motion. In the case of a magnetic field, it is the charge fields, which are associated with the charged particles, that are primarily doing the moving – and the magnetic field only exists so long as they are actually moving. Likewise, the charges can only move when there is an associated magnetic field present. Similarly, momentum fields are taken to be intimately associated with motion, which is not only consistent with the math, but would also be another one of the reasons why their presence has not been previously identified. Moreover, not only is there motion, but there is also direction. It is presumed that this direction is likely associated somehow with the internal configuration of the SL dynamic momentum field, but it would be somewhat premature to try to define how that association is manifest internally at this time. That would certainly be an area of significant interest for future investigations and experiments.

5a) May or may not have spin
One of the characteristics that is not universal among particles and quanta (once again, an umbrella term that I use for photon-like elements that have no mass) is spin. Some have it, some don't, and it can be present in varying degrees. Would this be something that is somehow closely associated with the momentum field, or would this be an indication of some additional phenomenon? That is a question for which I do not believe that the answer is clear yet – so that is left as an open question at this point. Regardless, spin is a critical parameter that we will need to keep in mind.

I am not sure if I have covered everything that needs to be covered adequately, but those are all of the points that currently come to mind. As a quick review, the crux of the concept that we are currently presenting is that momentum is more – significantly more – than just a state of motion of some sort of mass or photon. It is actually a compact, little, self-limiting (or SL) dynamic field that, in a manner fully analogous with the way that a magnetic field acts on a "static" charge field (please do not confuse that terminology with static electricity - there are some major differences), presumably acts to "pull" itself, and any static fields associated with it, through the Quessence.

I have outlined a few of the most relevant features that I believe that we can reasonably determine would be associated with it, but this is still really just a preliminary introduction to the whole concept. How it is all felt to work, to create the phenomena with which we are familiar, is something that we will need to introduce next. In the process, the context should help to clarify even more of the features and characteristics, as well as help to solidify the somewhat nebulous picture that I have painted up to this point.

In order to do so, there are two specific areas that we will need to be discussing: 1) Photons, and 2) Particles. However, we will first need to discuss the Quessence a bit more as well. After the Quessence is covered, the photon will be discussed next because, between the photon and the particle, it has the simpler composition of the two. Our current plan is to discuss the basic composition of the photon, and then to expand that understanding to explain the basic structure of particles, and what makes them different from photons, as well as why they have the distinctly different velocity characteristics that they do. Once we are done with those basic composition introductions, we will then go back to the photon and explain the basic mechanism of how a single photon can interfere with itself as it passes through a properly configured dual slit.

Covering all of that is expected to require significant discussion. There is a lot to the picture, and much of it is intertwined, so I hope that my efforts to try to present the picture in a somewhat summary fashion has not left anyone overly confused. If so, I certainly hope that some of what is yet to come will help to make it clearer once again.

Chapter 4

The Quessence

The "Quessence" is a term that I use for the "background" substance that appears to permeate all of space. While it is not the only "key" concept that is needed, it has certainly become one of the more critical keys to gaining an understanding of Reality. Some aspects of the phenomena began to emerge very early on, but some of the others have taken a significant amount of time to gradually coalesce and come together in a coherent manner. In the complex interactivity that occurs in Reality, there are some aspects of ideas that are helpful to have early on to provide better context for some of those that come later, yet at the same time, too much up front, without adequate background in other areas could possibly just lead to additional confusion as well. It becomes a significant challenge to try to guess what the best process of presentation might actually be.

Thus, I am hesitant to go too deeply into a discussion of the universal "background" too soon, because there is a significant amount of background analysis that can help if it comes first. Even so, I will strive to present a bit of a general overview here in order to give you a little better idea of how I see things to be. If you are interested in more right away, there is always my book, and there may also be more available here (depending on how far along I have managed to get).

When talking about the "background", most people refer to it either as the 'Aether', or as an 'Aether-like' concept. One problem with doing such is that there is already a great deal of mental baggage associated with the term 'Aether'. In a very general sense, I have even referred to my ideas as being somewhat "Aether-like", but only with much hesitation, for I feel that any such comparison is only superficially valid. After a great deal of consideration, I have therefore chosen to use a different term, not only to differentiate it from the 'Aether' concept, but also to strive to give it a terminology that better reflected what I believe is its true nature. Whether or not I have succeeded in accomplishing this is, of course, a matter of opinion. The term that I eventually came up with for the background environment that is all about us is the "Quessence", which is derived from the descriptive phrase: "quiescent sea of essence". The Quessence is not so much a "medium" (as the Aether was thought to be) as it is an environment – something that even though we cannot really see it – everything about us (such as particles, photons, atoms, and et cetra) "know" full well that it is there and respond to its presence accordingly.

I have mentioned before that we really never measure the absolutes, largely because when different factors are balanced out somehow, they do not create a discernable signal or force that we can monitor. I have also mentioned that fields are real, which means that they must have some sort of substance, or they could neither act or be acted upon. Yet – the concept of any sort of action-at-a-distance does not really make good sense either. I have come to believe that there are balanced (what, for the lack of a better term, I have referred to as) "field factors" that are well dispersed, filling what seems to us to be "empty space" absolutely everywhere. Whenever some sort of concentrated influence (such as a single charged particle) is introduced into some location, its influence causes an imbalance to propagate forth to create the perceivable fields with which we are so familiar.

The Quessence is ultimately a crucial factor in such phenomena as fields, momentum, speed (for particles and also – the limiting velocity of light), relativity, the "curvature" of "space", photon self-interference, and so forth. It is always there – and actually making its presence known via a variety of phenomena where we have long understood the mathematics and effects, but have never really gotten down to figuring out the how and why. This is such a highly critical point of understanding – as I have stated before, we really and truly need to get to where we truly understand the phenomenological how and why.

We generally seem to have gotten used to thinking of space as being filled up with a lot of little quantized bits of substance (such as particles, photons, atoms, and so forth). Such a frame of thought tends to lead to thinking of everything in between as possibly being empty. I certainly know that with the concept of the Aether "disproven" (as it was taught to me in school); such sure seemed to be a reasonable expectation (although it would not explain how

fields might work). So-called "modern" physics has even gone further by trying to explain the transfer of energy and forces by "fields" as really being the result of the exchange of "virtual" particles. Such a concept truly would seem to leave open the possibility of the space between all of those quantized bits as being a real possibility.

I will state simply that "virtual" particles are not real. They don't even make a very good fantasy. The concept has glaring irrationalities and gaping holes, it also has nothing solid to support it – except perhaps for a disdain for action-at-a-distance (which I do understand!) and some seemingly convenient numbers. (By the way, when one has an idea ahead of time of what answers they are looking for, and a plethora of potential candidate particles, it can be very easy to locate something that will appear to "fit". I have certainly seen such methods practiced too many times throughout my career. While the results of such an effort may look like a good fit, it does not really "prove" or even "validate" anything.) Moreover, despite some rather substantial efforts, there is not one shred of physical or experimental evidence to support the concept either. Beyond those few comments, I don't want to get sidetracked off onto that topic at this time, so I will just leave it there, at least for now.

I have said before that fields are real and have substance – if they were not, they could neither act nor be acted upon. We certainly have copious volumes of data and observations that amply demonstrate that they can both act and be acted upon. We are also well aware of the fact that the effects of the extended fields with which we are familiar (such as, for example, gravity, electrical charge fields, and magnetic fields) can be encountered at significant distances from the actual "sources" or origins of those fields – especially gravity. Yet, we do not "see" anything in between that would explain how they really work. Even so, no matter where we may go within the extent of those fields, their influences can be discerned by the appropriate sensors or probes.

I believe that in every single interaction that we ever see or observe, the reactions of any given quantized substance (whether it be particle or light, for example) are only to its immediate environment. Such reactions would be only indirectly responding to the actual "source" of the field – which has simply caused the environment about it to be changed a bit because of its presence in the "vicinity". (The term "vicinity", as used here is meant to refer to any location that might be close enough to be discernibly influenced by some given field "source" – which in the case of gravity could be on a rather enormous astronomical scale.) I have tried to explain how that works in much greater detail elsewhere. I do not intend to go into it in greater detail here, except to cover a few more points about fields.

I believe that, in distinct contrast to the quantization with which we have become familiar, the extended fields, and in particular, the static fields, with which we are familiar, are continuous. The source of the quantization ultimately derives from the proposed existence of SL dynamic fields – that is something that we will be covering in more detail later. I have discussed before how we rarely if ever actually observe or measure the absolute quantities or values of phenomena in Reality – that, I maintain, is particularly true of extended static fields. I maintain that there is nowhere, anywhere in the universe, where one can find even the very slightest smidgen of volume (at any scale) that does not have some amount of the substance of fields in it. While that may not actually prove to ultimately be the sum total of what is there, these field substances are a significant part of what makes up what I have referred to as the "Quessence".

The expanded term for the Quessence is the "quiescent sea of essence". The term "sea" is an allusion to its continuous nature, which is very much analogous to how a sea of water seems to be to us at a macro scale – only, in this case, we are totally immersed in it. The term "quiescent" refers essentially to the fact that we can only discern its presence when it is somehow disturbed, such as through the effects that result from the passage of a quantized substance of some sort through it, or the presence of an unbalanced field effect (what we know of as a "field" that surrounds such sources as charged particles). In short, where the background is truly quiescent and undisturbed, we can no longer discern that there is anything there, for everything is perfectly balanced out – nonetheless, we need to recognize that such does not in any way mean that there is actually nothing there.

Despite the seemingly significant "disproofs" arising out of the Michelson-Morley experiment, which have, indeed, shown that at least some aspects of the original Aether concept were flawed, it has very often been incorrectly interpreted as disproving the entire concept. All that the Michelson-Morley experiment really established was that the Aether, or any Aether-like presence, could not be "fixed" or somehow relatively "stationary" with respect to "absolute" space – with the earth passing through it without disturbing it, as had been supposed. I sincerely believe that one of the primary reasons why there has been such a prolific and

persistent series of alternative Aether or Aether-like concepts and ideas being advanced is because, even though some of the clues may be rather subtle, there are actually quite a number of clues that indicate that there must indeed be "something" there. To me, there were far too many compelling clues to feel otherwise. Nonetheless, as the picture slowly developed, I also felt that the differences between what is commonly conceived or any of the ideas that I had ever seen, and the concepts that were developing in my mind were significant enough that even referring to it as "Aether-like" would be misleading, and the term Quessence was eventually born.

One of the problems with the Aether concept (at least, as I understand it) was that it was conceived as being a "medium" for the electromagnetic waves, in a manner analogous to sound waves through a solid, liquid or gas. While there are some similarities to sound that do come into the picture (which we will get back to at a later point in this discussion), the Quessence, as I currently believe it operates, provides a frame of reference for electromagnetic waves, as well as the raw, normally balanced-out substance that fields are composed of. There are also some other significant interactions as well, but it does not simply act as a medium. However, before we can properly discuss such things as electromagnetic waves, photons, and such, we will need to take more of a look at what the Quessence is first, as well as how disturbances propagate through it.

Let's talk a bit more for a moment about "open" or "static" fields. As a reminder, both gravity and electrical charge fields are considered to be prime examples of static fields. With these fields, the particles, or masses about which we find measurable gradients are unquestionably quantized, nevertheless, I do not believe that the extended fields themselves are. I believe that there is a continuum of substance associated with each of these fields that pervades all of space everywhere, however, wherever it is evenly distributed, or where opposing types (as we positively know exist with charge fields, for example) are evenly balanced, we will not be able to measure anything but the imbalanced portions. This goes directly back to the point that we cannot measure absolutes, only the net differences – as relative measurements, a difference in potential or field strength from some one location and another. The indiscernible and unquantifiable portions are what I have previously referred to (for lack of a better term) as the "field factors".

Note: What we are saying in essence is that the Quessence is a composite combination of field quotients that are associated with ALL of the static fields. We have specifically cited the gravitational and charge fields (both "positive" and "negative" of course), though there could well be more. We have reasons for not citing some of the others that are thought to also fit that definition, but we will not be able to get back to them for a while yet. However, we will allow that there could still even be some that we may not have "discovered" or recognized yet.

In order to establish the kind of potential difference or gradient that we are speaking of, it would seem to be necessary to gather up and concentrate some portion of those field factors somehow into some sort of compact form – a particle. How this is accomplished is still beyond this point of the discussion and we will return to that later after we have covered some other associated concepts. What we want to introduce at this point is what happens in the Quessence as these various and sundry particles and particle systems move around. With all of those particles and particle systems running around everywhere within the Quessence, it would clearly not be a uniform distribution of field factors, however, we do maintain that it is still a continuous one.

Now, in order to discuss propagation through the Quessence, let's see if we can use an allegorical illustration to try to make the concepts easier to understand. We're not going to use anything fancy – just a big gloppy old mud pile. ("Gloppy" mud is soft enough to be able to shift [not stiff], yet stiff enough that it maintains a reasonably steep pile and doesn't just flatten out.) Now, what we are going to do is to locate a sensor somewhere in that pile, perhaps off to the side somewhere, near the bottom (just so that it is not too near the top, in order to give us some time to sort of tell what is really going on). This sensor is sensitive to both pressure and location. That means that it can tell us if there is a pressure pulse passing by, if the overall pressure at its location in the pile changes, or if it is somehow shifted in any direction.

Now, let's take a good-sized dollop of additional gloppy mud and plop it down on the top of our pile. The only need that we have on the size of the dollop is that it be large enough that it can cause discernible changes in the pressure at our sensor location, and that it can also cause the overall configuration of the whole pile to shift by

some measurable amount because of the extra weight at the top. Assuming that we can monitor our sensor very closely and accurately, we would see that at the exact moment that we plopped that extra dollop of gloppy mud on the top of the pile, there would be no response of any sort at our sensor whatsoever, for everything there would remain absolutely unchanged for the moment. Moreover, the lack of any indication at the sensor would continue for some little while thereafter.

Meanwhile, as soon as that dollop of gloppy mud strikes the top of the pile, everything in immediate contact with any part of that dollop would immediately be affected, and a pressure pulse would be initiated as each bit of mud exerted a force on whatever mud might happen to be immediately adjacent to the new mud in the dollop. The important point here is that the initial influence of the impact is ONLY felt at those points that are in immediate contact with the new mud – there is no action-at-a-distance whatsoever.

Now, as the mud that is in immediate contact is shifted, it then presses on whatever mud is already in its immediate proximity, creating additional pressure and causing that mud to also shift. That, in turn, causes the mud immediately adjacent to it to begin to be affected and shift, and so on as a pressure pulse is created and begins to propagate outward along a nominally spherical front, shifting the material as well as it propagates out in all directions through the pile. The rate at which it will propagate is what we know of as the speed of sound in the gloppy mud, for that is just our way of describing the speed at which such disturbances can propagate through any given material or substance with which we are familiar.

After some period of time, which would be governed by the speed of sound in the mud and the distance of the sensor from the location where the dollop was first plopped down, the sensor would be jostled by the shifting of the mud in its immediate vicinity as the pressure pulse passed by. Behind that pressure pulse, there would be a change in both the overall pressure in the mud (because of the added weight), and also a shift in the location of the sensor because of a deformation of the overall pile resulting from the new combination of weight and its modified distribution.

There are several additional observations to be noted here.

1) As with the initial response to the dollop being added at the top, the ONLY thing that any given bit of mud is ever responding to is the dislocation and other effects of some other bit of mud to which it may happen to be IMMEDIATELY adjacent. Repeating, there is absolutely no action-at-a-distance at operation here. It is true that ultimately the change started with an extra dollop of mud being added to the pile some distance away – but its influence had to be transferred from one point to the next over some real period of time before its influence could be felt at our sensor location.

2) The strength of the pulse when it passed our sensor would be less than it had originally been when it was initiated up at the top, in the immediate vicinity of where the dollop had been plopped down on the pile. That is because there was only so much energy that was added by plopping down that dollop. As that energy spreads out in all directions through the pile, across a roughly spherical front, it is distributed over an increasingly larger area, which area is directly proportional to the square of the distance from its point of origin, just as the area of the surface of a sphere is directly proportional to its radius.

3) When the redistribution is complete and the pressure pulses have all died down, there will be a new pressure distribution throughout the pile of mud as a result of the extra weight of the dollop that had been added on the top. Just as the energy of the pressure pulse at any given location was reduced as that pressure pulse traveled further from its point of origin; the DIFFERENCE in the overall pressure, as well as the total amount of shift or dislocation at any point in the pile, will also generally be reduced in a proportional manner as one gets further from the location of the original dollop. Again, that is because the overall magnitude of the effects arising from the composite changes is spread out over a progressively larger area. (Note, since gravity is a directional force, there will also be other factors and effects on the pressure changes based on where in the pile the sensor might happen to be relative to where the dollop

was plopped down. However, that particular effect is more of an artifact for this particular analogy, so we will not address it further.)

Before going on, I feel that there is a point that I need to cover briefly. There are many materials and environments in the world around us that seem continuous on the familiar macro scale of everyday life. Water, air and gloppy mud (rather wet and well-homogenized, meaning that it doesn't have any lumps in it) are certainly a few examples, although the list goes on and on. There was also a time when physics and chemistry looked at those familiar materials as continuous in that way as well. Then along came quantum effects in stages, starting with such things as atoms and molecules, and ending up with particles and finally even photons of light to contradict the old ways of seeing matter, energy, and the world about us. There were many who resisted the quantum reality, but the evidences have been thoroughly overwhelming – it is absolutely clear that quantization is a very real part of Reality.

Yes, quantization is most certainly real, but there appear to be a great many who have taken it further than is warranted. I don't even know how many papers, treatises, books, and such that I have seen, where quantization has been projected to continue on to areas and scales where we cannot yet really even discern for certain what is happening – it often seems that it is just assumed because of where we have already seen it manifest. Not only have I seen it carried to ridiculously small dimensions, but I have also seen cases where even time and space have been conjectured to be somehow quantized. If there truly is a Quessence (as I have asserted) – a "quiescent sea of essence", I feel quite certain that it would almost certainly have to be non-quantized. I cannot think of any scenario in which a quantized collection of field factors or essences would not have some sort of localized irregularities that would almost certainly have made it discernible at some point already. (Put another way, the way that it would have to be able to neutralize its constituents uniformly in order to remain so well hidden would indicate that it almost certainly would have to be continuous rather than quantized.) Moreover, with the conjectured existence of SL dynamic fields, there is a very specific cause for the quantization that we are so very familiar with, and we will be getting back to more on that before too much longer. However, the point that I feel needs to be clarified today is that the very fact that the Quessence cannot be measured, I believe, directly indicates that its basic nature would very likely have to be one of a combination of continuous, distributed substances. Naturally, since they are the primary constituents of the Quessence, the same would also, in turn, apply to the nature of fields as well.

Now, let's get back to our mud pile and see how these concepts might apply to the Quessence.

Let's start by identifying a few similarities between our mud pile analogy and the part of the Quessence picture that we are striving to introduce at the moment.

1) As I just mentioned, I believe that the substance of which the different constituents in the Quessence are composed are continuous rather than quantized, this particular characteristic is represented by the use of (well homogenized) gloppy mud in the analogy.

2) If one were to go through any pile of gloppy mud or similar substance and measure the internal pressures at different locations, they would find that there would be varying pressures at those different locations. That is because the internal pressures depend on the overall distribution of mass in the pile with respect to where any of those measurements might have been taken. In an analogous fashion, the strengths and distributions of measurable static fields in the Quessence will also vary from one location to another, depending on the locations of any related particles or masses (or any other influences). An excellent example of this is gravitational field strengths, which are most prominently affected by the distribution of major heavenly bodies such as planets, suns, and, eventually, as the scale increases – galaxies and so forth.

3) Just as the speed of sound in the mud pile would limit the maximum transit speed for disturbances traveling through the gloppy mud, so also – if space were not empty, but full of a background substance such as the Quessence – there would also naturally be some sort of a limitation to the maximum rate of transfer through that background substance as well. That is because anything that might happen to be composed of real substance will require some (rather limited perhaps, but real) discrete amount of time to elapse in order for it to either shift or be bypassed by anything that might be transiting through. Real substances simply cannot shift out of the way (and back into place if necessary) instantaneously, especially if their basic propensity is to remain static. Even if it were just a momentary pulse of some sort, real substances always require time for them to shift and pass that pulse on. It would not necessarily be directly analogous to the speed of sound through something such as mud (even though there may be some real similarities), for it would depend somewhat on the composition of the interacting phenomena, and whatever combination of forces that might happen to be in effect at any given place and time. However, there would certainly have to be some sort of disturbance-propagation limiter. This is a topic that we will get back to discussing more about later.

4) In a mud pile, every shift, pressure change or other effect from throwing on another dollop of mud only passes from one location to another in the pile as a result of those forces and nudges passing from one bit of mud to its immediate neighbors. ALL of the interactions are strictly local. The very same would also be expected to be true of the Quessence. ALL effects, such as the reactions of some particle or photon to fields or other types of effects are strictly local – there is absolutely NO action-at-a-distance whatsoever.

a) Field effects come about because some sort of discernible imbalance has (already) been created in some local area – by influences that have previously propagated out from some concentrated disturbance source at some time in the past. Just as with anything else, those disturbances require some discreet amount of time to get from one location to another. This is not generally noticeable with extended static fields (which are our most prevalent fields) because the velocity associated with the movement of the sources (typically particles) is ALWAYS more limited than is the propagation of its associated effects. Usually, the velocity differences are quite substantial; it is only when they are not that we begin to encounter "relativistic" effects. (Relativity is something that we will be getting back to, but we have a lot of other areas to cover first.) Thus, the field disturbance generally appears to move "instantaneously" – along with its source. All responses to a field are responses to the distortions in the immediate environment (very much like the way that water chooses its path downhill as a result of immediately local slope parameters only) – they are responding to something that is <u>already</u> present there. Thus, their response to the "source" of that field is only indirect, as a result of whatever disturbances that have previously been established.

Next, let's discuss a point that is not well represented by the mud pile analogy. I used a mud pile in that analogy because I felt that it would be easier for most to visualize what was happening, and therefore to better understand the points that it was meant to represent. However, mud is rather viscous and quite significantly reluctant to motion and changes. Such would not be expected to be a property of the Quessence. Quite the contrary – for if it were a property of the Quessence, it would certainly have made its presence so very evident that its characteristics would likely have been recognized and figured out long ago. Liquids, such as water can be moved through fairly easily – but they reside quiescently only in low places and always have some sort of surface where they cease to be concentrated; they are also quite noticeable to one who is working to travel through them. Gases generally fill all of the available space and are much less noticeable (except, for example, when there is a good wind blowing). Just as is the case with even a gas, there must be some disturbance of the Quessence as something passes by (which results in air drag), and in order for it not to be very noticeable, it would also seem likely that there must be something "helping" to bring this bypass effort all about. That appears to be one of the primary functions of SL dynamic fields – something that we have not properly recognized yet.

That is one topic that I would dearly love to dwell more on at this point, but there are some other critical areas of understanding that we will need to cover first, so we will simply have to leave further discussion on that point until some later time.

By all that I have been able to ascertain, the primary constituent substances of the Quessence appear to be field factors associated specifically with static fields – substances that by their very nature "prefer" to remain stationary and to distribute themselves evenly about, except when disturbed by interacting influences or otherwise "bottled up" into a more concentrated form. As stated before, by all that we can discern, the Quessence strives to remain quiescent. Whenever it is disturbed, it will assiduously strive to return to a nominally balanced, quiescent state as soon as possible after the source of that disturbances has passed by – its internal forces will cause it to seek equilibrium as rapidly as possible, thus, it will not "hold on to" any energy in and of itself. This is a very critically significant property to understand, one that will provide substantial insight into some of the areas that we will discuss in the future.

I have one more point that I feel that I need to make here. I have noted previously that the Quessence is not uniform overall. If it so happened that there were nothing else in the universe, presumably it actually would be uniform – in which case it would be nothing more than a featureless sea of balanced, or at least uniformly distributed, field factors. However, there are other things in the universe, and the Quessence, which has a composite makeup, appears to be affected significantly by a number of them. One of the influences that are particularly noticeable, and which appears to pervade every corner of what we can see or discern of the universe, is the presence of particularly large masses – which, of course, lead to the all-pervasive (and most useful as well) gravitational effects. There are, of course, also some other additional, and likewise rather significant, effects.

I have been avoiding specifying the exact nature of the interactions within the Quessence, as well as between the Quessence and the other bodies and quanta within it for a variety of reasons. The Aether was thought to act as a "medium" for light, in very much the same way as solids, liquids, and gasses do for sound. When it comes to the already discussed propagation rates, it certainly does appear to have some significant similarities. However, we would be well advised to not jump to any premature conclusions before we have had a chance to investigate whatever we can discern further (sometime in the future, as hopefully, physics and science realize better that there are better understandings available than what they are currently promoting). At this point, this should be left as a somewhat open question, although we will be addressing some further related interactions in more detail later as well.

Another major (and rather presumptious) assumption with the Aether was that it was "stationary" with respect to absolute space, and that everything, including the earth could move through it without any significant interference. This led to the idea that there should be some sort of discernible difference in the speed of light in different directions as a result of the earth moving (somewhat effortlessly) through the Aether – which would in turn affect the speed of light in those divergent directions. Such a phenomenon, if it could be confirmed and measured would be expected to provide a treasure trove of understanding. That led to the Michelson-Morley experiment, which produced instead, a totally null result relative to <u>what was expected</u>. Contrary to what I was taught in school, that experiment did NOT prove that there was no Aether, Aether-like, or some other sort of background substance filling space all around us – all that it did truly establish is that if there actually might happen to be something there, it did not exhibit the characteristics that they expected it to.

Based on what we do know from that experiment (as well as other clues), there are several basic characteristics that I believe are part of the way that the Quessence operates. Both of them have to do with some of the ways that large bodies such as the earth interact with the Quessence.

1) The first has to do with the fact that the earth does not just pass through without some sort of interaction, as was supposed with the Aether. Yet, it does not necessarily "drag" it all along either. It does provide some rather clear evidence that it creates a very substantial distortion in the Quessence, one of

whose most familiar manifestations is the very familiar force of gravity. That distortion clearly does move along (at least to some degree) with the earth, but that does not mean that the components of the Quessence are actually moving as well. For example, they could very easily be exchanging in and out (keeping the actual dislocation of any given portions rather limited) from the indiscernible, but more generally stationary, parts of the Quessence (out in "space") as the earth and its accompanying disturbance pass by – and we would still not be able to "see" it. The critical point to remember here is that the only factors that we can really discern have to do with the disturbance itself, and its relative character with respect to the earth. If the sensible aspects of its influence on the speed of light are such that the discernible aspects of the disturbance are effectively stationary with respect to the earth, particularly at the surface of the earth, then the "null" difference results that came out of the Michelson-Morley experiment would be exactly what we should have expected in such a condition.

2) The second aspect has to do with the rotation of the earth. One might expect that the rotation of the earth would still be expected to create potentially detectable differences in the speed of light at the surfaces of the earth. Perhaps that would be a yes, and perhaps it would not. One point that is important to keep in mind is that while the near side of the earth is moving in one direction, the opposite side of the earth is moving in the opposite direction. Indeed, the greater portion is actually moving in a contrary direction, but it is also further away, so its overall influence is diminished. The final result is that all of those effects tend to cancel each other out somewhat, such that there would be no NET, or externally discernible, effects that could be measured. Even so, where we are forced to use gross overall motions for most of our sensing, and thus, are limited to net, overall effects, that does not mean that those more complex effects would not be somehow internally discernible to the particles, photons, and the like all about us. Thus, it could be very possible that there could be some sort of beneficial effects on the matter about us (perhaps even very significant ones) that we have not even discovered yet.

Chapter 5

Photons

I believe that now is a good time to get started with some of the more enlightening (it is certainly one that has some rather far-reaching ramifications) concepts and aspects to come out of the Theory of Field Interaction – what I am referring to, of course, is the photon.

Light

Here is an over-riding thought about light to keep in the back of your mind as we begin to explore a very fascinating collection of phenomena in Reality. Light is always quantized, but it actually has a composite nature that is currently unrecognized. It is this composite nature that allows the closely associated (as well as more extended) electromagnetic waves to interact cooperatively when there are a lot of them together, to present the characteristics of an extended wave field as well. Thus, in certain situations or when observed in certain ways, it may seem to act as if it were continuous, but that is really just more of an illusion that arises out of the way that the electromagnetic wave fields interact together.

Photons

The photon is commonly thought to be nothing more than an isolated electromagnetic wave that propagates along at the speed of light. They are all about us in proliferation, not only as light, but also across the entire electromagnetic spectrum, from radio waves at the low end to the gamma rays at the high end. Only a small portion of that total spectrum is visible to us, though we can feel the heating effects of some of the infrared, and we can also see the results of some of the ultraviolet through either the tanning effects on our skin (and sunburns as well if we are careless), as well as with phosphorescent effects as well. There are myriad other uses of various wavelengths throughout the spectrum, far too many to warrant mentioning here.

Photons are known to be rather stable. The longest distance that we have actually been able to measure via triangulation is ~167,000 light years, where secondary effects from supernova 1987A, combined with some very careful angle measurements enabled an actual distance to be calculated via triangulation. The photons from that event have therefore been confirmed to have been enroute, essentially undisturbed, to our location for ~167,000 years. In my book, that is very stable! We may not have been able to directly confirm the distance of most of the myriad other sources of photons coming in to the earth from all over the heavens in such a direct manner, nonetheless, it is very clear that we are continually being bombarded by photons that have been in transit for periods of time that are sometimes many orders of magnitude longer than are those from supernova 1987A. The bottom line to all of this is that it is abundantly clear that if it is not disturbed, the photon is exceedingly stable.

The photon is ubiquitous all about us in a wide variety of forms, and has been extensively studied (especially since it was discovered that light and other electromagnetic waves are quantized) – yet it has been interesting to discover that there are some rather fundamental aspects of the photon that we do not yet really properly and fully understand. One of the more significant of these has to do with the inherent nature of 'spontaneous' harmonic oscillations. This is something that we will need to discuss next in order to prepare for some of that which will follow after. There are examples of spontaneous harmonic oscillation all about us, in a wide variety of phenomena, which demonstrate the principle that I am going to discuss next, which principle also has a very direct relevance to the nature of the photon. Yet, it is something that I have NEVER seen discussed or taught anywhere to any significant degree at any time before, particularly as it relates to the photon. In defense of the current situation, perhaps it is the essentially ubiquitous composite presence of extended electromagnetic wave fields, as well as the very evident longevity of the photon itself, that have served as obfuscating influences in its proper recognition. Certainly, given the current concept of what a photon is thought to be composed of, for any who might be otherwise aware of the concept, the photon would certainly appear to be a very distinct and clear exception to the principle. Before I am finished, I hope that I will be able to demonstrate that such is not the case.

This principle is not something that I started out with an understanding of either. There are some similar aspects of it that are present in some of the areas of electronics (for example), but it is certainly not something that I was ever exposed to in school. Somehow, as some of the concepts associated with the Theory of Field Interaction were developing, and with a significant ongoing phenomenoscience effort, one day it just seemed to "be there", clear as a bell. Since recognizing it, I have not been able to identify a single exception of any sort, and it has clarified other more subtle aspects of photons and electromagnetic waves in a remarkable fashion. For me, it has also provided a rather remarkable confirmation that the concepts that I am trying to present in a summary fashion in this series of presentations are at least significantly closer to the truth of Reality than anything else that I have ever seen presented anywhere else has been. Naturally, whether or not you agree is something that each of you will need to consider and eventually decide for yourselves.

The principle we are referring to has to do with the very nature of spontaneous harmonic oscillation, and it can be stated rather simply as follows:

> **Spontaneous harmonic oscillation is ALWAYS the result of an unstable (and unsupported) condition in some sort of a resonant situation or system.**

Despite perceived appearances, there are no exceptions whatsoever in Reality. This can be a highly illuminating principle when we apply it carefully and judiciously to the world around us. We will provide some examples to illustrate this principle in a moment, but first, we feel that we need to make a precautionary statement to avoid possible confusion:

> Please, do not confuse SPONTANEOUS harmonic oscillation with the common and seemingly similar artificially generated sinusoidal or other types of driven harmonic systems and phenomena. For example, AC power is normally sinusoidal at 50 or 60 hertz. This is not the result of any sort of spontaneous harmonic oscillation, but is instead a driven system where generally the sinusoidal waveform is intentionally generated using circular motion in the generator to create the sinusoidal harmonic pattern. Such a system does not decay because it is constantly driven – there is a constant input of sinusoidally configured power to keep it going. There are, of course, other examples, but that should suffice for the time being.

1) The Pendulum

One of the simplest, and perhaps the most familiar – but certainly the easiest to observe and comprehend, examples of spontaneous harmonic oscillation is the pendulum. There are a myriad of forms that it can take, but the most basic format is the one where there is some sort of mass that is suspended either from a suspension line or from some sort of swivel. The combination of mass and distance creates a resonant condition that automatically imparts some sort of periodicity to its operation whenever it is oscillating. If a pendulum happens to be stationary, and is left undisturbed at the bottom of its trajectory or swing, it does nothing, for it is already in its most stable state. A second type of stable state, but one with a higher energy potential, can be created by swinging it to one side to raise it up above the bottom of its swing, and then supporting it in that raised position somehow. So long as it is supported, it is again stable, and it will do nothing.

Harmonic motion in a pendulum can be induced in several generic manners. 1) The first is accomplished by swinging it to the side to raise it up above its lowest position and then releasing it – leaving it unsupported and thus, energized but unstable. 2) The second is implemented by imparting motion (kinetic energy) to a stationary pendulum at the bottom of its swing. 3) A third approach is to implement some combination of the first two, raising it some and perhaps giving it some sort of extra push as well. (A common and generally familiar example of this one is when someone pulls a child in a swing back and then gives an extra push as they set the swing into motion.) The first of the three approaches creates an unstable condition by adding potential energy to the system, and then allowing gravity to begin to accelerate it. By the time the pendulum reaches the bottom of its swing, that potential energy has been converted to kinetic energy. This kinetic energy then keeps it moving past its bottom-of-swing position until all of that kinetic energy has caused it to once again swing up to an unsupported, momentarily stationary, position at the other end of its swing – when all of the kinetic energy has

been once again converted to potential energy. Since it is once again above its lowest position and unsupported, the whole process starts over – and the pendulum will thus keep oscillating back and forth until all of that energy that had been imparted to it is somehow dissipated from the system. The second approach simply imparts the energy, as kinetic energy, directly into the system at the bottom of its swing, which causes it to travel upward until all of the kinetic energy has been converted to potential energy with the pendulum at an elevated, unsupported position. Thus, it is really just a different way of implementing the same basic condition as the first approach. The third approach simply recognizes that any combination of the first two will likewise yield the same result.

The concepts behind all of this are really quite simple. The structure of a pendulum creates an inherently resonant system. In a simple pendulum, gravity provides a force that continually seeks to return the pendulum to its most stable condition at the bottom of its swing. It is the simple trade from kinetic to potential and then back to kinetic energy in the system that causes it to resonate at its natural frequency until all of the energy in the system is somehow dissipated, and it settles once again to its stable position at the bottom of its swing. Only then will the harmonic oscillation once again cease.

Even though they may take a rather wide range of forms, essentially all mechanical harmonically oscillating systems can be described as some modified form of a simple pendulum (as, for example, the balance wheel in a watch or clock). While their forms may change quite dramatically, and sometimes the operation may somehow at least seem to be more complicated, the basic principles behind the operation of all of them are essentially identical.

2) Resonant Electronic Circuits

The way that resonant electrical circuits work is remarkably similar to the way that mechanical pendulums work – especially when one gets down to the basic driving principles. A pendulum is an inherently resonant system. There are also very many forms of inherently resonant electrical circuits as well. Typically, a resonant electrical circuit will have either capacitance or inductance (or very often, a bit of both) as a critical part of the circuit. One can think of the moving current in a circuit as analogous to the kinetic energy state in the physical system, while either the static charge buildup in the capacitance or the magnetic field buildup in the inductive system is analogous to the potential energy state. While the details of how the energy exchanges are made and how each of the circuit elements operate differs significantly between the two different storage mechanisms, the basic concept is that, once it is triggered somehow, the imparted energy will once again harmonically oscillate between the “kinetic” and “potential” forms until the energy is all dissipated. Oscillation in such a circuit will only occur when the system is “ringing down” from an energized yet unstable condition in some one way or another. It actually will not do so (oscillate in such a manner) when it is operationally stabilized somehow in a continuously externally energized condition.

Let me see if I can clarify something here that may not seem obvious or even evident to some. Oscillators are extremely common in today’s electronics – in particular, they are an absolutely essential element in every digital circuit, for they are what drive the digital “clocks” that are so crucial for making the digital systems work. Thus, it should be very clear that an oscillation can be started and maintained for indefinite periods of time. The key is that in order for them to do so, they must be driven and kept operating in the proper way, or they will either: not oscillate, or else they will ring down and stop relatively quickly. For example, if the input to the actual resonant part of the oscillator circuit was to be driven directly by a constant power source (such as a battery), the circuit would be stabilized in a stable condition and it will not oscillate. That would be basically analogous to swinging the mass of a pendulum to one side and then supporting it in that position – it is thus supported and stabilized, so it does not have the opportunity to oscillate.

Ringing down, the second option mentioned above, is directly analogous to what happens to a pendulum if it is set to swinging and then left alone. Sometimes it takes a while for a pendulum system to stop swinging and “ring down”, but that is because the rate of energy loss are relatively low. (Although, if there are lots of losses in such a pendulum system, sometimes it can happen rather quickly too.) In most electronic circuits, it tends to happen

relatively quickly. If the resonant frequency is high enough and the ring-down time long enough, there may be many harmonic oscillations come about during that ring-down time. On the other hand, if the resonant frequency is such that the ring-down time is less than one harmonic cycle, then there will not even be one full cycle before the energy in the system has all rung down. (Oscillator circuits will usually be designed to have longer ring-down times so as to make it easy to have multiple resonant cycles within the ring-down time – it simply makes it easier to keep the system oscillating.)

A critically key element to every oscillator circuit is a part of the circuit that is designed to allow the circuit to go spontaneously into oscillation, by leaving it unsupported during at least part of its cycle. It is then kept oscillating on an on-going basis by giving it some sort of "kick" at some appropriately synchronous point in the cycle. Often, this may be done with every cycle, but it doesn't necessarily need to be so long as it is at least often enough to keep it going. This would be analogous to giving a pendulum an occasional kick at the bottom of its swing, or perhaps imparting some energy at the top of its swing (as when pushing a child on a playground swing). Actually, such a boost can be imparted at any point in the cycle, *so long as it operates in synchronization with the harmonic oscillations*, so as to enhance the oscillation rather than suppress it. With the proper periodic impetus, either mechanical or electrical resonant systems can be kept oscillating indefinitely. Without such, they will <u>all</u> always eventually die down – sometimes after a significant period of time for systems with low losses or damping, but sometimes very quickly if the damping and/or energy drain are relatively high.

Now, let's apply this understanding to the electromagnetic wave phenomenon.

<u>Electromagnetic Waves</u>

Electromagnetic waves provide an intriguing phenomenon, but it is also one for which it is a bit tricky to truly get a good understanding. Because of the way that they readily add to other waves about them, they often create extensive wave fields that look continuous, especially when they are all of the same (or very nearly the same) frequency and in synchronization with each other. (Such is frequently the case with radio signals, for example.) That is likely one of the main reasons why it took so very long to realize that they are truly quantized as photons, something that has only been firmly established within the last 100 years or so. The overall rules for the wave action are exactly the same for individual photons as they are for other wave-based phenomena, such as sound and water waves, where the wave characteristics really are essentially continuous. (While the media in which sound and water wave phenomena operate do ultimately reduce to atoms and molecules, the scale and manner in which the sound and water wave phenomena operate are generally so much larger than the atoms and molecules that they do still basically operate as though in a continuous medium.) Much of my early education about wave properties was demonstrated and supported with the use of wave tables – it was very educational and enlightening. It was also a very clear way to see what was happening. When later classes progressed to optics and such, that background helped me to understand some parts of the phenomena better than would have occurred with the optics alone, for some of the characteristics of the wave action could not be as readily discerned in the optics as they had been in the water tables.

James Clerk Maxwell originally developed his fabulous electromagnetic wave equations, picturing them as truly being continuous waves, very analogous to some of the more available and very familiar continuous wave phenomena. He also surmised the existence of the Aether, and that electromagnetic waves were a disturbance in the Aether, probably thinking of them as being somewhat similar to the more familiar operation of such phenomena as sound waves. It was only later, after he had died, that it became firmly established and understood that electromagnetic waves were actually quantized – in what have since become known as photons. Photons are currently generally thought of as being nothing more than a very small quantum of electromagnetic wave energy with, what should be recognized as (at least with some of what we have already covered), some rather peculiar characteristics:

1) For one, as has already been indicated, it has been very well established that, if left undisturbed, they can travel enormous distances and still maintain their basic identity. Even though there have been found

to be frequency shifts to longer wavelengths over longer astronomical distances, even after traveling extreme astronomical distances, the nature of their origin can often still be clearly determined.

2) Another, sometimes puzzling, property is that they carry momentum. This is an area that has been puzzling for many since the momentum of particles and larger bodies is seen to be so very closely associated with the mass. In fact, the basic interpretation of the meaning of momentum (as I have always seen it taught and thought of by the mainstream anyway) is that it is a direct, physical result of the state of motion of a massive object. The problem that this presents for many, is that photons have no mass – so how is it that they can carry momentum?

We have stated before that we believe that the true root phenomena for momentum is not just a state of motion, but that it is actually rooted in a heretofore unrecognized dynamic field form – an SL dynamic field that I have referred to as a momentum field. While a photon may appear to consist of nothing more than "just" an electromagnetic field (for that is all that is outwardly directly manifest – at least, when we do not recognize all of the pertinent parameters), what we are proposing is that: Hidden inside of that that electromagnetic field is the true heart of the photon. There is a very close interaction between the momentum field and the electromagnetic field, one whose understanding harks back, in part, to the principle we discussed earlier, regarding how spontaneous harmonic oscillation only arises from unstable and unsupported resonant systems.

Before going on, let's review a few critical points providing soe additional insights and details that I have not discussed yet.

1) We have stated our conjecture that an SL dynamic field, specifically in this case a momentum field, is the true heart of a photon. By definition, we have stated that all dynamic fields are associated with motion in some way or another – indicating that there is no motion possible if there is no dynamic field present. Thus, if there may happen to be no motion whatsoever going on at some specific location at some given moment, then it would also be clear that there must be no dynamic fields present at that particular location at that particular moment. Conversely, if there is any type of motion whatsoever in any given location, then there must be one or more dynamic fields in the area to drive that motion.

2) The Quessence, when left to itself, is quiescent – it is composed only of components or factors that are not inherently associated with motion – what that means is that it is composed of static field components or factors only. Moreover, if it is not otherwise disturbed, it will always strive to balance out all forces or influences that might be anywhere within it to the lowest possible energy condition. In essence, the Quessence is the reservoir or repository for all of the non-energized static field components or factors in the universe. However, the Quessence is not generally left to itself – there are a plethora of particles and massive bodies, along with various forms of energy all over the place in a rather non-uniform and constantly changing distribution as most of them are constantly moving. Because of the variable influence of all of those different forms of energized substance, the Quessence is far from uniform everywhere, but – in between all of those dynamic field stabilized clumps of substance, with nothing to sequester or hold one part of the Quessence itself from any other part, it will always be found to be continuous (and not quantized!). Thus, we maintain that there would be nowhere, at any scale, that is totally free of some part of the static types of substance of which it (the Quessence) is composed – put another way, there are no true voids. The Quessence occupies absolutely every nook and cranny of the three-dimensional volume that we call space. (Technically, one can argue that it's not really a "void" since it is chock full of "stuff", regardless of whether or not we can directly "see" everything that is there. However, that is not something that we need to dwell on here for it is still technically a volume in which it can all be located.)

3) All of the quantization effects with which we have become so familiar are ultimately an effect (or result) of the presence and interactions of dynamic fields (more specifically, SL dynamic fields) operating independently within the Quessence (where, while they are thoroughly immersed in the Quessence, they are not really a part of the Quessence itself). In turn, ALL energy (i.e. usable motivation of any sort) in the universe, along with a rather substantial portion of the otherwise more static substances as well, are

associated in one way or another with dynamic fields. (Remember also that energy is always conserved in some form or another.) These particular points will take multiple installments to introduce fully, but we hope that they will become at least a wee bit clearer before too much longer. Likewise, we hope that several more of the points that were just covered will also become clearer and gain additional support as we continue to progress through this series of discussions.

With that quick review behind us, let's now begin to take a look at what happens as a momentum field interacts with the Quessence as it passes through. There is a great deal of insight to be gained from much of this, so I do hope that I can do it proper justice and make it adequately clear.

First of all, from a phenomenoscience perspective, the fact that the secondary effects (which we will be discussing over the next little while) even occur is, I believe, one of the critical clues that the Quessence is real, that it actually does have substance. If there were truly nothing there, if space were truly "empty", there would be nothing to trigger any sort of secondary effects – and the momentum field would then be left fully exposed and easy to discern (this should become clearer as we delve further into the makeup of the photon). We certainly do know that "if" the momentum field is real and actually there, it would certainly have to be anything but obvious (or it would have been recognized long ago). All that I have seen seems to support the idea that there would have to be something there. Moreover, after a great deal of evaluation and analysis, the description that I have already provided, along with some other aspects that have yet to be covered, appears to provide a reasonably good starting point towards a decent understanding of what it consists of.

There is one more critical point that we need to repeat, as a reminder really, and that is the fact that we have no means of knowing how much substance might actually reside in the Quessence. We simply cannot tell what the true quantity or "potential" of any of the given static field factors might really be, for they are largely neutralized and balanced out (just as the countless electrical charges largely are in the body , for example). So long as they are, we have no means of measuring them. Most probably, that is one particular bit of information that we will likely never know.

As already stated before, a momentum field (just as with any dynamic field really) is a little bundle of active motivation – something that we generally refer to as "energy". We have purported that it is real, it has substance, and therefore, it can both act, and be acted upon. That is an extremely important concept, for it means that as it propagates forward through the Quessence, it would be almost certain that, provided the Quessence is also real and has substance, it MUST be interacting somehow, and thus, causing some sort of disturbance with at least some part of whatever the Quessence might be composed. That is what we are going to be addressing next.

The clues as to what is happening come from several phenomena related to the photon that we can discern and measure. Perhaps the most significant one is the very evident presence of the electromagnetic wave field. The next several are closely related to that electromagnetic wave field, but they deal with points and considerations that are not usually discussed or highlighted, if they are considered at all.

1) The first has to do with the nature of the electromagnetic wave field itself – what actually makes it work? Throughout my education and career, I have seen extensive information on wave mechanics, as well as on the mathematics that enable us to rather thoroughly characterize how it works quantitatively in excruciating detail. However, in all that time, I have never seen anything that even raised the question of how or why it works as it does, nor of what types of effects or interactions might be at the root of the phenomenon itself. We shall be getting to that shortly.

2) The second has to do with the generally unrecognized principle related to spontaneous harmonic oscillation that we discussed earlier – at least, it is unrecognized with regard to the photon. Simply stated, it is that the very presence of harmonic oscillation in the electromagnetic wave field associated with the photon indicates most surely that, somewhere within the photon system, there must be an unstable and unsupported condition that is thereby in a state of decay. How then is it that a photon can continue on, stable and persistent (and only slightly modified with a relatively small reduction in its energy [frequency])

for literally hundreds of thousands of years if undisturbed? That, again, is something that we will be getting to very shortly.

3) The third has to do with the speed of light itself and the fact that (at least, unlike it is with particles and matter) it has a constant speed that is unrelated to the energy of the photon.

Electromagnetic energy is ubiquitous all about us. It always has been, but this is especially true today with all of the added radio, TV signals, radar, microwaves, more extended exposure to light both day and night from our artificial lighting, plus from even low frequency emanations from all of the power lines that are strung like so many antennas all over the land. While there have always been copious amounts always about, it now pervades our lives in even more numerous, often highly useful ways. Yet, how well do we really understand what is really going on in this common phenomenon?

Most typically, I have always seen it treated as if it is something that just "happens". Since we already know very well how to calculate and quantify its effects and interactions – no one seems to be concerned about whether we actually even understand "WHY". Even I did not truly realize that there was any significant shortcoming in that area until well after some of the ideas that we have been discussing had already begun to come together – then they day came when I all of a sudden realized what was really there, right before the eyes of my understanding. It was fascinating.

Much of what we do understand about the phenomena of moving charges (electrical currents, as well as plasmas and such) and magnetic fields comes from a great deal of study of electricity and magnetism in everything from lightening and static charges to electrical circuits, electronics (including vacuum tubes), and more over centuries. As a result of that knowledge, we have learned to do a great deal with them, very much to our advantage. While many of the whys and hows are rather clear in all of those electricity-based systems, electromagnetism has always just "been there". As a start, there is absolutely no question that it is "there" and very real. We have learned how to both generate it and to detect it, as well as many ways to take advantage of it – yet, we seem to have always treated it simply as a self-existing phenomena that warranted no further understanding than that it "is", along with the rather obvious recognition that it is related to electricity and magnetism. Perhaps we will be able to shed a bit more light on it over the next little bit.

To understand better what appears to be happening, let's first take a look at the interaction between the momentum field and the Quessence. Given that the Quessence is actually there, the momentum field would not be just traveling through an empty void or a "vacuum" (even in deepest space). Now, when we walk or swim anywhere, we need something to act against if we hope to be able to make any progress thereby. If we were to try to walk with our feet in the air (and not touching the ground), or even if we were to try to swim through something less substantial than water (such as the air) we would not get very far. If we were to try to walk, or swim out in space, where there is essentially nothing tangible for us to act against, it would be very hard for us to make any progress at all. Not only must we be in contact with something to make progress, but it must also have sufficient integrity to provide at least some resistance to our efforts, or most of our energy would just be wasted thrashing around uselessly. I firmly believe that the same thing holds true for everything that moves in the universe – it doesn't have to be "solid", a matrix of largely hidden static fields, or elements thereof, would likely work just fine. It does not have to be absolutely still and unchanging – one can swim across a moving river as well as across a still lake. The total absolute distance traveled would be significantly impacted, but the basic rules for moving (relative to the water), wherever one may happen to be at, would remain essentially unchanged. Thus, we would suggest that another one of the critical functions filled by the Quessence is to provide some sort of a frame of reference, something real and with substance against which dynamic fields, such as the momentum field, can act.

Moreover, there is another aspect of the momentum field's interaction with the Quessence that is every bit as significant and it is highly applicable to the considerations that we need to cover at this time. Given that there is actually something there, something with a significant degree of substantiality, any sort of dynamic field, such as the momentum field is presumed to be, would need to be able to either:

1) Travel through whatever may happen to be there without hindrance (meaning, from a phenomenoscience perspective, that the particular dynamic field in question does not happen to interact with those particular components of the Quessence).

Or

2) If it does happen to interact – its passage would almost certainly induce some sort of local impact or change on at least some of those interacting components. This interaction could be that it cannot just ignore and pass through some of the components of the Quessence, but needs instead to get them out of the way (this would be very similar to the way that an individual passing by a mechanical pendulum would need to push it aside, since we cannot just pass through solid matter). Then again, it could possibly have the capability to pass through it, but that it would still interact with it, and thus, exert some sort of influence that would induce it to move aside anyway. (Note: the end results of either one of the possibilities noted in this paragraph would produce experimental and mathematically equivalent results – they would look the same to us from our perspective outside of the system. We will not try to discriminate between them here, for we have neither sufficient indication at this point as to which is actually the case, nor does it matter to the considerations that we are striving to present.)

Note that it is also entirely possible that there may be components of the Quessence where we would not even have any substantial reason or basis for even suspecting that they might exist, simply because they do not happen to interact with any of the phenomena that we are currently familiar with,. We shall not concern ourselves with any of those at this time. With any given SL dynamic field, we should also recognize that there is also a very high possibility that it might interact with some known components of the Quessence (or with other SL dynamic fields or phenomena), and yet not do so at all with some of the others. We won't go any further into that at this time either, but there is more that we may be able to cover about that at some future time.

Our primary concern here at this particular time is that it does appear that, based on what we do know about the photon, the momentum field, as proposed, would clearly have to be interacting significantly with the charge factors in the Quessence. Whatever the exact nature of the mechanism might happen to be, as it passes through any given location, it seems very clear that it separates the positively charged factors some little bit from the counterbalancing negatively charged ones, which are (of course) initially located in the same nominal area of the Quessence. The nature and consequences of that process are what we will be delving into next.

If you'll remember, we have already discussed the close association between moving charges and magnetic fields, wherein it is rather clear that the simple act of moving any amount of charge, in any way, at any time, will always entail the generation of a corresponding magnetic field as well. Thus, the very process of separating the charges (or charge factors) to create a discernible electrical field would thus also automatically create a combination of charge separation (an electrical field) with an accompanying magnetic field. The simplest analogy that I know of to compare this to is that it is like taking a stationary simple pendulum and then beginning to move the bob to one side. While the actual nature of the energy and forces involved are distinctly different, the basic character of the interactions involved are highly parallel, and the mental picture created by the mechanical analog may be easier to visualize and grasp. As the pendulum bob is moved to the side, the upward swing of the bob will progressively add to its potential energy because the further it swings to the side, the higher it is raised above the bottom of its swing (that is analogous to the creation of an electrical field). In the process, it will also become imbued with some kinetic energy (depending in part on how fast and hard it is being swung) because the very act of moving the pendulum bob to the side inevitably involves imparting some degree of motion to the bob as well (which, of course, is analogous the generation of a magnetic field).

The critical key to understanding what happens next is that all the while that the charge components are being separated – as the momentum field passes by – that momentum field is also moving forward. Thus, the momentum field is soon past that particular location, and just like it would be if someone were to swing a pendulum out of the way so they could walk past where it was hung, the momentum field leaves behind it a combined, and now unsupported, electrical field/magnetic field disturbance (an electromagnetic field). Because

of the ways that they interact, whatever energy may be left resident in the magnetic field would continue to drive the separation of the charge components even further until all of its energy is fully dissipated some short time later. (This is directly analogous to the way that whatever kinetic energy there might be in a pendulum when someone quit pushing it would cause it to continue to swing outward and upward until all of that kinetic energy has been transformed to potential energy.) What would be left at that point is an unsupported harmonic system (with all of its energy momentarily in the form of a pure charge field [with our analogous pendulum, it would all be potential energy]). Subsequently, in full concert with the principle of spontaneous harmonic oscillation that we discussed earlier, since an isolated charge field is an unstable and unsupported condition, thus, it would then begin to oscillate until its energy is dissipated.

Let's try to illustrate this overall process using a mechanical analogy. Let's say that someone is passing through an area where there are stationary pendulums hanging about in every direction. Regardless of which direction they traveled, in order for that individual to proceed to move forward, they would need to clear whatever pendulums might be in their way away from their path so that they could pass by. This they could easily do, simply by swinging each pendulum to one side or the other as they came to it. Now, if we were to mentally watch this process from the side somewhere, we would see that as they progress, while all of the pendulums in front of them are stationary, the pendulums behind them, along the path that they had just traveled, would all be swinging. Depending on how great the losses might happen to be in each of those pendulums, as one looks ever further behind the individual, the residual swing in those pendulums would progressively diminish until (assuming there are no other disturbances) they would once again become stationary. We can picture this scenario continuing on indefinitely. At least, assuming that the individual doesn't get tired, they would be able to continue on indefinitely. What is important to recognize here is that the energy in any one of those pendulums is temporary, regardless of what the rate of the losses in those pendulum systems may happen to be, so long as nothing else disturbs them, at some point they would eventually once again become stationary.

Of course, to a point at least, this would be very similar to what happens with the residual electromagnetic field left behind by the passage of the momentum field, but with some very important differences as well. A person walking down a line of stationary pendulums would actually be leaving all of the energy that they impart to those pendulums behind, for there is no practical way to retrieve the energy left behind in those pendulums and return it to the individual who had set them swinging. Thus, all of the energy imparted to the pendulums is permanently lost to the individual, and that energy is subsequently eventually dissipated as losses within each pendulum system. The energy lost in each pendulum system is generally dissipated in one way or another mostly as heat from friction, thus that energy is essentially just scattered about and eventually lost to both the individual and the pendulum systems. Eventually, in real life, such an individual would also gradually tire out and their progress would inevitably cease. With the photon and the electromagnetic field, this part of the process would obviously have to work somewhat differently.

First of all, and this is very important, as the momentum field interacts with the Quessence, creating an electromagnetic wave field disturbance behind it in its wake, it also does thereby leave energy behind. Now, if that energy were permanently left behind, as it was in the mechanical system analogy, the momentum field would soon become bereft of its energy and would, of necessity, cease to be – however, as we have already stated, with photons that is clearly not what happens. A key understanding for what appears to happen here devolves back to what seems to be one of the key characteristics of the Quessence – it, by itself, is a static system, meaning that it is composed (at least primarily) of static field factors, and thus, cannot hold on to energy. While the Quessence cannot hold on to the energy – neither can the electromagnetic wave field. Where, as proposed, SL dynamic fields would be the only field configuration that is both self-defining as well as self-contained, it has gradually become evident that it is likewise only the SL dynamic field configuration that would actually be capable of controlling and thus, holding on to, energy indefinitely. Thus it is, that: as we are proposing that the picture of Reality is anyway, it has also become evident that ALL of the energy in the universe is ultimately closely tied to SL dynamic fields themselves, or to other transient effects closely and intimately associated with them. What we are saying here is that the electromagnetic wave field, which is so very intimately associated with the photon (and usually thought to be the total composition of it as well), is an excellent example of one of those "other transient

effects". It is not so much that the Quessence "abhors" energy, rather, it is simply that the Quessence is totally incapable of holding on to it; ONLY dynamic fields are capable of holding on to energy. So, let's get back to the electromagnetic wave field.

The electromagnetic field is actually an oscillating composite of two distinctly different but closely interacting fields. The electric field component is a static field, and like the rest of the Quessence, cannot hold on to energy by itself. The magnetic field, on the other hand, is a dynamic field – but it is an extended type of dynamic field (what I refer to as an EX dynamic field). Although it still has the closed lines of force of a dynamic field, it is not self-contained like an SL dynamic field is – and – while it does drive motion, it is perpetually expending whatever energy it may have by driving a totally different type of field, namely static charge fields. Thus, while it is essential for moving charge fields and does hold energy, it is incapable of HOLDING ON to that energy all on its own – instead, it transfers it to the static charges that it is associated with as quickly as it can. Thus, magnetic fields (and very possibly, all EX dynamic fields) can't really hold on to that energy either. This is why we have said that it is only the self-contained and self-limiting SL dynamic fields, which use the energy that they have primarily to DRIVE THEMSELVES first (rather than something else) that can actually hold on to energy indefinitely (unless they are otherwise disturbed somehow). [Although, as they do, they are also capable of carrying along whatever other components that they might happen to be intimately associated with at any given time as well – we will be getting back to that later.] It is very specifically because they do use their energy primarily to drive themselves that makes them "self-contained", and thus, capable of holding on to whatever energy they may have in a stable manner.

Thus, we have a momentum field that, because it is an SL dynamic field, is self-contained, and thus, is inherently capable of holding on to its energy indefinitely. Yet, at the same time, because (for whatever reason, as noted before) the static charge components separate a bit around it as it moves through the Quessence, it is also inadvertently putting some of its precious energy into those resulting electromagnetic wave fields that it is perpetually leaving behind it. Now, because neither of the components of the electromagnetic wave field (which are constantly oscillating, or trading their energy back and forth) are actually capable of holding on to the energy that they have, that energy must find somewhere to dissipate to, and do so relatively quickly. So – what other options are available? As it turns out, careful evaluation indicates that it appears that the electromagnetic wave field is in absolutely perfect tune with an excellent option – one that is thereby perfectly suited to receive that energy. The electromagnetic field is an oscillating harmonic system whose cycling frequency appears to be well correlated with the cycling rate of the momentum field that creates it, which is in turn directly associated with the total energy in the system – the more energy there is, the faster they both appear to cycle (momentum field) and oscillate (electromagnetic field). [Note here that, while the frequency and wavelength are mathematically interchangeable with the proper conversion and thus, nominally of seemingly equivalent value, from a phenomenoscience perspective, the truly fundamental variable of the two, particularly when dealing with the photon, is the frequency. It is truly the more basic of the two phenomena, for it is a direct outcome of the way that the energy cycles in the system. The wavelength is a physical result that arises from the combination of that oscillation frequency with the speed of light.]

From all appearances and the clues that are available to us, it does seem rather clear that there must be some sort of cycling process going on within the momentum field. As we have already stated, it also seems clear that it is one that is also closely associated and in excellent synchronization with, the oscillation that is occurring in the electromagnetic field. Whatever the exact nature of that cycling process in the momentum field might happen to be, it does appear to be in lock step with the oscillations of the electromagnetic field that surrounds it. For one thing, this would need to be an essential property for the photon to be able to hold on to its identity as well as it does, especially when it is either surrounded by many other photons, or when it is frequently intercepting other photons on an exceedingly regular basis.

How and why would this energy return come about (as I have averred that it does) within the system that I have proposed? I have already indicated that I have concluded that the Quessence cannot accept raw energy, for the static fields are incapable of holding it on their own. When there is not something "else" to hold static field

factors in some sort of a separated, measurable-field condition, they would simply respond to their own gradient-induced forces and redistribute themselves within the Quessence until they are once again in their minimum energy condition. (Note that such would also mean that the energy could not readily just "dissipate out" into the Quessence, for it is not prepared to receive it. Thus, that energy would be trapped right where it is at, and thus, would either have to find some sort of an already present "sink" for it to go into, or else, it would have to drive the creation of something [some sort of an SL dynamic field] that could.) The key within the photon is that the momentum field IS not only capable of holding on to energy, it will assiduously take up all of the energy that it can – particularly when that energy is both properly frequency and phase tuned to its current energy level and cycle. Given that this frequency correlation is related particularly to whatever cycling may be going on within the momentum field, then it would be expected that it is also very strongly affected by the quality of the phase match between the momentum field and any electromagnetic fields that might be about. Thus, in any given photon, where the electromagnetic field is initially generated by the interaction of the momentum field as it progresses forward through the Quessence – that electromagnetic field would also inherently be in a very closely correlated frequency and phase match with the momentum field that initiated it. This, in turn, would also make it a natural energy sink for the energy being shed by the electromagnetic wave field that it "left behind" as the components in that wave field seek to ring back down to their normally quiescent state once again in the Quessence.

The Speed of Light

Herein then comes another very important aspect of the system operation, one that explains one of the most evident properties of the photon – its velocity. Before explaining what appears to be happening, I feel that there is a point that needs to be raised for context. Very often, and this is particularly true for particles with mass (but it is seen elsewhere too), the velocity of some given particle or other entity is related in some manner with its total energy – the more energy that it has, the faster it goes. Such is not the case with the photon. It does cycle faster, if indeed, it is frequency-matched with the electromagnetic field, as we have proposed that it is. However, the velocity of all photons, regardless of their energy levels, is always the same – the speed of light through whatever medium the photon may be traversing at the moment. We believe that the reason that they are all velocity-matched is very much related to their structure and the way that they operate.

As a momentum field moves forward through the Quessence and initiates the disturbance that leads to the electromagnetic wave field oscillation, it is constantly leaving energy behind (this part of the process is very much analogous to the pendulum). The other key understanding is that the energy that is in turn being shed by the electromagnetic field is being shed only after the momentum field has already passed by. Thus, in order to be able to return once again to the momentum field as we have averred, that energy must be perpetually working its way forward from behind the momentum field (and thus – propagate forward, at whatever its own propagation rate may happen to be, in order to be able to return to the momentum field). Now, we have previously stated, and we certainly do not have any ironclad "proof" of this at this time (but I do believe that there is a rather substantial body of indirect evidence to support it), disturbances within any of the *known* static fields do not appear to be able to propagate faster than the speed of light in any direction through the Quessence. This most certainly appears to be also true of the charge and magnetic fields. It also appears to be true for mass fields (which would also include gravity), as well as for whatever fields are associated with neutrinos (that is something that we will get back to somewhat later).

For the photon to be able to continue on indefinitely, it is absolutely clear that it would have to operate in an energy-balanced manner. What that means is that, if the momentum field is leaving energy behind as we have indicated, then that energy would also have to be returning back to it at the exact same rate as it is being "lost".

Let's look at one plausible scenario as an example. Let's suppose that somehow it was inherently possible for a momentum field to travel at velocities exceeding the speed of light (provided it was not interacting with and constantly losing energy to the electromagnetic wave field). If such were to be the case, and the momentum field were then to try to move forward faster than the return electromagnetic field energy could propagate forward, it would be running ahead of the return energy, and as a result, its own energy levels would diminish. Now, let's

further suppose that, if it were on its own (again, if it were not subject to the electromagnetic wave field effects), that it would tend to move at a velocity that was actually proportional to its energy. However, given that it actually does interact with the charge fields, and thus, loses energy – making it subject to the electromagnetic wave effects – then, so long as it were to be outrunning the energy return, its energy would be diminishing – which would cause it to slow down until the return energy could begin to catch up. In such a system, the natural velocity – the only one at which the losses and return would remain in balance – clearly, would always have to be the forward propagation velocity for the returning energy.

In such a system, the balance of energy within the overall system would also naturally tend to balance out between the two interacting systems as well. If the momentum field was to be more energetic, and thus, cycling faster, it would also be expected to tend to drive the static field components harder, and thus dispense energy to the electromagnetic wave field at a higher rate. With the electromagnetic wave field more strongly loaded, and thus, driving harder, it would likewise be expected to shed its energy at a faster rate as well. Now, we have already indicated that the system could only maintain a proper energy balance when the energy return rate is well matched with the rate of energy loss. Thus, it would also be expected that the distribution of energy between the momentum field and the electromagnetic wave field would self-adjust until the balance of energy in each field was such that those two rates of energy transfer were properly balanced. Thus, the balance of how much of the total photon system energy is resident within the momentum field itself, and how much of it is momentarily contained within the electromagnetic wave field, would be expected to vary in a consistent manner as the total system energy varies. It might very well maintain a constant ratio between the two fields, or there might be some sort of systematic (likely linear) variation that is closely tied to the overall energy levels. That would be an interesting question to pursue.

This energy balance, in turn, could be a major factor in tying the cycling rates of the two parts of the system into a close lock-step of their frequencies – and thus, establishing a close coordination of the whole photon system. Moreover, all the while, it would be the propagation velocity of the return energy from the electromagnetic wave system that would be the final determinant for how fast the photon could move forward as a system. Thus, even though the energy in the momentum field might increase along with the cycling frequency, the requirement for a balanced energy exchange would effectively act as a *speed-governor* on the rate that the momentum field could actually progress forward – regardless of the overall energy in the system. Even though it may be churning harder and faster – so long as it is speed-governed by the propagation velocity of the returning energy from the electromagnetic wave field, there would be no way that it could ever exceed the speed of light. That would certainly account for why its velocity is totally divorced from the energy level present within the photon system.

Side note: Are there any inherent velocity limitations within the momentum field itself? I do believe that we can be fully confident that the propagation velocity of the energy in the electromagnetic wave field acts as a speed-governor on the photon. However, at this point in time, we really have no way of knowing how fast the momentum field might otherwise tend to travel if it were not so entangled with the electromagnetic wave field effects. (I believe that this last point provides an excellent demonstration of how, even as it helps to answer a variety of 'old' questions, it also manages to interject some 'new' ones as well. Most especially if we might happen to be on the "right" track, I maintain that such is to be expected – and thus, it provides cause for added confidence that we could actually be on the right track.)

There is one last point that needs to be covered regarding the speed of light before we finish for the day. It is that the speed of light is ALWAYS relative to the Local Quessence meaning that the Quessence acts as a local frame of reference for the photon. This is essentially a major part of what was demonstrated by the Michelson-Morley experiment. The other part is that it demonstrated was that the Quessence would also need to be essentially "stationary" relative to the earth, at least, at locations that are in close proximity with its surface. The earth constitutes a rather substantial mass – and its gravitational field is manifest in all of the areas about it. As we have stated before, the Quessence will always seek to settle out into the lowest possible energy state. With

respect to the earth, this means that near the earth's surface, it would be very logical for it to remain stationary with respect to the earth's surface. Somewhere between the surface and space out beyond the earth, there would then need to be a gradual transition as the most predominant forces gradually shift, so that well out away from the earth, the predominant frame of reference would be the sun and overall solar system. It is very much analogous to what would happen if we were to be swimming across some sort of current or stream. In such a case, the energy involved in all of our swimming efforts could only properly be evaluated in a valid manner if they are measured relative to the water *where we were*. Our velocity relative to some distant landmark might vary somewhat, depending on the speed and direction of the current flow, but our velocity relative to the local water would only depend on our swimming capabilities and efforts.

In other words, the speed of light is NOT constant relative to absolute space, NOR is it fixed and constant relative to all frames of reference. It is constant only relative to the LOCAL frame of reference presented by the Quessence. A key realization in understanding what is actually happening is that our capabilities to measure the speed of light is very much dependent on how well we can establish all of the pertinent parameters. In all of our best and most accurate setups – our measurement systems have always been stationary to the local Quessence as well – so we have not been able to use experimentation to discern any differences that might actually be out there.

Chapter 6

Particles

Just a note on where we are in the process of putting this discussion together: We are not yet fully ready to discuss particles, since we have not yet covered all of the basics regarding the photon, however, we will say at this time that momentum fields can be associated with particles as well as with photons. The similarities and the differences between the two are closely associated with many of the familiar properties that distinguish one from the other. Those are areas that we will cover in more detail after we have covered both photons and particles in a bit more detail. That will likely be a few installments in this document away yet.

We are planning next to cover how a single photon can interfere with itself, so we will be continuing to focus on photons before we get back to looking at particles. Even so, for the sake of perspective, I feel that it is appropriate at this time to provide a very brief indication of what the basic differences are between photons and particles. This will only be a brief summary, so please try not to read too much into this before we are able to get back to the subject of particles.

Particles

I do not believe that photons (and other quanta that we have not covered yet) and particles are really as dramatically different as they may seem. First of all, I maintain that SL dynamic fields are at the heart of both. For both the photon and most ordinary particles, the first SL dynamic field of interest is the momentum field. Second, given that a momentum field is included, they would also both be expected to have associated electromagnetic wave field disturbances – features that have long been recognized as, at least "sometimes", being there. [Note: When I was in school, I was taught that both photons and particles "sometimes" act like a particle, and "sometimes" act like a wave, in what was treated as some sort of mysterious dichotomy. In case it has not already become clear, I have always felt (even when I was in school), and I have long since become even more convinced, that they both ALWAYS have both particle-like and wave like characteristics. The particle-like characteristics arise from the presence of one (or more – we'll get back to that later) SL dynamic fields at their core – which is why quantization comes about in the first place. The wave-like characteristics are a direct result of the electromagnetic wave field disturbance that always accompanies momentum fields as they make their way through the Quessence. The ONLY reason that we typically only "see" one or the other of those characteristics at any one time in most of our experiments is because most of our experimental setups are only capable of clearly *responding* to one or the other of those divergent sets of characteristics. The specificity is NOT actually found in the phenomena being measured – but is instead only found in our capability to clearly detect both simultaneously. Moreover, I believe that there are actually some well known, but poorly understood phenomena and their experimental results that do actually reflect both of them simultaneously (even if not so clearly as to be obvious – especially because we still lack adequate understanding f Reality), but that is something that I expect to be getting back to before too long.]

The point that we want to emphasize at the moment is that all quanta, which includes the photon, consist of SL dynamic fields *only*, thus they will always tend to move at a constant limiting velocity similar to the photon, and for basically for the same types of reasons. Remember that, we believe inherently, SL dynamic fields are self-stabilizing, so they can exist on their own as separate phenomena – although it is also at least conceptually possible for there to be more than one type of SL dynamic field associated with a single type of quantum. The critical key difference that, by definition, differentiates quanta from particles is that there are NEVER any static fields of any sort whatsoever associated with any type of "quantum".

The moment that any sort of SL dynamic field also stabilizes any sort of static field as part of its system structure, the resulting phenomena will always begin to exhibit the characteristics of a particle. Just as with dynamic fields,

there can also be one or several static fields as well. The key is that particles will ALWAYS have at least one static field associated with them. There is a lot more that could be said, but that will have to do for now.

Author's Note:

This treatise is a work in progress. So long as this not is included at the end, I am still planning or expecting to becoming back and adding more to it. Reality is highly complex, and therefore so also are the areas touched by the Theory of Field Interaction. There really is quite a bit more to cover. Neither my other book nor this treatise will provide complete coverage of the topic, nor will even the both of them in concert. There will be areas covered in each that won't be touched in the other. There will also be different levels of coverage as well as different approaches to the topics that are covered. Thus, neither one of them will replace the other.

I would personally recommend that both of them be read somewhere along the way, but of course, such a choice is up to the reader. I can ask no more than that you at least give careful and thoughtful consideration to whatever you do read. I believe that there is great insight here, the likes of which I have not seen anywhere else before. You will have to judge whether or not you agree with that for yourself.

Whatever you may choose to do or feel, I wish you well!

T. B. Bon