The following is composed of a sequences of postings made to a special
Internet form.

From: "Robert A. Herrmann, Ph.D."
Subject: Non-secular mathematics and the infinite, Part I
Date: Thursday, October 30, 2014 3:35 AM

A history lesson. Prior to the late 1800s, a curve was defined as an
infinite collection of infinitely small line segments. The language
used to model physical science included terms such as the "infinitely
large numbers," the "infinite small numbers," and this definition of a
curve. With few exceptions, all of the mathematical concepts of the
"infinitesimal" and "infinite" refer to "quantities." These are also
called measures. But, they often DO NOT follow the same algebra as the
measures used in basic physical science. In most cases, whether these
terms are quantities or some other concept is to be understood by
context.

For example, the curvature of a curve was defined as the angle between
these infinitely small line segments. The word "small" has both a
quantity and none quantity conceptual meaning in this statement. Ask
anyone at the Applied Physics Lab. or in the Physics Dept. at Hopkins to
define the infinitely larger numbers and give their algebra and see if
they even bother to answer you. It is not the symbol oo or +oo. Such
numbers do not follow the rule that "oo+oo = oo." It is not a "cardinal
number." They do not follow the rules for cardinal number arithmetic.
Yet, ALL of the intuition that has led to the most significant
mathematical model of all time – the calculus – used these and other
similar terms to model the physical world. Why has all of this intuition
been removed from our modern textbooks?

Bishop Berkeley was the first to attempt to do so when he rejected the
calculus of Newton and Leibniz. He claimed that the infinitely small or
large did not refer to anything physical and, hence, could NOT be used
within the physical sciences. Newton attempted to argue otherwise. Why
cannot physical science use the term "infinitely large"? Because it has
religious overtones and only Berkeley and other "religious authorities"
are allowed to use these notions.

The facts are that through the late 1800s the applications of these
infinitesimal notions were applied inconsistently. They did not have the
proper algebraic structure necessary to apply them properly. Hence, many
felt that they needed to be eliminated. Further, in response to Cantor's
theory of the "non-finite" as well as others who found it necessary to
assume that a entity can be either intuitively finite or not finite,
attempts were made and some continue to do so today to remove this
notion from mathematics as a discipline. It took a while, but this was
the opening to create an atheistic mathematical form and atheistic
modeling techniques that do not lead to such theological overtones. This
occurred with the re-writing of the entire subject in the late 1800s.
This is what is taught in our schools and universities. You have been
exposed only to the atheistic calculus and the atheistic methods it uses

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to model our physical world. That's why the modern university trained scientist cannot define such terms as the "infinitely small."

It is rather easy to refute the constructionists' concepts both linguistically and conceptually. Indeed, the white road with its panels refutes the conceptual part, which is all that is necessary. Consider the Brouwer statements relative to his extension of the ideas put fourth by Kronecker. "At the basis of mathematics lies an unlimited sequence of symbols or finite symbol arrays, which is determined by the first symbol and a law that derives from each of these rows of symbols the next. For this purpose the sequence S of (natural) numbers 1,2,3,4,5, . . . is especially useful."

"A set (later called a spread) is a law, on the basis of which if an arbitrary natural number is repeatedly chosen, then each of these choices either generates a definite symbol array with or without termination of the process or brings about stoppage of the process . . . . Every sequence of choices (which is then not representable in finished form) is called an element of a set." (Wilder, R., (1967). Introduction to The Foundations of Mathematics, John Wiley & Sons, Inc. New York, p. 249-251.)

He states, "If for each n in S [the symbol sequence] there is determined a natural number k(n) such that every time a natural number greater than k(n) is selected as the nth choice, the process is stopped, then the set is finite." Due to the phrase "every time," he has stated poorly the idea of counting the objects in a set via the "nth choice" process. Is there ever a case where one cannot do the "if" part? Apparently Brouwer's natural numbers are not to be conceived of as objects contained in something but are simply a "sequence" of symbols. By the way, I notice that many mathematicians today have classified Brouwer's attempts at re-writing mathematics as a form of "insanity."

But what do the words or phrases, "unlimited," "arbitrary," "definite symbol array," "without termination," and "determined" mean? I suppose he considers these as intuitively known. Then he uses the phrase "element of" and "sequences of choices." One might ask, "Choices from what?" Notice that if his symbols exist as he claims, then, from the basic white road and panel view, the "1,2,3,4,5, . . ." exists as a totality. Indeed, all one needs to do is to add two symbols and write this as {1,2,3,4,5, . . .}.

In order to avoid one ever asking the question of whether an object like S is finite or not, he rejects the most basic logical form used within all of physical science. Given a property P. He rejects the notion that "P or not P" has any logical meaning, any "truth value." He adds other stuff to get "close" to this but never anything that can be shown to be exactly equivalent to it.

As to choices, the idea that human "arbitrary" choices or even laws are the only applicable means allowed indicates that his mathematics cannot be applied to quantum physics. A Bernoulli trail physical event P occurs

or does not occur. In this case, P or not P is required. A meter indicates this. There is no known law that determine from the occurrences of P when after a specific number of attempts the next P event will occur. The next occurrence is said to be independent from the one that came before. But, prior to the GID-model, the great mystery was, how it possible that these independent choices by Nature actually converge on average to a specific value? Then of course we have the expanding universe idea of today and its relation to quantum fields. Are quantum fields being created to allow for this expansion or do they simply exist in some sort of, (shall I write it) "infinite" form? The physical scientists consider mathematics as a tool and use those portions that rationally model its concepts.

Considering all of the remarkable results obtained using the corrected version of Cantor's set theory, results for which the Fields Medal has been awarded, any attempt to counter its axioms, in any manner whatsoever, must be rejected. It is likely that attempts to reject the infinite are based upon a hidden atheistic agenda. But, relative to Brouwer's array of symbols S as the basis for the natural numbers, I note that in 1949, Henkin used constants (symbols) of a first-order language to construct, for a set of first-order sentences T, a structure that yields one of the most significant of model theory results. His theorem states that T is consistent if and only if it has a model. (Theorem 3.8.5 in Herrmann, R. A. Logic for Everyone http://arxiv.org/abs/math/0601709)

Today it's actually possible to through away all these atheistic calculus methods and start students off on day one with the corrected calculus and the intuitive modeling techniques of the founders of the subject. I have a textbook in my library that does just that and it was used to do so. But, it's, of course, no longer used. The atheists have seen to that. As far as I can tell, the mathematics area one needs to learn to "technically" obtain the properties of these corrected concepts is also not taught in any university or college in North America. Maybe you still can, as I did, teach yourself. I was allowed to do so for my Ph.D. and have a degree in this area. No North American University Ph.D. has been given in this subject for the past 8 years. This area is a rather difficult one to learn, as I'll explain in my second posting. And since I have applied it directly to theology, it will not be taught since it directly counters the atheistic mind-set. REMEMBER the general theological interpretation is that GID models the design aspects of transforming thoughts into physical reality. The thoughts are those of a "higher-intelligence," one that also satisfies Biblical properties. The GGU-model is a COSMOGONY. None of the processes are physical. Thus, using the standard mathematics such as the calculus to successfully model these processes is not possible.

But, to comprehend the General Intelligent Design (GID) interpretation of the GGU-model this technical knowledge is unnecessary. I have purposely eliminated this necessity in some of my website articles. All one needs to do is to find them. I have done this by using easily

described finite human processes. Then I have shown how to, at least, partially comprehend these "higher" processes by comparing them to what we actually do in real life.   Dr. Bob

From: "Robert A. Herrmann, Ph.D."
Subject: Bon-secular mathematic and the infinite, Part II
Date: Thursday, October 30, 2014 9:01 AM

History lesson continued.

My graduation from Johns Hopkins University was delayed for various reasons, but when it did happen I got one of those phi beta kappa keys and, if I wanted it, a Gilman Fellowship and a job as a teaching assistant (the actual people that teach anything.) I was to be paid $1,800.00 year. But I was to make $4800 as a high school math teacher. My wife would not accept that since we were also expecting my first daughter to join us and I turned it down. Is that significant? It sure was. If I had continued towards my graduate degrees at Hopkins, I would not have worked in Nonstandard Analysis since the subject did not exist until 1966. So I went to a university that, at that time, was the only one near enough to attend and that gave all the necessary courses at night. I got my MA in math and a phi kappa phi key to go with the other one. (I have never found the doors these keys open, however.) With the MA, I was able, in those days, to gain an appointed as an Assistant Professor of Math at the Naval Academy as long as I continued my studies for my Ph.D. That policy changed just one year later. I did have offers from other colleges. Then in 1969, Robinson, who is the creator of Nonstandard Analysis (NSA), was at the Academy to present a talk on this new and exciting area, an area that at that time many consider the most important advance in mathematics over the past 100 years. I met and talked with him at a faculty get-together and he and others strongly suggested I pursue this new area. Of course, all of this is the result of "randomly produced" situations and choices.

"You see the area is a rather difficult one to learn as I'll explain in my second posting." What do I mean by this? Well, one needs to know all of the standard mathematics through, say, the MA. Then one needs to know enough from Mathematical Logic and Abstract Model Theory, which for me is self-taught. Then one needs to learn the very special techniques used in NSA. To apply it to the physical sciences, you need to know a lot about mathematical modeling and the sciences themselves. Now what does one do?

Prior to the late 1800s, there was no actual definition for the real numbers. You learned how to work with the rational numbers and the general idea that there are numbers different from these. But Cantor and Dedekind change that. They produced "formal" extensions to the theory of rational numbers. From this comes a formal extension of the real numbers to the complex numbers. These are all added to the previous theory. Sorry but the student has a lot more to learn. So it is with NSA, it is an extension of all of standard mathematics and its applications. But it is not merely an extension in the ordinary sense of this term. It is a complete overall replacement where portions can be translated into all

of the atheistic concepts fostered since the late 1800s. The entire
algebra of the "limit" is but a translation of the algebra of the
"standard part operator." AND this eliminates such limit-defined
nonsense as 1/0, which has no meaning whatsoever. So one again has a lot
more to learn if, of course, one wants to do so.

Robinson applied NSA to the semantics area of Mathematical Logic. I was
not aware that Robinson had done this, in 1978 and 1979, when I applied
it to the syntax area of a generalization called Universal Logic. The
NSA extends these areas and this is from where the totally new
terminology of the GGU-model and its GID interpretation comes. BUT, one
does not need to do any of this stuff. All one needs is the concept of a
non-secular non-finite as it is compared to the finite world about us
via an extended quantity concept. Such a non-finite and the
infinitesimals are first but "quantity" concepts. Although attempts have
been made for over 100 years to stop individuals from doing so, the
conceptual notions that are partially measurable via these quantity
notions can be envisioned. It has been claimed that mere human beings
could not imagine the "completed" infinite. The concept of taking a
finite number like 26 and "continually" adding 1 was okay. But nothing
else is possible. This is an atheistic lie. Do mental mages exist? Of
course, if they don't, then we cannot "see" mental images. But, I, for
one, do have mental images and can describe what I "see." This "stuff"
certainly "must" physical exist in some form within my physical brain.
If you have not done so, pleased consider the article
http://raherrmann.com/infinite.htm

When I return and present part III, I'll use these ideas and show you
how to imagine an non-secular infinite "ultraword." And how to compare
its properties to our every day thoughts and written modes of
description.

Dr. Bob

From: "Robert A. Herrmann, Ph.D."
Subject: Non-secular mathematics and the infinite, Part III
Date: Friday, October 31, 2014 10:31 AM

Today, the GGU-model and GID conclusions are rationally predicted from
observed human behavior. This must be strongly emphasized. They are
PREDICTED. They are NOT HYPOTHESIZED. But, to better comprehend my
descriptions, certain terms, others and I use, are not what you have
probably learned. These terms have different meanings. If you gain
better comprehension of their meanings, then but two terms can be used
to differentiate the GID model from the finite secular world in which we
live. I continually use the terms "infinitely" and "infinite" in my GID
descriptions. But, unfortunately, when most individuals read what I
write, they don't know what these terms signify. They base their
understanding upon the faulty pure secular concepts of the past 100
years or so.

In his 1930 edition of his book on theoretical mechanics, Max Planck wrote, "A finite change in Nature always occurs in a finite time, and hence resolves into a series of infinitely small changes which occur in successively infinitely small intervals of time." What does this possibly mean to the students taking a course in theoretic mechanics using his book? The word "series" is meaningful and the word "successively" is also. But the phrase "infinitely small" actually has but a very vague meaning. How can finite time be "resolved" into something that is "non-finitely" anything? It is the somewhat inconsistently applied notions of Newton and Leibniz that could not until 1966 and, indeed, 1978 be much better comprehended. Once the meanings of the two terms "infinitely" and "infinite" are more fully understood as "measures" and otherwise, then these are the only two terms needed to more fully understand GID.

Note that the phrase "infinitely small'' and its companion "infinitely large" do not appear in any modern textbook of which I am aware. Indeed, they do not appear in my 1968 math dictionary. The actual "complete" concept of GID "infinity" did not appear in a public form until June 6, 2014 at 05:54:18 mean time. The term "infinitesimal" that I use does appear in modern texts. BUT, its meaning in these texts is absolutely NOT what it means in NSA.

Unfortunately, non-mathematicians, when they read what mathematicians write in their textbooks, actually believe that this is how mathematicians intuitively comprehend concepts. This is entirely false. When it comes to definitions for the "infinite" what they write are attempts to express formally an intuitive notion that exists prior to the attempts to formalize it. It's the intuitive notions they retain, hopefully. Wilder gives some of this away in his book on the foundations of math where he states that all of the notions of the intuitive infinite relative to set theory, via the term cardinality, simply mean the intuitive notion of the "size" of a set. Being an old, old mathematician, I could tell you all the truth about what really goes on behind the closed office doors, but not at this time.

In 1978, I discovered a way to more easily comprehend the intuitively notion behind these two basic terms. But, first some less than exciting stuff as to how, for GID, to read such strings of symbols as *paradigm, *finite, and all of the cases where the * is replaced by the word "hyper." In NSA, this is the intuitive meaning of these symbols. An example. The real numbers contain the rational numbers. The rational numbers have properties we use all the time. They do not have all of the real number properties. I could state the different properties in formal terms but won't do it here.

In NSA to actually make things easier, the previous non-NSA term is used, such as the term "real," and then the symbol * or prefix "hyper" is attached to it. So what are the *reals or hyperreals? As with the reals containing the rational numbers, the hyperreal set contains the real numbers. It has (1) real number properties PLUS (2) additional (different) properties than the reals have. No matter what word comes

after the * or hyper, this notion of the object having some or all of the properties of the original named object and "possibly" additional properties is the meaning of the notation. This is why NSA is a extension of standard mathematics. To have the correct knowledge as to what the hyperreals are, you need to know stuff about the real numbers as well as any additional properties the *reals possess. I write "some" and the term "possibly." The properties are language dependent. Some properties cannot be expressed in the required language form. Thus, they may be lost and not be properties for the hyper object. But, you can drop "possibly" for GID-model, the new objects will always have at least one different property.

In 1978, I introduced the notion of "adjective reasoning." What I did is to formalize the way we have of making comparisons. I turned it into a valid logical process. Some one states "Mike is intelligent." Then someone states, for comparative purposes, "But, Joe is very intelligent." This seems to indicate that Joe is "more intelligent than Mike." But, "Carl is very, very intelligent in comparison to both Joe and Mike." That is, he is more intelligent than Joe, who is more intelligent than Mike and Carl is also more intelligent than Mike. Do you recognize this pattern? 0 < 1 and 1 < 2 implies that 0 < 2, but what are the 0,1,2? Well, just count the number of "very" strings added to the left of the word "intelligent." One thinks of number of the "very"s used as increasing the "strength" of the term "intelligent" in a comparative. "Very, very intelligent" is "stronger than" "great than," and similar terms, in comparison to the notion with fewer "very"s. Of course, the word "very" is not the only such word one can write on the left. Try "much, much, much more intelligent."

How does this bring better understanding to the terms "infinitely" and "infinite" when applied to the GID model? For my examples of how to imagine the infinite, put the symbol "very," on each white road panel (pane) and on the black background "beyond" the vanishing point put the word "intelligent." In "word theory," the term "word" means any "finite" left-to-right combination of symbols taken from an alphabet. I have extended this to the NAS concept. The thing I can now, maybe, imagine is a type of word with "infinitely many" "very"s attached to the string "intelligent." There are two ways to generally express this in displayed form. For the white road and panels, it would be "very, very, . . . , intelligent." For the GID model, it is often expresses as ". . ., very, very, intelligent." One way or another this "mental construct" is an example of an "ultraword" when this stuff is viewed from the NSA world. It has "infinitely many" "very"s attached to it. It has an intuitive infinite length. This notion of the infinite is a quantity notion attached to a mental image.

This mathematical concept of "infinitely many" means intuitively, from a comparison counting viewpoint, more than finitely many where we need to have intuitive knowledge as to what it means to count the number of colored blocks in a box sitting on the floor. I cannot completely write down this ultraword. So, it is a mental concept. The notion "from a comparative viewpoint" is the key. Now relative to God, one can state

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that "God is . . ., very, very, intelligent" compared to any of us. Now for GID the results are not hypothesized, they are rationally predicted. The notion of an "higher-intelligence," "hyper-intelligence" "*intelligence" is predicted. BUT I have recently shown that there is an important additional property for the GID infinite notion than the one displayed by the imagined white road and panels. I'll discuss that additional property that actually is significant to the theologian and us in part IV. I'll also discuss such notions as "infinitely powerful deduction" (hyper-deduction), something that an higher-intelligence can do and we cannot.

I conclude this part III with what intuitively the word "infinitely" really means in the phrases "infinitely small" used in Planck's physical world as well as the phrase "infinitely large." This phrase could not be correctly modeled mathematically until 1961-66. Planck is talking about numerical stuff, ideas used in order to apply the calculus to mechanics. The old concepts of "infinitesimal modeling."

These are the ideal numbers of Leibniz. The "infinitely small" numbers are supposed to be positive "numbers" (many times the problem was they word "positive" was not clearly understood) such that they are ". . . , much, much smaller" than say 1/2. That is they are, at the least, between, relative to some type of <, 0 and 1/2. But actually you can take ANY real number > 0 no matter how small and they are supposed to be between that real number and 0. Of course, there were no such numbers in Planck's time yet they used them in the hopes, I guess, they actually exist. This, of course, is what made the calculus a slightly inconsistent application of the concepts until mathematicians dropped this terminology. BUT, it was then and still is not dropped within much physical modeling. Every physicist should thank Robinson for eliminating this problem. Unfortunately, physicists have not, in general, bothered to learn the correct algebra.

Now the notion of the infinitely large numbers used for the original Leibniz notion, is the same sort of thing but, rather than <, a it's > that is used. Replace "smaller" with "greater." For the GID model, there is an actual length number that can be assigned to the "number" of very's in its corresponding ultra-word for a partial measure of the intelligence of an higher-intelligence. This happens since ultrawords are predicted from FINITE strings of "very"s sitting on the white road. But, this will still be characterized by but the one term – infinite. Notice I used the term "partial," an infinite notion that is but "partial." "Gee, I just got the idea as to what you mean by 'infinite' and now are you going to alter it?" Yes! This and other GID stuff that can be so characterized by using but the one term infinite is for he last parts of these postings.

Dr. Bob

From: "Robert A. Herrmann, Ph.D."
Subject: Non-secular mathematics and the infinite, Part IV
Date: Saturday, November 01, 2014 8:12 AM

Consider the GGU-model and its GID interpretation as they are related to
the non-secular. That is, is to basic Biblical theology. "Let us make
man in our own image." Today, the GGU-model is based upon a few simple
steps that model how we build our manmade universe. We substitute a
language (symbol strings, diagrams, images) and its properties for the
physical events it describes. To build things that don't immediately
fall apart after they are built, we use thousands of conditional
statements, "If (described event) A occurs, then (described event) B
occurs" to predict behavior. Then when A occurs, we use this conditional
statement to predict that B happens. In abbreviated form, write the
conditional statement as A => B. Write the "when A occurs" idea simply
as A. Write the actual next occurrence simply as B. So, what we build is
based upon predictions of the form A => B, and A, then B. Or A => B, A.
Therefore B. Today, this is our most basic rule for deduction.

Consider the white road and panels that help us imagine an infinite.
Consider two parallel white roads and panels. Start at the first panel
on white road (1) and write A => B on it. On the second panel of (1),
write B => C. I can conceive of continuing to write these different
forms and when I run out of alphabet letters I use ||| marks like ||||
=> |||||, etc. I conceive of doing this on "every" panel on the first
white road. (Remember, I "see this" by looking from the black
background.) Now on the second white road (2), I write A on the first
panel. Of course, so far this is all mentally conceived. I then apply,
mentally of course, the basic rule and get B, which I write it on the
second panel on road (2). But then I can take the B and the B => C,
apply the rule and get C for the next road (2) panel.

The complete first white road panels form intuitively an "infinitely
long" ultraword, which, as you "read" it starting from the "front" first
panel, reads in the usual intuitive order. In the same manner, the
deductions A, B, C, . . . , ||||, |||||, . . . form, in order, an
infinitely long ultraword. (Using the A as the first one corresponds to
my simply writing it on the first panel.) So, we have a mental process,
of sorts, that takes one standard ultraword and deduces another standard
and ordered ultraword. And we actually know of what these are composed.

What do you get if each A, B, C, etc., describes an entire slice of a
physical universe as it is designed to appear at a moment in observer
time and you apply this deduction process to the first ultraword? You
get the step-by-step deduced slices, as they appear in order in the
second ultraword. But, what if you are a special type of entity and can
change the deduced A, B, C, etc. into physical reality each time you
deduce it, then what do you get? I guess one might say you get a
developing physical universe.

I wonder how one might mathematically model the ideas presented in the
last two paragraphs? Very carefully I should think since this mental

picture is not how we would actually do it in our finite and local physical word. Well, if we use increasing long but finite pieces of the first white road's ultraword, then we get but finite collections of ordered symbols, a word in the ordinary sense. So mathematically model this process for this finite stuff, stuff we can do. I wonder what I get if I mathematically embed all the stuff into a special nonstandard model? I get infinite entities, hyperfinite ultrawords, in place of the standard complete ultrawords. One of these, of course, is also an hyperfinite set of deductions. Wait a minute, the term "deductions" isn't correct. The math model tells me it is something infinitely stronger than mere human deduction. So, I better call it hyper-deduction, or *deduction. Until actually physical realization occurs, every aspect, indeed, every GGU-model scheme for the production of a developing physical universe employs such *deduction on such hyperfinite ultrawords.

Analysis shows something else that is rather remarkable. The hyperfinite ultrawords have some sort of symbols in them that are not in any of the finite words used. Indeed, they are not even in the white road (1) and (2) ultrawords. Then each of the word-forms on the panels is also a word-form in the respective hyperfinite ultrawords. These new symbols are abbreviations for exactly what type of meaningful "events"? Although the answer to this is rather interesting, let's not be concern with it in these postings.

You can actually measure a form of human intelligence being displayed by such deduction using an idea employed within mathematical logic. There we are allowed to use the entire first white road's ultraword. From a given A, the more conclusions one can deduce from A over a short fixed period of time using the original standard ultraword would be such a measure, at least, of how "fast" one thinks. Analysis shows that an entity that does hyper-deduction can deduce an infinite hyperfinite collection of conclusions during the same time period. Under our pervious notion of the strengths of an attribute, this gives the GID interpretation that whatever such an entity might be, it is predicted to have an attribute that states that "it is an infinitely more powerful intelligence – a higher-intelligence – compared to us." Note that this is not hypothesized. It is predicted based upon what we can do. For a Biblical interpretation, any atheist who understands just a little of this would certainly hate its conclusions and might try all sorts of things to prevent the world from knowing about them.

Thus, descriptively, that is all that is necessary to basically describe the GID-model creationary interpretation. The complete predictions, as I technically obtain them in my papers and book on ultralogics, are interpreted as the behavior of an infinitely powerful mind that by various created non-physical processes changes hyper-designed mental-like stuff into physical reality. This entity designs, produces and, indeed, sustains all that there physically was, is and ever will be. All that we observe is indirect evidence for its existence.

"Wait, a minute. All of this is for creation, right?" Yes. "Well, what about the other attributes. Can we say the God's love is infinitely stronger than any similar actions we might take?" Well, yes and no. "What do you mean 'Yes and no'? Didn't you previously do this for your GD-model?" Yes, but I have not as yet discussed the fact that the "infinite" used in the GD-model and the one used in GID-model are not the same infinite. "You have got to be kidding. Here I thought I had just about gotten the idea of the infinite notion you use to describe God's creationary behavior and you tell me there is another concept that is different from that one." Yes, it's the "there is more to Him than just that" infinite.

After all, what is the dictionary definition of "infinite"? It says "unlimited" and, the Plato one, "immeasurable." I wonder how you can rationally model the immeasurable? And I thought I could complete this last part in this posting, but, else, this will not be the case.

Dr. Bob

From: "Robert A. Herrmann, Ph.D."
Subject: Non-secular mathematics and the infinite, Part IV.5
Date: Saturday, November 01, 2014 5:30 PM

There is no question about it, it is sometimes difficult to "unlearn." Did you know that there are claimed highly significant physical processes that cannot be mathematically modeled using what passes today for mathematics? The Feynman path integral used in quantum dynamics is not a mathematical object although the term "integral" appears in the name and the same type of symbol is used. This is only an heuristic notion we are told. Over 120 years ago many people rejected Cantors set theory not over his overbroad definition process, but for the very strange way he attempted to "measure" the size of the infinite – the transfinite numbers and their arithmetic. Today, some, maybe a lot, of mathematicians "love" it because it is strange and they can look like brilliant people who claim to "understand" something others don't. (They also keep secrets about how to envision such stuff.) It is often difficult to "unlearn" past ideas that no longer apply to a new situation.

There is a group of physicists that claim that our universe is composed of infinitely many material particles and the Big Bang theory still holds. They add to that claim that there are 10^{150} disjoint universes of this type. So, what does their term "infinite" mean? They seem to mean, relative to their education, something that has the same Cantor styled size as the natural numbers N or maybe the real numbers R. After all, that is our "modern" way to measure such stuff. The N size directly relates to my "white road" mental method of imagining the infinite, which I wish more could experience. But, for their cosmology, does it make physical sense? If you write $|N|$ for the size of N, the properties of
$|.|$ should model the number of these material particles. Thus intuitively it is reasonable to believe that there are $10^{150}|N|$

particles for the entire collection of universes. But, else, transfinite arithmetic says no. There are only |N| of them. Must we accept what transfinite arithmetic states?

Mathematical and scientific theories are language dependent. Did David Bohm's extended language theory he calls sub-quantum theory ever catch on? But, at least for the science fiction writers, extending rest mass terminology to a pure complex rest mass, mi, did since that is where tachyons come from. I could really loose my audience, whomever they may be, by telling them that NSA uses five or six different "languages" to express the behavior of its mathematical objects and the usual mistakes and misunderstanding come from mixing up the languages. But I won't do that for fear that they will depart and I will never hear from them again.

I have surmised that before continuing we need some information about what are (abstract) mathematical models. Such a model uses a collection of set theory axioms, usually rather informal, to construct. Then one selects a "domain," which is a set of objects that are used to construct a set of mathematical relations that satisfy a set of axioms in the following sense, that is, they hold "true" for the structure. What does "true" mean?   Consider the set of three letters {a,b,c} as the domain. Then let the set of three symbol strings {(a,b), (b,c), (a,c)} represent the relation. (If you really want to know what (a,b) means for set theory, ask me later.) Then the two objects {a,b,c} and {(a,b),(b,c),(a,c)} form an abstract structure. You then can define what it means for an expression to be "true" for this structure. If it is true, then the structure "models" the expression. The structure is an (abstract) mathematical model for the statement. For example, symbolically let D = {a,b,c} and R = {(a,b),(b,c),(a,c)}. A predicate in two variable R(x,y) is translated as (x,y) in R. (Two humans x and y are brothers.) Such statements can use these symbols as "constants." It is true in the structure that "for a,b,c, R(a,c)." Although not usually stated this means that, for the symbols a,b,c, the symbol (a,c) is a member of R.) It is shown in general that anything that you can logically deduce using classical logic from the set of axioms that holds true in the structure holds true in the structure. Thus such a structure is a model for a classically obtained theory. Give physical names to the stuff in an abstract model and you have a physical mathematical model. Or, via context, this is just stated as being a mathematical model.

You have a language that is restricted to the structure, that is, restricted to the stuff in it. You also have at least another language. The one I just used to define and construct the structure. This is often called the "meta-language" (metalanguage) and includes the language used for the structure objects. Structures themselves are built from a set of axioms used in informal set theory. They form subsets of a general model for set theory itself. Sometimes structures are not disjoint and some objects identified in one structure by a name are also identified by a different name in another structure. But, they all are part of the general set theoretic model.

NSA has a bunch of different structures or models for statements that if not carefully written in the restricted language hold true in a structure but are false in another structure. That is, don't satisfy the definition for truth in the other structure. So as not to have a contradiction, different terms are used that identifies the structure being used. I have tried to avoid this problem as much as possible. The * or hyper-terminology ALL refer to a specific structure. (It is called since you asked the "internal structure.") If the * or hyper is missing and they refer to stuff in you ordinary mathematics or physical science using types of statements patterned after statements written prior to 1966, then a structure that uses these is called a "standard" structure." Unfortunately, in NSA, some attempt to keep you out by using the term "standard" for both structures and you only knew what they are talking about via context. I don't do that.

So, how does this apply to a sensible model for the 10^150 "infinite" material universes? In the internal model, the hyperfinite stuff has a number that measures its content, i. e. size, that is not the |.| stuff. This actual number behaves like a number in N, but its not in N. So there is no contradiction problem. In the GGU-model, such a martial universe U has such a size number associated with it. The model is a general physical model constructed to accommodate such stuff. Denote this number by ||U||. Then the arithmetic of these numbers state that the size of the multi-universe is indeed 10^150||U|| and ||U|| < 2||U|| < 3||U|| < . . . < 10^150||U|| a pattern that seems to me rather more physical than the |U| = 10^150|U| pattern. The statement that 10^150|U|=|U| does hold but not in the internal model.

Well, I guess, I'll conclude this little lesson in NSA and will shortly continue to explore a necessary dictionary defined infinity notion next time and see how it differs from the mathematics concept.

Dr. Bob

From: "Robert A. Herrmann, Ph.D."
Subject: Non-secular mathematics and the infinite, Part V, the unlimited God.
Date: Sunday, November 02, 2014 6:47 AM

Relative to a creationary ID theory, here are a few questions. (Note this is relative to Dembsky's originally published Restricted Intelligent Design (RID) concepts.) (1) Does the theory rationally and directly point to the Biblical creator? RID - No; GID - Yes. (2) Does the theory have a measurable definition for creationary intelligence? RID - No; GID - Yes. (3) Does the theory show that every snowflake that has ever been produced and that has fallen to the earth is intelligently designed? RID - No; GID - Yes. (4) Does the theory only apply to very, very few physical-systems? RID - Yes; GID - No. (This is why it is termed as RID in comparison.) (5) Does the theory show that the tested and verified physical laws are intelligently designed? RID - No; GID - Yes. (6) Does the theory show that our universe is intelligently

designed in such a manner that it satisfies these laws? RID – No; GID –
Yes. (7) Does the theory satisfy a unification for all these physical
laws and accepted physical theories? RID – No; GID – Yes. (8) Does the
predicted theory processes show that the major argument for atheism is a
lie? RID – No; GID – Yes. (9) Has there been or is there available now
substantial funds to popularize the theory? RID – Yes; GID – No. (10) Is
the theory the first scientific one to investigate such intelligent
design? RID – No; GID –Yes. ETC.

Note: One need not really know the details of any of the stuff that now
follows when they put the word "infinite" or "infinitely" into their
statements about God. They can consider this as purely an intuitive
notion. But, what is described below does imply that what you mean by
this term is most likely a rational concept.

Since the early 1970's the set theory axioms used to construct the
various NAS models include the usual ones (the ZF with C usually, if you
don't know what the symbols mean that's ok) plus an additional one the
deals with stuff called atoms. But, it's not important that you know
about this stuff in any detail. That's my job at the moment. Using the
Part IV.5 material, the internal language measure ||U|| for the "amount"
of stuff in an infinite physical universe is a bad, bad measure for the
creator's infinite intelligence. Why is it bad? Well, it varies with
respect to <. Does God's creator intelligence vary? I doubt it.

So, now what can be done to correct this situation? It's 1974 and
although he did not know what I was going to do with it Ward Henson
published a paper with a very startling result. How he got the idea that
this result could be established, I cannot possible guess. It
demonstrates how NSA results are language dependent and one must be
careful in their use of language descriptions, please. Not too many
people are.

In the meta-language used for the entire set theory in which the models
are embedded are the set theory measures for the size of an infinite
set. Of course, this means that the set has many, many more members
than what we can count during any finite lifetime. It's really a BIG set
of stuff. I use the symbol
|.| for this "measure." Henson showed that, from the viewpoint of the
meta-language, all those hyperfinite things I use have the exact same
|.| size relative to the set of atoms used. So, you see why I had to
use two different symbols, the ||.|| and the |.|. If I had used the same
one, we would have a contradiction that both not = and = "hold" since <
means not = also. BUT, it is also a fact that relative to the
construction of the models, and the |.| ordering, the size of an
infinite hyperfinite set is "immense" as many of us strange people state
it while behind our closed office doors. BUT, BUT, BUT this is exactly
the thing I need in order to give a measure for the concept of the
infinite power of the creationary aspect of the Divine mind.

So, this is what I mean when I write the term infinite or infinitely in
this restricted case. This is a measurable form of the infinite

concept. BUT, BUT, BUT, again, this is not the infinite concept for the attributive GD-model, where there should not be such a restriction. So, now what do I do? Well, I just won't mention this distinction and hope for the best.

It's 2000 AD and a book is published that is sent to me to review. It contains a new approach to the construction of NSA models. Not much of a change, but just enough so that the axiom on atoms need no longer be used. The necessary atomic requirements are still present. Of course, this axiom is still used but it is not necessary. Since that time I didn't really feel like solving this last problem since who was following the technical aspects of my work anyway? Well, I'm 80 years old and time is probably very short so I thought I had better get to it. As I mentioned, the paper was written and archived at 02:24:06 hours on 09/30/2014. I haven't gone back to correct all the typos however. What does it say?

I show that, using the 2000 AD construction method, that there is an immense tower, so to speak, maybe almost reaching to the Third Heaven, of NSA models. And relative to these, there is no actual mathematical set theory bound for that |.| measure I use for the hyperfinite infinite concept. But, wait a minute. In my book on ultralogics, Theorem 4.1 has in its proof the fact that the infinite notion for the strength of God's attributes is a hyperfinite notion. Now what do I do?

Well, let's regress and try some way to obtain rationally the dictionary definition for the infinite and assign this to the general strength of God's attributes as they are compared to those of His created. There is a way to do this using a different language. The collection of all of these NSA obtained "increasing" hyperfinite |.| measures exists but is now called a "class." It is not a set. This class contains ALL of the |.| bounds for the hyperfinite |.| measures. There is no measure given to this class of stuff. One might use this class as a type of "intuitive model" for the immeasurable, the unlimited notion, needed for the general strengths of God's attributes as compared to all else. Indeed, I do. One can thus say that an unlimited strength for God's attributes is a rather simple rational conclusion.

Thus I have two different infinite notions. One stays in a fixed NSA model and has the limited measure |.| for the infinite intelligence exhibited for GGU-model creation of the physical. But, for the GD-model I use the general unlimited, immeasurable, infinite concept, which includes a general intelligence statement. This I call the generic infinite. QED

Dr. Bob, who has been doing things scientific for 63 years.

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