

Why is There Something Rather than Nothing?

Granet, Roger
roger846@yahoo.com

Abstract

A solution to the question "Why is there something rather than nothing?" is proposed that also entails a proposed solution to the question "Why do things exist?". In brief, I propose that a thing exists if it is a grouping or relationship defining what is contained within. This grouping/relationship is equivalent to a surface, edge or boundary defining what is contained within and giving "substance" and existence to the thing. This thinking is used to resolve several mereological (study of parts and wholes) issues. Next, in regard to the question "Why is there something rather than nothing?", when we get rid of all existent entities including matter, energy, space/volume, time, abstract concepts, laws or constructs of physics and math as well as minds to consider this supposed lack of all, we think what is left is the lack of all existent entities, or "absolute nothing". But, try to visualize this situation. This "absolute lack-of-all", would be it; it would be the everything. It would be the entirety, or whole amount, of all that is present. That's it; that's everything. Is there anything else besides that "absolute nothing"? No. It's "nothing", and it is the all. An entirety, whole amount or "the all" is a grouping defining what is contained within and is therefore an enclosing surface and an existent entity. In other words, the supposed "absolute lack of all" defines all that is present and is, therefore, an existent entity. It defines itself and is the beginning point in the chain of being able to define existent entities in terms of other existent entities. The grouping/edge of the absolute lack-of-all is not some separate thing; it is just the "entirety", or "the all" relationship, inherent in this absolute lack-of-all, that defines what is contained within. Finally, I use this conclusion to build a primitive model of the universe, which is made of existent entities, via what I refer to as a metaphysics-to-physics approach or philosophical engineering. It is argued that this type of thinking will allow faster progress towards a deeper understanding of the universe than the more top-down approach that physicists currently use.

Brief summary of the proposed solution

Gefter (2014) has suggested that the seeming insolubility of the question "Why is there something rather than nothing?" is based on a flawed assumption. I agree and propose the following. I think the flawed assumption is that the situation we often visualize as being "absolute nothing" or the lack of all existent entities (e.g., the lack of all matter; energy; space/volume; time; abstract concepts; laws of physics, math and logic; and minds/consciousness to consider this supposed "nothing") is really the lack of all existent entities. Instead, I think this situation is itself an existent entity. If so, this would mean that "something" is necessary, or non-contingent because even what we used to think of as "absolute nothing" is a "something". How can this be? The proposed explanation is as follows.

In regard to the question "Why is there something rather than nothing?", two possible solutions are:

- A. "Something" has always been here.
- B. "Something" has not always been here.

Choice A is possible but doesn't explain anything; although, more will be said about it at the end of this paragraph. Therefore, if we go with choice B, if "something" has not always been here, then "nothing" must have been here before it (by "before", I don't necessarily mean "before" as in time, but "before" as in a perceived transformation from "nothing" to "something"). If this supposed "nothing" were truly the lack of all existent entities, though, there would be no mechanism present to change, or transform, this "nothingness" into the "something" that is here now. But, because we can see that "something" is here now, the only possible choice is that the supposed "nothing" we were thinking of was not the lack of all existent entities, or absolute "nothing". There must have been some existent entity, or "something", present that could either have been the "something" we see now or that would have contained the mechanism needed to cause that "something" to appear. Because we got rid of all the existent entities we could think of, the only thing that could be this existent entity would be the supposed "nothing" itself. That is, it must in fact be a "something". This is logically required if we go with choice B, and I don't think there's a way around that. This idea leads to the result that "something" is necessary, or non-contingent, because even what we used to think of as the lack of all existent entities, or "nothing", is a "something". Ironically, going with choice B leads to choice A. If what we used to think of as "absolute nothing" were the case, and if this "absolute nothing" is actually an existent entity, or a "something", this would always have been true, which means that this "something" would always have been here.

How can what we used to think of as "nothing" actually be a "something"? I think it's first important to try and figure out why any "normal" thing (like a book, or a set of elements) can exist and be a "something". I propose that a thing exists if it

is a grouping or relationship present defining what is contained within. This grouping/relationship is equivalent to a surface, edge or boundary defining what is contained within and giving "substance" and existence to the thing. In the case of a book, try to imagine a book that has no surface defining what is contained within. Even if you remove the cover, the collection of pages that's left still has a surface. How do you even touch or see something without a surface? You can't because it wouldn't exist. The surface is what groups the individual atoms inside together into a new and unique existent entity called the "book", which is a different existent entity than the individual atoms inside considered on their own. So, a grouping or relationship present defining what is contained within is an existent entity. This rationale with additional examples is explained in more detail below.

Next, let's apply this definition of why a thing exists to the question of "Why is there something rather than nothing?" To start, "absolute nothing", or "non-existence", is first defined to mean: no energy, matter, volume, space, time, thoughts, concepts, mathematical truths, etc.; and no minds or consciousness to think about this "absolute lack-of-all". Now, try to visualize this. When we get rid of all existent entities including matter, energy, space/volume, time, abstract concepts, laws or constructs of physics and math as well as minds to consider this supposed lack of all, we think what is left is the lack of all existent entities, or "absolute nothing". But, this situation, this "absolute lack-of-all", would be it; it would be the everything. It would be the entirety, or whole amount, of all that is present. That's it; that's everything; there's nothing else. Is there anything else besides that "absolute nothing"? No. It is "nothing", and it is the all. An entirety, whole amount, everything, or "the all" is a grouping defining what is contained within and is therefore an enclosing surface and an existent entity. In other words, the supposed "absolute lack of all" defines all that is present and is, therefore, an existent entity. Because the supposed "absolute lack-of-all" is the entirety of all that is present, it functions as both what is contained within and the grouping defining what is contained within. It defines itself and is, therefore, the beginning point in the chain of being able to define existent entities in terms of other existent entities. The grouping/surface/edge of the absolute lack-of-all is not some separate thing; it is just the "entirety", "the all" relationship inherent in this "absolute lack-of-all".

The rest of this paper will go over this proposed solution in more detail.

Things exist if they are groupings or relationships defining what is contained within

I suggest that a thing exists if it is a grouping or relationship saying, or defining, what is contained within. Such a grouping or definition is equivalent to an edge, boundary, or enclosing surface defining what is contained within and giving "substance" and existence to the thing as a new unit whole that's a different existent entity than whatever is contained within considered individually. What is the rationale for this argument? To illustrate my thinking, I use the example of a pile of dirt. Why does a pile of dirt exist? Three things that might give existence to the pile of dirt are:

- 1.) The individual molecules of dirt inside the pile.
- 2.) The surface of the pile. What is a surface? It is a grouping or relationship defining what is contained within, the visual representation of which is the boundary or surface of the pile.
- 3.) Something outside the pile.

Discussing the last choice first, if the reason for existence of the pile were something, A, external to the pile, one would then have to ask why that external thing A exists? Using the same logic, it would be because of something called B external to it. Then, one would have to ask why B exists. To avoid an infinite regress, there would eventually have to be some thing that exists for reasons intrinsic, and not external, to it. Because that would be equivalent to asking the original question of why the pile of dirt exists without considering the external option, I will no longer pursue the external option.

So, that leaves two choices for why a thing, like a pile of dirt, exists: the stuff inside the pile, e.g., the individual molecules of dirt or the individual bonds between the dirt molecules, and the surface of the pile. Evidence supporting the grouping/surface argument and against the stuff inside argument is as follows:

- 1.) First, try to imagine a thing like a pile of dirt existing that does not have an outermost edge or surface. It's hard to do. You might say that you can remove the outer surface of the pile (the outer layer of dirt molecules) and then see that the stuff inside is still the pile. But, the smaller pile you see inside also has a surface. If you remove the surface of the smaller pile and visualize what's underneath it, that stuff underneath also has a surface. You could keep removing more and more outer surfaces and visualizing what's inside, but eventually, to avoid an infinite regress and to still have anything exist at all, there must be some smallest, most fundamental surface with no smaller surfaces (e.g., no smaller components) inside. So, this suggests that the reason the most fundamental of entities exists is not because of the stuff inside it but because of its surface.

To say this same argument in another way, suppose it's not the surface that gives existence to the pile but, instead, is just the individual dirt molecules and the bonds between them. One might then ask: why does a dirt molecule exist?" The stuff-inside reasoning would say that it exists because of the stuff inside it, e.g., the atoms making up the dirt molecule and the electromagnetic forces that hold the atoms together. Then, one might ask why does an atom inside a dirt molecule or an electromagnetic force exist?" The stuff-inside reasoning would say that they exist because of the stuff inside them (e.g., the neutrons, protons, and electrons making up the atom and the photons making up the electromagnetic force). Then, one might ask why do the neutrons, protons and electrons inside an atom and the photons exist? The stuff-inside reasoning would say that they exist because of the stuff inside them (e.g., the quarks inside the neutrons and protons and no one knows what's inside a photon). Just as above, this process could obviously go on forever. At some point, to avoid an infinite regress of explaining that things exist because of smaller and smaller stuff inside and in order to have anything exist at all, there must be some smallest, most fundamental thing that exists that has absolutely no smaller components contained within. An existent entity with no smaller components inside would seem to be just a surface. There's nothing within, and yet it exists. What else would it be besides the surface? And, this brings us back again to the idea that it's the surface, grouping or relationship defining what is contained within that causes a thing to exist.

This reasoning also applies to abstract objects that exist. In the mind, an abstract concept labeled "love", for instance, is a grouping saying what other ideas and concepts ("trust", "intimacy", memories of related physiological feelings, etc.) are contained within it. If you remove the grouping, then you no longer have the concept called "love", you just have a bunch of unrelated, individual ideas and concepts like "trust", "intimacy", etc., but they're not grouped together into a new concept labeled "love". Another example is the abstract concept in the mind labeled " $1+1=2$ ". This is a grouping that contains other ideas and concepts such as a mental image of one existent thing, another mental image of another single existent thing, a mental image of putting these together into a larger group of existent things, and a reference to a mental construct located elsewhere in the mind containing the words "this is addition. The label " $1+1=2$ concept" combines, or groups, these individual constructs together into a new existent entity or concept within the mind. In general, for non-mind existent entities, the grouping or relationship defining what is contained within is equivalent to the surface of the entity. For existent entities in the mind, like abstract concepts, the grouping defining what is contained within is still equivalent to a surface or boundary grouping other mental constructs together, but can be better visualized as the label the mind gives to the concept. That is, the mental label of "love" is the grouping or surface defining what other mental constructs like "trust", "intimacy", etc. are contained within the concept labeled "love".

2.) Second, a thing like a pile of dirt is not just a bunch of dirt molecules considered on their own. It's the grouping together of these individual molecules into a new unit whole called a pile. The pile is a different existent entity than the individual dirt molecules considered on their own. All the individual dirt molecules could be spread out individually over a section of land, and they wouldn't be considered a pile; they'd just be called dirt molecules on a section of land. But, group them together into a little hill, and a new unit whole called a pile is created. The visual representation of all these molecules, considered together, is the surface of the pile. The grouping together, or surface, defines exactly what is contained within and gives "substance" and existence to the thing.

Another example of this is that of a hole in a block of wood. Before a hole is cut in a block of wood, the stuff inside the future hole is just a bunch of unrelated locations in the block of wood. But, cutting the hole in the wood creates a surface that groups these locations together into a new unit whole called a hole. The surface, or wall, of the hole defines what locations are contained within this new whole called a hole.

3.) Finally, one might say that it's all the bonds and forces between the dirt molecules in a pile of dirt that cause the pile to exist, and these bonds exist inside the pile, so it's not the surface of the pile that makes it exist. This is a fair point, but two arguments against it are:

A. It's not the bonds (between dirt molecules) considered individually that causes the pile to exist. Each of the billions of bonds between dirt molecules considered on its own does not make a pile. It's the collection of all these bonds in the pile considered together that makes the pile. A collection of things considered together is a grouping, and a grouping is equivalent to a surface bringing all these things together. The visual representation of an individual bond between dirt molecules in the pile is just that of the bond and nothing else. But the visual representation of all the bonds considered together as a whole is the pile itself, and we see that as the surface of the pile. So, this again supports the idea that it's the grouping that ties together and defines what is contained within that causes a thing to exist.

B. Even if bonds and forces between dirt molecules could explain why a thing of many components might exist, they don't explain why a thing that has no smaller components (and therefore no bonds between components) exists. This brings one back to the idea that to avoid an infinite regress of smaller and smaller stuff, and bonds, inside and to have anything exist at all, there has to be some entity that exists with no smaller stuff inside. That is, a surface.

In sum, I propose that a thing exists if it is a grouping or relationship present defining what is contained within. This

grouping is equivalent to a surface, edge or boundary defining what is contained within and giving "substance" and existence to the thing. Some additional examples of existent entities and their groupings defining what is contained within are as follows. First, consider a book. Try to imagine a book that has no surface defining what is contained within. Even if you remove the cover, the collection of pages that's left still has a surface. How do you even touch or see something without a surface? You can't because it wouldn't exist. The surface is what groups the individual atoms inside together into a new and unique existent entity called the "book", which is a different existent entity than the individual atoms inside considered on their own. Additional examples are: The edges of a chalk circle drawn on a board are, together, a grouping of chalk molecules whose adjacent positions define all the chalk molecules contained within their borders. The grouping together of all these chalk molecules inside the border makes the chalk circle an existent thing. The outlines of a cloud define all the water molecules contained within, and this grouping together, symbolized by the outlines, makes the cloud an existent thing. A photon is a grouping of electromagnetic waves and their probabilities, and this makes the photon an existent thing. Finally, think about a set of elements. If it were unknown what elements are contained in a set, would that set exist? No. Even for the null set, it's known exactly what is contained within: the lack of all elements. The grouping, or definition, of what elements are contained within is essential for a set to exist. The grouping is visually represented by the curly braces, or surface/edge, around the elements of the set and is what gives existence to the set.

Some have questioned the role of the edge, or periphery, in defining an existent entity. For instance, Goldstick (1979) writes

"There is no more basis for identifying a hole with its periphery than for doing the same with a bump. Rather, a hole and a bump are what are contained within those spatial bounds."

This statement is flawed for the following reason. First, of course, the stuff contained within is necessary for a thing to exist (even if that stuff is "nothing" as for the null set), but it's not sufficient. Without the grouping together of that stuff into a new unit whole, as symbolized by the edge or periphery, the "stuff inside" is just "stuff". There's no "inside". "Inside" what? Inside the edge or periphery. In the above quote, the words "what are contained within" say as much. Without the edge or periphery, there would be no "within" in the phrase "what are contained within". The "within" is the edge or periphery. Now, this edge or periphery doesn't have some magical power to give existence to stuff. But, what it is is a representation of the grouping together of stuff into a new unit whole or existent entity. Said another way, without "those spatial bounds" defining what components are contained within, the air particles within a hole or the matter particles within a bump would be just a bunch of air or matter particles with no relationship tying them together into a new unit whole called a hole or bump. For the hole, the spatial bound is the surface/edge of the material in which the hole is located. Can you imagine a hole without its enclosing surface that defines it? I can't. For the bump, just like the pile of dirt, the grouping together of all the individual molecules of matter and the bonds and forces between them that are inside the bump creates a new unit whole called the bump that's a different existent entity than the molecules and bonds inside considered individually. The visual representation, or the spatial bound, of this grouping together is the surface of the bump. Without "those spatial bounds", there would be no hole or bump to talk about.

Finally, one may say that some abstract objects exist neither in the mind/head nor in the physical world outside the mind/head but, instead, in some sort of abstract, mind-independent Platonic realm. Even if some objects do exist in a Platonic realm, the reason they exist is because they're groupings, or relationships defining what is contained within. Additionally, abstract objects are considered to be without spatiotemporal location and causal efficacy (Linnebo, 2011; Rosen, 2012), meaning that they can't cause anything to happen. So, even if abstract objects did exist in a Platonic realm, they have no bearing on our universe, which does contain spatiotemporal locations and in which things happen.

Things exist where and when their groupings or relationships defining what is contained within exist

Some consequences of the idea that a thing, such as a set, exists if it is a grouping, or collection, defining what is contained within are as follows. One direct consequence is that until after a definition of what's contained within is complete, so that what's contained within is exactly known, there is no grouping, and the thing does not exist. Only after the contents are fully defined, which means that the definition of the contents is present, does the grouping and, therefore, the thing itself exist. If 9 out of 10 of the elements of a set are defined, the set still does not exist. A different set with just 9 elements could be defined as existing, but the set with 10 elements does not yet exist. This is basically a mereological essentialism-type approach (Chisholm, 1973; Feldman and Feldman, 2008), and it will be further discussed below. One benefit of this approach is that one can use this idea to resolve Russell's Paradox (Granet, 2011).

Another consequence of the idea that a thing, such as a set, exists if it is a grouping, or collection, defining what is contained within is that a thing exists only where and when its grouping defining what is contained within exists. This grouping/existent entity can be located either inside or outside the mind. Note that by "mind", I mean the materialistic view of the mind as being composed of physical things contained within the physical brain, but the following examples still

apply even if the mind is an immaterial thing located in some mythical Platonic realm. So, consider the example of a red apple on a table. The physical apple and the electromagnetic wave that makes up the red light reflected off the apple each exist as different existent entities outside the mind at the time that the physical apple and the electromagnetic wave exist. A mental image of the apple exists only inside the mind. Two different people will have two different, but existent, images of the apple inside their individual minds. Concepts of an apple in general, and not just this particular apple, will also exist inside each person's mind. If someone eats the apple, then the existent entity called "the whole apple" no longer exists outside the mind, but the entity called "the remains of the eaten apple" will come into existence outside the mind. Where does the idea of "redness" (of the apple) exist? I suggest that "redness", which is usually thought of as a property of things and not a thing itself, is actually an existent entity (e.g. a neural construct, or set of neurons, ion gradients, etc.) in the mind. "Redness" is the construct that the mind labels "red" which groups together other neural constructs such as the construct of the language word "red" and the memories of the physiological sensations felt in the past when red wavelengths of light entered the eye and were processed by the brain. Every sighted person has his or her own neural construct called "red", or "redness". These individual "redness" constructs are all somewhat similar, but not identical, because we all have similar, but not identical, experiences and physiologies. So, even properties are existent entities that are located in the mind and are linked to other existent entities like the neural construct called the "visual image of an apple". By being linked, one associates the entity/property "red" with the apple. Some feel that the property "redness" is an abstract entity that doesn't exist separately in each mind, but I would ask where does this abstract entity exist if not outside the mind or inside the mind? Where is this Platonic realm where abstract concepts exist? Until someone can point out where this realm exists, this is purely a faith-based argument, which while possible, can't be argued rationally.

To continue to explore this idea that a thing exists where its grouping, or definition of exactly what is contained within, is located and when that grouping is present, consider the example of a bag of ten specific grocery items. Several bag of grocery-related groupings (e.g. existent things) can exist in several different locations including:

1. The actual physical instance of the bag of groceries, A, containing ten specific grocery items G1, G2...G10 and located at position B and time C. Here, the bag groups together ten specific grocery items within the bag, which means that an existent thing called bag of groceries A is in existence. The ten individual grocery items all exist on their own but the bag groups them together into a separate existent thing called bag of groceries A. The existent entities that are the individual grocery items will be discussed more below. Note that once the bag, A, exists, if one then, after the fact, replaces one of the items with another item, G11, this is no longer bag of grocery items A. It is a new and distinct existent entity called bag of grocery items A1 because the definition of what is contained within has changed. One of the items is different, so the grouping defining what is contained within is different, which means that the existent entity is different. Note also that if one removes the grocery items from the bag, the existent entity called the physical bag of grocery items A at location B and time C no longer exists because the definition of what is contained within is different. While the bags of groceries with different items in them may be technically different existent entities according to the definitions proposed here, in every day life, one usually collapses these different entities together to say they're all the same grocery bag. While not technically correct, this approximation works for everyday life.

This example illustrates why the approach proposed here is basically the same as mereological essentialism (Chisholm, 1973; Feldman and Feldman, 2008). Mereological essentialism is the view that "if a compound thing W has a certain part P, then W cannot exist without having P as a part." (Feldman and Feldman, 2008). However, I'm suggesting that mereological essentialism can be collapsed to mereological "everydayism" for use in every day life. This idea of collapse of many different existent entities into one seems reminiscent of how one's observation collapses a quantum wave function of many different possibilities into a single outcome.

2. The neural construct in our mind called the visual image of the particular bag of grocery items A at position B and time C.

3. A different neural construct in our mind named the "concept of a bag of groceries". This mental construct called the "concept of a bag of groceries" is a grouping of all the other mental constructs associated with it such as "bag", "grocery store" and "grocery items". By grouping these other constructs together, the mental construct labeled the "concept of a bag of groceries" exists on its own within the mind. As an aside, what we think of as general concepts usually have the proper name (bag of groceries A), time and location stamps removed from their component mental constructs; this is why concepts are considered to be independent of time and place. So, the "concept of a bag of groceries" doesn't have the specific stamps of bag A at location B and time C associated with it.

The above three bag of grocery-related groupings are all separate existent things that exist in different locations either outside the mind or at some location within the mind. This example illustrates the point that any thing that exists exists within a certain location, domain, or reference frame. For instance, some things like physical instances of bags of groceries exist only outside the mind, and some things like the "concept of a bag of groceries" exist only inside a mind. Each different mind contains its own different existent grouping called the "concept of a bag of groceries". Another

example of an existent thing that only exists within the mind is that of the mental construct called the "concept of a unicorn". This grouping, or mental construct has real existence, but this real existence is only as a grouping, or construct within a mind. There is no instantiation of it outside-the-mind, as far as we know. So, whenever a thing is said to exist, it's very important to say within what location, domain or reference frame it exists and at what time it exists. As with the unicorn, a thing can exist in one reference frame but not another. A corollary of this is that the mind's conception of a thing is not the same as the thing itself. The mind's conception of a thing outside the mind and the thing itself are two different existent things that exist in different locations. The implications of this idea for the question "Why is there something rather than nothing?" are discussed in more detail below.

A grouping defining what is contained within, e.g., an existent entity, may or may not contain within it other existent entities with their own groupings or edges. Using the bag of groceries example, a bag may or may not contain individually existing grocery items within it. If it does contain grocery items, then these items exist on their own because of their own groupings/edges, but the enclosing surface of the bag gives existence to the entire grouping of these things as a separate, existent whole thing called a bag of groceries. Additionally, because the groupings/edges of the individual grocery items are located inside the bag, they exist only within the confines of the paper bag. As long as they stay inside the bag, these items exist only inside the bag, and one cannot say that they exist outside the bag. If one takes out one of the items, then it exists outside the bag and no longer exists inside the bag. Indeed, if one takes out one of the items, then the original bag of groceries no longer exists either because the definition of what is contained within has changed. Instead, a new bag of groceries exists with one fewer item. While this may be technically correct, in every day life, as described above, one can collapse this technical difference down to just saying it's the same bag of groceries. Taken together, a grouping, or existent entity, may contain other groupings within it, but these internal groupings/existent entities only exist within the confines of the external grouping. As described above, it's very important to say within what location, domain or reference frame a thing exists and at what time it exists.

Combining the idea that a thing, such as a set, exists if it is a grouping, or collection, exactly defining what is contained within with the related idea that a thing exists where its grouping, or definition of exactly what is contained within, is located and when the grouping is present gives the result that two identical (in appearance, properties, etc.) groupings defining what is contained within are two different existent entities because they're separate groupings in different locations. This means, for instance, that the existent entity that is the concept of the number "one" in Joe's head is a distinct existent entity than the concept of the number "one" in Jane's head. That is, there is no single existent entity called the number "one" that we all access. Also, an electron in position x is a different existent entity than an electron in position y despite their identical properties. These entities may look the same and have the same properties, but they're distinct existent entities with distinct groupings in distinct locations.

Taken together, the above suggests that a grouping, or relationship defining what is contained within is an existent thing. Such a definition or grouping is equivalent to an edge, boundary, or enclosing surface defining what is contained within and giving "substance" and existence to the thing. This enclosing surface may or may not enclose other existent things, but the enclosing surface gives existence to the entire grouping of these things as a new existent entity that's different than the components contained within considered individually. Also, things exist where their groupings, or defining relationships, exist. This can be inside a mind or outside the mind. Also, a thing can exist in one time or place but not another. Therefore, whenever a thing is said to exist, it's very important to say within what location, domain or reference frame it exists.

Implications for Mereology

Some examples of the above reasoning applied to well-known mereological (study of parts and wholes) examples are as follows.

1. Special composition question and unrestricted composition, or universalism: The special composition question (SCQ, van Inwagen, 1987; van Inwagen, 1990) asks under which conditions some objects together compose a further object (Korman, 2014). Unrestricted composition, or universalism, says that for any objects, the collection of those objects is always a further object. For example, if both a mosquito in Iowa and Barack Obama are existent entities, the SCQ would ask when do these together form a further object, and unrestricted composition would say always. Is this true? Using the reasoning described above, an object containing a mosquito in Iowa and Barack Obama doesn't automatically exist but could exist if a grouping of them exists. Obviously, there is no physical grouping of these things outside the mind, but there could be a grouping of them inside a mind if someone were to think of them grouped together. The grouping would therefore only exist in the mind of the person grouping them together. This answers the SCQ and makes the argument for restricted composition: Some objects only form a further object if there is a grouping together of them, and the further object exists only when and where the grouping exists.

2. The problem of the many: This paradox relates to any objects whose borders are not perfectly sharp, which at the

microscopic level, is basically all objects (Weatherson, 2014). It is best explained using the example of a single cloud in a clear sky. As Lewis (1993) writes:

“Think of a cloud—just one cloud, and around it a clear blue sky. Seen from the ground, the cloud may seem to have a sharp boundary. Not so. The cloud is a swarm of water droplets. At the outskirts of the cloud, the density of the droplets falls off. Eventually they are so few and far between that we may hesitate to say that the outlying droplets are still part of the cloud at all; perhaps we might better say only that they are near the cloud. But the transition is gradual. Many surfaces are equally good candidates to be the boundary of the cloud. Therefore many aggregates of droplets, some more inclusive and some less inclusive (and some inclusive in different ways than others), are equally good candidates to be the cloud. Since they have equal claim, how can we say that the cloud is one of these aggregates rather than another? But if all of them count as clouds, then we have many clouds rather than one. And if none of them count, each one being ruled out because of the competition from the others, then we have no cloud. How is it, then, that we have just one cloud? And yet we do.”

The reasoning presented here provides a resolution to this problem. Remember that a thing exists only where and when its grouping exists. The grouping can be either inside the mind (e.g., the brain) or outside the mind. Also, the inside-the-mind conception of an outside-the-mind thing, such as a cloud, is a different existent entity than the outside-the-mind thing itself. That is, the mind's conception of a cloud is a different existent entity than the cloud itself. This suggests that Lewis' presentation of the puzzle is incorrect when he writes:

“Many surfaces are equally good candidates to be the boundary of the cloud. Therefore many aggregates of droplets, some more inclusive and some less inclusive (and some inclusive in different ways than others), are equally good candidates to be the cloud.”

because these many equally good cloud candidates exist only in the mind of the observer of the cloud. The observer says to him/herself within his/her mind: Well, the boundary of the cloud could be there or over to the right a little bit, or over a little bit more. Inside the mind, each of these cloud candidates would be a unique mental representation of the cloud and therefore each would be a unique existent entity, within the mind. Also located only in the mind is the physical rule the observer chooses for defining what is the cloud outside the mind. So, outside the mind, there exists one cloud that meets this inside-the-mind rule for defining a cloud. I suggest that one possible inside-the-mind rule might be that a cloud is the grouping of the water droplets and the forces/bonds between them that hold these droplets together as a collective against the forces/bonds trying to drive them apart (e.g. the wind or Brownian motion). So, a water droplet, A, is in the outside-the-mind cloud if the forces between it and the other water molecules closer to the core of the cloud are stronger than the forces pushing it farther away from the other water molecules. As the wind becomes stronger, the water droplets that meet this definition change, and thus the composition of the cloud changes. Each cloud composition only exists for a short time as the wind changes. Overall, by this reasoning, there is one cloud outside the mind/head that meets a given definition of a cloud inside the mind, but there can be many cloud candidates and cloud-defining rules inside the mind/head. The issue with the problem of the many is due to confusing the inside-the-mind cloud candidate entities with the outside-the-mind cloud entity.

3. Composition as identity and the co-location of objects: Composition as identity is the idea that an existent entity containing parts is not a different existent entity above and beyond just the parts themselves. The example of a chair with a screw on leg has been used as evidence for this idea (Wallace, 2011). The leg of such a chair seems like it is a grouping defining what is contained within and thus an existent entity. So does the chair. But, doesn't this mean that two different existent entities, the chair and the leg, are occupying the same location (e.g. that they're co-located), which seems impossible? The solution to this paradox is to realize that in order to have two distinct and independent entities, the chair including the leg and the leg without the rest of the chair, one must have two legs. That is, the leg has to be duplicated. This can only happen inside the mind. So, inside the mind, these two distinct and independent entities may exist and be co-located. But, outside the mind, there's only one leg (it's not duplicated), so there is no co-location of the chair-and-leg entity with the leg entity. The question about whether or not this leg occurs in the chair-and-leg entity or just the leg entity occurs only within the mind of the observer. In sum, the idea of the co-location of objects is again due to confusing the thing that exists outside the mind and the conception of that thing, with its duplicate legs, within the mind. These are distinct existent entities that occur in different places.

4. Dion and Theon: This is a famous puzzle first proposed by the ancient philosopher Chrysippus. As told by Wasserman (2014):

“Dion is a normal human being and Theon is a large part of Dion consisting of everything but Dion's right foot. Suppose now that the right foot is removed. Theon obviously survives the operation, for his parts remain completely unchanged. But in that case it seems as if Dion does not survive the operation, for otherwise we would have two people in the same place at the same time. Hence, Dion does not survive the loss of his foot.”

Does Dion cease to exist when his foot is amputated? Do Dion and Theon occupy the same space? Besides sounding like a soap opera, the reasoning presented here suggests two solutions to this puzzle:

A. If the existent entity Dion is defined as only that grouping that includes the right foot, then without the right foot, it is true that Dion no longer exists, and there is no paradox.

B. If the existent entity Dion exists with or without his foot, the solution is similar to that for the co-location puzzle. For Theon to exist as a separate and distinct entity to Dion, there must be duplicates of each of the non-right foot atoms of their bodies. There must also be a grouping defining what is contained within for Theon. This can only happen within the mind of the reader. So, inside the mind, two distinct and independent entities, Dion and Theon, with duplicate non-right foot atoms, may exist and be co-located. But, outside the the mind, there's only one each of the non-right foot atoms. There also doesn't seem to be a grouping, or surface, defining Theon as a separate entity. Because the atoms aren't duplicated outside the mind, then without the right foot, there's one set of atoms and one grouping of them. You can call that Dion, Theon, or Harry. But, there's only one of him, and there's no co-location.

Why is there “something” rather than “nothing”?

In this section, I propose a solution to the question of “Why is there something rather than nothing? The proposed solution makes use of the above definition of an existent entity as a grouping or relationship defining what is contained within. Geffer (2014) has suggested that the seeming insolubility of this question is based on a flawed assumption. I agree and propose the following. Traditionally, when we imagine getting rid of all existent entities, including matter, energy, space/volume, time, abstract concepts, laws or constructs of physics and math as well as minds/consciousness to consider this supposed lack of all, we think what is left is the lack of all existent entities, or “nothing”. This is the “nothing” we think of in the question “Why is there something rather than nothing?”. But, I suggest that what we're visualizing as the lack of all existent entities, or “nothing”, is not in reality the lack of all existent entities. There's one existent entity that can't be gotten rid of. This situation, the supposed lack of all existent entities, is itself an existent entity. It is a “something”. This means that the original question, “Why is there something rather than nothing?”, is based on an incorrect assumption that what we visualize as “nothing” is really the lack of all existent entities. It also means that because even “nothing” is a “something”, then “something” is necessary, or non-contingent.

Because of the confusion caused by the idea that the situation we previously referred to as “nothing” is actually a “something”, I will enclose the phrases “something”, “nothing”, the “absolute lack-of-all”, and “non-existence” in quotes to emphasize that their meanings are being redefined. The rationale for the argument that “nothing” is a “something” is as follows.

Consider the question “Why is there something rather than nothing?”. Two choices for addressing this question are:

A. “Something” has always been here.

B. “Something” has not always been here.

Choice A is possible but doesn't explain anything; although, it will be discussed further below. So, if we go with choice B, if “something” has not always been here, then “nothing” must have been here before it (by “before”, I don't necessarily mean “before” as in time, but “before” as in a perceived transformation from “nothing” to “something”). If this supposed “nothing” were truly the lack of all existent entities, though, there would be no mechanism present to change, or transform, this “nothingness” into the “something” that is here now. But, because we can see that “something” is here now, the only possible choice then is that the supposed “nothing” we were thinking of was not the lack of all existent entities, or absolute “nothing”. There must have been some existent entity, or “something”, present that could either have been the “something” we see now or that would contain the mechanism needed to cause that “something” to appear. Because we got rid of all the existent entities we could think of, the only thing that could be that existent entity would be the supposed “nothing” itself. That is, it must in fact be a “something”. This is logically required if we go with choice B, and I don't think there's a way around that. What this means is that it's not possible to have the true lack of all existent entities because even the resultant “nothing” is a “something”. In philosophy language, this means that “something” is necessary, or non-contingent. Ironically, going with choice B also leads to choice A. If what we used to think of as “absolute nothing” were the case, and if this “absolute nothing” is actually an existent entity, or a “something”, this would always have been true, which means that this “something” would always have been here. But, at least we now can provide a reason for why this “something” has always been here.

If what we've previously thought of as “nothing” is actually a “something” is logically required for choice B, then instead of saying “That can't be. Something and nothing are not the same.”, it would be better to accept what is required and try to figure out how it could be rather than continuing to deny it. So, how can “something” and “nothing” be one and

the same? The proposed answer makes use of the above definition of an existent entity as a grouping or relationship defining what is contained within. When we get rid of all existent entities including matter, energy, space/volume, time, abstract concepts, laws or constructs of physics and math as well as minds/consciousness to consider this supposed lack of all, we think what is left is the lack of all existent entities, or "absolute nothing". But, this situation, this "absolute lack-of-all", would be it; it would be the everything. It would be the entirety, or whole amount, of all that is present. That's it; that's everything; there's nothing else. Is there anything else besides that "absolute nothing"? No. It is "nothing", and it is the all. An entirety, whole amount, everything, or "the all" is a grouping defining what is contained within and is therefore an enclosing surface and an existent entity. In other words, the supposed "absolute lack of all" defines all that is present and is, therefore, an existent entity. Because the supposed "absolute lack-of-all" is the entirety of all that is present, it functions as both what is contained within and the grouping defining what is contained within. It defines itself and is, therefore, the beginning point in the chain of being able to define existent entities in terms of other existent entities. The grouping/surface/edge of the absolute lack-of-all is not some separate thing; it is just the "entirety", "the all" relationship inherent in this "absolute lack-of-all".

This reasoning for why the "absolute lack-of-all" is actually an existent entity is complementary to the remove-the-outermost-layer argument described above for why a thing exists that showed that to avoid an infinite regress of removing outermost layers and to still have anything exist at all, there must be some smallest, most fundamental existent entity that has an outermost surface and absolutely nothing further inside. That argument started from the assumption of an "existent" entity, a pile of dirt, which had surface layers removed from it. The current argument starts from the assumption of the "absolute lack-of-all" or "non-existence". Both arguments come to the same conclusion but from different directions: that there is a most fundamental existent entity that is a surface with "absolutely nothing" inside.

If the situation previously, and incorrectly, called "non-existence" is actually an existent entity, why is so hard to visualize it as such? One reason is that we visualize "non-existence" within our minds, which exist. Because we can't get rid of our existent minds (which is a good thing!), we can't visualize the true lack of all existent entities (including the mind). Short of that, then next to our existent minds, "nothing" as defined here (e.g., the lack of all matter, energy, space/volume, time, abstract concepts, laws or constructs of physics and math, and minds) just looks like nothing. But, in doing this, we're confusing our mind's conception of "nothing" with "nothing" itself. That is, because we exist, we think of "non-existence" as being dependent on and defined as the lack of what is traditionally thought to exist. But, "non-existence" itself does not have this requirement; it is independent of our mind (minds would not be present in "non-existence") and of what is traditionally thought to exist. If we could somehow visualize "non-existence" itself (which we, of course, cannot) and not just our mind's conception of it, we would see that only once all, including the mind, is gone, does "non-existence" become the entirety of all that is present and, therefore, an existent entity.

Some might say that in the above, just by using the word "nothing", I'm reifying, or giving existence to, something that's not there at all. But, not only does that ignore the whole point about our mind's conception of "nothing" (and, therefore, the use of the word "nothing") being different than "nothing" itself in which no minds are present, it also ignores the fact that in order to even discuss the topic, we have to talk about "nothing" as if it's a thing. It's okay to do this; our talking about it won't affect whether or not "nothing" itself, and not our mind's conception of "nothing", exists. That is, we're not reifying "nothing" itself by talking about it because our talking wouldn't even be there in the case of "nothing" itself.

Some fruitful discussions of these ideas have occurred online (everything-list, 2011; fqxi, 2013). A paraphrased excerpt is as follows. The point was made there that saying that the "lack of all existent states", or what is traditionally called "non-existence", is equal to the existence of another entity is a contradiction. However, it seems clear that this is only a contradiction if what we've traditionally called "non-existence" really is the lack of all existent entities. Instead, what is being suggested here is that the situation we've traditionally called the "lack of all existent entities" is itself an existent entity. It's just a different entity than the ones we've considered as existing in the past. Another way of saying this is that our past use of the phrases "the absolute lack-of-all" and "non-existence" are incorrect; they're misnomers. Said yet another way, I'm suggesting that, in addition to our normal way of thinking about the supposed "lack of all existent entities", we consider that there's another way of thinking about this situation, and this other way causes one to see that this situation meets the definition presented here of an existent entity.

Right now, if you're thinking "How can a grouping/relationship defining what is contained within (e.g., the entirety, all and everything grouping) be an existent thing? It's just an abstract or mental construct, not a real thing.", remember the following. First, in the supposed lack of all existent entities, abstract and mental constructs would not be present. Second, the supposed "nothing" grouping/relationship being discussed here is "nothing" itself and not the mind's conception of "nothing". Again, in the supposed lack of all existent entities itself, the mind's conception of "nothing" would not be present. Third, if mind-independent abstract objects are defined as being without a spatiotemporal location and causal efficacy (Linnebo, 2011; Rosen, 2012), this means they can't cause anything to happen within space and time. Because our universe seems to exist within space-time, there's no relevance of these objects to our universe. Fourth, consider one of the most fundamental of particles, the electron. An electron is considered to be a "real" particle and not just an abstract concept. But, what is a "real" particle? What is inside an electron? What is the edge, or

relationship, defining what is contained within the electron? No one knows. All we really know is that an electron is an existent entity. As such, it is really no different than the existent entity that has been previously referred to as "non-existence". An existent entity is an existent entity. Whether or not this entity is called an "electron" or "the entity previously called "non-existence" doesn't matter. Additionally, two abstract existent entities, or two existent entities previously referred to as "non-existence" would look as real to each other as two "real" existent entities called "electrons". It's all relative. And, finally, whether the universe is made of abstract or "real" entities, there must be, at its base, some existent entity and some way that this entity can cause energy and perceived motion. Whether this entity is called abstract or real doesn't matter.

To summarize, "nothing", "non-existence", or "the absolute lack-of-all" (and not our mind's conception of the absolute lack-of-all) is the entirety, or whole amount, of all that is present. That's it; everything that exists or doesn't exist is there. It's the all. "Entirety", "all" and "everything" are relationships defining what is contained within, which means that "nothing", or the "absolute lack-of-all" is actually an existent entity, or a "something". One reason this is hard to visualize is because of the confusing of our mind's conception of "non-existence" with "non-existence" itself. Finally, referring back to the original question of "Why is there something rather than nothing?", the reasoning presented here also suggests that even though choice B was the option that was explored, doing so leads back to choice A in the end. That is, "something" has always been here, but it is one and the same as what we've previously, and incorrectly, referred to as "nothing".

Use of the Proposed Solution to Build a Model of the Universe

What is all the above good for? Like all proposed solutions to the question "Why is there something rather than nothing?", one can never prove the above hypothesis because one can never actually directly see whether the supposed "absolute lack of all" is truly the lack of all existent entities or is itself an existent entity. But, what we can do is as follows. Because there is nothing smaller than the supposed "absolute lack-of-all", the existent entity formerly called "the absolute lack of all" would contain no parts. It would be the smallest and most fundamental of existent entities and as such would be the fundamental building block of existence. Because the universe exists and has physical properties, this most fundamental of existent entities must therefore be the fundamental building block of our existent universe and must have physical properties from which the physical properties of the universe are derived. So, we can develop a model of this most fundamental of existent entities and, use it to build a model of our existent universe. If this model can make testable predictions, this provides evidence for the solution. I refer to this approach as a metaphysics-to-physics approach or philosophical engineering and think it is a way to turn metaphysics into a more science-like field. What this approach also means is that by discussing the question "Why is there something rather than nothing?", we are actually discussing fundamental physics. Somewhat similar ideas have been proposed by Tegmark (2008) and Rickles (2010).

So, what can we say about the physical properties of the existent entity formerly known as "non-existence"?

1. First, as described above, an existent entity is a relationship defining what is contained within and is equivalent to an enclosing surface defining what is contained within. The phrase "defining what is contained within" implies a complete definition because, unless it's complete, a definition can't really be said to define what is contained within. A complete definition of what is contained within suggests an unbroken surface. A broken surface should not be possible for an existent entity because that would suggest that the definition of what is contained within is not complete, which would mean that there's no existent entity.

2. Second, in order to have physical existence, an existent entity must have three dimensions. I cannot conceive of any physically existent entity that has either zero height, depth or length. If any one of these dimensions were literally, absolute zero, the entity would not be there. For example, if a line of graphite particles had literally zero height, there wouldn't be any graphite there to compose a line with width or length. Within the mind, it may be possible to imagine a very thin or "flat" entity where one of its dimensions approaches zero size, but this can only occur within the mind. Outside the mind, having literally zero height, depth or length means that an entity is not just flat, or very thin, but that it's not there. And, because the mind and its use of "flatland" concepts would not be present in the case of the existent entity that was previously called "non-existence", this existent entity can't be just flat but must have three dimensions.

One might argue that the existent entity formerly known as "non-existence" is a mind-independent abstract object and can thus have one or more of its dimensions be zero, but this argument is incorrect for the following reasons. First, as above, the situation we have previously called "non-existence", or "nothing", assumes that no abstract objects are present. Second, where is this Platonic realm of abstract objects that is neither in the physical world nor in the mind? Could you please point it out? Until then, this is a faith-based argument, which while possible, can't be argued rationally. Finally, if it were an abstract object, then as mentioned above, it would have neither spatiotemporal location nor causal efficacy (Linnebo, 2011; Rosen, 2012), meaning that it couldn't cause anything to happen. So, if the "non-existence" grouping were an abstract object, it would be unable to cause the constituents of the universe that are themselves units

of space to come into being. And, because it's the "non-existence" grouping, there would be no other existent entities present with causal efficacy to cause these constituents to come into being. Paraphrasing Hawking's famous question (1988), there would be no outside agent or "fire" to cause the transformation of this abstract object into the objects within space and time that make up our universe. However, because the objects that make up the universe are within space and time, this means that the initial existent entity that generated the universe must have either existed within space and time or have had causal efficacy, leading to the fact that the initial entity could not have been an abstract object and thus could not have had any of its dimensions be zero.

3. Next, this three dimensional state with an unbroken, enclosing surface contains no other information other than that it defines, or encloses, all that is contained within. What does this imply about its shape? Because there is no information to define corners, angles, asymmetries or size differences in any dimension, the state would be identical in all three dimensions. That is, it would be a sphere.

4. Because the existent entities described here would be the most fundamental building blocks of our existent universe, including its volume, or spatial extent, each entity constitutes a unit of volume and a location in the spatial extent of our universe. In philosophical terms, one would say that each of these existent entities is a "simple" because it has no component parts and that they are supersubstantialist in that each entity is identical to, and in fact constitutes, one location in our universe (Gilmore, 2014).

5. Given this first existent entity and its unbroken, enclosing spherical surface as well as our initial assumption that all that has traditionally been thought of as existing is gone, this means that because there is this surface, there will be the supposed "absolute lack-of-all" next to it. As above, this "absolute lack-of-all" is a grouping defining all that is present next to the surface of the first existent entity and is, thus, itself an existent entity. Therefore, the first existent entity and its surface has created a new instance of the "absolute lack-of-all" next to its surface. Actually, in order to cover the entire surface of the first existent entity, many new instances of the "absolute lack-of-all" existent entity would need to be formed all around the surface of the first existent entity. Because there's nothing present to distinguish these different "absolute lack-of-all" existent entities, they should be identical to each other and to the initial "absolute lack-of-all" existent entity. Once, the original spherical existent entity causes the formation of additional identical spherical existent entities all around its surface, the surfaces of these newly formed existent entities will then cause the formation of yet more existent entities around their uncovered surfaces. This process will continue ad infinitum and will lead to an infinite expansion of identical, existent entities starting from a single, initial existent entity. This process is similar to the big bang and its expansion to form the universe. It also has similarities to the idea of a cell causing the formation of other cells in cellular automata.

Even if one doesn't agree with the "absolute lack-of-all" existent entity idea, consider this. Unless it begins with the number of existent entities currently in existence, any hypothesis of the beginning of the universe will need some mechanism for replicating an initial existent entity to get more existent entities. I believe that the existent entity formerly known as "non-existence" is the only entity that has this self-replication property.

6. Finally, mathematics has shown that when twelve identical, tangentially touching, non-overlapping spheres are packed around the surface of another sphere of the same size, there will be some left-over space but not enough to fit in a thirteenth sphere (Conway and Sloane, 1999; Weisstein). If the central sphere in this scenario is the existent entity formerly known as "non-existence"; then, as mentioned above, it will cause the formation of identical spherical entities around its entire surface. However, in order to cover its entire surface, thirteen spheres are needed, but, as just described, there is not enough room to fit in all thirteen spheres without some overlap. Because none of these newly formed spheres would be favored, all would have an equal "right" to be there, and, thus, there would be overlap between at least two of the spheres. But, because each of the potentially overlapping spheres would have to have an unbroken surface in order to exist (see above), this means that the two entities trying to occupy the same space would be compressed and would meet at an interface between them. Each of these two entities has a natural spherical shape when not overlapping, but each is being blocked by the interface with its neighbor from assuming this spherical shape. Thus, each entity would be trying to be in its natural spherical shape while being opposed by its neighbor. This seems to be a natural source of energy in the universe. There has to be a reason for why there is energy in our universe, and the above provides a totally natural and geometrical one.

I refer to the above type of thinking, that applies physical reasoning to what were formerly considered to be philosophical constructs as a metaphysics-to-physics approach, or philosophical engineering. I believe this type of bottom-up, logic-based reasoning offers the best path forward for both philosophy and physics for understanding the nature of existence. Like all physical hypotheses, philosophical engineering must be internally consistent, be able to explain physical phenomena and provide testable predictions. This work is currently being pursued by the use of 3D modeling by the author.

Conclusion

Taken together, the above suggests that a thing exists because it is a grouping, or relationship defining what is contained within. Such a definition or grouping is equivalent to an edge, boundary, or enclosing surface defining what is contained within and giving "substance" and existence to the thing. A corollary of this is that a thing exists where its grouping, or defining relationship, exists. This can be in a mind or outside the mind. Also, a grouping defining what is contained within, and therefore an existent entity, can exist in one place and time but not another. Therefore, whenever a thing is said to exist, it's very important to say within what location, domain or reference frame it exists and at what time it exists. A second corollary is that the mind's conception of an outside-the-mind existent entity and the outside-the-mind entity itself are two different existent entities that exist in different locations. This argument for why a thing exists is then used to show that the "absolute lack-of-all", or "non-existence" (no energy, matter, volume, space, time, thoughts, concepts, mathematical truths, etc. and no minds to think about this lack-of-all), and not our mind's conception of "non-existence", is a grouping or relationship defining what is contained within and is, therefore, an existent entity. That is, what has traditionally been thought of as "nothing", or "non-existence", is, when seen from this different perspective, actually an existent entity or "something". This means that the same situation can appear totally different depending on the perspective of the observer. This also means that it's impossible to have a true lack of all existent entities, or "nothing", and, therefore, that "something" is necessary, or non-contingent. While this is not a novel idea, a mechanism describing why this is so, as presented here, is. Using this hypothesis, one could say that, thought of in one way, our reality is, at its base, the "absolute lack-of-all". If one could pull back the curtain and see what's really at the base of reality, one would find "non-existence". But, this "non-existence" is, when seen from a different perspective, an existent entity which, through the process described above, can replicate, produce energy and form our universe. So, it's yin and yang, but with a mechanism.

Finally, the proposed solution to the question of "Why is there something rather than nothing?" is used to form a preliminary model of the universe via what is referred to as a metaphysics-to-physics approach, or philosophical engineering. This approach makes sense for two reasons. First, using metaphysical reasoning, what was previously referred to as the "absolute lack-of-all" is, when seen from a different perspective, an existent entity and in fact the most fundamental of existent entities. As such, it must be what our existent universe is made of. Second, metaphysics is the study of the nature of being or existence. And, third, because the universe "be"s or exists, and physics is the study of the universe, then the laws of physics must theoretically be derivable from the principles of metaphysics. Like all physical theories, philosophical engineering must be internally consistent, be able to explain physical phenomena and provide testable predictions. This work is currently being pursued by the author.

References

- Chisholm, Roderick, "Parts as essential to their wholes", *The Review of Metaphysics*, 26:4 (1973), pp. 581-603.
- Conway, J.H. and Sloane, N.J.A., "Sphere Packings, Lattices and Groups", 3rd ed., (Springer-Verlag: New York, 1999), especially p. 21.
- Discussion topic on "Why is there something rather than nothing?" at [google.com/groups/everything-list](https://groups.google.com/group/everything-list/browse_thread/thread/ed1554a514ad1538/f803c76a9d37c744), 2011, https://groups.google.com/group/everything-list/browse_thread/thread/ed1554a514ad1538/f803c76a9d37c744
- Discussion topic on "Why does the world exist?" at fqxi.org/community/forum, 2013, <http://fqxi.org/community/forum/topic/1478>
- Feldman, Richard and Feldman, Fred, "Roderick Chisholm", *The Stanford Encyclopedia of Philosophy* (Winter 2008 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/win2008/entries/chisholm/>.
- Geffer, Amanda, *Nautulus*, 2014, 16; <http://nautil.us/issue/16/nothingness/the-bridge-from-nowhere>
- Gilmore, Cody, "Location and Mereology", *The Stanford Encyclopedia of Philosophy* (Fall 2014 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/fall2014/entries/location-mereology/>.
- Goldstick, Daniel, "Why is There Something Rather than Nothing?", *Philosophy and Phenomenological Research*, 40, 2 (Dec. 1979):265-271, especially p. 270.
- Granet, Roger, <https://sites.google.com/site/ralphthewebsite/filecabinet/theory-russell-paradox-godel>
- Hawking, S., *A Brief History of Time*, (Bantam Books: New York, 1988), pg. 190, "What is it that breathes fire into the equations and makes a universe for them to describe?"

Korman, Daniel Z., "Ordinary Objects", The Stanford Encyclopedia of Philosophy (Spring 2014 Edition), Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/archives/spr2014/entries/ordinary-objects/>>.

Lewis, David, 1993 "Many, but Almost One," in *Ontology, Causality and Mind: Essays in Honour of D M Armstrong*, John Bacon (ed.), New York: Cambridge University Press.

Linnebo, Øystein, "Platonism in the Philosophy of Mathematics", The Stanford Encyclopedia of Philosophy (Fall 2011 Edition), Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/archives/fall2011/entries/platonism-mathematics/>>.

Rickles, Dean, "On Explaining Esistence", "Foundational Questions Institute Essay Contest", 2010, http://www.fqxi.org/data/essay-contest-files/Rickles_Rickles_fqxi_2.pdf

Rosen, Gideon, "Abstract Objects", The Stanford Encyclopedia of Philosophy (Spring 2012 Edition), Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/archives/spr2012/entries/abstract-objects/>>.

Tegmark, Max, "The Mathematical Universe", *Foundations of Physics*, 38 (2008): 101-150, especially p 16.

van Inwagen, Peter, "When Are Objects Parts?", *Philosophical Perspectives*, 1987, 1: 21–47.

van Inwagen, Peter, *Material Beings*, Ithaca (NY): Cornell University Press, 1990.

Varzi, Achille, "Mereology", The Stanford Encyclopedia of Philosophy (Fall 2014 Edition), Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/archives/fall2014/entries/mereology/>>.

Wallace, Megan, "Composition as Identity: Part 1", *Philosophy Compass*, 6/11 (2011):804-816.

Wasserman, Ryan, "Material Constitution", The Stanford Encyclopedia of Philosophy (Summer 2014 Edition), Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/archives/sum2014/entries/material-constitution/>>.

Weatherson, Brian, "The Problem of the Many", The Stanford Encyclopedia of Philosophy (Winter 2014 Edition), Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/archives/win2014/entries/problem-of-many/>>.

Weisstein, Eric W. "Kissing Number." From "MathWorld"--A Wolfram Web Resource, <http://mathworld.wolfram.com/KissingNumber.html>