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PHYSICAL IDEAS AND DIMENSIONAL LOGIC v1.0

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The definition of the term “idea” is fairly constant from culture to culture. An idea is a thought, opinion, belief, plan or fantasy; an idea is a mental concept generated by and existing only in a mind; an idea is an abstract representation of reality; and above all, an idea is an ethereal phenomenon without physical substance.

These definitions tend to reinforce each other – accepting one definition leads you to accept the others. Common among these definitions is that they imply a manifest separation between ideas and the physical universe we live in. There is no inferred path between the logical manipulation of ideas and the ability of these ideas to predict or indeed affect physical behavior. Mind lives here, body lives there, and the relationship between the two have been, at best, awkwardly and contentiously explained.

In this essay we will look at logical arguments supporting the thesis that ideas are physical objects, and as such affect other physical objects – a physical mind affecting a physical body. We will redefine the term “physical object” to include ideas, we will distinguish the term “idea” from ordinary language, and we will look at how these new viewpoints affect logic.

In his text we will use the terms logic and mathematics as appropriate for the context being used, but please note that to avoid constant redundancy we will use the term “logic” to include both “logic” and “mathematics”. Godel’s Theorem has revealed that mathematics, as presently understood, has hierarchal limits not found in logic. However, mathematics throughout its entirety is a logical system while operating within its accepted and considerable boundaries. Mathematics at the least is a subset of logic, completely obeying logical laws.

PART 1 – IDEAS ARE PHYSICAL OBJECTS

The phrase “physical object” in common terminology is used to describe an object with at least three dimensions - height, width, and depth. We often assign a mathematical measurement to each dimension of a physical object, because a dimension that cannot be directly or relatively measured, however inaccurately, cannot be perceived. Dimensions are independent of each other – the height, width and depth of an object can be the same length, as in cubes and spheres (symmetrical objects), or different lengths (non-symmetrical objects).

Some objects have traditionally been defined solely by their dimensions. A line, for example, is most simply defined as a one-dimensional object, and a plane is defined as a two-dimensional object. Neither lines nor planes are considered physical objects; instead, they are considered ethereal mental “ideas”. Only by adding a third dimension – depth – does an object magically

cross over into the physical realm. Lines, planes and physical objects can be explicitly measured by mathematical means.

In contrast, some objects are measured relative to themselves or other objects. An example of a relative measurement is the definition of a geometric point - “a dimensionless geometric object having no properties except location”. Locations, of course, can be measured, either directly (one centimeter from the end of the line) or relatively (about one-third the line segment). So while a geometric point has no height, width or depth, it is still a measurable and therefore perceivable object.

Numbers can be argued either way. While they are themselves the instruments of mathematical exactness, their meaning is derived from their relationships to other numbers.

It is important to note that we are using the term “measurement” in all its related senses. When we take a numerical or relative measurement of a dimension, we are quantifying that dimension. At the same time, quantifying requires us to contextualize the dimension, where contextualizing simply means we are defining an idea in terms of other ideas. For example, the statement “This line is one meter long.” quantifies the line mathematically as exactly a meter in length, while simultaneously invoking ideas required to define the term “meter”. Similarly, the statement “A is greater than B.” requires a relative measurement consisting of a quantification and a contextualization (ideas pertaining to comparisons). This reasoning also follows for the statement “A = A”. The “meanings” of measurements, quantities and associated contexts are dimensions of each other, because none can be perceived – none can be defined – without the others.

Mathematics is a logical science, and when mathematics measures (contextualizes) physical objects it is fair to say that mathematics is employing both a non-physical logic and a physical logic – it is a non-physical logic when manipulating the traditionally non-physical ideas of lines, planes and numbers, and it is a physical logic when applying these ideas to physical objects like cubes, spheres, ships and trains. So the question arises – are there two types of logic? Does one branch of logic deal with non-physical ideas only, while another branch bridges non-physical ideas and physical objects? Or is it more likely that there is one type of logic that works simultaneously with both non-physical ideas and physical objects?

In practice, the same logical rules appear to work with both non-physical ideas like numbers, and physical objects like cubes. So it would appear that there is only one type of logic.

We say that logic “works” because when we apply logical rules to traditionally non-physical and traditionally physical objects we generate predictable, reproducible results. We take logic on faith that it will continue to work. I say we take in on faith, because there is no clear explanation outlining how non-dimensional ideas “cross-over” to predict the behavior of physical objects. What is the connection between non-physical ideas like the laws of motion and physical objects like stars and planets that allows this predictive ability?

The resolution of this connection issue requires a re-thinking of the nature of ideas, and of our definition of physical existence. This re-thinking does not require a leap of the imagination – instead, it just requires a more basic approach to the ontology of ideas. If ideas can be shown to have physical elements, then the relationships among ideas and physical objects become straightforward. No longer is the non-physical somehow affecting the physical, or the mind somehow affecting the body. Rather, the physical elements of ideas are affecting the physical elements of physical objects. In this way a zeitgeist, for example, takes on a practical role that has always been assumed, but never explained.

A theory supporting the physicality of ideas requires one fundamental assumption – namely, that any particular idea is perceivable. This perception can be mental, as in the perception of an idea like “goodness”, or physical, as in touch or sight. The tool of perception is a mind, and a fair definition of a mind is that it is at least a collection of ideas, where ideas are both the objects of perception, and also rules (groups of ideas) for organizing and manipulating ideas.

If we grant this one fundamental assumption – that ideas are perceivable – then we create a link to the physicality of ideas. A perceivable object must necessarily exist. An object that exists must exist in this Universe. This Universe was created in a Big Bang of energy. Everything that exists in this Universe is composed of energy. Energy has a mass component ($E=MC^2$). Mass requires matter for its definition. Matter is a physical object. Therefore ideas are perceivable, exist in this Universe, are composed of energy, have mass, and are physical objects.

This chain of reasoning establishes a foundation for a theory of physical ideas. But it also requires us to re-visit our definition of physical existence. Traditionally, physical objects are called physical because they can be accessed by our senses – three-dimensional objects that can be visually seen, touched, heard, smelled or tasted. But an idea like “time” cannot be seen, touched, heard, smelled or tasted in the traditional meanings of these terms. Yet we have shown the idea “time”, because it is perceivable, must necessarily have a physical existence.

The only solution is to re-define our definition of physical existence. A physical object has been traditionally defined as having three dimensions – height, width and depth. We need only to update this definition by defining each of the dimensions composing physical objects as being physical objects in their own right. It is a small shift in meaning, but a big shift in helping to understand how logic and physical objects – how mind and body – are physically related.

PART 2 – DIMENSIONS AND IDEAS

If we accept that dimensions are physical entities in their own right, then we are forced to take a closer look at what we mean by the term “idea”. To do this, we need to take a closer look at the term “dimension”.

We noted earlier that a physical object can be partially or wholly defined by its physical dimensions – height, width and depth. From this we can at least say that some definable elements of an object are dimensions of that object, as we traditionally define dimensions. Dimensions can be absolute, as in “There are exactly 60 seconds in a minute”, or relative as in “A is greater than (heavier than, farther than) B”.

A mathematician defines a dimension as “the least number of independent coordinates required to specify uniquely the points in a space.” A physicist defines a dimension as “A physical property, such as mass, length, time, or a combination thereof, regarded as a fundamental measure or as one of a set of fundamental measures of a physical quantity:” Both of these are useful definitions completely included in our usage of the term dimension.

We can generalize these definitions by stating that a dimension is a particular, uniquely definable element of an object’s outline, magnitude, architecture or design, where “design” includes the idea of “context” and its related ideas of “purpose and “location”. Because dimensions are uniquely definable, they are necessarily perceivable. By the chain of reasoning in Part 1 above, perceivable objects exist in this Universe and all their composing elements are necessarily physical objects.

With this in mind we can initially state that a dimension or collection of dimensions define an object. Because dimensions exist in this Universe they are necessarily physical creations of the Big Bang. As physical creations of the Big Bang, they must necessarily obey the same logical and mathematical laws of the Universe that all physical objects obey. It then follows that if all dimensions were created from a single force at a single point in time (the Big Bang), then each perceivable dimension must necessarily exist in logical and mathematical relationships with that originating force, and via that force with every other created dimension.

This brings us to a more complete understanding of the role dimensions play in defining objects. We can now state that a dimension or collection of dimensions, and the logical and mathematical relationships among them, completely define an object. Because these dimensions are physical objects, the terms “define” and “compose” serve the same purpose. Put another way, if dimensions are physical objects, it is as valid to say that dimensions define an object as it is to say that dimensions compose an object.

The unity of definition and composition – form equaling function – can be stated more explicitly. Logical and mathematical laws reveal relationships among objects. Logical and mathematical laws exist in this universe, and as perceivable objects that exist in this Universe, they themselves are composed of energy and mass. From that point of view, it is also valid to say that a dimension or collection of dimensions, and the logical and mathematical relationships among them, completely compose an object.

This conclusion has an effect on our understanding of the term “idea”. Traditionally, the term “idea” refers to the transient, language dependent letter groupings, images (including ideograms), and sounds we use to identify dimensions. Defining ideas in this manner has no doubt contributed, if not led, to the artificial distinction between mind and body.

However, if we accept that dimensions are physical objects, and that dimensions completely compose more complex physical objects, then language dependent letter groupings, images, and sounds must be physically related (via logical and mathematical laws) to the dimensions they refer to. In fact, these language dependent letter groupings, images, and sounds, being perceivable, must be physical dimensions themselves. This physicality explains their ability to form relationships with the physical objects they reference.

To put a point on it, what we traditionally call ideas are actually just dimensions of physical objects. And in a larger sense, consider that ideas are themselves physical dimensions – physical dimensions in a contextualized (logical and mathematical) relationship with other physical dimensions.

This leads to a new definition of what we traditionally have called ideas. There is no longer a complete (and unexplained) separation between ideas and the objects they identify. Instead, ideas are physical dimensions of physical objects. More completely, ideas are physical objects, ideas are dimensions of physical objects, and ideas are the physical (logical and mathematical) relationships among physical objects.

By this definition, no idea stands alone. Ideas are of necessity multidimensional objects because they require other dimensions for their definition.

Take a moment to grasp this. Adding a physical dimension to what was formerly believed to be a somehow non-physical object (an idea) fundamentally changes the role ideas play in the Universe. Physical objects are no longer distinct from ideas – instead, physical objects and

ideas are composed of the same substance – energy- and influence each other in physical ways.

So what then are the letters, images and sounds we use to name physical objects and abstract concepts? Essentially, these are the objects that we traditionally referred to as the ideas themselves – non-physical, language dependent ethereal “things” that communities consensually agreed referred to particular objects. Conventionally, the word “map” is considered the idea of a territory, but not the physical territory itself, and certainly not a physical object in its own right.

This conventional wisdom changes, however, when we accept that the word tree is an idea composed of energy and is a physical object in and of itself. The idea that is the language dependent word tree is not a physical tree (it does not have a tree’s billions of biological cells), but we have consensually agreed that one or more dimensions composing the idea tree are shared with an actual tree. This is a key point – in a physical universe, relationships are physical and practical, not imaginary. If the word tree is an idea associated with a physical tree, then that relationship requires the sharing of one or more physical dimensions between them.

I understand that this is a difficult concept, yet at the same time the conclusion is reasonable. The language dependent sounds that we call words can always be defined acoustically, as music is defined. But when we logically associate those sounds with physical objects, those sounds must be defined in terms of the dimensions of that physical object, or no connection between the word and the object is made.

Moving one level up – by that I mean using a larger context - may make this easier to see. Consider a physical paper map, and the corresponding physical territory (terrain) the map “represents”. Traditionally a map has been considered an idea of the territory, totally distinct yet somehow carrying information about the territory. But we have established that ideas are themselves physical, massive objects composed of physical, massive dimensions. Similarly, the territory is also composed of physical, massive objects composed of physical, massive dimensions. This creates a new perspective on the relationship(s) between a map and a territory. That common denominator is dimensions.

Perhaps this is a good time to quote Sherlock Holmes – “When you have eliminated all which is impossible, then whatever remains, *however improbable*, must be the truth.” Relationships among physical objects must necessarily be physical, practical relationships. Dimensions are the currency of relationships. The words we use to name these dimensions – the language we use to name these dimensions – are defined in terms of dimensions composing the named objects.

Words do not inherently “represent” dimensions other than the acoustic dimensions of which they are composed. Instead, their acoustic dimensions are a layer of dimensions that share dimensions (via other layers) with the physical objects they relate to. A more exacting answer explaining how acoustic dimensions share themselves with apparent non-acoustic dimensions will necessarily be found in the sub-levels that support acoustics (I don’t mean to appear mysterious or evasive, but sub-levels are another discussion). Certainly the solution will include the physical dimensions that are the sound of the word.

That said, we can still prove that acoustic sounds must in some way share dimensions with the physical objects they relate to. Simply, language follows perception, and is dependent upon it. Perception is directly related to language, and in a physical, material Universe all relationships are physical and material. A word is simultaneously a physical idea when viewed as an idea,

and also a physical dimension of another idea or physical object when viewed as a “word”. Words can no longer be seen as “labels” for the objects they refer to; instead, they are above all and always a physical dimension – directly (as in onomatopoeia) or indirectly (via logical layers) of the objects to which they refer.

That is the view from, as they say, 50,000 feet. Up close, the physical relationship between a word and the object it names becomes easier to see. For example, when we teach a child the meaning of the word tree, we point to a tree and associate the word “tree” to the physical object. Some dimensions of the tree – its height, outline, color and so forth become part of the stored meaning of the word tree – the stored dimensions. These are the shared dimensions that logically associate the word tree, the idea tree, with the physical tree.

So, to be clear, the sound and spelling of the word tree is not the tree itself. But the definition of the word does (and must) share enough physical dimensions with the tree to create a physical relationship with the tree.

A noteworthy example of ideas sharing dimensions with the objects they define is the concept of dark matter. No scientist has ever seen dark matter, yet mathematical calculations imply its existence. This is a pure example of dimensions defining an object – our idea of dark matter is composed entirely of mathematical calculations and the contexts they imply. The idea of dark matter must necessarily share dimensions with dark matter, or dark matter would simply not exist as a perceivable object.

Shared dimensions are the foundation of logic and mathematics, and that topic is discussed in the next section.

PART 3 – DIMENSIONAL LOGIC

It is a given that ideas are uniquely defined in terms of other ideas; no idea can be uniquely defined in terms of itself (an Identity). Put another way, A=A does not define A as unique from B - instead, it shows the relationship of A to itself. Traditional philosophy uses terms like “properties”, “attributes”, “classes” and “sets” to help define an idea in terms of other ideas. These terms are useful in that they identify logical and mathematical relationships among ideas, but they are not useful in the sense they do not explain the means by which logic and mathematics actually create these relationships.

The lack of an encompassing physical design that explains the inner workings of logic and mathematics is a serious issue. Logic and mathematics, as things now stand, trend more toward description and belief than hard science, and the acceptance of this current situation is another manifestation of mind- body duality. Understanding the mechanics of logic and mathematics strikes at the heart of the true nature of ideas and their relationship to the physical Universe in which we live.

The task before us is clear – logic and mathematics are the fundamental relationship builders of the Universe, connecting everything from sub-atomic particles to galaxies into a unified whole of meaning. We need to define how and why logic and mathematics create relationships, and in the process explain how they have managed to integrate themselves into the very fabric of our thoughts and our Universe.

These may sound like far-reaching goals, but there is a short path to achieving them. We start by taking a structural approach to idea definitions. We need to recognize the physical nature of ideas and define them as we define other physical objects – by their dimensions. Physically defining a physical object requires that we look at the physical elements of its structure.

Because ideas exist in this Universe, they are composed of energy and can be viewed as having mass. Massive objects are physical objects by any current definition in any current science. Ideas are therefore massive physical objects defined by their dimensions.

It is useful to note that when we use the term “dimension” we are expanding its definition to include any perceivable object, which includes any perceivable ideas. Further, we are defining an idea as a unique definition of a perceivable dimension.

Physical objects are commonly defined by their physical outline (such as a circle), by their magnitude, by their architecture, and/or by their design (their context). With this as a guide, we define a dimension to be a particular, uniquely definable element of an object’s outline, magnitude, architecture or design. From the reasoning in Part 2 above, we state that a dimension or collection of dimensions, and the logical relationships among them, completely define an object.

Put more generally, dimensions are physical objects, ideas are composed of dimensions, ideas are themselves dimensions of physical objects, and ideas are also the physical (logical) relationships among physical objects. Dimensions, in these contexts, are the common denominator of each and every object in the physical Universe. Similarly, because ideas are collections of dimensions, ideas can also be seen as the common denominator of each and every object in the physical Universe. This is a small step in understanding that will lead to some large resolutions.

Before proceeding to these resolutions we should state that the simplicity of this path does not require us to change any of the fundamental laws of logic – from that standpoint, nothing changes. What does change is our understanding of the mechanics of logic. A physical logic must obey the discovered and undiscovered logical and mathematical laws of physics, because current science shows that physical objects obey physical laws of motion and structure. A true syllogism is true because the physical elements – the ideas – composing the syllogism are organized in an architecture that obeys fundamental physical laws.

Essentially, viewing ideas as physical objects transforms logic from a mental classification system into a true physical science. Logic is no longer operating on intangible, non-physical ideas; instead, logic is operating on dimensions organized according to the physical laws of the Universe. Truth and meaning align with logic and mathematics in a fundamental architecture that admits reproducible proofs and reliable predictions.

As a physical framework of physical objects, logic undergoes another transformation as well. Each perceivable object is composed of physical dimensions logically and mathematically related to each other, and to every other dimension created by the Big Bang. Therefore logic can be perceived as a dimensional structure completely integrated into and between each perceivable object in the Universe. Seen on a large scale, logic and mathematics are dimensional, physical and spatial objects completely composing and infusing the Universe.

I am reminded of Ludwig Wittgenstein’s words “The limits of my language means the limits of my world.” When logic is defined as dimensional, physical and spatial, our language for understanding our world is limited only by our ability to perceive and define unique dimensions.

Thus far we have proposed a physical model for logic and mathematics that integrates logic and mathematics into each object in the Universe. The next step is to devise a practical explanation of the mechanics of logic and mathematics – an explanation of how logic and mathematics

actually create relationships among dimensions, ideas and what we traditionally have called physical objects.

Our proposed physical model for logic and mathematics states that objects are composed of dimensions. One sure and certain way to create a physical relationship between Object A and Object B is to share one or more of A's composing dimensions with one or more of B's composing dimensions. For example, if both A and B contain the identical dimension C within their physical construction, then A and B share a physical relationship via C (think of a Venn diagram, or mathematical sets with some common members).

This physical relationship is what we have traditionally been calling logic and mathematics. Looked at one way, logic and mathematics create relationships by sharing dimensions among objects. Looked at another way, logic and mathematics are created when objects share dimensions.

The sharing of physical components among objects is a familiar idea. Valence Theory, where atoms bond via shared electrons, has been a staple of chemistry for many years. As in Valence Theory, the more dimensions shared among objects, the stronger the logical and mathematical bond between the objects.

If follows from this discussion that if Object A exists in a relationship with Object B, then all the dimensions of Object A exist in either direct or indirect relationships with all the dimensions of Object B - via the directly shared dimension(s) of A and B. It also follows that objects in a relationship are dimensions of each other.

We can take this a little farther. Because dimensions are physically composed of other dimensions via their definitions, each dimension is necessarily a nexus for other dimensions. With this in mind it is useful to think of the Universe as a Dimensional Nexus. It then follows that logical relationships are pathways through the Dimensional Nexus. For example, this implies that the ten mathematical dimensions of string theory are actual physical pathways of connected nodes.

Two questions (at least!) arise. For the first question, consider that a shared dimension is a node connecting logical and mathematical groupings, and that each dimension in these groupings is also a node for other logical and mathematical groupings.

If each of these nodes is unique, then they form a structure that is essentially a single point – think of the Big Bang before the Big Bang – and our notions of space and time are merely changing points of view within this fixed structure.

If, on the other hand, there are multiple copies of individual nodes, allowing them to exist in multiple locations simultaneously, does this mean there are semi-discrete "galaxies" of nodes? And if so, do these semi-discrete galaxies allow for multiple or parallel Universes? Was the Big Bang the birthing – the reproduction – of primary dimensions?

One way to resolve these two scenarios, of course, is to conceive of dimensions as wave forms, like photons, expanding and forever connected across their breadth. Waves would allow for both a unified structure and "multiple locations", and their wave-particle duality resonates well with mind-body duality.

The second question pertains to awareness. What exactly is traversing the logical pathways in the Dimensional Nexus? Certainly it is energy, and certainly it is composed of dimensions. Defining awareness in terms of physical dimensions is, I think, as hard or as easy as you care to

make it. Either way, it is here that religion and science may find common ground.

PART 4 - CONCLUSION

The implications of physical ideas are both practical and banal. Practical, because physical ideas define the mechanics of logic – they offer a reasonable explanation of how logic relates to the physical objects it appears to control. Banal, because physical ideas have no effect on the hard science that has gone before it - physical laws remain the same.

Mind and body can now be seen not as opposites, but as aspects of the same underlying framework of physical dimensions. The map is no longer an ethereal idea of the territory; instead, the map is a physical dimension of the territory – indeed, the map is composed of multiple physical dimensions of the territory.

Dimensions are the common denominator of perceivable objects in the Universe. Thinking about ideas is equivalent to dimensional thinking, and when perceived as massive objects, the physicality of ideas creates a Geometry of Ideas organized by the logical laws of the Universe.

Albert Einstein famously said “I, at any rate, am convinced that *He* [God] does not throw dice.” In that statement Einstein argued (against the quantum theorists) that the Universe was logical and orderly, devoid of randomness and inconsistency. However, Einstein also said "as far as the laws of mathematics refer to reality, they are not certain; and as far as they are certain, they do not refer to reality.” The first statement implies an underlying order that the second statement does not. I am hopeful that in a physical universe, where each dimension is shared directly or indirectly by every other dimension, there is a harmony and structure that supports the first statement, while leaving his second statement to a time when mind and body were conceived as separate and distinct.

END