# Is This Philosophy or Science?
# – Or –
# Why Is There So Much Focus On Concepts?


## Abstract

This discussion is specifically focused on the question of whether the treatise "The Theory of Field Interaction" as well as the other associated documents on the website tbbon.net constitute mere philosophy or true science – even though there is a very marked focus on concepts throughout rather than the more "customary" and familiar (to many scientists anyway) mathematics. In the process, it discusses some limited aspects of the differences between science and philosophy – at least, as regarding the topics at hand. A careful process to discern scientific truths, one which embodies the basic principles and approaches of phenomenoscience, is then outlined, with the goal being to demonstrate that, indeed, both phenomenoscience and the subject treatises are actually very good science, although they use processes significantly different from current common practice. The point is made that without the proper preliminaries – i.e., some very careful phenomenoscience – it is not possible for us to apply mathematics properly – and thus, too much dependence on mathematics can actually become a trap instead of a means for keeping us on-track. The implication is also made that, because of too much inappropriate dependence on some of the wrong tools (especially mathematics), much of what is promoted as "good" science today is in reality, actually little more than unfounded philosophy. When mathematics is applied without sufficient conceptual checks and balances of the right type, it becomes very easy to doll philosophy up with sufficient misguided math to obscure its true character quite effectively.


## Introduction

It is most unfortunate that there are many today who feel that if some particular treatise is not heavily endowed with mathematics, it cannot be good theoretical physics or science but just so much conjecture or philosophy. There also appears to be a far too common misconception in physics and science today that mathematics, even on its own (without any other real support), somehow has an overriding capability of keeping us from veering off-track from the truth of Reality. If such were truly to be the case, then the idea that heavy dependence on mathematics as an critically essential element of good theoretical physics or science throughout all stages and phases would indeed be a valid conclusion. However, such is not the case – indeed, there is almost nothing that could be further from the truth. As a result, so-called "modern" physics is currently suffering from a whole range of highly troubling anomalies and irrational inconsistencies.

Mathematics can be a most wonderful and useful tool, but <u>only IF</u> it is used correctly. Mathematics is far too flexible and actually has no inherent ties whatever to Reality for reckless dependence on it alone. The only ties to Reality that mathematics can ever really manifest are those that <u>we</u> somehow manage to imbue it with when we develop whatever initial formulations we may use, as well as with whatever other limits and requirements that we may impose on the subsequent operations. It is not the actual mathematical techniques and process rules that truly make the difference, but it is HOW we use them that are the very most important. In order to do so properly, we must first have enough of an understanding for how Reality actually works – from a real-world phenomenological "how" and "why" perspective – for us to comprehend properly how to actually apply the tools of mathematics correctly. Thus, before we delve into any associated mathematics too deeply, we need somehow to develop that crucial understanding of the "physics" of how and why the different phenomena act and interact in the ways that they do. That is something that we have unfortunately failed to do properly, especially with a number of the more recent concepts. As a result, despite extensive mathematical support, so-called "modern" physics, and therefore much of science as well, have gotten well off-track from the truths of Reality.

In order to get back on track, we are going to have to take some significantly different approaches from those that have allowed us to end up where we are – ones that some will have a tendency to perceive of as "philosophy" (based on currently common perceptions). We will need to do some serious conceptual, phenomenological preliminary work using some techniques that have fallen somewhat out of favor, as well as to develop some of those conceptual, phenomenological techniques further in ways that have perhaps not really been adequately pursued yet. Only after we have accomplished that, would it be properly appropriate to bring back in many of our mathematical tools – taking care to use those new-found insights to help us understand how to use our mathematical tools correctly.

**What Is It that Actually Constitutes "Good" Science?**

In today's world, science is generally considered to be explicitly focused on Reality, on "real" things – things that can be somehow verified and confirmed to be true. That is why the combination of experimentation and measurement is considered to be one of the principle pillars of modern science in general, and physics in particular. That is a most noble goal, and one that is certainly worth pursuing as diligently as is possible. Mathematics is considered to be another principle pillar of modern physics, for it is the tool that enables us to quantify both our measured and our theoretical results, and thus – to model what we see in such a fashion as to be able to make both numerical "confirmations" as well as predictions based on our observations and theories. In concept, it is very useful for correlating our computational "theories" with our observations – and numerically at least, it actually *seems* to have worked quite well. As a direct result, and especially because of some very puzzling conceptual developments and conundrums over the last 100 years or so – quantum mechanics and relativity in particular being prime examples – many seem to have concluded that the pillar of mathematics, along with the pillar of experimentation and measurement are collectively the truly critical "foundation-type" pillars of modern physics. Sometimes, it even seems that some consider mathematics to be even more important than experimentation and measurement. Moreover, there are many who would have us believe that not only must they both *always* be there, but they would also have us believe that they would be fully sufficient, *all by themselves*, if all else were to fail and not make sense.

This particular mindset appears to have arisen primarily because, as some seemingly peculiar aspects of the aforementioned areas of physics were observed and evaluated, and associated mathematics (which did happen to provide numerically equivalent answers) were subsequently developed, it was concluded that the associated concepts had been adequately confirmed as "correct". However, the conceptual pictures that were built around those numerically equivalent formulations just couldn't be made to make rational, coherent sense. Subsequently, as an eventual consequence of that dilemma, the conclusion was ultimately reached (and has since become promoted as certain "fact") that Reality, at least in some cases, must somehow be "counterintuitive" – it cannot be relied upon to always make rational, logical sense. Thus, the idea of using the rationality of the concepts as one of the prime tests for their validity, and then striving to truly comprehend the phenomenological how and why of the way that Reality actually works as it does fell somewhat out of favor. It became sufficiently "enough" to simply have mathematical formulations that provided "good" answers that just happened to match what was observed or measured. Subsequently, the answer for a question of "how" or "why" very often became no more than a mathematical formula – typically with no real consideration of the actual physical phenomenological modes of interaction.

For reasons that we will be elaborating on more below, I personally believe that the above "definition" or scope of science is significantly too narrow. I very sincerely agree and believe that it needs to be focused on Reality and on real things – but I believe that such a goal should truly mean an effort to *gain as accurate and complete of an understanding as possible of Reality as it truly is*. Where this definition differs from what is given above is that, among other things, we need to recognize that experimentation and measurement, even when in combination with math, regardless of how crucial they may ultimately be, cannot be considered sufficient *all by themselves*. Moreover, we also need to accept the very real fact that there are already some very common aspects of Reality that we truly cannot detect or measure – sometimes just not directly, and other times not at all. Moreover, we also need to accept the very real possibility that there may well be even more immeasurable aspects of Reality that have not yet even been recognized. It truly is not realistically reasonable to expect that if it is real, we should always be able to see and measure it – an excellent example of that is the neutrino. Even though we have recognized ways of discerning when one *must* have left an interaction, or when it *must* have been involved with one, we have never actually seen or detected one. Instead, we cleverly set up special situations where we can readily watch for the types of *secondary* effects that indicate that such an interaction *must have occurred*. Similarly, the possibility that there could be something else, or possibly many other somethings out there that we are still not aware of – and that possibly we can neither see nor measure (where in fact, we may never be able to), should be regarded as distinctly significant.

As another example, there are actually several other parameters that we use regularly – ones that we either cannot truly measure at all, or, where we can only measure certain limited aspects associated with them – yet, such limitations are not generally recognized or are often totally overlooked. Some of them are discussed in the book, *"The Theory of Field Interaction"* (hereafter referred to only as the "book"), and some of them are also identified in some of the other discussions, but the discussion regarding them is more than we wish to include here. Thus, we will not name or discuss them here – except to note that there are more, and will just mention the neutrino for now.

The point that we are striving to make here – and this is crucial – is that if we were to limit ourselves arbitrarily (for whatever reason we may choose) to only that which we feel that we can actually see and measure, at least indirectly, we will have set ourselves up for almost certain disaster. For, in the event that there actually did happen to be *anything* else that we truly cannot see or measure – we will have *ensured* our failure to properly discern the truth of reality. That, in turn, would mean that we would have failed at what – I believe – should be our primary goal, that is, to learn as much of the truth of Reality as we possibly can.

All of the above does not excuse us in any way from doing everything that we can to verify and corroborate, as much as we can possibly devise or implement ways of doing so – by whatever means might actually be available to us, whether they may be direct or indirect. To trudge off foolishly into the dark, without doing everything we can to make sure that we are going in the right direction, would be a reckless endeavor that would likewise be highly prone to lead us down the wrong path.

With that in mind, I believe that there are at least three critical principle pillars of physics and science, meaning that all three are ESSENTIAL for minimum confirmation of the truth, yet at the same time, even all three *may not always be sufficient*. We will always need to use as many of our available tools as is possible, in concert, if we ever hope to keep from getting off track from the truth. We must be most, most careful, for there are no guarantees, so we must always crosscheck our results in each and every way that we can. In addition to the pillars of experimentation and measurement, and of mathematics that have already been mentioned, the third *critical* pillar is to discern as accurate and complete of an understanding of the actual phenomenological concepts which lie behind both the experimentally measured results and the associated mathematics as we can possibly devise. This process of discerning an accurate phenomenological understanding of Reality is a rather complex process that I have chosen to refer to as phenomenoscience, which is covered in more detail in another discussion.

One of the principle concepts underlying phenomenoscience, and one that I firmly believe is a critical absolute in our efforts to discern the truths of Reality, is that Reality is fully and unequivocally rational and consistent at all scales or ranges of parameters – with absolutely NO) exceptions! That is, I firmly believe that it will prove to be so once we have finally conceived of the correct phenomenological concepts sufficiently correctly and accurately. This would, of course, mean that rationality, as well as consistency – across a wide range of scales and parameters – would be principle and critical tests for whether or not the phenomenological concepts (and – eventually at least – the associated mathematics) that we have developed could possibly be considered potentially true and accurate. This does not necessarily mean that those concepts must feel "right" the very first time that they may be encountered. However, if they do not eventually coalesce into a consistent and rationally comprehensible set of concepts over time – then it behooves us to conclude that (regardless of how closely any associated mathematical results may seem to coincide with our measurements) there MUST still be something missing or awry in those concepts.

For us to either 1) abandon the requirement for rational concepts, and just go with the mathematics – <u>or</u> – 2) for us to accept that Reality is somehow ultimately irrational or counterintuitive, are both approaches that are prone to lead to *serious* errors. As, indeed, I believe they have already done. In all that we can actually see and most readily discern, I have *never* seen any situation wherein Reality has ultimately truly proven to be irrational. However, I have repeatedly encountered many areas and applications where there have been incomplete or flawed concepts held by some, of what they thought was really happening – where those who did not properly understand what was going on felt that what they were seeing was indeed irrational. Yet, once a sufficient understanding of the truth became clear, my experience has been that the appearance of irrationality inevitably *always* evaporated. That, essentially, is why I sincerely believe that once we get to where we correctly understand the concepts behind what we have observed, we will indeed find that it truly is rational.

Thus, we are very specifically proposing that: If <u>any</u> of the theories that we have do not, at least eventually (within some reasonable elapsed period of time and effort), coalesce into a consistent and rationally comprehensible set of concepts, then we need to be prepared to go back and reevaluate whatever we may have. We need to be prepared to go back and reconsider our ideas, and then to continue searching as long as we may need to, until we *can* find a consistent, coherent combination that does work in a rational manner. Certainly, we will need to make good use of all three pillars – experimentation, phenomenological concepts (using phenomenoscience), and, *eventually*, mathematics as well, plus , perhaps a multiplicity of other tools – to find ideas and concepts that truly work well together in a rational and comprehensible manner to create a total picture that we can reliably build on. It matters not how good our mathematics may numerically support the experimental results (for the same math can often support multiple concepts) – if we do not have a truly valid and effective understanding (or at least – something that is reasonably close thereto) of the correct phenomenological concepts behind the mathematics and experimental results, our future progress will be significantly hampered. Whenever our phenomenological understanding is significantly flawed or inaccurate, trying to build on whatever it is that we may happen to have is somewhat like groping in the dark, where we don't really know where we are or what is in the area about us. We could easily get lost and not even realize it – that would not be good science.

## What Is Philosophy?

I suppose, in the sense that such a question as given in the title of this discussion might be raised, that philosophy might be used to refer essentially to an endeavor that is perceived to attempt to discern the truth with a strong emphasis on concepts and phenomenology, but without adequate attention to experimentation, mathematics and other corroborating and verifying techniques. Sensitivity to such an approach would be most reasonable, for the history of science is replete with examples of where science has suffered major setbacks for centuries because of too much reliance on just such misguided (and, ultimately, inadequately supported and verified) endeavors.

With such a definition or perspective in mind, we will now set out to show that, despite a very strong and purposeful focus on concepts (at least in the initial presentation), this endeavor, including the book, is indeed aimed at true science and not philosophy. For one thing, although there appear to be many who do not recognize it, as has been amply demonstrated over the last century, experimentation and mathematics are NOT sufficient to avoid rather substantial problems with philosophy and unfounded conjecture masquerading as science. We will strive to show how there are actually three critical pillars, as well as multiple other approaches, all of which are a critically inherent part of this whole effort to find the truth.

## Why Did This Project Get Started?

We sincerely believe that physics in particular, and therefore, science in general, have gotten significantly off track, in part at least, because of too much dependence on experimentation and mathematics *alone*, particularly when the concepts that were derived from the available mathematics never actually coalesced into a rational, comprehensive picture.

We currently have a number of areas in “modern” physics where there is overwhelming experimental evidence, coupled to well-exercised mathematical formulations, which show quite conclusively that the data is good, and the mathematics produces numerical results that are clearly in excellent agreement with all that we have observed. That is wonderful – it certainly gives us a good basis to try to build upon. However, attached to many of the phenomena related to these more recent developments, there are concepts and ideas that absolutely do not make any sort of rational sense. In fact, some of them are in total, blatant defiance of anything even remotely akin to reason. Furthermore, even though Reality clearly transitions seamlessly from one area to another, we have not always been able to do so with our approaches and our equations – we still often have to deal with each different area somewhat separately and independently. Despite all of our efforts to find a way, for example, Relativity and quantum mechanics have to be dealt with in irreconcilable ways. All of this indicates that though the experimental evidence and associated mathematics appear to be quite good, something *somewhere* must be awry. There was certainly a time when such incongruities would not have been tolerated or considered “good” science.

In our current way of doing things, mathematics is used as one of our primary tools for confirming the validity of our concepts. We make certain guesses and then use the resulting ideas to develop some mathematical equations with which to test those guesses against our observations. We check the mathematics by comparing the *numerical* results of our equations against the experimental results – all of this is intended to confirm the validity of our concepts. Typically, if the math happens to produce good answers when compared with the available data, the concepts are taken as fully verified (sometimes, even when many of the values used in of those mathematics may have been empirically derived!). The real problem arises when the mathematical equations result in numerically good answers, but the concepts associated with them do not actually make any sort of rational sense. More recently, the predominant response to that situation has too often been to accept the math and abandon the requirement for rationality in the concepts. It sounds good – but there is a gaping hole in this plan. Mathematics is a model – and ONLY a model – it is not sufficient to ensure the validity of the concepts on its own any more than are any of our other tools or techniques. Even when we may be using multiple tools in coordinated concert with each other, we must still be most, most careful – for Reality is rather complex and cannot relied upon to lay out all of its secrets to convenient and readily discerned observation. Indeed, there is very good reason to suppose that Reality could yet be hiding a significant number of secrets that we have not even dreamed of yet.

Mathematics is highly flexible – it does not have *any* inherent connection to Reality whatsoever, *except* for whatever connections we ensure are established and maintained as we create our equations and values. Moreover, whenever we start trying to build math off other math, without an adequate understanding of the actual, correct underlying phenomenological concepts – along with an assurance of their rationality (which, sadly, has been implemented far too much!), we cannot ensure that a valid connection is maintained between those new mathematics and Reality. There has always been a rather significant portion of extant mathematics that has been created as an exploration of mathematics itself – in which there has been absolutely no effort whatsoever to create or maintain any sort of connection with anything in Reality. This can actually create a rather useful bag of tricks that has often proven fruitful for application to real-world problems. However, <u>we</u> are the ones who must ensure that when any mathematics are applied to *any* sort of real-world physics or science applications, that their connection with Reality is actually valid and appropriate.

While I will not go into the details here (there are a few well established examples referred to in the book), there are multiple examples that can be provided to show that there can be some very disparate sets of concepts or mathematical approaches that can reduce to the exact same numerical results, if not even the same final equations. We have been attempting here to establish several significant considerations that we feel rather firmly demonstrate that: numerical mathematical agreement with the observed results is <u>NOT</u> sufficient to *prove* that the concepts behind the mathematics are correct! All that such would truly accomplish is to demonstrate that the given equations produce results that are at least *numerically equivalent* with what we observe in Reality. However, that is not proof! Again, this is covered in more detail in the book.

What all of this means, is that we need to have other additional techniques and approaches for verifying that the concepts behind the mathematics are indeed the correct ones. We also need to be able to ensure that whatever mathematical manipulations are performed are also truly reflective of the ways that Reality actually works. Such *absolutely cannot* be accomplished without a reasonably decent understanding of how and why the various phenomena in Reality act and interact in the ways that they do. What we are striving to illustrate here is that a good understanding of the phenomenological concepts is an *equally critical* pillar to the commonly recognized pillars of mathematics and experimentation. Generally, we need to bring as many of our available tools as possible into play, for it typically requires multiple tools working together in carefully orchestrated concert to be able to do the job adequately.

A highly critical and extremely challenging aspect of bringing in the phenomenological understanding of the ways that Reality works involves ensuring that such understanding correctly reflects the actual workings of Reality. That is where good, careful phenomenoscience, which we have discussed in more detail (though far from thoroughly), needs to be brought into the process. Next, we will outline the approach that we have used for this effort in order to try to accomplish much of what we have been alluding to. It begins with an initial critical test, one that is designed specifically to enable us to start reasonably safely with the available observations and mathematics – in an effort to ensure that our understanding of them is reasonably valid. We then provide the outline of a roadmap that is aimed at verifying whether any given set of new concepts <u>truly</u> and properly matches the available observations and their associated mathematics. Since far too much confidence has often been placed on mathematics-only confirmations, or sometimes, there have actually been unconfirmed concepts that have been somehow erroneously accepted as actually verified and valid, only after working to confirm our starting conditions are we properly prepared to continue with the rest of the effort. This is very much an experimental process, except that the elements that we are initially testing here are the concepts themselves. The standard that we are then testing them against is, as best as we can discern, composed of only the reasonably properly verified available data and observations. The specific goal is to establish a regimen, whereby we can systematically test to see if any of the new concepts that we are considering truly meet some sort of a reasonable minimum set of criteria for acceptance as valid. This particular regimen was the central approach and basis for the effort that finally led to the compilation of the Theory of Field Interaction and the related documentation.

### The Approach – First – Verify Which Concepts We Can Be Most Confident Are Valid

> **Note:** This first part of the process is designed for one specific purpose – that is, to identify where there actually is a proper, valid correlation between some given set of observations or phenomena in Reality and any associated concepts – as well as any related mathematical equations. We need to be truly confident that we understand reasonably well which should be accepted and promoted as truly valid – as well as which should not. It is proposed that this portion of the process, or some modified or refined version of it, should be considered an absolutely critical element of any scientific work involving the development of new or more complete concepts.

**Step 1 – Review Experimental and Mathematical Correlation** The purpose of this step is to ensure, as best as we can before starting, that we truly have a reasonably correct understanding of what has actually been properly verified. Without going into detail in this summary discussion (it is covered in more detail in the book), we will simply state the following. With the common practice of formulating a hypothesis and then testing it – there have been far too many cases where all aspects of a theory are promoted as experimentally verified, when actually only some limited part of them truly have been. Most typically, this tends to arise when only certain aspects of a hypothesis can actually even be tested. Characteristically, if the results of the testing provide the expected results, the entire hypothesis is often subsequently promoted as “verified”.

What we truly need to do is to keep firmly in mind, *which* aspects of the hypothesis have actually been properly verified – and then to recognize (and remember!) that while it may seem to appear as though the other aspects have been verified, they truly have not been. That is because, until, and unless, they ever truly are – there is always a very real possibility that the true character of the phenomenon in question may not really actually have been as closely related to the hypothesis that was being tested as it might have seemed that it was. This particular aspect of the effort proved to be a critically important part of the whole overall process. That is primarily because it turned out that there were a number of such situations identified, many of which were helping to “hide” alternate possibilities – possibilities that could potentially help us to find other viable concepts and approaches that might be able to lead us closer to the truth of Reality. Those are among the types of situation where good phenomenoscience becomes so very crucial to the overall success of the effort.

We cannot over emphasize how critically important it is to recognize what has been truly verified and what hasn’t! The basis of its criticality is rather straightforward. If an initially hypothesized concept is not the only rational concept that could lead to the observed results, or alternatively, to the related mathematics – then it has not been truly verified. When a hypothesis is initially conceived, we can almost never be sure that there are not other concepts that could yield equivalent results. Moreover, if we do not truly comprehend the physical HOW and WHY as related to how the phenomenon actually works, we cannot even be sure if our formulations are truly germane to the case at hand. That is why we need to be so very careful in what we accept as valid.

The goal of this step is to try to ensure that the subsequent steps are only built upon *truly verified* experimental and mathematical results. If we happen to assume that some unverified results are correct, we can easily be misled – either led completely off track to where we are not able to successfully find the correct answer, or possibly reaching the wrong conclusions (where we would likely encounter problems later!). This step is a sincere effort to ensure that all of – yet only – correctly verified experimental and mathematical results are explicitly and properly included in the subsequent efforts. Thus, any aspects that are not confirmed as truly verified are either ignored, or at least considered suspect in all of the following stages.

**Approach: Perform a Multi-faceted Test of Any Associated Concepts** This approach or aspect of the effort is performed repeatedly throughout, so it is a part of the initial effort, but is also a critical part of the later steps in the effort as well. This is one area of this test protocol that cannot be reduced to a given set of explicit criteria and techniques. That is because it can be sensitive to the nature of the concepts and phenomena under evaluation. Some combination of techniques and approaches that may be valid and effective for one set could very well be completely inadequate for another. What we will provide instead, is a partial listing of some of the evaluation criteria and approaches that can be considered – focusing especially on those criteria and considerations that were particularly germane to this effort.

- **Logical and Rational** As already noted, we consider it a truism or axiom that ultimately, Reality will <u>always</u> prove to be logical and rational – at least, once we truly have an adequately correct and accurate grasp of the associated phenomena.
- **Be Free of Persistent Paradoxes** Sometimes there may seem to be paradoxes in a system of ideas, which eventually work themselves out and go away. Persistent paradoxes are those, which, no matter how much effort may be put into the evaluation of a particular phenomenon or series of phenomena, refuse to go away. In a sense, this is closely related to the requirement to be logical and rational, but it is a very specific test that can often be very useful.
- **Consistent and Coherent** This one is perhaps a bit more difficult to describe and define completely and succinctly, but it is nonetheless very critical. As parameters such as size, speed, volume, and et cetera change in Reality, it has always been observed to be an orderly transition. Thus, our equations as well as our concepts must, eventually at least, likewise provide for an orderly transition between scales, applications, or phenomena in a consistent and continuous manner.
    - **Apply to Multiple Phenomena** There are some patterns that are found repeatedly throughout Reality, sometimes in some highly disparate and seemingly highly different phenomena or situations. This is an application of "consistent" that can be a very powerful test – especially when the results are affirmative. If a particular concept can be applied to multiple phenomena or areas of consideration in a logical and consistent manner, it should be considered very carefully, for it might be a very strong indicator that it is very possibly at least getting significantly closer to the truth. The more phenomena or areas of consideration that it can properly cover, the more confidence we should perhaps have in the potential correctness of that concept.
- **Produce Numerical Results Equivalent to Verified Mathematics** Even though mathematics is not fully suitable for all that is often ascribed to it, it is still a very powerful

and potentially highly effective tool. Also, while even excellent numerical agreement does NOT constitute any form of "proof" of "correctness"; it can be very encouraging. Moreover, the lack of good numerical agreement DOES provide an essentially certain indication that *something* is wrong! Thus, the presence or lack of numerical agreement can be a very valuable indicator of how well we are (or aren't) doing. This particular consideration is used to ensure at least that any concepts resulting from some particular combination of ideas would actually be expected to produce results that are truly numerically equivalent to properly verified mathematics. At least, it is important to verify that they are expected to result in numerical values that are consistent with whatever properly verified mathematics have already been shown to produce results that are numerically equivalent to observed outcomes.

**IF** our concepts pass the above tests and any others that we can think of to apply along with or in place of them, success! – we can be pretty confident that if we are not dead on, we are at least reasonably close (or, at least – closer) to the truth and we can skip to Step 3. However, if they do not pass the above or similar tests, we should take it as a pretty strong clue that there are at least some problems with our concepts – perhaps some of those problems could be rather serious and major. In that case, we would need to proceed with Step 2 until we can arrive at a set that do pass.

**Side note:** The above sets of tests are ones that many of the currently accepted concepts in modern physics actually fail to meet! That goes back to why we have pursued this effort.

**Step 2 – Explore and Evaluate** This step constitutes our efforts to see if we can find a set of concepts that better fits the (properly verified) combined observations and mathematics. One particularly important principle to keep in mind in this step is that if something appears to be awry – it is very likely that we would not know where or when some crucial point or points might have been overlooked. It could well be hidden among some of the more recent developments (which have not yet had as thorough of an evaluation as many of the older concepts), or, it could be something that no one may have ever thought to look for in some of the more established concepts. As more is learned about Reality over time and with additional testing – there will always be a very real possibility that some of the more recent observations could turn up evidences of hidden factors or interactions that no one ever had any reason to consider previously. It is, of course, always possible that some of those hidden factors or interactions could be closely related or affiliated with concepts that we have long felt were well established and thoroughly verified and complete.

This particular step is highly iterative, and there is no simple way to describe how to go about the core efforts of exploring and evaluating. In general, there are really two basic interactive stages to this particular step.

1. Explore and evaluate – look for new ideas. We will discuss some aspects of this part of the process in more detail in a moment.
2. Recheck for validity – this basically means to repeat the evaluations of Step 1 in an effort to see if any of the ideas appear to work better than what is already out there. If it fails, or does not appear to be any better, go back to the "explore and evaluate" stage and try again.

How the "explore and evaluate" stage is performed will generally be highly individual, depending on the strengths and skills of the person or persons performing the effort, therefore, trying to give specific instructions would be of little or no value. However, there are a few basic principles that would be wise to consider seriously and to keep well in mind throughout. One very basic principle to keep in mind here is that:

*It is not reasonable to keep going at some task or challenge, always in the same or a very similar way, and expect somehow to obtain a significantly different result.*

Presumably, if the current concepts are awry, it is because something was misinterpreted or overlooked somewhere along the way. Therefore, given that great care and attention have already been applied to the existing concepts – one cannot reasonably expect to get a different result if there have not been any truly novel ideas or possibilities interjected into the process somewhere. Therein lies the real challenge of this step.

Another critical key is to be open to hidden possibilities somehow – phenomena that could be right before our eyes, yet "hidden" from view in some manner, or, at least, not very obvious – and yet, to also *not* get off-track from the truth. If there actually is something missing or misunderstood, it would almost certainly need to be at least somewhat hidden, or it would very likely have been recognized long ago. This is why the "recheck for validity" is such an extremely important part of this step. If one were indeed open to, and searching for some sort of "hidden" factor, it would be almost certain that there would likely be many dead ends pursued along the way, and the "recheck for validity" should enable us to avoid spending too much time on those dead ends.

One other particularly useful principle would be to realize that Reality tends to be rather consistent. A careful study of what we already know shows that there are many recurring themes that keep showing up in very different, sometimes completely unrelated areas, frequently with some sort of minor variations from the other known incidents of that same theme. Therefore, it is strongly suggested that one of the best ways to find new ideas to consider would be to look at other phenomena to see if they might provide any hints at possibly hidden clues of what types of clues or ideas to look for or consider elsewhere. This would be particularly true of any phenomena that are known to demonstrate characteristics (phenomenological and/or mathematical) that appear to be somewhat similar or analogous in some way to whatever it may be that we are trying to understand. Then, try to understand phenomenologically WHY those particular similarities are manifest in the already known phenomenon or phenomena, and then consider the possibilities to see if they might provide any new ideas – even if they might initially seem to be a bit rash or bold. Remember, the more reasonable and straight forward it might seem initially, the more likely it would be that someone would already have thought of it. At the same time, it is especially true that where any of those new ideas might seem rather bold and daring; the need for the "recheck for validity" stage of this step also becomes much more important.

Remember – we would not expect to know, a priori, where any possible oversight(s) might be, so do not hesitate to keep searching back, even among what may seem to be firmly established concepts. Keep looking for available clues in Reality. Keep on exploring and evaluating – going back as often as needed, and possibly also going further back into older concepts than might have originally been thought to be in question – until, finally, something seems to begin to come together and pass the "recheck for validity" tests. Once it does, it would be most wise to reevaluate those "recheck for validity" tests most, most carefully and thoroughly to ensure that it truly is passing them properly. Once that point is reached – there is still one final, extremely crucial step to take.

**Step 3 – Communicate and Test New Ideas** This step is where the "rubber meets the road". This is essentially the point at which the Theory of Field Interaction now is. This means that we are not yet at the end of this process, but merely transitioning into this crucial final step or phase of the effort. This is the point where we strive to bring in substantially increased resources, both in mental capacity, and in where-with-all to implement experiments and tests that may require a great deal of both expertise and equipment.

Just as a side note – even though a truly good physicist needs to be conversant and capable with all of the different tools of physics, especially those comprising the critical pillars – it is also true that each of us have some areas at which we are better and others where we are not quite as adept as others might be. Some shine most strongly in experimentation, others in the mathematics, yet others in concepts, and many in some mixture of the above, as well as other peripheral areas. While I have managed to get along reasonably well with mathematics – especially with whatever might have been needed for success in my career, and I have also done quite well with experimentation and testing – I would guess that my greatest strength likely lies with comprehending the concepts – both where they work well, as well as where they don't. This point now, however, is where we need to bring in and draw upon a group of minds working cooperatively – a group that includes premier experts in each of the critical areas, as well as access to some pretty sophisticated resources.

There are essentially three parts to this step. They are outlined below.

1. <u>Review the concepts for rationality and consistency</u> – this means getting as many others as possible looking at what has been compiled to see if a significant fraction might also agree that there may be true merit in the new ideas – whether they pass the "recheck for validity" tests as well as was originally thought. This is really quite critical, for if they don't believe that there is, it is unlikely that anyone would be interested in investing any effort in the other two parts of this final part of the process. This is the motivation for writing the book and making it available to others.

2. <u>Derive new equations where needed to cover some of the truly new areas</u> – this is perhaps one of the first follow-on areas that could be attempted with relatively limited resources. What is truly needed here, are some individuals who are particularly adept at accurately deriving new equations based on concepts. Two areas of particular interest, as relates to the concepts in the book, would be to demonstrate the following:

    1) Evaluate the relativistic concepts diagrammed in the book to show that they also really do reduce to the Lorentz relativity factor, thus demonstrating that these concepts are indeed truly mathematically equivalent to the current concepts.

    2) Consider the range of possibilities for the statistics of the process proposed for the redshift – the goal here would be to show that the conceptual concepts presented would truly have the potential to support what has been observed.

    Such derivations, and any others that might be deemed needed or appropriate, would lend a great deal of support to the potential correctness of the concepts and ideas that are presented in the book.

3. <u>Perform new experiments</u> – particularly needed here are experiments that are designed specifically to test between any of the currently accepted ideas and their corollaries among the new ones that have been suggested. Such tests would likely be based on certain aspects of the new concepts – aimed at characteristics that would suggest a different projected outcome from what might be expected based on the currently accepted ideas. For example, there are several sets of experiments suggested in the book that would be expected to produce results that could serve to test some characteristics related specifically with the ideas presented in the book – and thus, potentially produce a differentiating indicator. It is felt that if those tests produce the expected (predicted) results, they would support the new ideas and not the currently held concepts – thus providing some actual experimental evidence to support the new concepts.

> Keep in mind that, as discussed earlier, and in significantly more detail in the book – even such positive results would not necessarily provide "proof positive" evidence for every aspect of the concepts presented in the book. Thus, we would still need to be careful about reading too much into our results – we would still need to keep in mind what has actually been verified and what has not, so as to keep from getting off-track once again sometime in the future. Nonetheless, if we did, in fact, experience a significant series of positive results as predicted; it would provide substantial evidence that we are once again at least moving in the right direction. It is certainly also possible that others may conceive of yet even more additional tests as well – if so, those tests should also be considered.

The goal of this step, of course, would be to ensure eventually that there was actual experimental, as well as mathematical evidence to corroborate and verify the conceptual tests discussed at the end of Step 1 – or show that there must still be something awry or missing if the results aren't positive. Thus, we would ultimately hope to provide a full set of critical pillars to either support or contradict the ideas that have been presented – or, perhaps, at least indicate whether they are indeed potentially closer to the truth. Only at that point would we be reasonably equipped to decide if these new concepts are likely valid or not.

**In Summary – A Few Added Points to Consider**

Beyond the points that have already been made, there are a few other considerations that very purposefully went into keeping the presentation focused specifically on a conceptual-only approach. A few of these are points which I feel need to be briefly presented. There are bound to be some individuals who would disagree with the approach that I have taken, nonetheless, I felt that the following points were crucial, and that the essentially conceptual-only approach for the treatise (as it has been presented) would be the most prudent one to take.

**The Experimental and Mathematical Data Upon Which It Is Based Are Already Available** I do not feel that this particular point can be overemphasized. There is already an enormous amount of data available regarding both the experimental and mathematical underpinnings of the ideas that are presented in the book. That is one of the most central points of this entire effort – the data are there and well verified, they do not need to be regurgitated. It is primarily and specifically only the concepts associated with all of that data, as well as some of the presumed verifications for some of the peripheral data, which are felt to be flawed. Thus, the primary thrust of this effort at the moment is to address whatever *conceptual* changes may appear to be needed – which still must ultimately prove to be likewise based on all of the verified experimental and mathematical results that are already available. Given that, trying to include all of the associated data and equations would only have bloated the text of the book unnecessarily – while not really adding anything critical to the discussion. In an effort to keep the discussion reasonably accessible and understandable to a relatively broad audience, there were a number of places where the basics are alluded to or only briefly summarized – on the assumption that if the reader might not be aware of the existing data, they could readily find out more about it on their own.

Closely tied to these concerns is the feeling that including all of the added data – and especially the mathematics – would have been confusing to some and likely distracting to others (where many of those who are used to the mathematical emphasis could actually focus heavily on that and thus miss the crucial conceptual insights).

Because of the interactivity of the proposed concepts, there are already a lot of interweaving threads that naturally wend their way throughout the entire treatise. To have also added discussions of all of the existing data and the specifics of where it came from, would have just complicated the presentation unnecessarily – and possibly led to confusion for some.

**Some Fundamental Changes In Emphasis Are Needed** This is where the concern for distraction comes into the picture. Where many physicists today have been carefully and thoroughly trained to focus on mathematics, there is no question that the lack of such a focus will likely be somewhat different (and perhaps even be perceived as disappointing) from what they are used to. However, where we feel that the emphasis (at least at this point) truly needs to be on the concepts, to have included all of that math would have likely just distracted them from the main point of the discussion. This would tend to occur because they would naturally tend to focus more on the familiar math – trying to figure out what had changed (where the basic goal is that it doesn't, at least not in the end result) – than on the critical concepts. The final result of such a scenario would be that any such readers would likely miss at least some of the critical aspects of the presentation and thus, much of what is truly most important.

Once again – the treatise is primarily conceptual for a reason, the problems we are trying to address are not necessarily even reflected in the math – if they were, they would likely have been recognized and corrected long ago. For example, the mathematics behind relativity, especially the numerical results that arise from some of the basic equations are extremely good – excellent even. However, the ways that those equations were interpreted, right from the beginning, have created a variety of conundrums that have yet to be properly resolved by the mainstream physics community. They are just accepted as an unavoidable dilemma that must somehow be a part of "nature". I very deeply believe that Reality, once we have it correct and have had time to consider it long enough, will prove to be imminently comprehensible and logical. Since the existing mathematical equations produce excellent numbers that have been very well verified as matching what is observed in Reality, just looking at the math absolutely CANNOT be expected to resolve the problem adequately! Whatever concepts might come out of any effective reevaluation would ultimately have to produce equations that result in final answers that in the end prove to be at least mathematically equivalent to what we already have.

As another example, as proposed (in the book), there is significantly more to momentum, inertia, and fields than meets the eye. The basic concept is that these added insights reflect characteristics that have always been there, but that are anything but obvious. These added insights are a critical aspect of the central principles presented in the book. However, even though there are significant insights added, the classical physics equations related to them are absolutely *unchanged*. The whole point of this effort is that while we may need to reevaluate the concepts, and even consider ideas that have appeared to be well founded and secure, whatever new concepts might have been developed were required, in the end, to fit numerically the identically same equations to be considered potentially valid. Thus, other than confirming that they do fit the already existing equations – or, at least, their resulting numerical values and relations, any other references to those equations would be irrelevant.

**We Are Striving to Restore a More Proper Balance to Physics and Science** That includes a stronger focus on *rational* concepts. It also means making it thereby more accessible to many whose specific skills may be more limited than those of practicing physicists. We need all of the good heads that we can get considering the points that are covered herein.

## Conclusions

There are major problems in physics and science today, but they have been largely ignored by the mainstream. Who ever really wants to admit that much of what they have been taught is somehow deeply flawed and potentially well off base? This would be expected to be even truer of those who have chosen to dedicate their careers, as well as their lives to the pursuit of physics. Such an admission would sort of leave them “up the creek without a paddle”. Thus, the mainstream position is not really that surprising from the perspective of common human nature.

Nonetheless, physics and science have gotten well off-track, something that is rather obvious to those whose primary concern is the proper and correct understanding of Reality more than of feeling good about what they might think that they know. Given that such is truly a correct description of the current situation, there is a rather challenging task that yet lies before us, for it should be clear that whatever the cause for the deviations might be, they would certainly need to be somewhat less than obvious, or they would likely have been discovered by now. That really only means that we need to be that much more careful in our endeavors, so as to avoid just replacing one bad idea for another.

In the treatises that have been referred to, there are some rather novel and sometimes peculiar-seeming ideas presented. Those ideas have not been arrived at lightly or quickly – they are the end result of a great deal of carefully considered effort. The effort to get to this point has been a very torturous and challenging one. There were many dead ends and false leads that were pursued. They have not been, nor will they be covered in any detail. They did not lead to a better understanding, and thus, they are not really important. What has been finally arrived at after all of that effort though, is.

In summary – in my treatise, I focused on the concepts because:

1st) The mathematics were largely good, or, at least they provided numerically good answers. Thus, they were not really in question, but the interpretation of them was, as substantiated by the extensive on-going debate that has continued to this day. If the math is largely good, then it does not warrant much attention.

2nd) Until we get the concepts right, we really do not properly and fully understand what the math really means – we do not really know or understand HOW Reality works or WHY, and, as a result, we don’t really know what to even look for next, or where. The natural result of that is that our future progress is stymied somewhat and our progress significantly frustrated relative to what might otherwise be possible.

We hope that with all that has been covered above – that it should be reasonably clear that this effort is aimed at accomplishing true science, and not just philosophy. We are certainly not all of the way there yet, but we believe that we have gotten a good start. We dare to maintain that the real problem has been that, by ignoring all of the problems and flaws – the paradoxes and conundrums – in the currently accepted concepts, it is actually *mainstream physics* that has been losing its connection with solid science, all the while pretending that all was well, when it was not.

T. B. Bon