Misc Q&A

By Dustin Darcy (Jan. 1st 2011, revised: Aug. 5th)
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Q: Doesn't examining the Great Extinctions and speciation rates sweep the rug out from under the sinusoidal theory? Please explain the mathematical model in more detail.

Historically speaking I'll be the first to admit that societies have moved both forwards and backwards which would seem to fly in the face of any idea of cultural evolution. However, I think we may be observing noise in a larger shaping algorithm. A physics analogy might help to explain how this position might be true. Classical physics works beautifully on the macro level, but the quantum standard model does a vastly better job of explaining the whole. Unfortunately quantum mechanics fails to account for gravity. This continues to vex physicists.

Clearly since both are accurate descriptions of physical reality, even the lay person can see there must be something that fills in the gap and merges the two systems. There's plenty of conjecture as to what this unifying structure might look like (string theory, loop quantum gravity, Penrose spins networks, E8 supersymmetry, etc), but no one has as of yet definitively found it. So in the here and now we make do with Einstein's general-relativity and the standard model.

Similarly I believe the behavioral sciences may be looking at the "quantum" perspective when there's a larger algorithm at work that's describing the classical mechanics of anthropology.

Thinking about this ultimately led to the study of several physical-anthropology books, describing energy consumption rates of civilizations, such as Leslie White's *Science of Culture*. Researching this it became obvious the S.H. concept, as a logarithmic spiral (not a circle), had a strong connection to Kardashev's scale and even seemed to fit the description as detailed in the *Physics of the Impossible*, on p.146, "Kardashev estimated that any civilization growing at a modest rate of a few percent per year in energy consumption will progress rapidly from one type to the next, within a matter of a few thousand years to tens of thousands of years."[1]

Furthermore the idea expressed in the graph, as seen in Fig.1,[2] suggests that if we're to imagine "a most exigent scenario" ($x = -1$) it would have to be in relation to a sentience because exigence has no meaning absent an actor. Sentience defined here "as *any* life-form that has the capability of evolving in to a self-aware species with some form of physical appendage or mechanism to work its environment." So at some point between 4.5 Ga and 2 Ma speciation eventually resulted in a branch of Hominoidea where behavior morphed from purely selfish characteristics (beyond parental care) to genuine group based collaboration (i.e. Marx and Engels' theorized "primitive communism"[3]). What doubled me over when I first saw it was that at the point of greatest exigence — an extinction level event — we see the transition from "self" based behavior to

[1] For a full technical treatment see: Kardashev, Nikolai. "*On the Inevitability and the Possible Structures of Supercivilizations*", The search for extraterrestrial life: Recent developments; Proceedings of the Symposium, Boston, MA, June 18–21, 1984 (A86-38126 17-88). Dordrecht, D. Reidel Publishing Co., 1985, pp.497–504. http://articles.adsabs.harvard.edu/full/1985IAUS..112..497K/0000497.000.html

[2] Primary Graph, v1.8.9 [Fig. 1]. http://img710.imageshack.us/img710/5674/fourseasonsofscarcityan.png

[3] Mode of Production (2004). Wikipedia. http://en.wikipedia.org/wiki/Mode_of_production#Primitive_communism

"group" based dynamics, seemingly bearing out the validity of the concept and its geometrical representation (Fig.2)[4].

While I doubt this was an overnight transition. It suggests our early ancestors adapted to the environmental devastation by engaging in group oriented collaboration to ensure their individual self preservation.

Similarly at point **(b)** we see something that further corroborates the concept.

At the inception of the universe, since there was no life, there would have also been 0 exigence. Likewise since this process resulted in the creation of everything. We can very easily describe this point as being "infinite in value" or, at the very least, self perpetuating. Furthermore the very fact that the universe is speeding up is an indicator the universe will more than likely expand indefinitely (NASA WMAP data 2008)[5,6]. So it should hardly be contentious saying the universe is the closest thing we observe that exhibits "infinite" characteristics.

That's two data points at **(b)** and **(c)** each fitting the hypothesis in a surprisingly consistent manner. So what of point **(d)** then?

As our species continues to evolve, what have we collectively worked towards? We've strived to offload our burdens to be borne by some other force. Whether that be a beast of burden, a natural process like windmills, water-wheels, or in the modern day, nuclear processes; through-out our goal has been to overcome nature enforced exigency. The closer we come to accomplishing this, what's been the result? Greater "life as a good to be consumed" for all individuals. To accomplish this though we've needed more "value to be produced and reproduced" to support the increased number of people living "life as a good to be consumed."

Eminent physicist and founder of string field theory, Dr. Michio Kaku, expects within 100 to 200 years[7] we should to a large extent be able to control the physical processes of our planet. So if everything on Earth can be controlled, then there's no reason any living person should ever have to suffer since future humans would possess a full accounting of the planets resources[8] and have the capability to manipulate any local outcome. If we can accomplish this it would be equivalent to 0 exigency because we'd have a fully-managed closed system. Assuming this is possible in reaching 0 exigence we would simultaneously provide -1 good (the greatest good to be consumed for the group). This would manifest as the complete self-empowerment of all people (possibly as some form of over-unity energy source[9]).

So the concept bears out in many ways. If there's still any doubt about the accuracy of a cyclical representation, here's another example that hopefully brings the point home. We can

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[4] Addendum, v2.0.8 [Fig 2 & 3]. http://img210.imageshack.us/img210/5674/fourseasonsofscarcityan.png

[5] Krauss, Lawrence. (2009-10-21). AAI Lecture. *"A Universe from Nothing."* http://www.youtube.com/watch?v=7ImvlS8PLIo

[6] Wilkinson Microwave Anisotropy Probe (2010-01-26). NASA. http://map.gsfc.nasa.gov/

[7] Kaku, Michio (2011). *"Physics of the Future: How Science Will Shape Human Destiny and Our Daily Lives by the Year 2100."* NY: Doubleday. p.11. ISBN 978-0385530811. http://books.google.com/books?id=lGS9Lbv0PdsC

[8] Cohen, David (2007-5-23). *"Earth's natural wealth: an audit."* New Scientist. (2605): 34-41. http://www.science.org.au/nova/newscientist/027ns_005.htm

[9] Personal notes (2010-2-27). *"Understanding End Self & the Q3/Q4 crossover."* http://tinyurl.com/Q3-Q4-crossover2

assume humans will continue to find things to quantitate and compete over, even if we succeed in overcoming material scarcity. Here's a fairly powerful example of what I've dubbed "ordinal scarcity" or the "original earth conundrum,"

[Scarcity] seems to form all imperatives. Even more so it seems to expose a crucial element of how the human brain works. Scarcity is fundamentally a part of our psychological make-up. It's not just something imposed on us by reality through the forces of nature, but something that we strive for and actually seek out.

Consider that many millions upon millions of years from now, when humanity has the ability to fundamentally convert matter to energy and energy back to matter perfectly recycling all transitions (potentially beating the 2nd law of thermodynamics – see figure 1, point (a)); and when man has the ability to replicate and create anything whether it be cloning an exact copy of yourself, creating a planet, or summoning in to existence a TV or what-have-you:

Scarcity will still exist.

Why? Because there is no way to replicate the exact instance of the original Earth. Put another way there is only one original NY. Even if we can recreate Earth exactly as it currently exists and drop it in to another system, precisely modeled on our current solar system, there would still be only one original Earth.

Due to this people would still have battles over property and the value of a house would be subject to the whims of the individuals bidding on it. For example, the house in NY on the original Earth would necessarily be worth more than the copy because it would be known by all parties as the first, authentic incarnation. So the qualitative association is what would create the value despite the two houses, environments, and conditions otherwise being physically identical.

Thus scarcity still exists as a concept in people's minds and because of this future people will still need some mechanism to determine resource allocation (likely a stored social value system like money).

Now let me explain where this is really coming from.

A = A

They're not equal.

They're two separate things though identical in almost every way, but they're two separate instances (i.e. one is on the left, the other is on the right). Thus we create scarcity and inequality even when it doesn't exist. We seek out difference wherever we can find it.

Now imagine if you could even remove that. If we can do that we haven't removed a real scarce thing, we've removed a part of human psychology.

There's something very strange, special and magical about this idea.

A ≠ A can be objectively true[10,11] *and I get the impression it's at that point where the quantitative bridges to the qualitative world.*

So once humans succeed in overcoming quantity limitations (i.e. cardinality as perpetual motion machines) there are still ordinal limitations to quantitate on. However if quantity can be overcome more than likely order will follow suit. Suggesting that at the conclusion of this process, as described in the paper, there can be an end to lack,

... consider what happens at the end of "lack of knowledge" and "lack of being able to be in all locations."

At that point we'll be omniscient, omnipresent, and omnipotent. So the only thing that will be scarce is "the lack of something." If you can know all things, be everywhere, and control all things what then? I see several possibilities but the most obvious are either a) start over, hit the reset button or b) become the vessel of a new sentience or universe.

Which is to say the cycle starts all over again. Even if the circle isn't the idealized version of this periodic function we're at the very least looking at something as represented in a logarithmic spiral.

Put another way if humans can truly accomplish all things then there will be a point where there's simply nothing left to do. Can you imagine a more horrifying fate? This "lack of something" suggests the process curves back on to itself, creating a new scarce universe for us or something else to overcome. This process would then create all possibilities and probabilities in perpetuity.

So if this can be conceived as possible. Then the formula in this case is simply: $^{y}/_{x} \Rightarrow {}^{\sin(a)}/_{\cos(a)} = \tan(a)$, where *y* is "life as a good to be consumed" and *x* as "life as exigency." Meaning as exigency decreases life as a good to be consumed increases. Thus the "value to be produced and reproduced" is the ratio between the two. So when "life as a value to be produced and reproduced" goes to infinity, life as exigency is 0, and life as a good to be consumed is completely maximized.

This even makes intuitive sense. "Infinite value to be produced and reproduced" would obviously allow for the greatest possible life as a good to be consumed because it's unending value.

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[10] Priest, Graham (2006). *"In Contradiction: A Study of the Transconsistent."* NY: Oxford University Press. ISBN 978-0199263301. http://books.google.com/books?id=TMztJKtWWSAC

[11] Assuming rationality acceptance of a contradiction is usually by way of a paradox. So evaluating (a ≠ a) as true, it can be said the ordinal positioning implies a (ε, δ) or that *the value* is separate from its container. Usually we imply uniqueness by subscript (a_l or a_r), but left & right implies differentiability even without notation. In comp-sci speak:

```
template <class T> const char* EquOrNot(T l, T r) { return (l == r) ? "==" : "!=";}  void main(int argc, char* argv[]) { int a[2] = {3,3}; int *b[2] = {&a[0],&a[0]}; int *c[2] = {&a[0],&a[1]}; printf("%i %s %i\n", *b[0], EquOrNot(*b[0], *b[1]), *b[1]); /*prints: 3 == 3*/ printf("b_0 %s b_1\n", EquOrNot(b[0], b[1])); /*prints: b_0 == b_1*/ printf("%i %s %i\n", *c[0], EquOrNot(*c[0], *c[1]), *c[1]); /*prints: 3 == 3*/ printf("c_0 %s c_1\n", EquOrNot(c[0], c[1])); /*prints: c_0 != c_1 */ }
```

Upon further thought I realized the idea even corresponded to density plots of the universe. Since the cotangent eventually zips off to -∞ this then made me think of the Weyl curvature hypothesis[12] suggesting, as Dr. Roger Penrose notes, that when mass completely radiates away time goes to ∞ and the conformal factor Ω tends towards 0 at point **(a)**, as seen in Fig. 5.[13]

Perhaps the strangest part of the concept is it suggests *everything*, including math, is simply a function of lack, or scarcity, resulting in,

1. Cardinality – physical *quantity* limitations, as opposed to "Grand Hotel" style paradoxes
2. Ordinality – physical *order* limitations, correspondent to Turing-Russell halting-problems
3. Duality principle – dialectical argumentation illustrating there's always a *discrete* +/- counter position; or in a physical sense similar to getting matter / anti-matter pairs out of energy,[14,15] or contrasting light against matter[16]
4. Reflexive / Irreflexive relations – concepts of beingness, existence and nothingness[17]

Suggesting, as Dr. Tegmark[18] hints at with his mathematical universe ToE[19] diagram,[20] that all of math is a unified body with definable points of intersection where all elements can be unified and analyzed as representations of each other. I contend that absence, as typified by zero, is this unifying principle. Below are the identities and relationships as I currently imagine them:

1. Reflexive-Ordinal identity:
   $(A \neq A) \equiv \emptyset$
   Assuming the statement can be true rather than false.

Note: $(A = A) \equiv A$, showing that reflexive-equality or -inequality can be simplified in both cases down to a single term as a type of substitution.

2. Cardinal-Dual identity:
   $0 \equiv (+ \cup -)$, or perhaps, $0 \equiv (+ \wedge -)$[15]
   implying dualness has a cardinality of 2 in the normal case (i.e. $A+B = A-B \Rightarrow 2B = (A-A) \Rightarrow 2 = A(1-1)/B$, where $B=0$, assuming not indeterminate due to $\frac{C*y}{D*y} = \frac{C}{D}$ where the 0's cancel thus mimicking $\lim_{b\to 0}(\frac{x*b}{b}) = x$; or 4 when accounting for conjunction and negation. This suggests an ...

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[12] Penrose, Roger (2005-11-7). Oxford University Lecture. "*Before the Big Bang? A new perspective on the Weyl Curvature hypothesis.*" http://www.youtube.com/watch?v=fJ-D5AUGVcI

[13] Density Plot, v2.0.8 [Fig.5]. http://img246.imageshack.us/img246/6535/fourseasonsofscarcityanq.png

[14] Koji Mukai, David Palmer, Andy Ptak, Paul Butterworth (1997-7-24). "*Energy-Matter Conversion.*" NASA. http://imagine.gsfc.nasa.gov/docs/ask_astro/answers/970724a.html

[15] "…following theoretical physicist Paul Dirac, … *a vacuum, or nothing, is the combination of matter and antimatter*. Their density is tremendous, but we can't perceive any of them because their observable effects entirely cancel each other out." University of Michigan (2010-12-8). "*Theoretical breakthrough: Generating matter and antimatter from the vacuum.*" ScienceDaily. http://www.sciencedaily.com/releases/2010/12/101208130038.htm

[16] Personal notes (2010-2-9). "*Syllogistic system of opposites.*" http://tinyurl.com/matter-light-differential

[17] Sartre, Jean-Paul (1956). Hazel E. Barnes trans. "*Being and Nothingness*." London: Routledge. ISBN 0671867806. http://books.google.com/books?id=X6RtpboH478C

[18] Frank, Adam (2008-7). "*Is the Universe Actually Made of Math?*" Discover. http://discovermagazine.com/2008/jul/16-is-the-universe-actually-made-of-math

[19] Tegmark, Max (2007-10-8). "*The Mathematical Universe.*" MIT. http://arxiv.org/abs/0704.0646

[20] Ibid, "*Mathematical ToE diagram.*" http://space.mit.edu/home/tegmark/toe.gif

3. Ordinal-Dual relation:
   $\emptyset \equiv \neg(+ \vee -)$

4. Cardinal-Ordinal Dual-Reflexive relation:
   $(0 \cong \{+ \vee =\}) \leftrightarrow (\emptyset \cong \{- \vee \neq\})$
   or in other words 0 as summation / reflexive, and ∅ as absence reflected in lack of cardinality / irreflexive. Meaning this type of 0 ⇒ {ordinal = 2, cardinality = 1} and ∅ ⇒ {ordinal = 0, cardinality = 1}

Some fascinating characteristics start to emerge as you think about these adjacencies, for instance $\forall A: \emptyset \subseteq A$, meaning ordinal ∅ when related to the cardinal-space has a cardinal length of ∞. Suggesting ordinality and cardinality run parallel to one another.

The relationship between ordinalness and dualness would seem to be triangular in nature. Probably the easiest way to start to see this is to simply imagine dualness perpendicular to reflexivity; and {cardinal, ordinalness} as parallel and simultaneously orthogonal to {dual, reflexive}; though there are some strange characteristics when considering $(A \neq A) \equiv \emptyset$. It's hard to imagine $\neq \perp \emptyset$ in the instance when $A \neq A$ as being identical to ∅. Though this may make some sense in that ≠, as a binary operation, doesn't always imply ∅ in the instances where $A \neq B$ is true and the values are different. So the ⊥ intersection occurs when ≠ is a contradiction.

Zero as a 7-Fold Truth-Table Mapped to a Spherical Formal System

			A embodies cardinal 0, because z+y=z-y ⇒ 2y=z-z ⇒ 2=(z-z)/y, y=0 assuming ¬¿	B can be expressed as, "positive doesn't imply negative." (i.e. +0).	C can be expressed as, "negative doesn't imply positive." (i.e. -0).	0 is traditionally held to be + nor -. In light of (A) this suggests 0 (as the empty set) ≠ 0 (as summation).	E, as a tautology, resembles the Universal Set because ∀X: (E v X) = E, where X is any characteristic. However in this case E ⇒'s equality because all things are themselves. This can be seen as, ∀X: (E ^ X) = X.	F, as a contradiction, is the closest logical approximation to nothingness (∅ ≠ ∅) as it's devoid of all positive characteristics.	G is the merging point between sets {A, D}, {B, C}, and {E, F}. G requires the extremes to be center.
	α	β	A	B	C	D	E	F	G
	+	-	+ ^ -	~(+ ⇒ -)	~(- ⇒ +)	~(+ v -)	(A) v (B) v (C) v (D)	~((A) v (B) v (C) v (D))	+ ⇔ -
0)	T	T	T	F	F	F	T	F	T
1)	T	F	F	T	F	F	T	F	F
2)	F	T	F	F	T	F	T	F	F
3)	F	F	F	F	F	T	T	F	T

There are a total of f[4] = 16 permutations, where f[x] = 2ˣ, with 8 as inverses:

Normal	Inverses
1) α = (A v B) (i.e. Q1)	09) ¬(α) = (C v D) (i.e. Q3)
2) β = (A v C) (i.e. Q2)	10) ¬(β) = (B v D) (i.e. Q4)
3) A = (+ ^ -)	11) ¬(A) = (B v C v D)
4) B = (+ ~⊃ -)	12) ¬(B) = (A v C v D)
5) C = (- ~⊃ +)	13) ¬(C) = (A v B v D)
6) D = (+ ~v -)	14) ¬(D) = (A v B v C)
7) E ⇒ ∀X: (X v ¬X)	15) F ⇒ ∀X: (X ^ ¬X)
8) G = (+ ↔ -)	16) ¬(G) = (+ ⊕ -)

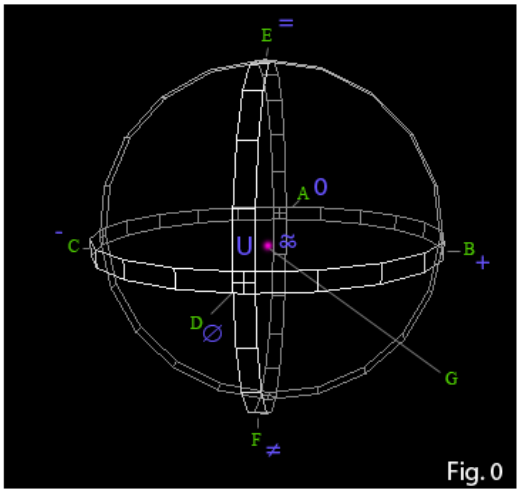

Fig. 0

Notes & Correspondences

G defines the extremes of three pairs: {A, D}, {B, C}, {E, F}. By default G expresses (A v D). (B v C) is captured as the inverse and (E v F) is captured through, G ⊕= ¬G ⊕= G ⊕= ¬G, causing G to become ¬G and G to become ¬G; or expressed another way G ↔= ¬G ↔= G ↔= ¬G. (E v F) materializes after step I. G ⊕= ¬G ⇒ G = {T, T, T, T}. Similarly using biconditionals after step I. we see G ↔= ¬G ⇒ G = {F, F, F, F}.

What this suggests is that zero is infinite-centric. This would explain why our reality is 0-centric as the concepts are inverses of one another. It would also imply that like infinity, zero isn't discrete. So similar to how countable infinity isn't the same as uncountable infinity,[21] this suggests zero has numerous properties that can be evaluated and transformed through careful explicit usage of these characteristics.

What's shocking is that these mathematical properties seem to describe omni- characteristics!

Omnipotence is the hypothesized ability in the far distant future that a species would find a mechanism to "convert matter to energy and energy to matter perfectly recycling all transitions;" and through this process eventually gain control over all of physical reality. This anthropic description of omnipotence, with all the baggage it entails, can be abstracted in to pure math. We quantitate the universe by length, size, mass, density, etc. These numerical representations have little to do with order, nor do they have any bearing on equality or polarity. They're purely cardinal. In this manner omnipotence can be seen as representative of overcoming the "number of elements of the set" (i.e. overcoming cardinal zero ⇔ absolute ∞).

Similarly omnipresence which addresses the scarce "original earth" scenario, as outlined earlier, would be defined as overcoming ordinality (empty set [∅] ⇔ universal set [U]).

Omniscience is the concept of having all knowledge, and knowledge is often expressed as "contrasting information between different domains." If knowledge can be viewed purely as offset or contrast then we're simply formulating knowledge as a series of negative and positive constructs just to varying degrees. This can then be seen as overcoming the mathematical duality principle in the form of dualistic monism (+ ⇔ -).

Omni-benevolence is the hardest to explain, but it's the final form of lack (discussed on pg. 6 of the SH whitepaper). This is the concept of overcoming "beingness" which is reflected through reflexive and irreflexive relationships. Frankly it's difficult to conjure to mind something that can both exist, but not. The closest thing observed that exhibits this characteristic are photons which are both probability waves and/or particles. But overcoming equality and inequality (= ⇔ ≠) eventually would result in this last step connecting to utter limitlessness.

It's important to note that in no way am I suggesting *all life-forms* will reach this penultimate state. Rather I'm suggesting only sentiences that manage to pass through these various periods and adapt to the challenges imposed by the circumstances will succeed. This is why I'm advocating so heavily that all people focus on this concept of reducing "all nature imposed exigency." A slide backwards may very well spell the end of our species.

Q: Isn't this more an op-ed than a hypothesis?

Even though the paper isn't written in a hypothetical tone, there's absolutely a hypothesis postulated. The theory is explicitly spelled out in the abstract where it's argued that "*all things are driven by [absence]*" (i.e. 0) through the "*ontic characteristics of scarcity.*"

[21] Rehmeyer, Julie (2009-1). "*Small Infinity, Big Infinity.*" ScienceNews. http://www.sciencenews.org/view/generic/id/9269/title/Math_Trek__Small_Infinity,_Big_Infinity

This is borne out in many fields:

1. In a physical sense the one place where we'd expect to find nothing is in a vacuum, but even there we find a broiling sea of virtual particles popping in and out of existence. It would seem Aristotle's maxim that "Nature abhors a vacuum" rings as true today as it did 2300 years ago.

   Strangely enough the energy density of empty space, the elusive vacuum energy, somehow behaves as a repulsive force causing the universe to expand instead of contracting. This cosmological constant, or dark energy (the biggest thing in the known universe)[22], at 10^{-29} g/cm^3 (pretty close to 0, no?) appears to be the best explanation for why this is happening.

2. Similarly with any form of life the root driver will always be the most immediate form of lack (food, water, shelter, etc). After these needs are satisfied other types of lack can be sated (curiosity – i.e. lack of knowing, traveling – i.e. lack of experience & presence, and so on).[23] This particular approach has been fairly successful in modeling characteristics of life in computer simulations.

   Work done by Dr. Jürgen Schmidhuber[24] has shown that setting the driving function to compress the number of bits necessary to accomplish a task becomes a form of "creativity."[25] This is accomplished, again, by finding more ways to quantitate on "lack" or in the words of Dr. Marcus Hutter, "No Intelligence without Goals."

3. The concept also extends in to the realm of pure math. Cardinalness, ordinalness, dualness, and even reflexivity are each functions of "lack" or zero.

   The simplest way to demonstrate this is to show that all abstract numerical objects stem from 0 on the Cartesian plane. From this we get the numerical concept of 1. Without "one" no other number could equal itself (i.e. if '1' is removed from our domain and range then '$2 * 3 \neq 6$' because '$6 / 6 \neq 1$', meaning no number is a part of itself). The number-line is contingent on previous elementary and prime factors all stemming from 0. This provides an epistemological understanding of why addition and subtraction rely on 0 as the identity element. Similarly repeated addition in the form of multiplication or division shows a linear increment using the identity element of 1.

   It can furthermore be shown that abstract numerical elements stem from 0 in the sense that we can only calculate primes from a lower position along the number-line. We can't arbitrarily locate primes. This is, again, an indicator of dependency. There are other

[22] "*What is the Universe Made Of?*" (2010-4-16). NASA. http://map.gsfc.nasa.gov/universe/uni_matter.html
[23] Inglehart, Ronald (1977). "*The Silent Revolution: Changing Values and Political styles among Western Publics.*" Princeton, NJ: Princeton University Press. ISBN 0-691-10038-1. http://books.google.com/books?id=NuOsQgAACAAJ
[24] Schmidhuber, Jürgen (2010-1-5). Singularity Summit 2009 lecture. "*Build An Optimal Scientist, Then Retire.*" http://www.hplusmagazine.com/articles/ai/build-optimal-scientist-then-retire & http://youtube.com/watch?v=sa65t1fVsNA
[25] Schmidhuber, Jürgen. "*Theory of Universal Learning Machines & Universal AI.*" Istituto Dalle Molle di Studi sull'Intelligenza Artificiale. http://www.idsia.ch/~juergen/unilearn.html

reasons why the concept seems to illustrate mathematical correctness on a broader scale tied to Euler's identity, but the explanation is complex and long-winded.

So the concept is:

1. testable (i.e. the bar for 0 exigence[26,27] is controlling local natural forces[28,29,30] and ensuring all people have the basics – this is a goal humanity can work towards);
2. falsifiable (i.e. find something that doesn't revolve around lack or if in achieving 0 exigence humanity doesn't enter a period of "plenty"[31] the idea can be said to have little predictive capability);
3. it's reductionist in that it collapses *all* things to a single driving force;
4. broad in scope;
5. explanatory of numerous phenomena across many areas;
   and,
6. would better explain why the "science of scarcity" (economics) is such a strong shaper of culture.

Q: Are you suggesting God-hood has already happened?

To answer this I rationalized **(1)** if things come from nothingness, but all things can be overcome then a God is an inevitability. So **(2)** if we can see this process as being something that's knowable, then **(3)** we have to ask ourselves, "Has that already happened?" **(4)** To answer (3) we then look at the knowable components, (2), and contrast them against older holy texts to see if there are any similarities. If there are it then suggests the answer is, yes, God as a developed sentience already exists.

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[26] In Maslow's hierarchy of needs *0 exigency* would translate into guaranteeing the base physiological and safety levels of the 'need' pyramid. See: Maslow, Abraham (1954). "*Motivation and Personality.*" Harper Collins. ISBN 978-0060419875. http://books.google.com/books?id=ncwDAQAAIAAJ

[27] For a longer treatment discussing ideas on *0 exigence* see: Patel, Raj (2009). "*The Value of Nothing.*" NY, NY: Picador. ISBN 978-0312429249. http://books.google.com/books?id=INJ93YBrpzoC; and FDR's Jan 11th 1944 State of the Union address arguing for a 2nd Bill of Rights. http://www.youtube.com/watch?v=3EZ5bx9AyI4

[28] Sanburn, Josh (2011-1-3). "*Scientists Create 52 Artificial Rain Storms in Abu Dhabi Desert.*" Time. http://newsfeed.time.com/2011/01/03/scientists-create-52-artificial-rain-storms-in-abu-dhabi-desert/

[29] FECYT - Spanish Foundation for Science and Technology (2010-12-3). "*Researchers find mathematical patterns to forecast earthquakes.*" ScienceDaily. http://www.sciencedaily.com/releases/2010/12/101202124116.htm

[30] NASA/Jet Propulsion Laboratory (2010-6-14). "*NASA demonstrates tsunami prediction system.*" ScienceDaily. Retrieved 2011-1-6, from http://www.sciencedaily.com/releases/2010/06/100614161722.htm

[31] See Ronald Inglehart's 2000, Washington Quarterly, "*Globalization and Postmodern values*" paper, based on the World Values Survey (WVS), demonstrating how "the early stages of economic development [rapidly accelerates societies from] starvation level to a reasonably comfortable existence." From this he shows, "… new values reflect conditions of economic security. [So i]f one grows up with a feeling that survival can be taken for granted, instead of feeling that survival is uncertain, it influences almost every aspect of one's worldview." This "[e]conomic development seems conducive to the social and cultural conditions under which democracy is most likely to emerge and survive." The result being that these societies are then likely "to emphasize postmaterialist values, giving higher priority to quality of life than to economic growth." This is fortuitous because "beyond a certain threshold the subjective payoff from economic development ceases." Therefore, due to this law of diminishing returns, financially stable countries should be more inclined to assist less developed nations. http://muse.jhu.edu/journals/washington_quarterly/v023/23.1inglehart.pdf

To go about answering (3) I spent a large amount of time in 2010 investigating Native American, aboriginal, pagan, new age, Eastern and Western spiritual doctrine. Interestingly a brief survey of Eastern beliefs, particularly Taoist traditions,[32] does show parallels to the main thesis but not enough to warrant any definitive conclusions. There are also additional correlations to be found in Sufism,[33,34] Islam,[35] Hindu-tantrism,[36] Bahá'í cosmology,[37] and many others as outlined on page 7 of the SH whitepaper. However of all the systems investigated Kabbalah[38] is by far the most similar to SH in the sense that it not only describes the same geometric constructs, but a similar metaphysical understanding of lack.[39]

It may help to appreciate just how similar Kabbalah is to SH by looking at some of the major icons of the belief and how it is they relate to the hypothesis. Take, for example,

1. Isaac Luria's 5 worlds[40] as compared to Fig. 3 from the SH addendum[4] (see *Curiosities I*)[41]
2. Merkabah[42,43]-Hekhalot[44] Mysticism and the resemblance to Fig. 2 (see *Curiosities II*)[45]
3. The Ten Sephirot,[46] Tetragrammaton,[47] and Fig. 4 omni-diagram[48] with its ten points on the upper portion of the Fig. 4 circle,[49] as contrasted against the tetractys geometry[50]
4. On the tefflin "the three headed Shin is the Shin of this world, while the four-headed Shin is the Shin of the World to Come."[51] Note Fig. 1 shows the shift from *Q3* to *Q4*. Similarly in Fig. 5 and on *Curiosities III*[52] the transition shows 3rd density transitioning to 4th density.

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[32] Tzu, Lao (1963) [1891]. J. Legge trans. "*Tao-te Ching.*" Penguin Classics and Forgotten books. ISBN 978-1606201480. http://books.google.com/books?id=az5A7wv3nw8C and also see: http://www.taoteching.org/

[33] Hanif, N. (2000). "*Biographical Encyclopedia of Sufis (South Asia).*" New Delhi: Sarup & Sons. p.344. ISBN 978-8176250870. http://books.google.com/books?id=O3GXOqPa67MC

[34] Craig, Edward (1998). "*Routledge Encyclopedia of Philosophy: Genealogy to Iqbal (Vol.4)*." Taylor & Francis. p.66. ISBN 978-0415187091. http://books.google.com/books?id=5m5z_ca-qDkC

[35] Glassé, Cyril (2008). "*The new encyclopedia of Islam.*" Rowman & Littlefield. pp.159-161,224. ISBN 978-0742562967. http://books.google.com/books?id=D7tu12gt4JYC

[36] Subramuniyaswami, Satguru (2003). "*Dancing With Siva: Hinduism's Contemporary Catechism.*" India: Himalayan Academy Publications. p.838. ISBN 978-0945497967. http://books.google.com/books?id=EWlHPAkjBKUC

[37] Hatcher, John S. (2007). "The Ascent of Society: The Social Imperative in Personal Salvation." Baha'i Publishing Trust. p.99. ISBN 978-1931847520. http://books.google.com/books?id=yGwlO9NvGqQC

[38] Berg, Michael (2007-2-27). "*Decoding the Past – Secrets of Kabbalah.*" [TV Production]. History. 44min overview of Kabbalah. http://video.google.com/videoplay?docid=-8617500122476262686#

[39] Kosinec, Anthony (2006-7-13). "'*Kabbalah Revealed' Episode 1: A Basic Overview.*" Bnei Baruch. 15 lectures on Kabbalistic philosophy. http://www.kabbalah.info/engkab/kabbalah-video-clips/kabbalah-revealed-a-basic-overview

[40] Drob, Sanford L. (2001). "*Olamot/ Worlds/ Lurianic Kabbalah.*" http://www.newkabbalah.com/Worlds.html

[41] Curiosities I, v2.1.0 [Fig. 2.3, 3.1, & 6]. http://img823.imageshack.us/img823/5674/fourseasonsofscarcityan.png

[42] Cf. Ezekiel 1 (JPS) http://www.mechon-mamre.org/p/pt/pt1201.htm and http://en.wikipedia.org/wiki/Merkabah

[43] Scholem, Gershom. (1991). "*Origins of the Kabbalah*." Princeton University Press. pp.18-24. ISBN 978-0691020471. http://books.google.com/books?id=9dRi8v-j7OMC

[44] Morton S., Don Karr trans. (1943,1995) "*Hekhalot Rabbati.*" http://digital-brilliance.com/kab/karr/HekRab/HekRab.pdf

[45] Curiosities II, v2.0.8 [Fig 2.2, 7, & 8]. http://img716.imageshack.us/img716/5674/fourseasonsofscarcityan.png

[46] Cf. http://en.wikipedia.org/wiki/Sephirot and the diagrammatic representation of the Sephirot as Iggulim Circles

[47] Tyson, Donald (2008). "*Tetractys of Pythagoras.*" http://www.donaldtyson.com/tetract.html

[48] Omni Diagram, v2.1.0 [Fig. 4]. http://img832.imageshack.us/img832/5674/fourseasonsofscarcityan.png

[49] Darcy, Dustin (2010-9-9). "*Kabbalistic Curiosities (cont.).*" http://tinyurl.com/fig4-sephirot-explained2

[50] Hall, Manly P. (1952). "*The Secret Teaching of All Ages.*" Los Angeles, CA: The Philosophical Research Society. pp.LXXIII, CXIV. ISBN 0-89314-830-X. http://www.donaldtyson.com/tetract2.jpg

5. The twelve tribes (Hoshen), stones, and bulls[53] behave as a metaphor for Israel[54] as "the union of the people with God"[55] which, compared to the Fig. 2.2[45] spiral, shows 4-quarters / 1-cycle looping 3 times giving a sum total of 12 quarters apexing at "God-hood."
6. In Genesis (Bereshit) the number 6 is symbolically associated with the perfection of man[56] and Fig. 1 shows a rotation into the 6 o'clock position. This coupled with Fig. 2.2 generates a series of three six's – a common motif as seen in Revelation 13 and 1 Kings 10 (Melachim A).[57] Also note both verses center on economic themes and the *Scarcity Hypothesis* [SH] is first and foremost an economic philosophy.[58]

The odds are uncanny that SH should fit this well with Kabbalistic symbology. So looking at these correspondences, as well as amongst others outside the scope of this brief Q&A, begs the question, "Did the Abrahamic patriarchs come to this knowledge through analytic reflection or by virtue of divine inspiration?" Answering this question is key because the former doesn't establish God's existence it may only bespeak a similar philosophical line of thinking.

Luckily it isn't that difficult to distinguish which of these is true. All that's required is that we compare the dates to determine if it was possible that Ezekiel or Isaiah knew enough

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[51] Ginsburgh, Rab. Yitzchak (2005). "*The Hebrew Letters: Channels of Creative Consciousness.*" p.310. GalEinai Publication Society. ISBN 978-9657146071. http://books.google.com/books?id=bDLZl-Kjj_8C

[52] Curiosities III, v2.0.8 [Fig 2 & 5]. http://img534.imageshack.us/img534/9489/fourseasonsofscarcityanp.png

[53] "12 tribes" – Gen. 49; "stones" – 1 Kings 18:31-34; and "bulls" – 1 Kings 7:25. http://tinyurl.com/Gen49-Kings7-18

[54] Genesis 32:24-30 (NIV). http://www.biblegateway.com/passage/?search=Genesis%2032:24-30&version=NIV1984

[55] Maude, Mary Fawler (1862). "*Scripture manners and customs.*" London: Society for Promoting Christian Knowledge. p.509. ISBN 114704502X. http://books.google.com/books?id=8oMEAAAAQAAJ

[56] Chenault, Georgann (2009). "*The 6th Day – Creating A Perfect Man.*" http://www.genesisdays.com/days6.htm

[57] Cf. Revelation 13:16-18 (NIV) and 1 Kings 10:14 (NIV). http://tinyurl.com/rev13-and-1kings10

[58] Since the SH concept revolves around scarcity (n. insufficiency or shortness of supply) it, clearly, has a deep connection to economics (as defined by Lionel Robbins, "*... the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses.*"). It would seem in 1 Kings 10:14 that Solomon collects six-hundred & sixty-six gold talents to indicate a ratio between (*life as a good to be consumed* / *life as exigency*). The number being suggestive of the golden ratio $\varphi = (1 + \sqrt{5})/2 = -2 * \sin(666°)$ or its conjugate, with either-or occurring every 18°'s. This is compelling because (I + V + X + L + C + D) = DCLXVI = 666 = (1 + 5 + 10 + 50 + 100 + 500) and thereby equals the series: $1 + 1*\underline{5} + 5*\underline{2} + 10*\underline{5} + 50*\underline{2} + 100*\underline{5} = 666$. A variation of 5,2,5,2,5… where the new number is multiplied by the previous one. Now, note, as stated above, $\varphi=(1 + \sqrt{\underline{5}}) / \underline{2}$. As strange as this is, it appears there's an actual mapping between an irrational value (φ), an integer (666) and the same number as a degree measure (666°). Suggesting Solomon had somehow hit upon that man is meant to be proportioned to this ratio in much the same way galactic spirals, the human heart (Ulmer, 2009: 339 – hinted at in Dan 7:3-4), sun-flower seeds, nautilidae shells, and quantum phase transitions (Coldea, 2010: 177-180) proportion themselves to φ. The number even manifests as a product of the base-10 primary digits, 0123 + 456 + 78 + 9 = 666, as a triangular number, and as a sum of squared primes which are the building blocks of the number-line: $2^2 + 3^2 + 5^2 + 7^2 + 11^2 + 13^2 + 17^2 = 666$. The reason φ is so special is because it's the most optimal fair way to proportion the big to the small (Livio, 2003: 112). Suggesting the problem at the heart of our economic system is that we (1) arbitrarily pursue efficiency (when efficiency over time makes all people unnecessary); and (2) operate under the assumption that hands-off positive economics allows for non-zero sum exchanges. Unfortunately in a zero-sum reality we're obligated to play by the universe's rules. Without understanding this our society is bound to eat itself alive because we're failing to come to grips with the fact that someone must lose & the incongruity that we can't simply discard these people. A way to solve this is to define what's too much by what's too little (good/exig.), putting a ceiling on wealth by tying those at the bottom to those at the top, & thereby helping recycle people back in to the system.

trigonometry[59] to incorporate it into early Jewish theology. A cursory check shows early trigonometric writings date back to about 2nd century BCE. By comparison scholarly historical research dates Ezekiel's birth to Jerusalem in late 7th century BCE (~622 BCE) and places his death, in Babylon, at around ~570 BCE. Isaiah, as Ezekiel's elder, is even less suspect, having lived somewhere between ~740 BCE and ~690 BCE. This gives a gap of at least four centuries. Dealing with this large of a time-frame it's difficult to dismiss the chronological discrepancy as simply error margin.

However, as interesting as this might be, there's still a real need for additional forms of confirmation. So looking to more modern times Isaac Luria (1534-1572), as a major Kabbalistic innovator, stands out as a good additional case study. The question in this scenario being, "Why did Luria expand on the four spiritual worlds as described in medieval Kabbalistic tradition (based on Isaiah 43:7) and go on to add a fifth? Was the innovation philosophical or the result of divine inspiration?" If it's philosophical it would, again, speak to a rational process instead of something transcendental.

The answer comes to us this time through, professor of Jewish Studies, Lawrence Fine's biography of Isaac Luria titled "Physician of the Soul, Healer of the Cosmos,"

> *'No matter what form of communication was involved, they were all understood to result in knowledge gained, not through intellectual means, but through a contemplative intuition nurtured by a life of intense piety. Indeed, perhaps the most remarkable claim about Luria's esoteric knowledge is precisely the explicit rejection of intellectuality as a means of arriving at religious knowledge. Such wisdom was believed by Luria and his disciples to be inaccessible through conventional methods of intellectual study: "The secrets of the Torah and her mysteries are not revealed to human beings by the power of their intellects, but by means of divine vitality that flows from on high, through God's messengers and angels, or through Elijah the prophet, may his memory be a blessing."*[60]

> *Vital amplifies this point in unambiguous terms, saying, "there is no doubt that these matters [i.e. esoteric knowledge] cannot be apprehended by means of human intellect, but only through Kabbalah, [that is,] from one individual [directly] to another, directly from Elijah, may his memory be a blessing, or directly from those souls that reveal themselves in each and every generation to those who are qualified to receive them."*[60,61]

The commentary is unambiguous.

All of this when put together seems to support the "divine inspiration" hypothesis. So in conclusion after calculating the odds of how certain events played out as they did,[62] and tallying in the chances of the correspondences as described above. I would have to say that the evidence lends itself towards believing the end-stage has been reached.

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[59] Cf. Ezekiel 1:10,15-16. Ezekiel 1:8-9. Isaiah 6:2 (NIV). http://tinyurl.com/Ezek1-Isa6

[60] Hayyim Vital's introduction to *Etz Hayyim*, p.7 – see D. Menzi & Z. Padeh (2008) eng. trans. "The Tree of Life: The Palace of Adam Kadmon." Arizal Publications. ISBN 0979597102. http://books.google.com/books?id=RrjXAAAAMAAJ

[61] Fine, Lawrence (2003). "*Physician of the Soul, Healer of the Cosmos.*" Stanford University Press. pp.98-99. ISBN 978-0804748261. http://books.google.com/books?id=B2o8vqvrQOcC

[62] Darcy, D. (2010). "*Odds of 4.4 Earthquake.*" http://scribd.com/doc/31702032/Odds-of-4-4-Earthquake-Merkabah-v2-1-5