Analysis of the Refined Details of the GGU-Model and an Application to Human Corporeal and Incorporeal Experiences.

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Abstract: The GGU-model predicts physical and physical-like behavior. The premises can be considered as descriptions for directly observable physical events. Descriptions for physical events or objects are composed of elements taken from a general language and, as customary, are representations for the actual physical events or objects, respectively. The predictions yield all observable and describable physical events. Further, higher-forms of descriptions are predicted. These yield physical-like events, where the differences in linguistic behavior and descriptions for the terms employed signify differences in the behavior between the physical-like ultranatural events or objects being described and the original physical events or objects, respectively. After introducing the necessary terminology and concepts, in Section 5 of this paper, the corporeal physical-system and events that correspond to the, generally described, human being are identified. Then a closely associated and predicted incorporeal physical-like system and events are interpreted. Of significance is the choice predicted existence of a non-physical but physical-like "invisible" universe.

1. Introduction and What is a Mathematical Model

The technical basis for the results presented are found in Herrmann (2013a, 2013b) and the many references mentioned in these papers. Further, since an object termed a "mathematical model" is being described, the usual practice is employed in the appropriate cases of not using qualifying statements that imply a degree of doubt, such as the phrase "might be."

Various disciplines and especially "scientific" ones are first based upon linguistics. One needs an intuitive and rather complete comprehension as to the meanings of the terms employed. The words, sentences, paragraphs here presented are composed of "strings" of alphabet symbols that are intended to invoke within the brain, or within the "mind" if one so choices, the actual physical entities to which they apply. Significantly, they also need to invoke the difficult to define notion of the "concept."

Today, additional techniques are employed to express a concept. These are visual images, via drawings, photographs, motion pictures, electronic displays on monitors

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and even holographic images. Then there are all the various methods used to transmit audio information. Via computer programming and virtual-reality other human sensors are employed in the hopes of giving yet a deeper level of comprehension. For the GGU-model, the "general language," here denoted by the symbol **L** and that is used for this mathematically model, conceptually includes each of these language forms.

In the beginning of the "theory of aggregates" (the theory of sets), entities termed "sets" were linguistically defined to be collections (sets) of entities. The words chosen to express the members of such sets are supposed to express rather simple concepts that in the minds of most of those who "read" them are, at least, assumed to invoke the exact same concept. It was discovered that simple statements can lead to classical-logic contradictions. For example, defining a set as "the set of all sets." To mathematically avoid this where only symbols are employed, formal set theory is introduced and has, essentially, been shown not to led to such contradictions. However, what passes for the definition of a formally defined set is very limited and does not correspond to the actual method employed by mathematicians and, expecially, the method used when mathematics is applied to other disciplines. The original method of the discipline controlled language definition is carefully employed in order to avoid such contradictions.

> An **informal set theoretic mathematical model** or for this article **the mathematical model**, for a specific discipline, is a collection of informally defined sets. The sets and their members are then symbolized. These symbols are termed as "representations" for the originally defined objects. Then informal set theory is applied to the symbols. This backwards-and-forwards correspondence is termed an **interpretation.**
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> For nonstandard-analysis, the mathematics symbols take on six distinct names that mostly denote different categories. They are the informal, standard, extended standard, internal, external and sigma categories. The seventh and most important language used is the meta-language, which is an informal language that describes these sets and the set-theoretical relations between them. The mathematics often "predicts," via classical deduction, the existence of other "new" characterizable sets related to the previously defined sets. These new objects are given names and, in various cases, the names are similar to those given the original closely related sets from which they are predicted. For the GGU-model, these new sets and their members can often be interpreted, relative to the original associated objects, via comparison. This gives addition comprehension.
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> Much of the informal GGU-model is defined using linguistic and mental concepts via an interpretation. But, importantly, the inter-

preted linguistic notions further correspond to physical or other similar entities that the descriptions specifically signify. Thus, there are two interpretations employed in these cases. The symbols correspond to linguistic notions that correspond to physical or similar objects the linguistic notions represent. **This correspondence is applied throughout this article. Such terms as "represented by" might be used as a reminder that the correspondence is being applied. This correspondence must be strictly maintained.**

Although the manipulation of the symbols and the processes employed are defined in abstract terms, in order to enhance a mathematical theories interpretation and intuitive comprehension, the original abstract symbols are often given names that correspond to the **intended** interpretation. This type of name selection is done throughout science. A "vector" carries a little physical information. But, relative to this information, Newton stated that such information can be combined, in a geometric way, and this information describes how the combined behavior leads to observed behavior. But a "vector space" that abstracts, in symbolic form, the basic combining properties is a pure axiomatically controlled collection of symbols that are rationally manipulated by application of described rules. Such a mathematical structure can have application to areas highly distinct from Newtonian physical-system behavior such as to economics.

The language used for the symbolized mathematical theory entities yields discipline statements that follow the strictest known form of exact reasoning. Along with the mathematical theory's ability to predict, by deductive methods, it is the development of a strict logically rigorous discipline that is a major hallmark of the mathematical model. As presented below, symbols and their intuitive names are assiduously applied.

The language **L** to which rational deduction is applied is not merely finitely long strings of symbols, but, as mentioned and as shown in Herrmann (2002), it can also be considered as composed of images, coded sensory information and even such somewhat vague notions as moods. Necessarily, all such objects are mathematically modeled via codings and coded symbolic representations for descriptive physical characteristics.

For physical science, language elements correspond to physical behavior or the appearance of physical entities and, in general, these are termed as "events." The physical cause and effect concept relates directly to fundamental symbolic forms and modes of deduction. For example, consider the simple conditional form $\mathrm{C} \to \mathrm{E}$ ("If C, then E."). This intuitively implies that "cause" C "produces" the "effect" E. It is a simple physical law expression. Hence, with $\mathrm{C} \to \mathrm{E}$ assumed, when C occurs it is to be expected that E occurs. This is the simple application of the propositional deduction rule termed "modus ponens." Thousands of these statements model physical activity via the "black box" notion. Information "goes into the box," the brain. Then internal mental activity is simply assumed to occur. The results are then physically displayed external to this "black box." This deductive form symbolizes processes that allow us to function within our natural environment since this form satisfies the physical laws that describe corresponding, apparent, cause and effect statements. The basic GGU-model is constructed from just such a simple deductive form, C $\rightarrow$ E, as it guides our everyday experiences.

A **physical-system (natural-system)** is a defined collection of named physical objects, the constituents, which are so related as to form an identifiable whole. Specific relations between the constituents are the bases for establishing the behavior of the entire structure. However, there are certain describable exceptions that are termed **emergent properties.** These are physical-system properties that are descriptive in character and appear not to be generated by the properties of the constituents. GGU-model methods allow for the emerging properties to be modeled. Science-communities give names to the physical-systems that are of interest to them. The names can be rather arbitrary in character and need not correspond, intuitively, to the intended interpretation. Each human being, when considered as composed of defined material entities, is a physical-system. Such disciplines as theology also given names to both physical-systems, such as in Genesis 1, and other systems of a different nature.

Observer time is intuitively considered as "time" that is measurable via a universe's physical processes. At an observer time moment, that is, at each moment in the development of a physical universe, there exists a **universe-wide frozen-frame** (UWFF). This is a momentary fixed three-dimensional slice of a universe. It denotes the entire universe at a moment as if a universe is in suspended animation. Observer time is an aspect of primitive time. **Primitive time** simply denotes a sequences of events. (However, these can be substratum events as well and some members of a science-community may not accept substratum events as "real.") Primitive time denotes an "ordering" and should be but intuitively comprehended as such. It is possible that, depending upon the cosmology, observe time need not exist. For this article, observer time is assumed to exist. A universe is a physical-system, which is itself composed of named physical-systems. When formed, it represents the physical event that comprises each physical-system and each physical event that occurs throughout a universe at a specific moment. Relative to spatial descriptions for events, they are described relative to each other. A UWFF can be modeled by a single-frame of a 3-D DVD reproduction for a universe. Conceptually, a UWFF is considered as representable by a broadly defined description using a general language.

A **developmental paradigm** is a sequence of broadly defined descriptions, images and sensory impressions for the moment-to-moment development of a physical-system. In particular, the "time" development of a universe. Originally, only such UWFFs were considered. Recently, an important refinement has been added to the GGU-model processes. This refinement yields developmental paradigms for collections of physical-systems that comprise each UWFF. Obviously, it is permissible to consider physical-systems as comprising other physical-systems. Indeed, the GGU-model is based upon considering physical-systems within physical-systems, within physical-systems, etc. A sequence of such general descriptions is a developmental paradigm and when considered as a whole yields a designed UWFF. A human being is a physical-system and, from a scientific viewpoint, is composed of many layers of physical-systems. Importantly, for a specific physical-system, physical-systems or "physical-like systems" of which it is composed, if any, or with which it is "closely associated" (Herrmann 2013b)) are called its **internal structure**.

2. Formal Developmental and Instruction Paradigms.

The GGU-model describes four types of universes, denoted by $q = 1,\ 2,\ 3,\ 4$. These depend upon how they are physically limited in observer time. For the first step in the refinement, each UWFF can also be limited, from a spatial viewpoint, in the same manner. Originally, Herrmann (2002), each UWFF member of a developmental paradigm is denoted by a number taken from an ordinary sequence of numbers. Then, in 2006 (Herrmann (2013a), a refinement was introduced that corresponds to a general description taken from a general language $\mathbf{L}$ as symbolically modeled by members of a "double" sequence $\mathbf{f}^q$ that applies to four distinct types of ordered presentations of the UWFFs. A double sequence uses two "numbers" to locate its values. The two numbers are usually represented by the "order pair" notion, such as the identified (1,2)-UWFF. Such a sequence now generates the **physical developmental paradigm**

This double sequence is embedded into a mathematical structure and generates a sequence ${}^*\mathbf{f}^q$. This sequence generates the **hyper-developmental paradigm** that contains members from a predicted **hyper-language** ${}^*\mathbf{L}$ (a **higher-language**). The hyper-sequence ${}^*\mathbf{f}^q$ contains $\mathbf{f}^q$. (The symbols $\mathbf{L}$ and ${}^*\mathbf{L}$ are informal in character. The actual formal symbols used are $\underline{\mathcal{W}}'$ and ${}^*\underline{\mathcal{W}}'$ and represent a generic form in that each has two distinct mathematically modeled meanings that are selected relative to applications.) This higher-language intuitively contains the language $\mathbf{L}$ as well as a vast collection of other exceptionally difficult to interpret higher-form language elements. The word "language" is used in the term "hyper-language" since, when interpreted, a hyper-language behaves in a manner similar to that of an ordinary language. However, it also possesses distinctly different characteristics as well.

For a further refinement, the members of $\mathbf{f}^q$ and ${}^*\mathbf{f}^q$ are not members of $\mathbf{L}$ or ${}^*\mathbf{L}$, respectively. The notation is change and, for each (i,j), $\mathbf{g}^{(q,r)}(i,j) = \mathbf{v}$ is a (i,j)-UWFF determining double standard sequence, and, for each of the appropriate (i,j), ${}^*\mathbf{g}^{(q,r)}$ is a (i,j)-UWFF of various types not just the standard ones determined by internal sequences $\mathbf{v}$ with values $\mathbf{v}(k,s)$. `It is the values of this second double sequence that generate a particular UWFF's collection of systems with their internal structures.`

For a specific (i,j), the values $\mathbf{v}(k,s)$ are types of "instruction-entities." An **instruction-entity [resp. hyper-instruction-entity]** is a member of $\mathbf{L}$ [resp. member of $^*\mathbf{L}$ that is not a member of $\mathbf{L}$] that describes the properton (Herrmann (2013b) or "x-ton" formation of the various systems that comprise a UWFF.

As denoted in Herrmann (2013b), **standard descriptions** that represent physical-systems or physical events are denoted by various $\mathbf{g}^{(q,r)}(i,j;k,s)$. (This symbol is completely defined in section 6 and is a simplification of the $\mathbf{g}^{(q,r)}(i,j) = \mathbf{v}$ combined with the $\mathbf{v}$ sequence values $\mathbf{v}(k,s)$.) The symbols $i,\ j,\ k,\ s$ can vary over two types of "naming" (identifying) numbers. Since the GGU-model is a cosmogony, then, for specific k, the terms physical-system and "physical-like system" are rather generic in character as is the s internal structure. There are, generally, three types of standard physical-systems or other systems, produced by standard or "hyper" "instruction-entities," respectively. (1) They are empty. (2) They are but repetitions. (3) They are composed of, at least, one, comparatively, different object. As discussed below, choices are necessary and such choices are allowed by customary mathematical methods.

For the hyper-form, $^*\mathbf{g}^{(q,r)}(i,j;k,s)$ there are 16 different types of $(i,j;k,s)$ quadruples. Along with these 16, they can be interpreted by choice of (1), (2) or (3). Hence, there are, generally, 48 different interpretations possible for the hyper-form. However, selection of a specific (1), (2) or (3) interpretation can eliminate the other two for a specific $^*\mathbf{g}^{(q,r)}(i,j;k,s)$. Further, due to a special technical method, where (1) is employed, only the hyper-form $^*\mathbf{g}^{(q,r)}(i,j;k,s)$ needs to be considered. This is the practice in the remainder of this article.

(Various terms that appear in quotation marks are defined later in this article.) The q and r vary independently over the four types 1, 2, 3, 4. It is standard practice within physical science to allow linguistic descriptions to represent actual physical events. The word photon takes the place of the actual object when its behavior is being described. The same is true for visually presented simulations via electronic or printed images.

The interpretation of the symbols $i,\ j,\ k,\ s$ is a follows: The ordered pair (i,j) identifies a specific UWFF, denoted as (i,j)-UWFF or a specific "hyper-UWFF." The k identifies a physical-system or physical event or a "physical-like system" or other events. In a vast number of cases, the k can be of type (1). The s identifies instruction-entities that yield an internal structure or a physical-system or "physical-like system" or "physical-like event" that is"closely associated" with k. `Recall that the term ''internal structure'' need not be related to the notion of ''contained in.''`

When redefined and analyzed, the special sequence $^*\mathbf{f}^{(q,r)}(i,j)$ as a set of sets of "hyper-instructions" is interpreted as generating descriptions that are composed of members $^*\mathbf{L}$. However, since $\mathbf{L}$ is a subset of $^*\mathbf{L}$, then the descriptions include those that depict physical-systems and events as well as. The **hyper-descriptions** are those taken from the higher-language $^*\mathbf{L}$ and that are not members of $\mathbf{L}$. The symbols for the set of all such higher-language entities is ${}^*\mathbf{L}-\mathbf{L}$. It is the interpretation of members of the predicted ${}^*\mathbf{L}-\mathbf{L}$ that yields the hyper-descriptions for special events, general termed "ultranatural," that are called the "physical-like" events. These are analyzed in a later section of this article.

There is the corresponding duel $\mathbf{g}^{(q,r)}(i,j;k,s)$ (Herrmann, (2013b)), where the same notation is employed and is of special significance. The sequence's values are also composed of members of $\mathbf{L}$ but the values carry a different name. They are called **instruction-entities.** For the refined version of GGU-model, a [resp. hyper] instruction-entity is a specially expressed instruction taken from [resp. ${}^*\mathbf{L}$] $\mathbf{L}$. They are modeled after descriptive instructions that are given when we construct our man-made universe from fundamental materials. However, they are actually much simpler in that they convey only the "number" of objects that are to be combined to make a more complex entity. They also contain instructions as the how various configurations are related relative to one-another. This is similar to building things only from specific types and forms of building materials and assembling configurations in specific relations to one-another.

In order to employ the correct number, hyper-instruction-entities taken from ${}^*\mathbf{L}$ are necessary. This yields combinations of the basic **ultra-propertons** - the **intermediate propertons**. The instruction-entities that describe the number of intermediate propertons necessary to produce a physical-system are taken from $\mathbf{L}$.

> There exist other substratum entities that are considered as members of a set X, the **x-tons**, and these determine the internal structure of various physical-like events or other substratum objects. The properties of the members of X are only describable by **pure** members of ${}^*\mathbf{L}$. That is, they contain few if any **alphabet symbols** from $\mathbf{L}$. The term **substratum** for this model referees to a region that is not considered as part of a physical universe. It is also called the background world or background universe. (It is, of course, possible to include this as an immaterial part of a physical universe like a "quantum field" that can be termed as a "subquantum region" although it does not behavior in a similar manner.)

A (i,j)-**hyper-UWFF** is any (i,j) identified UWFF that contains a "physical-like" system or entity or contains a k physical-system with a closely associated s "physical-like system" or entity. (However, in general, it need not be a member of the "invisible universe" described in Section 4.) Let $(i,j)=(1,2)$. Then notationally a "time-fixed slice" is represented by the hyper-descriptions ${}^*\mathbf{g}^{(q,r)}(1,2;k,s)$, as k and s vary. The set of hyper-descriptions (hyper-instructions) that yield a k system is, usually, represented by ${}^*\mathbf{h}^{(q,r)}(1,2,k)$. For the case of the standard purely physical form of (1,2)-UWFF, the s members of this set that are identified by nonstandard hypernatural numbers all are of the special type of instruction that yields type (1) results.

For physical-systems, the k varies over a set of integers and the s notation for meaningful internal structures vary over the natural numbers. Except for the "invisible universe," for this interpretation, all other k values yield type (1) systems. Considered as developmental paradigm descriptive designs, this yields the physical-systems and other systems and their internal structure as they are described by ${}^*\mathbf{f}^{(q,r)}(1,2)$. (Note: Often the phrase "described by" is not included with such notation. It should, however, be understood as part of the definition for the symbol strings being employed.)

To obtain physical-systems and their physical internal structure, certain instruction-entities ${}^*\mathbf{g}^{(q,r)}(1,2;k,s)$ that are not members of $\mathbf{L}$ are necessary. These special hyper-instruction-entities give the actual number of ultra-propertons that are grouped so as to represent a single property. These are grouped to produce physical-systems or entities with multiple properties. These are the intermediate properton. The hyper-instruction-entities and the standard instruction-entities yield this "binding" type of procedure until all the necessary intermediate propertons and their groupings will generate increasing complex physical-systems. The entire (1,2)-collection is called an **info-field** and the realization operator yields the entire (1,2)-UWFF or (1,2)-hyper-UWFF collection of systems.

For various secular interpretations of the GGU-model, the individual hyper-instruction-entities and the instruction-entities represent fundamental substratum processes. We essentially have knowledge relative to certain special members of ${}^*\mathbf{L}$ that, intuitively, have but one or two symbols missing when they are interpreted. On the other hand, for a vast collection of other members of ${}^*\mathbf{L}$, no such "human" knowledge is possible.

3. Accepted Mathematical Methods that Allow For Choices.

The GGU-model mathematical methods employed to predict are a product of those employed within the discipline termed Mathematical Logic. In order to function within the physical world, we need to behave in accordance with the limits place upon such behavior by the physical world. As we progress, these limits are impressed upon our brain. They are learned. From the moment we perceive a physical event, then, from, at least, learned experiences, the brain processes the perceived information and presents us with what would be termed as a "rational" choice or even choices that we immediately or, after contemplation, physically follow. In linguistic form, the limitations are often termed as "physical laws."

Approximately 2500 years ago, it was noticed that there are specific expressible rules that linguistically relate described behavior with the predicted behavior that is considered as permissible. This is not just what is physically permissible but what is permissible by a specific society. The most significance aspect of this discovery is that the rules are independent from the actual behavior being described. That is, the meaningful statements can be altered, but the rules are fixed. This is when the study of "logic" and "logical deduction" began. It has been shown, from an exceptional number of examples, that it is a basic "form" of a linguistic construction that constitutes the rules for logical deduction.

In Herrmann (2002), it is shown that the same rules apply to general languages as well. That is, they apply to combinations of images. This helps to explain how children, prior to language acquisition, appear to follow the same rules relative to learned behavior. It is also shown that such things as vague as human moods follow the rules. In the subject of Mathematical Logic, these rules and other notions are symbolized in order to duplicate the mental input and output of these linguistic related rules. The notion of a descriptive meta-language and meta-logic are employed. Today, a meta-language is exactly what is employed when a computer programmer learns how to construct a computer program using a highly symbolic language. Further, the unstated "logical" processes employed to make such a construction correspond to a meta-logic even if the program is designed to duplicate a specific form of symbolized deductive thought.

Mathematical logic procedures are used to demonstrate how the mathematical method of choice is applied, where a choice needs to be made from what is essentially an infinite collection of possibilities. Although after claiming for a hundred years that it cannot be done, the concept of the "infinite" can now be mentally imaged (Herrmann (2013c)).

In order to duplicate the mental processes, logical axioms are employed. Only special forms of linguistic expressions are allowed for propositional deduction. Formal strings of symbols are defined by simple rules and individuals must learn how to express these forms as exactly written, from left-to-right. The fixed symbols, when interpreted, can correspond to meaningful words, but other symbols are considered and these represent general linguistic or other forms of expression.

For example, $(((\neg \mathrm{P}) \land \mathrm{Q}) \leftrightarrow (\mathrm{R} \to \mathrm{S}))$ is such a form. However, such a form is often simplified via the notion of the "strength of the operations." In simplified form, it is $\neg \mathrm{P} \land \mathrm{Q} \leftrightarrow \mathrm{R} \to \mathrm{S}$. A partial linguistic interpretation reads "Not P and Q, if and only if, if R, then S." Notice that, for clarity, the "commas" seem necessary.

The logical axioms are "schema." This means that they represent many different forms. The P_3 axiom is written as $(\neg \mathcal{A} \to \neg \mathcal{B}) \to (\mathcal{B} \to \mathcal{A})$, where $\mathcal{A}$ and $\mathcal{B}$ are any of infinitely many propositional forms obtained using the operation symbols (connectives) $\neg$, $\land$, $\lor$, $\to$, $\leftrightarrow$ and one or more of the propositional variables P, Q, R, S, ... Since one needs to choose such specific forms to fill the positions in an axiom, one has a lot of forms from which to choose. Actually, some of these operations are usually replaced with equivalent ones using the other remaining symbols.

The notation ", . . ." is not often explained. It is assumed that what has been finitely stated on the left of this symbol is "easily" comprehended and the reader can "repeat" the "stuff" conceptually. This particular notion means repeat it infinitely many times, something that now can be imagined. If one writes $a_1, a_1, a_2, \ldots, a_n$, then this means repeat the a with the numerical subscripts until the subscript is a number here denoted by the general symbol n. In this example, the items used in this notation are rather simple. But, sometimes the expression used is complex and it may take some effort to comprehend exactly what it is one needs to mentally repeat.

In the intuitive propositional language, one can state the rather unusual "not, not Joe" phrase. Most individuals consider this phrase as having the same meaning as the single word "Joe." But, to be sure that the formal approach yields this correspondence, a formal deduction is needed. There are many "formal proofs" that show that such a deduction is valid. In the following formal proof, the symbol $\vdash$ means that, by application of the axioms and the one rule of deduction "modus ponens" MP and a step-by-step process, similar to how Euclidian geometry proofs are written, one obtains from the string of symbols on the left of $\vdash$ the symbol (or string of symbols) on the right of $\vdash$. In such a proof, the reason for each step is supposed to be stated. These are on the right-hand side.

[1] $(\neg(\neg \mathrm{A})) \vdash \mathrm{A}$.

(1) $(\neg(\neg \mathrm{A}))$ . . . . Premise
(2) $(\neg(\neg \mathrm{A})) \to ((\neg(\neg(\neg(\neg \mathrm{A})))) \to (\neg(\neg \mathrm{A})))$ . . . . P_1
(3) $(\neg(\neg(\neg(\neg \mathrm{A})))) \to (\neg(\neg \mathrm{A}))$ . . . . $MP(1,2)$
(4) $((\neg(\neg(\neg(\neg \mathrm{A})))) \to (\neg(\neg \mathrm{A}))) \to ((\neg \mathrm{A}) \to (\neg(\neg(\neg \mathrm{A}))))$ . . . . P_3
(5) $(\neg \mathrm{A}) \to (\neg(\neg(\neg \mathrm{A})))$ . . . . $MP(3,4)$
(6) $((\neg \mathrm{A}) \to (\neg(\neg(\neg \mathrm{A})))) \to ((\neg(\neg \mathrm{A})) \to \mathrm{A})$ . . . . P_3
(7) $(\neg(\neg \mathrm{A})) \to \mathrm{A}$ . . . . $MP(5,6)$
(8) A . . . . $MP(1,7)$

Notice that step (4)

(4) $((\neg(\neg(\neg(\neg \mathrm{A})))) \to (\neg(\neg \mathrm{A}))) \to ((\neg \mathrm{A}) \to (\neg(\neg(\neg \mathrm{A}))))$ . . . . P_3

and step (6)

(6) $((\neg \mathrm{A}) \to (\neg(\neg(\neg \mathrm{A})))) \to ((\neg(\neg \mathrm{A})) \to \mathrm{A})$ . . . . P_3

are examples of P_3, where considerably different $\mathcal{A}$ and $\mathcal{B}$ are chosen.

Accepted choice processes, such as these, are considered as rational meta-logical processes since they are described in such a manner that others can "follow" how a selection was substituted into the general scheme and the result obtained. All one needs to do to satisfy such a choice process is to describe the object to be chosen in such a manner that others can also make a corresponding choice. It is assumed that the human brain does so in an intuitively intelligent manner.

Choice Implies Intelligence. The notion of choice is philosophically related to intelligence. First a purpose is described. Then a choice is made from a well-defined list of choices. The degree to which the choice satisfies the purpose is a measure as to how one has applied their intelligence to make the choice. The likelihood that the purpose will be satisfied indicates the degree of rationality associated with a choice. In the displayed formal proof, the choices are all highly rational since they lead from the premise to a justified final step in the proof, which is the purpose for such a proof.

4. Ultranatural Physical-Like Events.

In (Quantum) Particle Physics, there are postulated a vast array of "invisible physical" entities. Completely distinct from this, the GGU-model predicts the existence of a vast array of non-physical entities that are necessarily physically invisible. However, as in Particle Physics, the predicted non-physical GGU-model entities and processes can be indirectly verified within a physical environment. Indeed, it is also a fact that every physical event is indirect evidence for the GGU-model entities and processes.

When the term such as "rational" is employed, it is an absolute fact. Within scientific discourse, a special linguistic technique is usually employed. Although the statements actually carry various degrees of doubt, they are stated as if they are fact. They are stated in an "absolute" manner. This fact is supposed to be common knowledge to the reader. In this article, when a choice leads to specific implications this linguistic approach is applied, it being understood that there can be choice dependent degrees of doubt.

Physical-like Systems or (Physical-like) Events. These are systems or events that behave like physical-systems or events within our universe but by definition are not entirely part of our universe. From the viewpoint of observation, **physical-like systems or events** can be exceptionally difficult to describe. **Observation** signifies human and machine physical observations and includes, for human beings, all sensory information that is reproducible via virtual reality.

Intuitively and relative to the notion of observational "degrees," maximally a physical-like event can have the same observational degree as a physical event, where it only differs in one unobservable feature. Minimally, it can have no observable features. Considerable speculation is possible as to what constitutes the unobservable features. However, in this article such speculation is greatly restrained. A formally presented example is give in Section 6.

[Given a nonempty set B. Then the notation $b \in B$ means that b is one of the "things" in B. It is a "member or element of" B.] (**The UWFF and hyper-UWFF notation**). In general, the rational generation of a universe, via the (i, j)-UWFF, employs the i and j identifiers. For this application, only a universe of a specific type is being considered. Depending upon the q type, the i varies over various collections of "integers." For $q = 4$, these include an interval of hyper-integers $[\alpha, \beta]$ over which i varies. In all cases, the j varies over a hyper-interval $[0, \lambda]$ of hyper-natural numbers. For the i that are not members of $[\alpha, \beta]$, the (i, j)-UWFF is of type (1) (the empty UWFFs). Notationally, the set $(i, j) = (1, 2)$-UWFF represents a UWFF composed of only physical-systems and is a collection of descriptions or instruction-entities. By choice, the $(1, 2)$-hyper-UWFF represents a hyper-UWFF containing, at least, one physical-like system or event or; at least, one physical-like system or event that is closely associated with a standard k.

(**The physical-system and physical-like system notation.**) The notation ${}^*\mathbf{h}^{(q,r)}(1, 2, k)$ is for a collection of descriptions (hyper-descriptions) or instruction-entities (hyper-instruction-entities), that produce (represent) a physical-system k with its physical internal structure or, for the soon to be defined "invisible universe," physical-like systems and entities. For non-invisible universe UWFF, the k names that are employed for nonempty objects are taken from the set of integers.

(**The internal structure notation.**) For a specific standard name k, the s named physical members of the k physical-system are represented by ${}^*\mathbf{g}^{(q,r)}(1, 2; k, s)$ via the type (1) procedure. The non-empty physical internal structure members of k have s names that are members of the set of natural numbers. If k is a physical-like system, then there is a ${}^*\mathbf{g}^{(q,r)}(1, 2; k, s)$ that represents a member of ${}^*\mathbf{h}^{(q,r)}(1, 2, k)$, where s is a hyper-natural number name for an hyper-internal structure or a physical-like system. The s varies over the same type of interval as does the j. Due to the use of type (1) and (2), descriptions or instruction-entities, a ${}^*\mathbf{h}^{(q,r)}(1, 2, k)$ need not actually yield a physical-like system. That is, when produced, it is identical to a $\mathbf{h}^{(q,r)}(1, 2, k)$ produced physical-system.

> In the most general case, the identifiers k and s need not refer to specific objects but only to specific instruction-entities. Since this is a theological interpretation, then this is no longer the case. Every perdesigned physical-system has the identifying name k. For a k physical-system, the standard s is an identifier for an instruction-entity for a "closely associated" internal structure or physical-system. As our universe develops, an altered physical-system can retain its original identifier k or this can change to a different k' not yet employed. Of course, we have no why of knowing whether this occurs. But, by choice, we can constrain such changes for various purposes.

Due to the parameters employed, the descriptions $\mathbf{P}$ for the physical-systems and the physical internal structures comprises a special subset of $\mathbf{L}$. This subset, when embedded into the mathematical structure employed, yields the ${}^*\mathbf{P}$ subset of ${}^*\mathbf{L}$ that contains numerously many hyper-descriptions that are not members of $\mathbf{P}$. For physical-like aspects of the internal structure, the hyper-instruction-entities that correspond to these predicted hyper-descriptions can employ members, the x-tons, of the set X as entities. This means that, in this case, we have no knowledge as to the internal structure although *we can specify, by choice, that types of hyper-instruction-entities be employed that lead to* (*1*), (*2*), (*3*) *types of objects.* Specific UWFFs are consider as composed of four collections of physical or physical-like systems that follow the same sequential pattern as do the four types of UWFF. However, of significance, as far as the construction the specific UWFFs are concerned, a choice of instruction-entities of type $r = 4$ is sufficient.

Each specific UWFF is separated into a fixed collection of physical-systems, many of which can be disjoint while others are considered as yielding an overlay of an increasing complexity of physical-systems. As mentioned, since the GGU-model pertains to many distinct cosmologies, the physical-systems are cosmology dependent. However, their "general" relative behavior is not so dependent. To illustrate in more detail the production of physical-systems and other possible entities, consider a fixed system k contained in the (1,2)-UWFF. Recall that the notation for both the hyper-development-paradigm general design and the hyper-instruction-entities is the same and to which the notation applies is contextually determined.

We first consider the internal structure of the k physical-system. Members of this internal structure are represented by the varying values of the s. The identifying name s is a member of a type of numerical ordered set. In the nonstandard model, there are special numbers that, after 300 years, now properly model the "infinite" numbers first proposed by Newton and Leibniz. (At present, the term "infinite" is simply part of the name. Few know that such a concept was first proposes by these individuals.) The proper form and abstract behavior of these numbers was not discovered until the early 1960s. The set of hypernatural numbers is denoted by $\mathbb{N}_\infty$. One such infinite number is here denoted by λ and the notation $[0, \lambda]$ denotes a set of such identifying numbers that are greater than or equal to 0 and less than or equal to λ. The notion of "greater than" and "less than" is similar to but, when viewed from the meta-world, need not be exactly the same as that employed when we stated that 2 is greater than 0 and less than 3. For the (1,2)-hyper-UWFF, the construction of a specific physical-system k proceeds as follows:

Consider ${}^*\mathbf{g}^{(q,4)}(1, 2; k, s)$, where s varies over a hyperfinite naming interval $[0, \lambda]$. (Recall that this is a k-system (generated by) ${}^*\mathbf{h}^{(q,4)}(1, 2, k)$.) The s named aspects that represent the internal structure of the k-system vary over various selected possibilities. For the simplest examples and for fixed natural number $p > 0$, the various $s \in [0, p]$ yield distinct physical entities. Next, for all the standard $s > p$, the instruction-entities yield type (1) objects. That is, no objects are formed. Or, they simply produce (2), repeated objects that are the same as a previous one in $[0, p]$. Indeed, the same two possibilities can hold for all s such that $s \in [p, \lambda - 1]$, where each is an internal hyper-instruction-entity and $s = \lambda$ is composed of hyper-instruction-entities that yield (3), an actual new physical-like system, a new hyper-internal structure, or a substratum entity that is closely associated with the k physical-system. However, if $s = \lambda$ also yields an empty internal structure, for the specific k, then ${}^*\mathbf{h}^{(q,4)}(1,2,k)$ and $\mathbf{h}^{(q,4)}(1,2,k)$ yield the same results. These are specifically defined "general" choices that when one learns the concepts can also by applied in accordance with the mathematical method of allowed choice. But, what does physical-like behavior signify?

> Physical-systems and the physical entities that comprise their internal structure have many describable properties represented by members of $\mathbf{L}$. The descriptions that relate the relative behavior between various physical-systems and other objects are the most significant for the interpretation given in this article. These descriptions are essentially also members of ${}^*\mathbf{L}$ and describe the B(1) *relative behavior* of the physical-systems with respect to other objects. The other objects are the physical-like systems and corresponding substratum entities. Physical-like systems and corresponding substratum entities behave like physical-systems and physical entities within our universe but they are, by definition, not entirely part of a physical universe. B(2) The physical-like systems behave relative to each other in the same manner as physical-systems behave relative to each other. B(3) The substratum entities, in general, behave in manners similar to but are far from identical with the behavior of defined physical entities. By choice or prediction, the B(1), B(2), and B(3) behavior patterns are the only ones considered, for physical-like systems, in the remainder of this article.

There are additional hyper-instruction-entities that refer to x-tons and, possibly, special propertons. The x-ton members of X or the special propertons can intuitively correspond to actual constituents of the predicted **ultranatural** physical-like events. The word "ultranatural" is a general term that helps identify such objects as being members of a special substratum that is part of the ultranatural world.

For a theological interpretation, this "ultranatural world" contains a preternatural world, which is a specially defined portion of a world often termed as "supernatural." Indeed, the preternatural aspect of the ultranatural world is contained in the Biblical "second heaven." Ultranatural-events are predicted but what is not predicted is whether they are of type (1), (2) or (3). Hence, when such events are discussed, a rational choice is necessary.

Since the human being is an extremely complex physical-system composed of extremely complex physical-systems, then, by choice, for the final stage of k's complexity, the ${}^*\mathbf{g}^{(q,4)}(1,2;k,\lambda)$ is a non-empty ultranatural physical-like system. Remember that this is for a (1,2)-hyper-UWFF. For the same type of complex physical-system and developing UWFF, non-empty physical-like and hyper-designed closely associated ultranatural physical-like systems can continue to occur. The idea that they are associated with a physical-event does not mean the physical event needs to be continually present due to another predicted result. These are the rational **choice predicted** hyper-UWFFs determined by ${}^*\mathbf{g}^{(q,4)}(1,\gamma;k,s)$, where $\gamma \in \mathbb{N}_\infty$. These follow the same general properties as the ${}^*\mathbf{g}^{(q,4)}(1,2;k,s)$ produced entities.

The Invisible Universe. The invisible universe is composed of the (i,γ)-hyper-UWFF. The originally designed ${}^*\mathbf{g}^{(q,4)}(1,\gamma;k,\lambda)$ ultranatural (internal structure) physical-like system, where $\gamma, \lambda \in \mathbb{N}_\infty$, need not be continually in close association with the behavior of the k physical event but can act in a rather independent manner. This is an important possibility. Indeed, in general, exactly to what type of object an particular k corresponds is unknown. A specific interpretation for certain types of "k"s is given below. The behavior of the hyper-UWFFs (i.e. slices of the invisible universe) produced by ${}^*\mathbf{f}^{(q,4)}(i,\gamma)$ can vary considerably as i varies. Further, there can be many distinct primitive time (i,ν)-hyper-UWFFs. This can lead to "many more" slices of the invisible universe being formed during a miniscule standard observer time period. Thus, many possible physical-like entities and alterations in behavior can be members of a type of substratum invisible universe that can exist as long as our physical universe exists. It is contained in the preternatural world. This is a rationally predicted possibility.

However, just as important is the result that we, in our present physical mode and relative to prediction, have little or no descriptive knowledge as to how many distinct physical-like entities contained in the invisible universe's hyper-UWFF slice might be perceived by our physical senses. "Evidence," if any, would allow us to acquire such knowledge. On the other hand, physical-like entities would, at least, behave in a manner consistent with the behavior of the original physical-systems with which they were associated. We also have almost no specific knowledge as to any alterations in such behavior once they act independently.

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5. An Experiential and Biblical Interpretation.

(Note: What is presented next need not be related to theological concepts. Obviously, such concepts can be replaced by secular notions and a different interpretation can include expressions such as "an higher form of nature." Further, the rational existence of the invisible universe does not make it fact. For us, only various forms of evidence can indirectly imply that it exists. One can accept certain Biblical statements as absolute evidence that imply its existence. However, this is not present day scientific evidence. Does such evidence exist?)

When one writes or speaks, it is to a specific audience. In so doing, not all hypotheses used for a logical discussion are mentioned. The ones not so mentioned are termed as "common knowledge." This knowledge is that which is "understood" by the audience. Relative to Genesis 1, can we determine some aspects of the common 1350 BC knowledge Moses expected of his audience?

During that approximate time period, Moses twice states that the Hebrews are forbidden from associating with "wizards" (KJV). Thus, wizards existed at the time Moses presented his portion of Scriptures. Biblically, seven more times such warnings are given. It was common knowledge how they behaved. Isaiah 8:19 tells us one aspect of how wizards behave. They "peep," like a bird, and "mutter." Most likely, for the common knowledge, this includes making "nonsensical" incantations, "speaking words" that they claim lead to actual physical realizations, exactly like magicians claim. Today, we "know" that these are but "tricks." Of course, wizards also claim special knowledge.

When Moses states that "God said" (âmar) such and such and aspects of the physical universe appear, he later states that God warns that this certainly is not intended to imply that God is a wizard since God forbids the Hebrews from associating with wizards. However, they are to assocaite themselves with God. The Hebrew term âmar is used elsewhere in the KJV and, as it was also understood in Biblical times, is a special Hebrew idiom for "thinking" or for "thinking within oneself." Since this is a stated characteristic of God, then a phrase relative to how God presents instruction-entities, guidelines, orders, and information, when not otherwise qualified, is via the "thinking" notion. We are told, at least, fifteen times in the Old Testament, and specifically relative to the Holy Ghost, by Jesus, Paul and John that God communicates "mentally" with individuals. A mathematical model exists (Herrmann 2004, 2006) that, via interpretation, shows rationally how this is accomplished relative to Noble Laurent John Eccles' (1984) concept of an immaterial aspect of human thought and its connection with the human spirit.

I and others have stated what was common knowledge but what was purposely, I think, suppressed after about 120 AD when individuals were told that they need "special knowledge," accorded to but a chosen few, to interpret "properly" the Bible. This erroneous notion was not completely dispelled until the early 1900s. An understanding of various aspects of God's behavior comes from associating such behavior with common knowledge "mental" concepts and corresponding descriptive terms. To understand the GGU-model in its most basic intuitive sense, the terms used are stated relative to the mental notions pertaining to language, deduction and, today, are analogue-modeled by processes that are generalizations of how human activity is first mentally considered and then how the processes physically produce our human made universe.

Unfortunately, when it comes to the modern concept of the human "spirit" as an immaterial but actual entity that does not need to follow materialistic physical rules, the common knowledge of the Old Testament Hebrews does not appear to include such characteristics. Then only in Luke 8:55; Acts 7:59; 1 Cor. 5:5 and James 2:26 is the apparent notion mentioned, although in Luke and James the "breath" meaning also makes sense. But, by the Timothy two or three witness test (1 Tim. 5:19), I accept that it refers to an immaterial created aspect of the human being that probably is not shared by any other animal form.

(In the following, when the symbol strings UWFF or hyper-UWFF (the substratum form of a UWFF) are used, then this symbol string still has substantial meaning even if one drops any previous "mathematics" string of symbols.)

The basic intuitive aspects of mathematics and our physical world are often first discussed using finite examples and illustrations. Even when it is assumed that our universe may be infinite in "size" or that it contains an "infinite" amount of material, this is most often "approximated" by the finite. From the viewpoint of the GGU-model higher-intelligence, each universe, each collection of primitive time dependent "slices" of a universe, each non-empty portion of a slice and its internal structure behaves as if it is finite. However, in comparison, this higher-intelligence finite, called the hyperfinite, is not an entirely humanly applicable finite.

> From the GGU-model viewpoint, our universe is exceptionally complex and is only partially comprehendible by the human mind. But this complexity does not carry over to the higher-intelligence. This complexity is compounded by the necessity of the participator universe. It is for these reasons that only certain features of our universe are describable in a humanly comprehensible language.

5.1. Basic spirit relations.

Recall that the "numerical" names for various types of descriptions or instruction-entities are denoted by the symbols $i,\ j,\ k,\ s$. The identified objects are produced by the GGU-model processes. Relative to the Genesis 1 day-four creation scenario, which is prior to the creation of the human being, rapid-formation of the exterior universe occurs. During this process, the original Earth and its local environment are held in "suspended animation." This means that there is a specific hyper-UWFF, denoted by γ at this stage, with its previously created nonempty physical-systems that are identified by various k that are, most likely, members of a finite "primitive time" interval $[0,n]$. As the exterior universe progresses, that is as the i appropriately varies, the corresponding hyper-UWFF, that is, slices of the invisible universe, denoted by ${}^*\mathbf{f}^{(q,4)}(i,\gamma)$, sequentially repeats the original Earth and its local environment in every detail. After the day-four event is complete and the original Earth and local environment is inserted into the standard UWFF, the γ determined ${}^*\mathbf{f}^{(q,4)}(i,\gamma)$ hyper-UWFF is no longer used for this purpose. However, this does not mean that such hyper-UWFF need not be employed for other purposes.

> **Identifying names.** Whether a system is a physical-system, physical-like or some other substratum entity is not dependent upon the k-name it is accorded. It is the internal structure that determines the type of system. For the UWFFs and this model, the $k \in [\alpha, \beta]$ very over the hyperfinite interval of hyper-integers ${}^*\mathbf{Z}$. In order to uniquely identify a system throughout its development, a unique identifier taken from $[\alpha, \beta]$ is employed. There are "enough" such names for this purpose. For this model, each name is considered as fixed unless specifically altered for a specifically stated purpose.

> **The Human Being and Identification.** Completely distinct from the idea advocated by most secular scientists, I consider that the most significant Genesis 1 created entity is the human being. Hence, theologically, there is, by design, a special collection of such $k_{hb} \in [\alpha, \beta]$ reserved for past, past and future human beings. These are numerical representations for the "names" mentioned in Rev. 20:15. (This corresponds somewhat to the modern meaning of the Daniel's (Dan. 5:26) interpretation of Belshazzar's vision; the "Your number is up" expression.) These names are carried over for each of the designed participator universes as well. In the following, for each appropriate ${}^*\mathbf{g}^{(q,4)}(i,j;k,s)$, the k that corresponds to a specific human being is further denoted by k_{hb} and ${}^*\mathbf{g}^{(q,4)}(i,j;k_{hb},s_{hb})$ denotes the instruction-entities for the corresponding internal structures s_{hb}.

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The various s denoted objects can be empty, repeated or of a special type, for appropriate portions of the interval over which s varies. `For simplicity,` $s = \lambda = \lambda_{k_{hb}}$ `corresponds to the human spirit entity.` Following my desire to restrain speculation, other than k_{hb}, any possible physical-system alteration participated by the substratum presence of a $\lambda_{k_{hb}}$ identified spirit entity *that is physically perceivable* <u>may be</u> a mere vague animated outline of an entity that appears somewhat similar to a human being or it <u>may be</u> an animated nebulous entity that "behaves" in a manner similar to a human being.

> `In this article, the basic purpose for various choices is to present GGU-model objects that are interpretable in terms of not only the common knowledge we now associate with the proposed human spirit but that will also satisfy, to various degrees, some apparent evidence.  If`

the various mathematically viable choices presented next are successful in modeling the apparent evidence, then the choices are rationally obtained and rationally model the evidence.

Due to the use of the type-4 UWFF approach, every physical-system, when originally designed via the developmental paradigm, has a specific k identifier. This identifier is continued even in the case that the internal structure is empty.

Using the x-ton entities of X, an additional closely associated (Herrmann, (2013b)) substratum internal structure or a closely associated substratum physical-like system ${}^*\mathbf{g}^{(q,4)}(i,j;k_{hb},\lambda_{k_{hb}})$ is formed. For two standard developing (i,j) and (i',j') UWFFs, the general behavior patterns between the entities produced by ${}^*\mathbf{g}^{(q,4)}(i,j;k_{hb},s_{hb})$ and ${}^*\mathbf{g}^{(q,4)}(i',j';k_{hb},s'_{hb})$ for the same identifying name k_{bh} yields a relation between the two selected internal structure descriptions s_{hb} and s'_{hb}. As the (i,j) vary over the actual realized UWFF, this yields a properly defined relation between various defined s_{hb}.

For the (i,j) and (i',j') closely associated human spirit denoted by $\lambda_{k_{hb}}$ and $\lambda'_{k_{hb}}$ there exists a corresponding binary relation S such that $(\lambda_{k_{hb}},\lambda'_{k_{hb}})\in S$ relative to the now corresponding hyper-UWFFs. This yields a "general behavior pattern," between the (i,j)-$\lambda_{k_{hb}}$ and (i',j')-$\lambda'_{k_{hb}}$. Any alterations in the physical-system uniquely identified by k_{hb} need not be the cause that yields alterations in the physical-like system $\lambda_{k_{hb}}$. Obviously, there are also such relations relative to different (i,j)-UWFF and other human beings.

By definition, any λ_{hb} is closely associated with the k_{hb} physical-system. Until separated, one can consider λ_{hb} as a preternatural substratum object that is ''attached'' to k_{hb}.

5.2. Separated spirit entities.

For Christian and other theologies, human spirit entities are considered as separated from the human being's physical-system at some moment in observer time. This is a "death-type" separation. Such spirits are made part of the progressing slices, the hyper-UWFF, of an invisible universe as generated by the ${}^*\mathbf{f}^{(q,4)}(i,\gamma)$ and which are **specially associated** with the previous slices of a physical universe. (Note that there are many other (i,γ) hyper -UWFF, where $\gamma\in\mathbb{N}_\infty$. For this investigation whether these are all empty or not does not concern us.) In more detail, for each i, the representation ${}^*\mathbf{f}^{(q,4)}(i,\gamma)$ is a type of hyper-UWFF, that, although closely associated with the physical-like ${}^*\mathbf{g}^{(q,4)}(i,j;k_{hb},\lambda_{k_{hb}})$ entities for the standard identifiers j, is interpreted as being a **separate** hyper-UWFF that comprises a slice of the invisible universe. All of ultranatural UWFF are pre-designed and have participator universe properties. Further, the general GGU-model processes generate them. That is, they are generated by a special portion of the (i, γ) info-fields.

Since, in general, specific human being behavior is, at least partially, independent from the behavior of the vast majority of other human beings, then the same type of rather independent behavior is predicted to occur under this separation scenario. During a universe's development, the original k_{hb} from which a spirit is separated is replaced with an empty physical-system or, at the least, with a deteriorated system. It, however, remains an identifier for the original entity. Then, for such a k_{hb}, there is also a relation for the invisible universe's (i, γ) and (i', γ)-hyper-UWFFs that exists between the λ_{hb} and λ'_{hb}.

The participator requirements can have significant influences upon the spirit aspects of the invisible universe. From personal experience as well as the experiences of others, various physical manifestations associated with the invisible universe are a result of physical participator activity. Of course, theologically, these manifestations are allowed via pre-design. Such manifestations can be rationally justified by mathematical means.

Mathematically represented relations can exist between hyper-UWFF and the standard UWFF. As a basic intuitive example, consider the $(1, 2)$-UWFF and the $(1, \gamma)$-hyper-UWFF. Then, via biological participation, certain relations between these UWFFs are satisfied. Due to the "close association" concept and the miniscule nature of the primitive time interval that ranges from $(1, 0)$ to $(2, 0)$, a specifically named k physical-system can retain this identifying name through this primitive time period. Any alterations in the physical-system are not considered significant enough to warrant a name change.

Let physical-system $k = 2341$. Then, notationally, a relation between the instruction-entities, for various internal structures s, contains objects of the type $((1, 2; 2341, s), (1, \gamma; k_{hb}, \lambda_{k_{hb}}))$. The entire relation is interpreted as stating that, observationally, the 2341 physical-system is altered by the related $\lambda_{k_{hb}}$ physical-like system that is a member of the $(1, \gamma)$-hyper-UWFF slice of the invisible universe. This relation is a **corporeal-incorporeal** relation actuated by participator activity.

`Thus, due to the close relation between the` (i, j)`-UWFF and` (i, γ)`-hyper-UWFF, under very special circumstances, physical evidence emerges that indicates the substratum presence of a human spirit entity that, intuitively, is a member of the` (i, γ)`-hyper-UWFF. However, due to the difficulty in describing the behavior of physical-like events, speculation relative to detailed alterations in the associated physical-systems is not described in this article.`

The GGU-model is not generated by any so-called physical laws. The model satisfies what are humanly comprehended relations that we use to build our human made universe. Most of modern secular science has taken the stance that under many circumstances we cannot make exact predictions as to physical behavior. They claim as a physical principle that simply because we cannot make such predictions that "nature" is lawless under these circumstances. This allows the secularist to construct analogue models that use entities that simply appear and disappear within a region of "uncertainty" and do not display their presence prior to or after any physical experiment. If, relative to a numerical range of photons, the number of photons that emerge from an experiment fit into the range, one cannot state that, in general, this range is a physical law for the number of photons due to those uncounted photons that are assumed to participate in physical activity within the physical range of uncertainty.

Relative to what we can comprehend, science cannot establish the so-called uniformity of nature relative to our comprehension of what constitutes physical regulations. Designed variations in our understandings of physical behavior can occur throughout the development of our universe. This, at the least, is what constitutes "miracle events." It is interesting to note that many such Biblically described miracle events and all that I have experienced are related to human activity and, hence, are the products of the GGU-model participator requirement.

Consider another nonempty $k^{\dagger}_{hb}$. Then there is the closely associated $\lambda^{\dagger}_{k_{hb}}$. The same choices as to the interpretation of k_{hb} and $\lambda_{k_{hb}}$ described above apply in this case as well. However, as the universe progresses, this yields a relation $(\lambda_{k_{hb}}, \lambda^{\dagger}_{k_{hb}})$ between the separated spirit entities within the various (i, γ)-UWFF. Of course, such relations are extended to all of humankind. *In this case, a designed relationship continues to be maintained between the spirit entities. That is, a relationship exists between separated* $\lambda_{k_{hb}}$ *and* $\lambda^{\dagger}_{k_{hb}}$.

For this theological interpretation, such relationships continue until the appropriate activity as described in Revelations occurs. From the GGU-model methods, the necessary participator altered spirit behavior is designed and sustained by God as He is identified as the model's higher-intelligence. There are certain corporeal and, apparent, incorporeal experiences that verify the above two general types of behavior manifested by spirit entities.

5.3. Separated spirit entity evidence.

From the previous discussion, alterations, at the least in local physical behavior, that do not follow our ideas of what constitutes physical regulations, are allowed. Any further justification for such alterations is unnecessary.

I have photographic DVD-reproduced evidence. However, I have not personally authenticated this material. Assuming such verification, then scientifically such material is not classified as mere mental abberations. This evidence has application to spirit behavior. Other spirit-type activity is described, at least, once in the Bible.

"A spirit glided before my face, and the hair on my body stood on end. It stopped, but I could not tell what it was. A form stood before my eyes, and I heard a hush voice: . . ." (Job 4:15-16 (NIV)).

This indicates that for various designed purposes certain special spirit-like activity does Biblically occur. Why it should occur under other circumstances is unknown. The evidence shows that something is occurring and this "something" does invade designed UWFFs.

> Physically recorded apparitions either appear in vague human-like physical forms or they behave in an approximate human-like manner. Significantly, such approximate behavior does not appear to be limited in the same manner as our human behavior is limited by physical law. It is also possible that recorded but clearly meaningful audio evidence that is a result of human participation can occur. This three sentence description is rationally consistent with the above UWFF and hyper-UWFF, invisible universe principles.

There are claimed spirit interactions with the hyper-UWFF and the corresponding UWFF where a type of quasi-separation seems to occur. These have been termed as "near-death experiences" and are strongly repudiated by some members of the atheistic community. As to a "secular" cause, they make unverifiable claims relative to brain activity. In published documents, individuals attempt to describe their impressions of what occurs during such experiences. If the experiences are relative to physical-systems, then **L** descriptions should suffice.

The major problem with such experiences is that the human brain, if it should receive information relative to other major spirit activities, say via the immaterial aspect of human thought, then it may or may not be able to translate this information into a description that meaningfully relates the details of such experiences. The obvious reason for this is that the words or images that can do this may require nonstandard members of $^*\mathbf{L}$. That is, their experiences with other separated (independent) spirit entities need not correspond to any language we employ while in a physical state. But, this does not preclude descriptions for the general behavior that spirit entities experience with respect to each other. Unfortunately, only in a very few cases, do authors admit to this difficulty in describing an event and state that their descriptions may be but illustrations that may aid in better understanding the behavioral relations they experienced with other separated spirit entities.

As pointed out previously, ultranatural hyper-UWFFs yield a developing substratum invisible universe that is mostly describable in detail only by members of the language $^*\mathbf{L}$ that are not members of **L**. `For this reason, I do not give any detailed speculative descriptions as to the contents of these hyper-UWFFs that comprise the spirit entities preternatural world.`

There is indirect Biblical evidence that interactions between human spirit entities and the physical world can exist. It serves no purpose to discuss what the practice today entails, but in Deuteronomy 18:11, God requires that specific activity practiced by individuals in the "nations" not be part of the Hebrew culture. This includes "consulting the dead." The way this is stated tends to imply that such a practice corresponds to real, rather than, faked events. Of course, it does not indicate whether such communication is mental or includes some other spirit associated physical-system alterations. Further, such activity needs to be pre-designed relative to various participator choices.

6. Some Technical Notions Associated with Section 5.

(It is not necessary that a non-mathematician reader consider this section.)

The following material, employs the notation from Herrmann (2013b), for $r = 4$, and a further analysis of the nature of the v function. (Although, in general, this approach need not be used, the notion of first considering an informal structure and then embedding it into a formal standard structure is maintained in this section.) Consider nonzero $K \in \mathbb{N}$. When (i, j) appears as a subscript, it is often written as ij. For each $i \in \mathbf{Z}$, ($\mathbf{Z}$ the "formal" integers) let $c_i = i/K$. (In this section, informal and standard formal integers are both denoted by $\mathbf{Z}$.) For the rational numbers $\mathbf{Q}$ and each $i \in \mathbf{Z}$, let $[c_i, c_{i+1}) = \{x \mid (x \in \mathbf{Q}) \wedge (c_i \leq x < c_{i+1})\}$. For such $i \in \mathbf{Z}$, partition $[c_i, c_{i+1})$, in the same manner as done in Herrmann (2013, 2006), by a denumerable increasing sequence of partition points t_{ij}, $j \in \mathbb{N}$, such that $t_{i0} = c_i$, $t_{ij} \in [c_i, c_{i+1})$ and $\lim_{j\to\infty} t_{ij} \to c_{i+1}$. For various $i \in \mathbf{Z}$, the set of rational numbers $\{t_{ij} \mid j \in \mathbb{N}\}$ models a "primitive (time) interval." For example, let $t_{ij} = (1/K)(i + 1 - 1/2^j)$.

For the set of rational numbers $\mathbf{Q}$ and for each $m \in \mathbf{Z}$, the map $\mathrm{t}\colon \mathbf{Z} \times \mathbb{N} \to \mathbf{Q}$ takes each $n \in \mathbb{N}$ and yields a basic collection of rational numbers contained in each $[c_m, c_{m+1}) = \{x \mid (c_m \leq x < c_{m+1}) \wedge (x \in \mathbf{Q})\}$, where $m \in \mathbf{Z}$ and $c_{m+1} \in \mathbf{Q}$. Let $R = \{\mathrm{t}(p, q) \mid (p \in \mathbf{Z}) \wedge (q \in \mathbb{N})\} \subset \mathbf{Q}$. Each member of the (i, j)-UWFF developmental paradigm or instruction paradigm $\mathrm{d}(i, j) \subset \mathrm{W}'$ (the language) and contains a unique rational number identifier taken from R.

The type-4 primitive time interval $(-\infty, +\infty)$ is partitioned as indicated. For various $m \in \mathbf{Z}$, n varies over the entire set $\mathbb{N}$ and yields a strictly increasing sequence of rational numbers $\mathrm{t}(m, n) \in [c_m, c_{m+1})$ such that $\lim_{n\to\infty} \mathrm{t}(m, n) = c_{m+1} = \mathrm{t}(m+1, 0)$. For each $m \in \mathbf{Z}$, let each $\mathrm{t}(m, n)$ in R correspond to $\mathrm{F}(\mathrm{t}(m, n)) \in \mathrm{W}'$ and the collection of all such $\mathrm{F}(\mathrm{t}(m, n))$ is a developmental paradigm or instruction paradigm, when applied to physical-systems in the (i, j)-UWFF. Depending upon the foundations, if used, informal $\mathrm{d}(i, j)$ corresponds to $\mathbf{d}(i, j)$ in the standard model. Each $\mathrm{F}(\mathrm{t}(m, n))$ is distinct in, at least, one identifying feature - primitive time. An obvious composition yields a bijection $\mathrm{F}^q \circ \mathrm{t}\colon \mathbf{Z}_q \times \mathbb{N} \to \mathrm{d}(i, j)$. In what follows, this composition, being but a technical matter, is suppressed.

The universes are restricted to four q-types and the UWFF identifiers are restricted to four subsets $\mathbf{Z}_q$ of the set of integers $\mathbf{Z}$. However, for the generation of each (i,j)-UWFF, due to the application of the notion of a empty constituent, only the $r = 4$ is employed. This allows for an important implication to be used.

Let $\mathbf{T} = \mathbf{Z} \times \mathbb{N}$ and $\mathbf{T}_q = \mathbf{Z}_q \times \mathbb{N}$. It is the $\mathbf{T}$ that generates the constituents of each (i,j)-UWFF. To be simple and practical, the **informal GGU-model is constructed within the world of** W′. In the mathematical standard world, W′ is replaced by "equivalence" classes $\underline{\mathcal{W}}'$ that additionally all describe the formation of "words" in W′.

Even in the case of a type-1 universe, the type that has a physical beginning and a physical ending, there can be type-4 UWFF. These are infinite slices with an infinite amount of material. For a specific (i,j)-UWFF, the defined sequence that generates the constituents is defined on $\mathbf{Z} \times \mathbb{N}$. (Due to the special technical method employed, where only type-4 UWFF are considered, many, but of course, not all, values of (k,s) generate empty systems.)

A completely detailed type-q universe is generated by a single word as a member of an extended language W′ and such words are sequentially represented by

$$\mathbf{g}^{(q,4)} \in (\underline{\mathcal{W}}'^{\mathbf{T}})^{\mathbf{T}_q}. \tag{6.1}$$

This yields that for $(i,j) \in \mathbf{Z}_q \times \mathbb{N}$, the sequence $\mathbf{f}^{(q,4)}(i,j)$ represents an (i,j)-UWFF. Then for each $(i,j) \in \mathbf{Z}_q \times \mathbb{N}$, there is, for each $(k,s) \in \mathbf{Z} \times \mathbb{N}$, the $\mathbf{g}^{(q,4)}(i,j;k,s)$ interpreted object. For certain, but not all k, this can be an empty set of words. For the nonempty case, some, but not all, of the s descriptions or instruction-entities can be empty. In all other cases, the nonempty collection of words, generate repeated previous, or distinct physical, physical-like systems or internal structures, respectively.

The following holds when expressed completely in a first-order language.

$$\forall i \forall j \forall k \forall s((i \in \mathbf{Z}_q) \land (j \in \mathbb{N}) \land (k \in \mathbf{Z}) \land (s \in \mathbb{N}) \leftrightarrow \mathbf{g}^{(q,4)}(i,j;k,s) \in \underline{\mathcal{W}}'.$$

This transfers relative to the nonstandard model into the following set-theoretic statement.

$$\begin{aligned}\forall i \forall j \forall k \forall s((i \in {}^*\mathbf{Z}_q) \land (j \in {}^*\mathbb{N}) \land (k \in {}^*\mathbf{Z}) \land (s \in {}^*\mathbb{N}) \leftrightarrow \\ {}^*\mathbf{g}^{(q,4)}(i,j;k,s) \in {}^*\underline{\mathcal{W}}'.\end{aligned} \tag{6.2}$$

$${}^*\mathbf{g}^{(q,4)} \in ({}^*\underline{\mathcal{W}}'^{\,{}^*\mathbf{T}})^{{}^*\mathbf{T}_q}. \tag{6.3}$$

This yields, for $(i,j) \in {}^*\mathbf{Z}_q \times {}^*\mathbb{N}$, the ${}^*\mathbf{g}^{(q,4)}$ produced ${}^*\mathbf{f}^{(q,4)}(i,j)$ (i,j)-UWFF. Then for each $(i,j) \in {}^*\mathbf{Z}_q \times {}^*\mathbb{N}$, there is, for each $(k,s) \in {}^*\mathbf{Z} \times {}^*\mathbb{N}$, the interpreted object ${}^*\mathbf{g}^{(q,4)}(i,j;k,s)$. Essentially, the following hold for these sets of hyper-numbers.

(A) $\mathbf{Z}_q \times \mathbb{N} \subset {}^*\mathbf{Z}_q \times {}^*\mathbb{N}$, (B) $\mathbf{Z} \times \mathbb{N} \subset {}^*\mathbf{Z} \times {}^*\mathbb{N}$. The "language" elements are constructed in a special manner. Due to this construction, for the standard members of these defining sets of identifiers, essentially, (C) $\underline{\mathcal{W}'} \subset {}^*\underline{\mathcal{W}'}$. The previous theological interpretation is developed from (6.2) and (6.3) and (A), (B) and (C) by rationally selecting members of ${}^*\mathbf{Z}_q \times {}^*\mathbb{N}$ and ${}^*\mathbf{Z} \times {}^*\mathbb{N}$.

As a formal example for physical-like events, let the finite set $\mathbf{D}$ denote a finite set of rational number parameters for a described physical law $\mathbf{PL} \in \underline{\mathcal{W}'}$. Then for each $i \in \mathbf{Z}_q,\ j \in \mathbb{N}$, there is a relation $\mathbf{R} = \{(\mathbf{D}, \mathbf{f}^{(q,r)}(i,j)) \mid (i \in \mathbf{Z}_q) \wedge (j \in \mathbb{N})\}$ that one interprets as stating that "D satisfies each (i,j)-UWFF."

Via formal *transform as informally stated, this implies that for each $i \in {}^*\mathbf{Z}_q,\ j \in {}^*\mathbb{N},\ {}^*\mathbf{R} = \{({}^*\mathbf{D}, {}^*\mathbf{f}^{(q,r)}(i,j)) \mid (i \in {}^*\mathbf{Z}_q) \wedge (j \in {}^*\mathbb{N}\}$. However, in this case ${}^*\mathbf{D} = \mathbf{D}$. So, for the (i,γ)-hyper-UWFF, the parameter values are the same as in the physical case, and probably the description for the physical law is, for the (i,γ)-hyper-UWFF, exactly the same as for a standard UWFF.

On the other hand, if $\mathbf{D}$ denotes a required infinite set of rational or real numbers as necessary to describe the physical law, then ${}^*\mathbf{D} \neq \mathbf{D}$. This can lead to a description that requires parameters that do not describe any physical behavior. Indeed, this is exactly what occurs for the law describing the electromagnetic spectrum and that led to the discovery of the ultra-propertons.

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For part I, see http://arxiv.org/pdf/math/9903081 http://raherrmann/cont3.htm