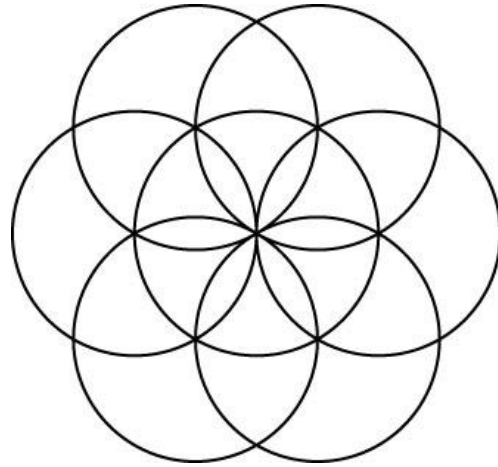


BUBBLES OF PERCEPTION



**EXPLORING THE LIMITS AND THE FUTURE OF HUMAN
PERCEPTION**

PAUL REBHAN

Bubbles of Perception

E-Book Version

Table of Contents

Introduction	1
Chapter 1 – Bubbles of Perception	2
Chapter 2 – Bubbles of Logic	8
Chapter 3 – Bubbles of Imperialism	15
Chapter 4 – Stretching Some Bubbles	22
Chapter 5 – The New Bubble Machines	37

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Introduction

This document introduces a model for comprehending and exploring the limits of human perception. I call this model Perceptualism. Perceptualism combines concepts and research data from a variety of fields to create a unique way of understanding these limits, and perhaps overcoming them.

Chapter 1 reviews some examples and ideas that illustrate the many ways in which our perception is limited.

Chapter 2 reviews some ideas about how our perceptual limitations have influenced and constrained ideas about logic, and concepts such as “knowledge.”

Chapter 3 discusses how humans have historically presumed that all phenomena should be evaluated and judged solely according to human perceptual standards. I refer to this prejudice as perceptual imperialism, and explain why it may serve to limit potential in virtually all areas of human endeavor.

Chapter 4 offers ways to reconsider some very old ideas and questions about “life” in consideration of our perceptual limitations.

Chapter 5 suggests that it is time for us to significantly alter the evolution of human biology in order to expand our perceptual limitations. I suggest that this will occur by merging humans with what we currently call computers, and creating a new successor species, which I refer to as *techno-sapiens*. This general idea is not new. However, I offer a few considerations regarding this topic that I have not seen elsewhere.

If the suggestion of altering human biology sounds unnecessary or unreasonable to you now, it may not seem that way after you’ve read chapters 1 through 4. There is already evidence to suggest that this will inevitably happen. I foresee a day in the not very distant future where our successor species will look back and consider current human mental capacity much in the same way that contemporary humans consider the mental capacity of turtles.

I have attempted to present Perceptualism in a way that can be understood without any previous specialized study, yet contains enough original propositions and references that it should be of interest to readers who have already studied related topics such as philosophy, physics or psychology in depth.

In order to accomplish this, I must assume as little as practically possible on behalf of the reader. Therefore, chapter 1 will begin with some points that may seem rudimentary. I must briefly review these points in order to reduce the potential for misinterpretation and presumption later on.

If you are comforted by concepts such as certainty, truth, facts, knowledge, reality, intelligence, consciousness, supreme beings or even your own identity, then what I am about to present may disturb you. Such disturbances may be the necessary first-steps in allowing us to break free from the mental prison of human perception.

Chapter 1

Bubbles of Perception

A SUNNY DAY

Person A is in a home with no windows. Person B resides in the same city as A, and is in a home that has windows. A telephones B and asks, “Is today a sunny day?”

How does B arrive at an answer to this question? B will probably rely on his physical senses to provide data about his surroundings. In this example vision will be an important physical sense, as B will probably look out a window to evaluate the amount of sunlight outside. B will also utilize his brain to perform the thought-computations necessary to determine an answer. Those thought-computations will be unique to the situation because B is in a particular place, at a particular time, working with a particular set of cognitive capabilities and available information.

However, when Person B uses his sight, he may not see everything there is to see. His thought-computations may not account for all possible permutations of data, and the uniqueness of his perspective may provide an answer that would be different from someone else’s. The combination of these factors creates Person B’s “unique-perceptual-experience.” Let’s take a closer look at how unique-perceptual-experience is constructed and what limitations it may have.

THE PHYSICAL SENSES

Humans seem to rely upon the physical senses to perceive experiences of their surroundings. These senses are generally considered as the devices that provide stimuli to the brain. They have been traditionally categorized as sight, sound, touch (tactile), smell and taste, with internal sensations such as a stomachache, the physical attributes of emotion, or the sensation of equilibrium falling generally into the tactile category.¹

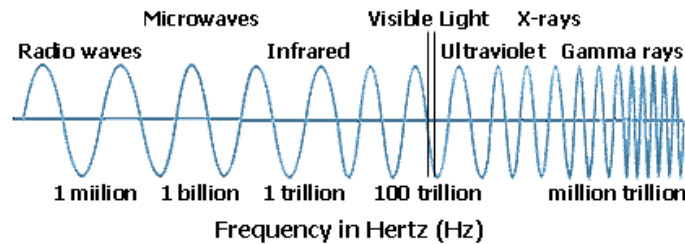
Much is ostensibly comprehended about the limitations of our physical senses. For example, human eyes are said to be capable of detecting frequencies of light waves within the range of 400 nanometers (violet) to 700 nanometers (red) in length.² Frequencies outside this spectrum are generally considered to be undetectable by humans. However, butterflies are said to be capable of sensing light waves at frequencies lower than 400 nanometers.³

Human ears reportedly detect air vibrations (or sound) in the approximate range of 20 to 20,000 cycles per second (CPS).⁴ Frequencies beyond this spectrum are generally considered undetectable by humans. Dogs, however, appear to be capable of hearing frequencies up to 45,000 CPS, and some whales have reportedly responded to frequencies as high as 125,000 CPS.⁵ From this type of information we may surmise that there are sights and sounds around us that we do not see or hear. The physical human senses appear to have discrete limitations that are sometimes surpassed by other species.

Even when not considered in relation to those of other species, human sensory ranges are still seemingly limited. Consider the spectrum of light visible to the human eye (400 to 700

nanometers). This is a tiny percentage of the currently comprehended range of light between radio and gamma waves.

Considering these and many other such limitations (for example, how large something must be before we can see it or feel it), we have evidence that there are objects or events that humans are not innately capable of sensing.



To explore realms beyond our sensory limits, we have developed various technologies such as microscopes, telescopes, radar, magnetic resonance imaging (MRI), microtechnology, nanotechnology, etc. As neurologist Robert Burton noted in 2000, advancements in technology continue to stretch the limits of human perception:

When I started in neurology in the mid-60s, there were no CT, MRI, or PET scanners and only a handful of known neurotransmitters. We worked in intellectual darkness and speculated...⁶

Historically, ideas about ambiguous terms such as knowledge and reality have been based generally on what human sense organs have been capable of detecting. This reliance on the physical senses has heavily influenced thinking in the areas of philosophy and science. Consider some statements that reflect this from pivotal figures in early scientific thought:

Our senses do not deceive us. This is not because they always judge correctly, but because they do not judge at all. – Immanuel Kant

All statements must be testable by observation. – Johannes Kepler

There is no conception in a man's mind which hath not at first been begotten upon the organs of sense. – Thomas Hobbes

THE SENSE OF THOUGHT

Our brains seem to process information. We generally and vaguely refer to such processing as thought (or brain computations). For the purposes of this discussion, I am referring to any type of brain activity as thought. We appear to receive much of the information that our brains process via the so-called five senses. Furthermore, thoughts seem to be reflexive, meaning that the products of one thought may become ingredients or stimuli for other thoughts. Thus our thoughts are, at a minimum, stimulated by input from our physical senses and by our preceding thoughts.⁷ Earlier I referred to a sense as something that provides stimuli to the brain. Within such a definition, thoughts can also be classified as a sense (just like sight, sound, touch, taste and smell) because thoughts also provide stimuli to the brain via their reflexivity. Within this document I shall refer to the combination of the five so-called physical senses and the sense of thought as the six senses.

Some people have proposed that we are capable of experiencing things arising from neither the physical senses nor the workings of the brain. These might include experiences such as emotion, others often referred to as “energy” or “non-physical” phenomena, or yet others referred to as “spiritual” or “supernatural” experiences. While there may be evidence of experiences that do not coincide with our current sensory models⁸, these, or any other sorts of experiences can also be categorized within the realm of thought for the purposes of this discussion. To illustrate this perspective consider emotions, non-physical experiences, “supernatural” experiences or any other such claims empirically: wherever those states may come from, they nevertheless must seemingly be registered by the brain in order for a person to claim any type of awareness about them. Alternatively, if an experience might occur without information about the experience entering the brain, the person’s brain would have no ostensible basis to make any claim about the experience.

Considered in this perspective, and in recognition that our physical senses appear to have discrete limitations, might there be a discretely limited spectrum of human thought? If so, what might the boundaries of thought be and could they be measured? Can we detect quantifiable ranges of thought (similar to the range of light that our eyes can detect) beyond which we are incapable of perceiving? Could we possibly recognize such boundaries?

The question “What are the limits of human thought?” could be interpreted as being paradoxical, because in order to come up with certain aspects of an answer we would need to identify things that we are incapable of conceiving (those things beyond human thought capability). One simple, generalized approach this question would be to answer in terms of what we are capable of comprehending and then define the set of all-else as being that which we are incapable of perceiving. We could simply state that the thought capacity of any human is everything that he or she may think of. In this imprecise way, we might at least say that we can conceptually generalize about what is inside the boundary of thought, just not what is beyond it.

In the realm of thought, as in the realm of the physical senses, we have developed technologies that extend some of our innate mental limitations. The development of writing supplemented our memory limitations by allowing us to store and recall information that might otherwise have been forgotten. More recently, computers have allowed us to process much larger quantities of data than our brains otherwise could, and at much greater speed in many cases.

It would seem that certain boundaries of human thought can be identified and expanded, both on individual levels and on collective levels. In another very simple example, I may claim that my brain received a great deal of new data yesterday. The memories of that data, along with their residual effects, now seem to be accessible to various parts of my brain, while these same items were seemingly not accessible to my brain two days earlier. Therefore, my total collection of brain content has ostensibly expanded in some way to include this additional information.

There is also historical evidence suggesting that thought boundaries expand on individual and collective levels and that humans seem to have a penchant for not recognizing these limits. Consider just two examples from the multitude of historical quotes that exemplify this point:

While it is never safe to affirm that the future of Physical Science has no marvels in store even more astonishing than those of the past, it seems probable that most of the grand underlying principles have been firmly established and that further advances are to be sought chiefly in the rigorous application of those principles to all phenomena which come under our notice. – Albert Michelson, 1894, awarded 1907 Nobel Prize in physics⁹

There is no likelihood man can ever tap the power of the atom. – Robert A. Millikan, winner of the Nobel Prize for Physics in 1923¹⁰

Referring back to the question “Is today a sunny day?” person B must ostensibly utilize his six senses to provide an answer. However, there are some additional considerations that may affect B’s answer.

ASSUMPTIONS

One such consideration is that B will need to apply some contextual-assumptions to the situation, such as the assumption that Person A is asking about the weather in the city in which they both reside. Most human communications are predicated on contextual-assumptions.

For example, Person C and Person D are walking down a street together. C asks D, “What time is it?” D makes many assumptions, such as that C is asking about the time zone in which they are currently located, that C is asking for a measure of time using the common human Earth-based standard of a 24-hour scale, and so on. If the same question were asked while C and D were somewhere over the Pacific Ocean while on an airline flight from New York to Beijing, there could be fewer contextual-assumptions. D would probably need to ask C about which time zone she was inquiring. Person B’s answer to the question “Is today a sunny day?” is contingent upon similar contextual-assumptions.

Assumption is an enormously important component of human perception, and as I will suggest later on, there is seemingly no escape from assumption in any form of thought or experience. To always ask, “what is assumed?” and to consider the effects of assumed variables are critical components of Perceptualism.

OTHER SUBJECTIVE FACTORS

B’s brain may have a unique interpretation of the amount of cloudiness that allows a day to still be considered sunny. B’s brain may also process information in a unique way that produces considerably different results than those of another person working with the same data. His answer may be temporally dependent in that it may change over perceived time. For example, he may see a different amount of clouds in the sky if he looks again ten minutes later. Or, perhaps he has an undiagnosed eye condition that causes his vision to blur when looking at bright light, causing him to attribute the blur in his vision to fog or haziness.

His thought-processing may also be shaped by limitations in the data available to him. For example, one big dark cloud may be hovering over the particular window out of which he looks, while from other windows or from anywhere else in the city, he would see only clear

skies. B's answer is also relative in that he is probably not capable of seeing the entire city from every possible perspective simultaneously.

AS-YET-UNPERCEIVED-FACTORS

Additionally, other variables may affect B's perception that I have not yet imagined or of which I am not even capable of imagining. Admission of this contingency allows for the possibility that additional or unexpected information may yet be discovered that might affect B's conclusions. I refer to this possibility as "as-yet-unperceived-factors." Allowance for the possibility of as-yet-unperceived-factors is another critical component of Perceptualism.

To summarize, there may be many potential variables that affect B's perception. This concept can be applied to virtually any other situation to demonstrate the wide variety of factors that create a unique-perceptual-experience for any entity.

Person B may not pointedly reflect on all of this when he is asked "Is today a sunny day?" He may be only superficially cognizant of looking out a window, deciding that the sky is somewhat cloudy and answering the question by saying, "No."

However, if Person B were more careful and accurate in answering, he might otherwise reply, "Based on my sensory input (including reflexive thought), my contextual-assumptions, other subjective factors, and with the caveat that there may be as-yet-unperceived-factors that could alter my calculations, I would classify this day as not sunny."

OSTENSIBILITY

In consideration of the many variables that may constitute any unique-perceptual-experience and in the interest of brevity I shall use the words "ostensible", "seemingly" and "ostensibly" within this document when making statements that might otherwise be inadvertently construed as being declarative, definitive or absolute. In such cases, the words "ostensible", "seemingly" and "ostensibly" are intended as an abbreviated reference to "perceived as such, based on sensory input (including reflexive thought), contextual-assumptions, other subjective factors, and with the caveat that there may be as-yet-unperceived-factors that could alter this perception."

What I've outlined up to this point is a general way to think about the limits of human perception. I do not propose this particular model, or its classifications, as any type of perfect or ultimate way to define unique-perceptual-experience. There may be a virtually limitless number of ways to consider the subject, but this one provides a simple framework from which to explore further.

However, it should be emphasized that the identification and mandatory inclusion of *assumed variables* and *as-yet-unperceived-factors* is an important distinction of this model. Even though a perception may appear to be complete, these variables can serve as an ongoing reminder and catalyst to search or allow for more information.

PERCEPTION-BUBBLES

I have outlined a model of how our physical and thought senses seem to have discrete limitations and how many variables may come together to create a particular unique-perceptual-experience. To simplify this conceptually, I like to imagine a person with a

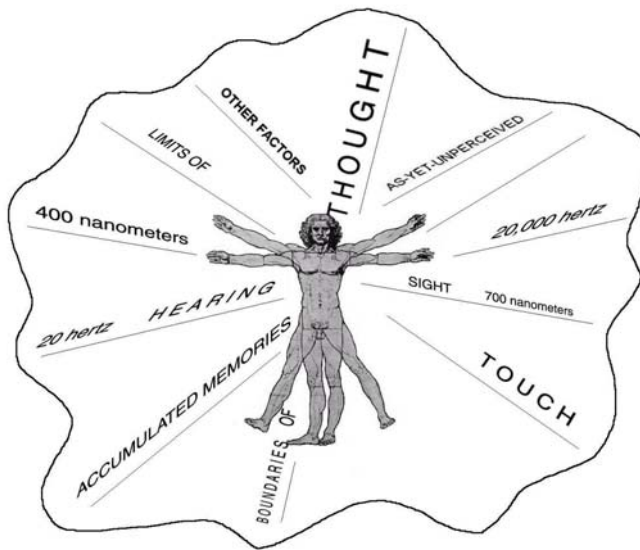
multitude of lines, of varying lengths, passing through him in various directions. Each line represents the range of a particular perception that the person may have.

For example, one line could represent the range of eyesight, while another could represent the range of hearing, the range of tactile sensitivity or the range of thought. Some lines might represent less currently tangible factors, such as the person's accumulated memories, limits of imagination, etc.

If the perceptual limits represented by these lines are imagined as being surrounded by some type of membrane, a picture may emerge appearing as a kind of lumpy three-dimensional bubble surrounding the person. This virtual bubble would represent the cumulative perceptual experience available to the person. It could be referred to as their perception-bubble.

The perception-bubble can be thought of in logical terms as a discrete set: the set of all unique-perceptual-experience-possibilities for any person.

It might be easy to comprehend how the perception-bubble concept could be applied to other species, such as a whale, a horse, dog, an insect or even a cell. For example, in the case of the dog, we already have some information indicating that the line representing a dog's hearing spectrum would be longer than that of a human.



The concept of perception-bubbles could also be applied other types of objects, even those considered “inanimate” or non-physical. However, an elaboration on this subject would not be directly pertinent to the focus of this document, so I will address these concepts in a future document.

Let's now examine how the concept of perception-bubbles applies to the human concepts of knowledge and logic.

Chapter 2

Bubbles of Logic

THE OMNIVERSE AND INFINITY

Historically, the term “Universe” was used to indicate the entirety of everything, everywhere. If something were referred to as being “in the Universe,” it would be any conceivable (or even inconceivable) object, such as matter, forces of nature, thoughts, experiences, space, time or anything else.

During the 20th century scientists redefined traditional concepts of the Universe, offering new proposals such as relativity, quantum mechanics and string theory. Some theoretical physicists now postulate that there may be more than one Universe and a multitude of dimensions beyond those we seem to perceive. They suggest that these many universes and dimensions may occupy a larger container called the Multiverse.¹¹

This has caused some contradiction in terminology. Some people still use the word Universe intending to mean the totality of everything. Others refer to the Universe, but do so only in terms of the Multiverse theory. In order to avoid confusion, I have adopted the term “Omniverse”¹² to fulfill the originally intended meaning of the term Universe. The Omniverse can be generally defined as the totality of all things including Universes, Multiverses, other dimensions, realms or any other objects currently perceived or as-yet-unperceived. It is, in essence, the totality of all, everything, or the set of all sets. For the remainder of this document I will use the term Omniverse when referring to this concept.

Theoretical physicists have also hypothesized that there may be an end to everything – an end to the Omniverse. Beyond this end there could be no objects: no space, time, matter, forces, thoughts, no things at all.¹³

There is, however, an obvious logical problem with such a statement. If there is an end to the Omniverse beyond which there is nothing, then in what is the Omniverse contained? The suggestion that the Omniverse is not contained in anything asserts that the Omniverse inhabits no place, that it is manifest in no realm. Under current concepts of human logic, this statement appears to be illogical. Without some type of container or some type of premise upon which it could be asserted, the Omniverse could have no basis for assertion.

Some newer theories explain space in ways that differ greatly from traditional human perception. One such theory suggests that space is manifest in some way like the surface of a curved tube¹⁴ and that there is no end or beginning. This explanation may be adequate in a metaphorical, mathematical or abstract perspective, but any type of manifestation within this model would seemingly still have to occupy some realm – even if that realm were to defy physical space as humans currently perceive it.

It could also be speculated that the Omniverse is manifest only in some non-physical form. For example, some philosophies suggest that our perception of space is just an “illusion”, that our world is just some kind of huge and relatively complex computer-like program, that it is just the dream of some superior being, etc. While these ideas may be plausible, any such

explanation would still require a container, whether or not that container corresponds to the human perceptions of space or time. The particular concept of our experience being a manifestation of some type of computer-like program is particularly poignant today. Given recent developments in fields such as computer science, nanotechnology, biotechnology and cognitive science¹⁵, such a proposal seems easily understandable and relatively plausible.

Nevertheless, any such definition still places the Omniverse in a container: the container of our thoughts, the container of a computer, the container of something beyond human perceptions of space and time, the container of some other being, etc. In this way there is an unending question of containment. For any proposed container or manifestation of the Omniverse, we are compelled by human logic to perpetually ask “In what is that container contained?” or “Upon what premise is that assertion based?”

Based on current human logic, there appear to be at least two obvious alternative propositions to the question of containment:

1. The Omniverse is infinite.
2. The Omniverse is manifest in a way that is neither finite nor infinite – a type of containment or habitat that is as-yet-unperceived or beyond our current comprehension and outside of the perception-bubble boundaries of current human logic.

If option 1 is considered as being accurate, the containment question is essentially left unanswered because even infinity must seemingly be manifest in some way or occupy some realm if we are to assert any confirmation of it. By definition, however, the concept of infinity would necessarily include its own container and thereby it at least defers the containment question in perpetuity.

If option 2 is considered as being accurate, we would not be able to draw any conclusions at this moment because we would currently be incapable of comprehending the characteristics of this answer.

Either way, we are left with a question that is seemingly unanswerable, given our current human perception-bubbles.

This issue applies in the opposite direction as well. As we explore smaller realms of matter, it is equally illogical to presume an end to smallness. Simply stated, if any object can be perceived as occupying what we perceive as the three dimensions of space, it must ostensibly consist of something. The unending chain of questions must also continue in this direction, ceaselessly asking “Then what is that object made of?” and so on.

So far as modern science is concerned, we have to abandon completely the idea that by going into the realm of the small we shall reach the ultimate foundations of the universe. I believe we can abandon this idea without any regret. The universe is infinite in all directions, not only above us in the large but also below us in the small. If we start from our human scale of existence and explore the content of the universe further and further, we finally arrive, both in the large and in the small, at misty distances where first our senses and then even our concepts fail us. – Physicist Emil Wiechert, 1896¹⁶

Every explanation must be further explained. – Karl Popper¹⁷

The paradoxical concept of infinity has been explored in various ways for thousands of years. Around the first century BC, the Roman poet Lucretius elaborated upon this idea using a hypothetical experiment. Lucretius suggested that if one could shoot a dart far outward through space and it was stopped by some sort of boundary of space, then whatever stopped the dart would have to be in a location beyond where the dart had stopped. Hence it would be proved that space continued beyond where the dart had stopped. Alternatively, if the dart were allowed to continue past the boundary, then that boundary would obviously not be the end of space.¹⁸

Before Lucretius, Aristotle suggested what was perhaps the most practical way to consider infinity. He proposed that since one could never prove infinity in an empirical way, we should accept the concept of potential-infinity as opposed to actual-infinity.¹⁹ In this way we would never deny the possibility of infinity; we would just accept that infinity could not be proven (under our current perceptual limitations).

Georg Cantor challenged ideas about infinity in the late 1800s by developing mathematical systems that treated infinity as a complete value, rather than a value that could not be defined because it went on forever. Cantor's ideas revolutionized mathematics and had a profound effect on 20th century systems of math and logic.²⁰

However, Cantor's work deeply disturbed many of his contemporaries and continues to generate controversy today.²¹ His proposition of treating infinity – a concept that by definition is uncountable – as a countable number seemed paradoxical or nonsensical. Yet despite their “not making sense,” his ideas were productive and useful in particular ways.

The Cantor story is an interesting illustration of perception-bubbles in action. Within a traditional perception-bubble of human logic, Cantor's ideas seemed invalid, yet within other perception-bubbles they seemed to attain certain validity and usefulness.

ABSOLUTISM

In consideration of the aforementioned infinity issues, consider the question of describing any object in the Omniverse in an absolute way. The concept of absolutism proposes that there are objects which are unaffected by all of the perceptual issues previously discussed. An absolute object would maintain exactly the same characteristics regardless of any observer's perception-bubble. In order to prove the validity absolutism, you would seemingly have to identify some object that satisfies this definition.

It is important to note that for the purposes of this document, the term “object” can be any conceivable thing: a force of nature, a collection of sub-atomic particles, a rock, a human, a society, a planet, a universe, a god, infinity, etc. An object can even be something seemingly non-material like an idea or the realm of mathematics. This term is simply a way to refer to all possible individual items or collections of items in a consistent way.

Suppose we wanted to test any object in the Omniverse to see if it was absolute. We might find an object that appears to never change, regardless of what perspective it is examined

from. Perhaps its invariability could even be supported from certain mathematical perspectives. We would not be able to claim the object as being absolute though, because the previously mentioned infinity issues mean that no object of the Omniverse can ostensibly be quantified in any complete way. There would always be some potential additional perspective from which the object had not yet been proven to remain unchanged.

This implication leaves us unable to claim any sort of absolute definition of not only the Omniverse, but also any of its objects. At best, we can seemingly only create definitions using our individual or collective perception-bubbles regarding the Omniverse or any objects within it.

This general concept is reflected in, and supported by, a famous theorem developed by Kurt Gödel. The following excerpt from *An Incomplete Education* by Judy Jones and William Wilson provides a concise and simple explanation of Gödel's Theorem:

In 1931, the Czech-born mathematician Kurt Gödel demonstrated that within any given branch of mathematics, there would always be some propositions that couldn't be proven either true or false using the rules and axioms ... of that mathematical branch itself. You might be able to prove every conceivable statement about numbers within a system by going outside the system in order to come up with new rules and axioms, but by doing so you'll only create a larger system with its own unprovable statements. The implication is that all logical systems of any complexity are, by definition, incomplete; each of them contains, at any given time, more true statements than it can possibly prove according to its own defining set of rules.

The same logic that supports Gödel's Theorem adds to the argument against absolutism. Just as in mathematics or in the concept of the Omniverse, any object is ostensibly incapable of absolutely defining any other object if both objects share the same realm.

This concept has a correlation in many human concepts, which, by their implicit definitions, are absolutist. These concepts are ostensibly impossible to ultimately quantify in the same way that the Omniverse or mathematics are unable to be ultimately quantified, and thus they attain meaning only when they are defined within the limited context of perception-bubbles. Some common examples of this are comparative concepts such as true/false, good/bad, up/down, life/death, everything/nothing, and others such as infinity, intelligence, space, time and consciousness. Some alternative ways to consider these concepts are suggested later in this document.

At this point in the discussion we have a logically inconsistent basis for some fundamental ideas about the Omniverse as well as for those concepts seemingly invented by humans in an attempt to precisely define some very imprecise ideas. Does that mean we should abandon all concepts founded upon absolutist ideas? Perhaps not, because notwithstanding their inconsistencies, these absolutist ideas may possess certain types of validity when considered from alternative perspectives.

One alternative perspective is that absolutist ideas may be considered useful simply by virtue of their manifestation as ideas. From this, or other alternative perspectives, absolutist concepts might be interpreted as constructional objects (arguments or premises) from which

further logical assertions might be subsequently built (similar to the way Cantor used the concept of countable infinities in practical ways).

THE LIMITS OF LOGIC

Now consider the concept of absolutism as applied to the central tool that we humans have relied upon to evaluate all phenomena. That tool is logic, and as I will explain, it appears to be clearly impaired by the limits of human perception. Although there remain various arguments about the definitions and quantifications of logic, the trait ostensibly common to various logical models is the very general concept that conclusions or assertions must be based upon the acceptance of appropriately related premises or causes.*

When we consider the limits of human perception and the problems of absolutism together with the proposition that there may be some kind of fundamental or absolute logic, we run into another tricky issue: logic itself can seemingly not be absolute. We can never say, "We have found the basic building blocks of logic." There must always be more underlying logic to support whatever "foundations" of logic we discover.

At this point we are left with some interesting considerations as they apply to the very concept of logic itself. Here are a few of them:

1. The concept of absolutism appears to be illogical and unsupportable because no object can seemingly be proven to be absolute.
2. If the concept of absolutism appears to be illogical, then the very statement of this illogicality cannot be accepted as being unquestionably accurate, because summarily declaring that absolutism is illogical is itself an absolutist statement.
3. Even though the concept of absolutism appears to be illogical, it may possess some usefulness based simply on its conception (perhaps similar to the way Cantor's countable infinity found practical use).
4. The concept that absolutism is illogical suggests that logic itself cannot be absolute, because logic can have no ultimate or absolute foundation or verification.
5. So, if logic cannot seemingly be considered to be absolute in any way, then perceived foundations of reason, learning and heuristics are ostensibly not absolute as well. This incompleteness of logic would imply that no alternative proposals regarding logic could be absolutely denied, no matter how absurd they might appear to be from a human perspective.

Consider the previously discussed human perception-bubble limits and the potential biases that these limits may create in our thinking. These limits additionally support the idea that human conceptions of logic and reason may be limited. There may be systems of inquiry and

* Of course, what we have historically perceived as the Omniversal "law" of cause-and-effect can also not be accepted as being absolute for all of the reasons already stated.

understanding beyond our current perceptions of logic that would allow us to perceive things as-yet-unperceivable.

In their 1998 book *Philosophy of the Flesh*, George Lakoff and Mark Johnson presented a very compelling case for what they refer to as "the embodiment of reason." They cite a great deal of recently obtained evidence supporting the hypothesis that human thought and concepts of logic have evolved from, and are completely based upon our biology. One implication of their proposal is that we would be likely to have significantly different systems of logic if we were constructed differently. This clearly suggests that logic is not absolute: it is species dependent.

Philosophically, the embodiment of reason via the sensorimotor system is of great importance. It is a crucial part of the explanation of why it is possible for our concepts to fit so well with the way we function in the world. They fit so well because they have evolved from our sensorimotor systems, which have in turn evolved to allow us to function well in our physical environment. The embodiment of mind thus leads us to a philosophy of embodied realism. Our concepts cannot be a direct reflection of external, objective, mind-free reality because our sensorimotor system plays a crucial role in shaping them. On the other hand, it is the involvement of the sensorimotor system in the conceptual system that keeps the conceptual system very much in touch with the world. – Philosophy in the Flesh²²

There is also evidence in other areas, such as quantum physics and math (these areas will be discussed later), suggesting that at certain levels beyond human perception, rules can change. Things that seem absolute and immutable at certain human levels of perception appear to mutate in curious ways at other levels. Current concepts of logic are intertwined with concepts of math and are clearly built upon human perception of the so-called physical world. It would seem appropriate, therefore, to accept the very plausible possibility that our general concepts of logic could similarly mutate at scales beyond the human sensory range.

In terms of set theory, it may be useful to consider all propositions that fall outside of conventional logic as a discrete set. Such logic could be referred to as extra-sensory logic, post-human logic, Antilogic²³, etc. (For simplicity, I will refer to this hypothetical logic as Antilogic.) Under the aforementioned premises, Antilogic might potentially be considered as having status equal to (or even greater than) human-centric logic.

This can be summarized by the following statements:

- No assertions, conclusions, logic or perceptions can be considered absolutely proven or complete.
- Logic (or any other objects) can only be defined to the extent of any observer's perception-bubble.
- Since logic, ostensibly, cannot be absolutely defined or proven, then alternative propositions cannot be summarily denied.

Given what has been explored up to this point, I suspect that there is a great revolution awaiting us in the evolution of logic: one that might be best referred to as post-human logic

or Antilogic. In order to unveil it, we will have to break free from our current biological limitations.

Chapter 3

Bubbles of Imperialism

Up to this point I have attempted to provide a logical argument that supports the following assertions:

1. Human perception is discretely limited in obvious ways.
2. No object (including logic) can be considered as being absolute.

In Chapter 1 I provided some historical quotes to illustrate assumptions of complete knowledge that were overturned by subsequent discoveries. Those subsequent discoveries created major changes in collective human perception – they stretched humanity’s perception-bubble. In the 20th century, the collective perception-bubble of humanity was stretched by a multitude of new ideas. Three of these are particularly interesting in relation to this discussion: relativity, quantum mechanics and string theory.

In the theory of Special Relativity, Einstein suggested that human perceptions of time could vary under certain circumstances. He also proposed that light would appear to move at a consistent speed regardless of how fast an observer was moving. Additionally, his General Relativity theory provided a radically new way to think about space and gravity. These proposals facilitated perceptions that were quite different from those commonly experienced by the human senses.²⁴

Quantum mechanics stretched the collective-human-perception-bubble even further. It revealed that at a scale too small for the physical human senses to detect, some of the so-called laws of physics that humans had believed to be immutable and absolute seemingly disappeared. Things that seem to occur at the level of quantum mechanics are so different from our human sensory experience that one of the field’s most prominent researchers, Richard Feynman, stated, “I can safely say that nobody understands quantum mechanics.”²⁵

Most recently, theoretical physicists have been exploring a field called string theory. The basic concept of string theory suggests that at levels even smaller than those defined by quantum mechanics, matter may be composed of tiny vibrating objects referred to as strings.

As a result of string theory, theoretical physicists have been exploring the concept that the physical Universe we seem to occupy may just be one of many Universes that "float like bubbles in water."²⁶

At about 10^{-38} metres across they (strings) are 20 powers of ten smaller than a proton...at this scale quantum gravity reigns and space as we know it probably transforms into a multidimensional structure which transcends our ordinary notion of space and time. – The Search for Infinity²⁷

Prior to these theories (and prior to the development of technologies that allowed them to be tested), there was no obvious reason for humans to have considered space and time in such ways. The collective perception-bubble of humans prior to these developments did not

ostensibly facilitate such perspectives. Humanity's history of perceiving finalities of knowledge has been based simply on our inability to perceive any further. Inevitably, these limits have continued to be surpassed, as the tools of technology have become more sophisticated.

These examples and the historical references in chapter 1, along with the logical arguments of chapters 1 and 2, provide ample evidence to suggest that we should never accept any explanation as being final or any knowledge as being complete. Yet, many prominent and influential thinkers apparently continue to accept and perpetuate such notions.

PERCEPTUAL IMPERIALISM

Even today, some of our most accomplished and illustrious thinkers seem to embrace absolutist concepts despite all evidence to the contrary. They appear to do this without providing a logical basis for their beliefs, which appear to be based upon unsubstantiated assumptions. Furthermore, many appear to denounce alternative propositions without seriously considering them or without providing a comprehensive logical basis for their denouncements.

One of the most blatant examples of this is the popular search for a "theory of everything." This hypothetical theory would explain every aspect of nature, and those who have faith in its provability suggest that once it is found, it will conclude our search for answers about the Omniverse. It is obviously an absolutist concept and is challenged by all of the previous considerations discussed in this document.

There are many other examples of assumptions and bias in science by some of today's leading scientific figures. Here are two that I read recently:

Can we devise a universal litmus test for scientific statements and with it eventually attain the grail of objective truth?...the answer could well be yes....Here is the argument. Outside our heads there is freestanding reality. Only madmen and a scattering of constructivist philosophers doubt its existence. - E.O. Wilson²⁸

Quantum mechanics is a very good approximation to the truth. – Stephen Weinberg²⁹

These statements presume some type of Omniversal, immutable and objective "truth." The first statement also assumes some type of absolutist, yet undefined concept called "reality." The concept of some Omniversal, absolute "truth" is not verifiable considering the factors previously discussed here. The confirmation of any assertion can seemingly only be verified within the scope of perception available to the observer.

In July 1993 Stephen Hawking was asked what he thought about astrology. He responded "rubbish." In 2001 he elaborated a bit more, stating, "The reason most scientists don't believe in astrology is because it is not consistent with our theories that have been tested by experiment."³⁰ The latter statement seems a bit more reasonable than the first. But, should a current lack of supporting data for something justify absolute refutation? At one time, quantum mechanics was *not consistent with theories that had been tested by experiment*. That did not necessarily make quantum mechanics an invalid proposal before it was

discovered. It simply meant that the evidence available at a particular time would not have been sufficient to support it.

The general concept of astrology – that humans are somehow affected by cosmological events – would seem to possess at least some potential for plausibility, even though there may not currently be clearly understood methods to test or verify related hypotheses. For example, today we have much information about electromagnetic radiation sent to Earth³¹ from the Sun.

In the 1940s, RCA hired an engineer named John Nelson to figure out how to improve radio broadcasting. Nelson discovered that the Sun's activities (and to a lesser extent other planetary activities) altered radio transmissions on Earth.³² Prior to Nelson's discovery, people had no evidence of these effects. Today, we have evidence that human brains are quite sensitive to electromagnetic radiation.³³ We have evidence that human bodies transmit and receive electromagnetic fields. We also have learned of things like "cosmic dust" that perpetually bombards Earth. How many other as-yet-unperceived objects may be in action between humans and the rest of the cosmos?

Additionally, we perceive the Omniverse as some sort of continuum, regardless of arguments about what that continuum may or may not consist of. All Omniversal objects can be perceived as interrelated and connected in certain ways, no matter how distant. Humans are inexorably linked in an explicitly comprehensible physical way to the rest of the Omniverse, even though the effects of such connections might currently be imperceptible to us.

While there may not be sufficient evidence today to assert that cosmological events noticeably affect our behavior, it would not seem prudent to summarily disregard this possibility given our perceptual limitations and humanity's history of ever-widening comprehension.

Physicist Roger Penrose authored a lengthy book called *The Emperor's New Mind* in 1989. In it he presents an argument generally proposing that humans are more than the sum of their physical parts and that something he refers to as "consciousness" is a result of more than just physical processes or the perceived forces of nature. The book is primarily concerned with examinations of "intelligence," "consciousness," "minds" and "awareness." Amazingly, Penrose liberally refers to these terms while constructing elaborate arguments and assertions about them, but he never attempts to define them. He attempts to use logic, mathematics and scientific evidence to support his assertions about objects that remain unidentified. Finally, near the end of the book, Penrose makes this brief statement:

*....I do not think that it is wise, at this stage of understanding, to attempt to propose a precise definition of consciousness, but we can rely, to good measure, on our subjective impressions and intuitive common sense as to what the term means and when this property of consciousness is likely to be present....I more or less know when I am conscious...*³⁴

Such a statement is clearly not sufficient from a logical or scientific perspective. When addressing the definition of intelligence, he is equally ambiguous and refers back to the undefined word "consciousness."

There is also the question of what one means by the term "intelligence." ...In my own way of looking at things, the question of intelligence is a subsidiary one to that of consciousness. I do not think that I would believe that true intelligence could be actually present unless accompanied by consciousness... .³⁵

He also presumes the capability to evaluate consciousness in other objects, even though he is not capable of even defining it for himself: *"What evidence do we have that lizards and codfish do not possess some low-level form of consciousness?"* Not only does he presume judgment capabilities, but he also assumes that whatever this non-defined characteristic is, humans have it to a greater extent than lizards or codfish. Perhaps his statement may have some type of validity within a specific frame of reference, but it cannot have logical validity without providing a definition of consciousness and evidence that he is capable of evaluating it in other objects.

My objective in pointing out these examples is not to be disparaging. These statements came from exceptional thinkers who have made many contributions to science. The point is simply that even our most accomplished thinkers are subject to the limitations of being human: to the limitations of their own perception-bubbles.

These examples could be considered as a kind of scientific imperialism. But imperialism is not limited to science. There also appears to be a long and continuing history of philosophical imperialism. I have yet to find philosophical writing that does not include at least some reliance on assumptions for the interpretation of words such as "truth," "existence," "good," "intelligence," "being," "fact," "right," etc.

Consider the word "intelligence." Even though there appears to be no clearly defined or agreed upon definition of this word, many philosophers appear to have made grand presumptions about intelligence, such as

- There is any such thing as intelligence.
- Humans may be classified as intelligent.
- Humans possess a higher form of intelligence than other objects of the Omniverse.
- Humans are even capable of understanding, defining or evaluating concepts of intelligence.
- Other objects should be subjected to evaluation by these vague human concepts and standards of intelligence.

Perennial questions of philosophy such as "Is a plant intelligent?" are predicated on such assumptions. Without a discrete definition of intelligence and without evidence that humans are capable of judging it, such questions are logically impotent.

A kind of intellectual imperialism permeates our culture with ideas such as Artificial Intelligence. The term Artificial Intelligence appears to be an unnecessary distinction invented by humans who consider themselves in possession of higher levels of this undefined thing called intelligence than other objects in the Omniverse.

Another example of intellectual imperialism is the Turing Test. This test was proposed as a way to determine if any computer possesses Artificial Intelligence. In this test a person communicates remotely (historically using a keyboard) with a computer. The person is not told that he or she is communicating with a computer. If, after communicating for a while, the person cannot determine whether the other party is another person or a computer, then the computer is said to possess Artificial Intelligence.

Some of today's leading scientists seem to have accepted the premise of the Turing Test without reservation.³⁶ Yet the premise is unsubstantiated. It presumes that there is some kind of absolute definition of intelligence, that humans possess this intelligence, that the display of human characteristics is proof of intelligence and that a human participant would be capable of recognizing intelligence. This is a test based on ambiguity and assumption. My perception-bubble expects that the misnomer of Artificial Intelligence will eventually be abandoned.

From a broader perspective, these examples, and other presumptions can be considered as a kind of biological or perceptual imperialism: an assumed notion that humans are capable of evaluating and judging things in any way that should be considered absolute.

It is probably worthwhile to reemphasize here that I do not propose Perceptualism as any type of ultimate or absolute system, philosophy or "truth." Rather, I propose that Perceptualism and its tools can be useful for comprehending our current limitations and searching for ways to get beyond them.

There is also the factor of bias (whether intentional or unintentional) against unorthodox thinking and the psychological tendency to defensively uphold beliefs. As noted by psychoanalyst Russell A. Lockhart, Ph.D., when a person adopts a belief, he or she is unintentionally inclined to seek evidence to support the belief while discounting evidence that opposes the belief.³⁷ This unintentional bias can compound the effects of limited perception.

In his book *The Conscious Universe*, Dean Radin, Ph.D., points out many examples of unintentional bias, including the following:

*... sociologist Harry Collins showed that for controversial scientific topics where the mere existence of a phenomenon has been in question, scientific criticisms are almost completely determined by critics' prior expectations.*³⁸

*An experiment demonstrating the self-fulfilling prophecy was described by Harvard psychologist Robert Rosenthal in a classic book entitled *Pygmalion in the Classroom*. Teachers were led to believe that some students were high achievers and others were not. In reality, the students had been assigned at random to the two categories. The teachers' expectations about high achievers led them to treat the "high achievers" differently than the other students, and subsequent achievement tests confirmed that the self-fulfilling prophecy indeed led to higher scores for the randomly selected "high achievers."*³⁹

Consider these additional examples from science journalist Richard Milton:⁴⁰

Michael Faraday was described as a charlatan by his contemporaries when he announced that he could generate an electric current simply by moving a magnet in a coil of wire.

For five years, from December 1903 to September 1908, two young bicycle mechanics from Ohio repeatedly claimed to have built a heavier than air flying machine and to have flown it successfully. But despite scores of public demonstrations, affidavits from local dignitaries, and photographs of themselves flying, the claims of Wilbur and Orville Wright were derided and dismissed as a hoax by Scientific American, the New York Herald, the US Army and most American scientists. Only weeks before the Wrights first flew at Kitty Hawk, North Carolina, the professor of mathematics and astronomy at Johns Hopkins University, Simon Newcomb, had published an article in The Independent which showed scientifically that powered human flight was “utterly impossible.”

In the late 1700s, the French Academy of Sciences rejected the claim of meteorites because “rocks cannot fall from the sky.”

While the conceptual ideals of science appear to be unprejudiced, they occasionally seem to get distorted and trapped by the limited perception-bubbles of those who attempt to practice and govern it.

Science is not one thing, it is many, it is not closed, but open to new approaches. Objections to novelty and to alternatives come from particular groups with vested interests, not from science as a whole. – Paul Feyerabend⁴¹

EVALUATING PROPOSITIONS

We have reviewed perception-bubble limitations, the principles of absolutism and the biases of perceptual imperialism. In order to avoid these traps it could be useful to evaluate alternative propositions based on their possibility, plausibility, and probability:

In terms of possibility, the evidence presented so far would strongly suggest that we should never consider any proposition to be absolutely impossible.

Plausibility is a measurement of ostensible underlying logic. For example, there is at least some ostensible underlying logic (mentioned previously) to suggest that a link could be discovered between cosmic events and human behavior.

Probability is a measurement of ostensible evidence. To continue with the example of astrology, while it may have some logical plausibility, scientists have seemingly not yet been presented with enough consistent, repeatable evidence to accept any related hypotheses as being probable. Probability is a particularly interesting subject because it relates to two important features of the contemporary scientific method: repeatability and statistical significance. Some considerations of these factors will be discussed later, relating to anomalous phenomena.

In a way, the collection of possibility-plausibility-probability factors can be thought of as sequential steps in establishing relative levels of acceptance for any assertion. Humans commonly use the term “knowledge” to indicate reliance on an assertion. For example, someone may say, “I know that I will not fall through the Earth when I sit on this chair.” It might be more accurate for a person to say: “Based on previously acquired evidence and experience, I am relying on what seems to be an exceedingly high probability that I will not fall through the Earth when I sit on this chair.”

The common usage of the word “knowledge” intersects with another commonly used human term: “belief.” There may be many ways to delineate these two terms, but for the purposes of this discussion I shall use a simple distinction:

People generally claim to “know” something when they have accumulated enough evidence to support what appears to be the exceedingly high probability of an expected outcome. This expectation is so high that it is accepted without question.

People generally claim to “believe” something when they accept an assertion without accumulating a similarly high amount of evidence.

In this way, individual interpretations of the difference between “knowledge” and “belief” can be considered as varying points along a scale of probability.

Chapter 4

Stretching Some Bubbles

Humans have historically attempted to create definitions of various concepts using absolute terms. However, as previously discussed, absolutist concepts seem to have many flaws. Any attempted absolute definition will be limited by the perception-bubble of the entity that creates the definition.

In consideration of everything previously presented, following are a few suggestions from my perception-bubble for ways to reconsider some topics that humans have historically tried to consider in absolute ways. These suggestions are not intended to be definitive. They are simply offered as potentially useful alternatives that take into consideration the factors of Perceptualism.

REALITY

Historically, people have used the concept of reality to suggest some sort of absolute perspective from which there can be no alternatives. The previous chapters offer a variety of reasons why such a concept has seemingly no substantiation. From the practical human perspective, a more accurate interpretation of this concept might be: “a perception shared by the majority of humans.”

Beyond the problems already discussed, definitions of reality (or of any other absolutist concepts) are subject to many interpreted meanings, even in common mass-perception human usage. I have yet to encounter any definition of this word that is even remotely useful or meaningful to me. To illustrate how elusive such definitions are, just consider the seemingly simple aspect of trying to define such concepts using human language. For example, here is a definition of the word “real” taken from Merriam-Webster's Dictionary:

REAL: Function: adjective

1 : *of or relating to fixed, permanent, or immovable things (as lands or tenements)*

2 a : not artificial, fraudulent, illusory, or apparent : GENUINE <real gold>; also : being precisely what the name implies <a real professional> b (1) : occurring in fact <a story of real life> (2) : of or relating to practical or everyday concerns or activities <left school to live in the real world> (3) : existing as a physical entity and having

properties that deviate from an ideal, law, or standard <a real gas> -- compare IDEAL 3b c : having objective independent existence <unable to believe that what he saw was real> d : FUNDAMENTAL, ESSENTIAL e (1) : belonging to or having elements or components that belong to the set of real numbers <the real roots of an equation> <a real matrix> (2) : concerned with or containing real numbers <real analysis> (3) : REAL-VALUED <real variable> f : measured by purchasing power <real income> <real dollars> g : COMPLETE, UTTER <a real fiasco>

3 *of a particle : capable of being detected -- compare VIRTUAL* 3

- *re-al-ness* noun
- *for real* 1 : in earnest : SERIOUSLY <fighting for real> 2 : GENUINE <couldn't believe the threats were for real>

Function: noun

- *re-al-ness* noun

- *for real* 1 : in earnest : SERIOUSLY <fighting for real> 2 : GENUINE <couldn't believe the threats were for real>

Function: noun

a real thing; especially : a mathematically real quantity

Within this definition, we have already run into perception-bubble inconsistencies. For example, the phrase “*of or relating to fixed, permanent, or immovable things (as lands or tenements)*” can easily be understood as only valid within particular perception-bubbles. From the perception-bubble of a human who resides in a town and who perceives a nearby mountain as never moving, this phrase might be adequate. From the perception-bubble of quantum physics the demarcation between what a human perceives as a mountain and its surroundings might be perceived as a violently moving area of sub-atomic entities with no clear indications of larger scale division. From the perception-bubble of our solar system’s sun, the mountain may be perceived as a tiny bump, rapidly spinning along with the rotation of a little planet that is continuously circling the sun – hardly fixed or immovable. Even from the perception bubble of humans on Earth, over a temporal perspective of 200,000 years, the mountain may dramatically change its shape and boundaries.

Notwithstanding the perception-bubble problems, in order to pursue this definition further all words used in this definition would need to be defined. For the purpose of this example I’ll just follow one of these words, the word *genuine*:

GENUINE:

1 a : actually having the reputed or apparent qualities or character <genuine vintage wines> b : actually produced by or proceeding from the alleged source or author <the signature is genuine> c : sincerely and honestly felt or experienced <a deep and genuine love> d : ACTUAL, TRUE <a genuine improvement>
2 : free from hypocrisy or pretense : SINCERE

Again, I’ll just follow one of the words used in the definition above: the word “actually”:

ACTUALLY:

Function: adverb

1 : in act or in fact : REALLY <nominal but not actually independent -- Karl Loewenstein> <won't actually arrive for an hour>
2 : in point of fact -- used to suggest something unexpected <he could actually read the Greek>

As you can see, at only the second level of attempting to define the words that define reality, we have already found a circular reference: “real” is defined as “genuine”. “Genuine” is defined as “actual”. “Actual” is defined as “real”. This process could be continued, but would only lead to an ongoing series of circular references.

Words such as reality are ostensibly only meaningful when expressed and comprehended within the context of perception-bubbles, not when they are thought of as being absolute. I would suggest abandoning the use of such words and replacing them with more cautious statements that acknowledge the unique-perceptual-experience of whatever entity makes the statement.

NON-REALITY, EMPTINESS, NOTHING

“Nothing” has never been ostensibly proven. For many years, scientists referred to empty space, and considered the concept of empty space to be a de facto standard. In recent years however, new discoveries have proposed that space is not empty, but instead filled with things like dark matter and space plasma. Even the concepts of dark matter and plasma must be challenged by asking: “what is there between the bodies of these things?” When scientists talk about finding ultimate particles that are the building blocks of all matter, we must similarly ask “what is between these particles?” To simply answer “nothing” is not sufficient. As we’ve seen with the other examples, this line of questioning will ostensibly go on without end.

We do of course, utilize the concept of nothing in a seemingly abstract way for mathematics and theoretical logic. Our perception of the concept nothing therefore makes it an object that we are at least capable of perceiving, if not verifying empirically. By possessing just this one attribute, nothing is not quite nothing. It is at the very least, a perception.

As Aristotle pointed out, the concept of any space being empty is also paradoxical and logically inconsistent. Three-dimensional space by virtue of its humanity-bubble definition would occupy some extent of what we refer to as length, width and height. If a space could be literally empty, it would seemingly not even maintain dimensional attributes. Also, a literal interpretation of no-thing would suggest that nothing could not even be itself – it would appear to be a self-nullifying definition. The same points apply to the concept of a vacuum. Considering humanity’s historical errors of assumption in science and philosophy, as well as the proposition that as-yet-unperceived-factors could some day override these logical inconsistencies, it would seem wiser to define non-reality, emptiness, nothing, and all other terms intended with the same general meaning as *“as-yet-unperceived things.”*

INFINITY

As discussed in the previous sections, infinity has so-far remained immune to empirical provability. However, various alternative interpretations of infinity may be useful in logical explorations (as in the case of Georg Cantor) or when it is considered as potential-infinity as suggested by Aristotle. Perhaps it would be useful to otherwise consider the idea of infinity as simply *“as-yet-unperceived limits or ends.”*

TRUTH, FACTS, KNOWLEDGE

Historically, humans have attempted to use these terms with absolutist intent, which is an ostensibly implausible effort as already explained. An alternative to the absolutist view would be to use functional definitions of such concepts within definable contexts of perception-bubbles.

Concepts of irrefutable facts, laws, truths or knowledge would be better qualified as being only irrefutable as far as can they currently be perceived by any evaluating entity.

Even in formal systems of logic and mathematics issues such as truth, facts, laws and knowledge do not have absolute meaning.

Formal systems are constructed with axioms, upon which all subsequent computations are built. Axioms establish the rules of each system. They allow or disallow certain things to be done.

Historical axioms of math were based on human perception. It is not difficult to imagine an early human moving stones around and observing basic concepts of arithmetic that would later be accepted as “self evident” axioms. But how self-evident are the axioms of math? Can we absolutely state that 1 plus 1 will always equal 2? Not exactly.

In addition to all of the issues previously discussed that would argue against any type of absolute concepts in math or logic, consider the realm of quantum mechanics where one electron can simultaneously appear to be in more than one location and other equally strange phenomena seem to occur. Imagine how different the “self-evident” axioms of math would have been if such events were routinely observed within the spectrum of human eyesight.

No matter how self-evident an axiom appears to be there is a point at the adoption of any axiom where someone or something decides what rules will be followed based on assumption. Questions of causality, infinity and alternative perceptions still remain, waiting to be probed further and maintaining the possibility that axioms may change.

Mathematician Gregory J. Chaitin summed this up in his 1999 book *The Unknowable* in the following way: “...why are the axioms (*of math*) accepted without proof? The traditional answer is, because they are self-evident. I believe that a better answer is, because you have to stop somewhere to avoid an infinite regress!”⁴²

Chaitin specializes in Metamathematics, a discipline that examines the foundations of math. He has worked in areas that expand upon the work of Godel and others, indicating that underneath basic mathematical axioms lies a world of what he refers to as “randomness.”⁴³ He has suggested that math should no longer be considered an unchangeable, absolute system. Instead, Chaitin suggests that math must be considered in the same way that contemporary physics is now considered – a system where rules may change at various scales.

*Real knowledge is to know the extent of one's ignorance. - Confucius*⁴⁴

*What, then, is truth? A mobile army of metaphors, metonyms, and anthropomorphisms--in short, a sum of human relations, which have been enhanced, transposed, and embellished poetically and rhetorically, and which after long use seem firm, canonical, and obligatory to a people: truths are illusions about which one has forgotten that this is what they are; metaphors which are worn out. - Nietzsche*⁴⁵

NATURAL, ARTIFICIAL

Commonly, something is deemed artificial if it is created by humans and would not otherwise be found in the Omniverse. Yet, other species create new objects (bird nests, termite mounds, etc.) and they are not commonly considered as artificial.

To what degree does a termite mound differ from a human-built house? One could argue that the human house should be defined as artificial because it is much more sophisticated than a termite mound. Industrialized human homes have microwave ovens, air conditioning, lights, etc. However, termite mounds contain elaborate food processing and temperature regulation systems (and their systems don't even require electricity).⁴⁶ From certain perspectives, termite homes could be considered more sophisticated than many contemporary human houses. Where would the lines between natural and artificial be satisfactorily drawn?

While humans do appear to produce more elaborate and varying constructions than other species, the question of defining what is artificial seems to be a judgment of scale, not absoluteness. In consideration of this I would suggest simply eliminating the concept of "artificial" and regarding all objects and events as being natural.

GOOD, BAD

Here again, the principles previously discussed apply in an obvious way. Any object may judge another object as being good or bad, but this evaluation is ostensibly governed by the perception-bubble of the judging entity.

Notwithstanding this understanding, what about the concept adopted by some religions and philosophies that there might be some sort of absolute good or evil that is universal throughout the entire Omniverse? Such absolute definitions could ostensibly never be proven because in order to do so, (as previously discussed) the proving entity would have to be outside of the Omniverse.

Some people might claim that the concept of a god, or gods, would fulfill such a qualification. The problem with such a claim is that if any object, including any kind of god (regardless of its definition), were asserted to be beyond the boundaries of the Omniverse, the concept of the Omniverse would automatically expand to include the habitat of that object. Hence, that object would not be logically capable of judging anything in Omniversal absoluteness, because it too would be subject to the limitations of absolutism and the principles of perception-bubbles.

Even war, disease, crime and other phenomena that most humans appear to consider as being not good, are only judged as not being good within the collective perception-bubble of particular groups of humans. When considered in alternative contexts, such phenomena might be interpreted differently.

In his book *The Lucifer Principle*, Howard Bloom contends that concepts traditionally considered as evil are "woven into our most basic biological fabric." Bloom asserts that characteristics of human behavior we generally view as bad or vile are nevertheless an inextricable and inevitable part of nature's process, and that we humans are simply "pawns who suffer and die to live out (nature's) schemes."⁴⁷

I would suggest completely abandoning the concepts of good and bad, and replacing them instead with a comprehension that there are ostensible effects from the actions of any object involved in any situation that may be interpreted as beneficial or detrimental depending on the perception of the interpreting entity. Effects may be judged as good or bad by each perception bubble. There is no basis to assume that such definitions must be shared.

“for there is nothing either good or bad, but thinking makes it so” – Wm. Shakespeare: Hamlet

INTELLIGENCE

Most definitions of intelligence that I’ve reviewed seem to vaguely propose that in a very general perspective, intelligence is the ability of an object to acquire, synthesize and apply data. It should be obvious by this point that attempts to define intelligence in any absolute way will be subject to all of the absolutist contradictions previously discussed and that from a practical perspective, any attempted definition could only be verifiable within limited perspectives.

Additionally, the concept of intelligence has left us with the legacy of perceptual and biological imperialism, as described in Chapter 3. How much more might humans have been able to historically perceive if they had not been restricted by the judgment limitations in human concepts of intelligence?

Because it is so unclearly defined and subject to a multitude of interpretations, I would suggest completely eliminating this word as well as the vague concept of intelligence. Instead of speaking in terms of intelligence, we can speak more specifically in terms of particular processes or characteristics that any entity may display.

CONSCIOUSNESS

Consciousness is another concept that humans have seemingly never clearly defined, but one which humans nevertheless seem to accept in a vague way as being absolute. The issues previously mentioned regarding intelligence and intellectual imperialism apply equally to consciousness. Whatever definition one may ascribe to this term, it ostensibly cannot be considered absolute.

Most humans seem to generally interpret consciousness as the ability of an object to display human characteristics. I suspect this to be a poor definition from many perspectives.

Historically, philosophers have asked questions such as “what is consciousness?” This is an impotent question. It assumes that there is a thing called consciousness and that humans would be qualified to recognize it and define it.

One particularly interesting perception-bubble definition of consciousness would be the ability of any object to be reflexive, in that it can manifest some data that is then fed back to itself. In this way the object creates feedback loops (just like the feedback loops that allow human brains to feed themselves thoughts). This suggestion is embellished by experiments in designing neural networks where recurrent feedback loops appear to facilitate characteristics of memory, learning, acquisition and application of data.⁴⁸

There is also a fascinating theory developed by Gary Schwartz, Ph.D. and Linda Russek, Ph.D. that seems to compliment this particular perspective. Their theory is called Systemic Memory and it proposes that all objects are engaged with other objects in a perpetual exchange of information. Systemic Memory proposes that as information flows back and

forth between objects there is a “dynamic memory of their exchange over time through the circulation of their information and energy.”⁴⁹

The proposal that every object somehow retains some sort of residual “memory” effect from all other objects with which it has ever interacted provides a hypothetical basis for things like homeopathy, aroma therapy, kinesiology and other practices traditionally unacknowledged by the current scientific orthodoxy.

For example, if a person wore a wristwatch every day for twenty years, this theory would imply that twenty years of feedback data between the parts of the watch and the person might somehow have been accumulated and retained in both the watch and in the person. It further implies that one might be able to somehow obtain information about the watch-wearer by extrapolating that data from the watch.⁵⁰

Some people who claim to have extra-sensory abilities suggest that they can obtain information about others by touching their personal property. The Systemic Memory hypothesis could provide a logical explanation for such a claim, although it would not seemingly answer the question of how a person would be able to extrapolate such data.

Such a possibility was suggested in the case of Claire Sylvia, a woman in her forties who received a heart-lung transplant in 1988. After recovering from the surgery, she reportedly had cravings for beer and chicken nuggets, foods that she had not desired at any time before the surgery. Reportedly, she subsequently discovered that beer and chicken nuggets were favorite foods of the 18 year-old boy whose organs she had received.⁵¹

Under the hypothesis of Systemic Memory, the previously mentioned description of intelligence and the previously mentioned definition of consciousness, every object might be considered as having intelligence or consciousness; an electron, a cell, a human, a galaxy, etc.

SANITY

Psychological characteristics shared by the majority of the human population are considered normal. Anyone with those attributes is considered sane. Anyone with psychological characteristics falling outside of that majority is considered to have psychological problems or to be insane. Definitions of sanity seem to be completely subjective based upon the majority collective norm of humans in any given era.⁵² This system is inherently problematic in that there is ostensibly no other arbiter employed to quantify varying levels of mental functioning. Humans are considered psychologically sane as long as their brains work like everyone else's.

Under such criteria, the majority of humans could be considered abnormal or insane if their psychological characteristics differed from the majority of other Omniversal objects. This concept could also extend to our concepts of logic, rendering our self-perceived logic or intelligence nothing more than a psychological dysfunction when compared to other Omniversal creatures or when viewed from alternative perspectives. I suspect this to be a key issue relating to the limitations of human cognition. To paraphrase a popular human expression: *the patients may be running the planet.*⁵³

These ideas support plausibility for a variety of reconsiderations about human normalcy. As an example, consider a generally accepted symptom of alleged psychological disorder: hearing disembodied voices. A person may claim to hear voices speaking to their brain. Without any evidence of such an occurrence that could be perceived by the majority of others, this person would be diagnosed as mentally ill. The possibility that there may be voices speaking, and that this person may be the only one within range who has the extended sensory capabilities to recognize it, is generally not considered a plausible explanation. Yet, there is a continually growing body of scientific evidence to suggest that some humans do possess sensory perception capabilities beyond average ranges.⁵⁴ Things that have historically been referred to as illusory might be more accurately considered as “alternative perceptions.”

Another interesting aspect about this issue is that while deviations from the socio-psychological norm are sometimes repressed or attempted to be reversed in the name of maintaining health, deviations have been the ostensible catalyst for progress and growth in nature. Biological evolution appears to be based on the adoption of deviations. Groundbreaking scientists, artists and other achievers in human history were those who deviated from the norm. What is deviant in one era may be normal in another. Perhaps one day soon we may all hear voices.

Today, we are seeing an interesting phenomenon with the recently emergent diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) in children. ADHD is generally characterized by symptoms of inattention, hyperactivity and impulsivity.⁵⁵ This type of behavior appears to deviate from the traditional 20th century norm. Children diagnosed with ADHD have difficulty in dealing with traditional learning methods and traditional behavioral standards. There is some controversy about the validity of ADHD diagnoses, and many theories as to the cause of ADHD including sociological, medical and dietary factors. There may however be another perspective that does not necessarily conflict with those theories, but instead may offer an anthropological complement to them.

This alternative proposal suggests that ADHD may not necessarily be a disorder from the perspective of a larger timeframe, but may rather be the beginning of a biological evolutionary change in human brains.

One suggestion as to why such a brain change would be adopted by nature is that human information exchange is continually accelerating at exponential rates.⁵⁶ In order to digest ever-increasing amounts of information, humans no longer rely on traditional biological methods. We have in many ways surpassed previous biological saturation points for the digestion of information. This is partially evidenced by our current reliance on computers and technology.

Under this premise it could be considered that brains being diagnosed with ADHD might be early examples of evolutionary changes that facilitate multi-tasking, non-linear thinking and input of information at a much more rapid pace than previous brains. Under such a definition these children would be the first in a new variation of human brains, designed for the 21st century, but being judged and suppressed by those with 20th century brains.

There is a growing body of research that supports the plausibility of this idea. In her book *Dreamers, Discoverers & Dynamos: How to help the child who is bright, bored and having problems in school* Dr. Lucy Jo Palladino discussed the similarities between children diagnosed with ADHD and characteristics of people she refers to as having “exceptional intelligence:”

They enjoy adventure and prefer new territory, especially when it comes to their own mental landscape. Like Edison, they are highly original, unconventional, and inventive. They are the mavericks, pioneers, and artists. Because they are disposed to divergent thinking, it is an uphill battle for them to concentrate on only one idea at a time. In view of this, their school years, like Edison’s, may be filled with pain and frustration.⁵⁷

Bonnie Cramond, Ph.D., associate professor of educational psychology at the University of Georgia, made the following statement in a 1995 paper:

There is a possibility that structural differences in the brain are related to the differences in cognitive functioning that appear as ADHD or creativity. Neurobiological anomalies are reported in both the literature on ADHD (Hynd, Hern, Voeller, & Marchall, 1991) and the literature on creativity (Herrmann, 1981; Torrance, 1984).⁵⁸

In the same document Dr. Cramond discussed the case of Michael Kearney, who was diagnosed at an early age with ADHD. The drug Ritalin was prescribed as a solution, but Michael’s parents rejected this treatment, opting to instead provide him with a home based education that was contoured to his specific needs. Michael went on to become the youngest person to ever earn a Masters degree, in Chemistry, at age 14.

THE THEORY OF EVERYTHING

Many contemporary theoretical physicists propose that there is an ultimate, fundamental set of laws that govern all aspects, perceived and as-yet-unperceived, of the Omniverse. Many are working to discover such a theory. They suggest that once this fundamental set is found, explanations of everything in the Omniverse will rise from them, and there will be no causative explanations below them. This conception is clearly based on absolutism and contains all of absolutism's logical inconsistencies. It is simply not ostensibly plausible unless we abandon current ostensible logic and disregard the issues raised previously in this document.

Perhaps a more accurate way to consider this endeavor would be a search for the “Ostensible Theory of All that we Currently Perceive.”

"The history of science teaches us that each time we think that we have it all figured out, nature has a radical surprise in store for us that requires significant and sometimes drastic changes in how we think the world works. Then again, in a bit of brash posturing, we can also imagine, as others before us have perhaps naively done, that we are living through a landmark period in humanity's history in which the search for the ultimate laws of the universe will finally draw to a close." - Brian Greene, The Elegant Universe, 1999

“Universe is inherently complex and eternally regenerative. It can have no 'beginning' or 'ending'. Vast numbers of scientists as yet labor vainly to account for the misconception of beginnings and endings...There is no single building block-there are only complexes of complex systems.” R. Buckminster Fuller, Critical Path 1980

LIFE, DEATH

As with the other concepts discussed in this chapter, attempts to absolutely define the words: “life” and “death” can easily be perceived as a futile endeavor. Historical human concepts of life have seemingly emanated from within the limits of our perception bubbles and the assumption that any object showing certain human-like characteristics may be defined as “alive”. This way of defining life also adds to the previously discussed issue of biological imperialism.

We could consider these vague human concepts of life, and the idea of separation between “living things” and “nonliving things” from a variety of perspectives. For example, from what we currently refer to as the sub-atomic level, components of all objects in the Omniverse appear to be perpetually interchanged, and forces of nature appear to continuously perpetuate through seemingly unending chains of cause and effect. Therefore, parts of every human (and every other object) as well as the residual effects of every human's actions can be perceived as being immortally reborn and reconstituted as they become components of new objects (including becoming causes of subsequent reactions).

Under such a perspective, the components from which our bodies are made do not appear from nowhere without any history and do not disappear after our brain-body units have decomposed on the human-perspective. These components are continuously recycled into other things. Under such a perspective, concepts of being alive or being dead do not have absolute meaning, and concepts such as reincarnation can be reconsidered as particle recycling.

PERSONALITIES & INDIVIDUALITY

As stated earlier, human brains can use the product of one thought as the input or stimulus for another thought. This reflexive thought capability, along with the input from our other senses creates a perceptual demarcation – a unique impression that each of our perceived biological units has of being separate from all other objects of the Omniverse. This seems to be the figurative center of human-scale perception-bubbles. It creates the individual perspective of our unique biological packages.

In such a perspective, we all are quite unique and eternally individual because each of us accumulates a seemingly singularly unique series of sensory experiences while we are assembled in these particular biological forms. So far, there does not appear to be evidence of any two people ever ostensibly sharing a complete human scale “lifetime” with the exact same sensory (including thought) inputs. As a result all humans (as well as all other objects in the Omniverse) could seemingly be described as undeniably unique and individual.

From this perspective, if I could be cloned or duplicated in some way that could produce an instant and complete duplicate of me, the new person would no longer be me from that point forward. Although he would share my memory history, physical composition, genetics and

so on, from the moment he was created he would begin experiencing a different perception-bubble. Our unification would only be in the past. He and I would have different perception bubbles from that point forward. We would be different individuals with a shared past.

Suppose we were able to obtain some DNA from Jesus, DaVinci or Hitler and be able to create new persons with their exact genetic compositions. Does this mean that the clones would be destined to repeat the activities of their predecessors? The ostensible answer can be easily perceived as no. Although their genetics (as well as any as-yet-unperceived other factors) might cause the clones to share innate characteristics with their predecessors, they would nevertheless have entirely new sets of unique experiences after their assemblage and these experiences would create entirely new and eternally unique perception-bubbles.

Beyond this perspective is the question of demarcation. Although the previous cloning example focused on a human body as an individual, individuality could apply to any sub-component of a single human, or could apply to groups of humans.

In this way, the perception of any object (or collection of objects) as being an individual can be accepted by mutually agreed upon definition of boundaries rather than by dogmatic definitions of what constitutes an individual or an entity. There is no absolute definition of me as an individual, only mutually shared perceptions of what is assumed to be “me.”

Humans seem to share a common perception of each other as being separated by what we refer to as our biological bodies. In this day-to-day usage, I use my vision to delineate the boundaries of various persons based on my visual perception of where their skin appears to end. However, if my current eyes were replaced with infrared sensors that only recognized heat fields, I might instead define wider boundaries of each person I “saw” based on the fields of heat that extend beyond the boundaries of skin. This conceptual shift can seemingly continue in any number of ways, such as if my current eyes were replaced with sensors that “saw” at a quantum or electromagnetic level. Perhaps in that case I might not be able to delineate any clear boundaries between “me” and any other person or thing.

I suggest that there is no “me”, there is no “you”, there are simply perceptions.

In his 1975 book *Sociobiology*, E. O. Wilson wrote: “although pondering the definition of an individual might strike one as a waste of time, it is actually a substantial philosophical problem...the brain too is a collection of billions of neurons – each one or small collections could be considered minibrains, etc...just as a group of humans thinking together could be considered a single unit...”⁵⁹

One convenient model to consider the individuality of a human (or any other object) would be this:

The culmination of unique physiology (individual biochemistry, genetics, epigenetics⁶⁰, etc.) plus that person’s accumulated unique-perceptual-experiences with the caveat of possible, as-yet-unperceived factors.

individuality =
Physiology + Perception bubble + potential for as-yet-unperceived factors.

This is not proposed as any type of ultimate definition, only as a simplified and potentially useful model for certain explorations that I have found convenient.

Abandon knowledge; discard self – Shen Dao⁶¹

SOULS, SPIRITS, AURAS

The common general concept of a soul or spirit seems to be that of some extra-sensory component attributed to each human which is beyond observable perception, and which allegedly retains in perpetuity, characteristics that were attributed to the biologically perceived individual. Obviously, based on the perceptual limits previously discussed, there would be no reason to summarily deny this possibility. However, a lack of empirical evidence, lack of a logical hypothesis and the problems of verification previously discussed for other absolutist concepts suggest that there would also be no reason to accept this notion in its common interpretation. Within the framework of the previously mentioned Possibility/Plausibility/Probability scale, it would seem as if the traditional concept of souls and spirits is still stuck somewhere in the range of plausibility.

Nonetheless, there are some interesting alternative interpretations that could be applied to the general idea that some aspects associated with what we perceive as individuals might continue on in various ways.

For example, from a contemporary-physics point of view, we perceive that human bodies emanate electromagnetic characteristics.⁶² These characteristics are generally considered to be outside of the ostensible sensory range of most humans. If such fields might be detectable in some way that is not currently apparent to humans, they could provide one type of plausible basis for the idea that humans or other objects have unique energies, auras, vibrations, etc.

Studies have shown that electromagnetic fields from one object will interact with fields from other objects within appropriate proximity. Those objects will then be affected in ways that may alter their interactions with other objects (such as the passing of an electrical charge). While the practical implications of this might be imperceptible on a human scale, the principle implies that residual effects from any electromagnetic interaction between a human and any other object propagate throughout space in a seemingly infinite series of cause-and-effect chain reactions.

In such a description, the residual effects of any person's unique electromagnetic fields could be said to propagate perpetually – to immortally survive even after the perception of a biological body has disassembled.

There may be many more alternative perspectives that could be logically explored, such as material causality. As humans experience the perception of passing time they are perpetually receiving stimuli and transmitting stimuli from their physical actions. As each person's actions are received and synthesized by other objects, a perpetual chain of seemingly unending cause-and-effect is developed. When the cause-and-effect chains of all objects in the Omniverse are considered in concert, an incredibly complex web of causality can be

perceived. Thus, the results of any person's actions can be thought of as propagating without ostensible end.

This concept is similar to an idea proposed by Edward Lorenz in 1963. He suggested that something as seemingly benign as a butterfly flapping its wings in one part of the world might lead to subsequent drastic weather changes in another part of the world, because of the compounded residual effects of the butterfly's initial movement.

If residual causalities such as these are referred to as a soul, then the soul could easily be perceived as an immortal object.

REINCARNATION

As mentioned previously, the components from which our perceived bodies are made do not seem to appear from nowhere, without any history and do not seem to disappear after our perception of decomposition. These components appear to be continuously recycled into other things. In consideration of this, and of the previous suggestion that there is no basis for an absolute definition of individuality, life or death, concepts of reincarnation can be easily reconsidered as component recycling, or residual manifestations of the ostensible cause-and-effect chains discussed in the section on souls and spirits.

It may also be plausible (although the probability might not seem high unless additional factors are discovered) that in some circumstances more than just relatively small groups of objects could be reconstituted from one person to another. This would allow for the possibility that reincarnation might be plausible in different sizes. Or perhaps beyond our current perception, there might be additional components of humans that we have not yet discovered which could reconstitute in some more complete form.

Under the previously mentioned Systemic Memory hypothesis, any components reconstituted from one person to another could carry "memories" from each of the persons to whom they previously belonged. Those memories could potentially be utilized in some way by their current host or could theoretically disperse to other components of their current host establishing a physiological hypothesis that could allow one person to have some type of access to another person's memories.⁶³

Taken one step further, this hypothesis could produce a basis for the concept that not only could a predecessor's memories be recognized, but that in some additional way the predecessor's synthesizing abilities could be accessed by the current host. This is because synthesizing methods might be stored as Systemic Memories (as described in the previous section regarding consciousness). In such an example, someone who might possess elements that were once part of Mozart might theoretically be able to compose music by accessing Mozart's memories or reproducing Mozart's creative processes.

EXTRA-SENSORY PERCEPTION, TELEKINESIS

For the most part, 20th century science discarded claims of extra-sensory capabilities such as telepathy, telekinesis, psychometry etc. because of an ostensible lack of repeatable, verifiable evidence.

Consider the following hypothetical experiment. In this experiment we genetically alter all human beings so that all future generations are blind. Notwithstanding the possibility of sight-related descriptions being passed down from prior generations, the future all-blind generations would not perceive the sensation of, or have any practical concept of what optical vision is. Visual colors as we currently perceive them would not have meaning.

Their version of ostensible “reality” would be one where sight was at best, a hypothesis. Now suppose genetic mutation occurs and a very small number of this group begins to have very limited visual acuity; for instance the ability to see the color violet only, and in a very unfocused way. They just register a dim and fuzzy glow when they are exposed to violet light. On Earth, the color violet is not extremely widespread in nature. However, violet light is sometimes displayed in vibrant sunsets.

Occasionally, some people in the small, mutated group would be facing the right direction at the right time on the right days and would notice the color violet in sunsets. To the majority of other humans this claim would be incredulous. Even if some scientists or researchers did attempt to verify these claims they would experience a great hurdle in establishing repeatable testing because sunsets do not create the same colors on a consistent basis. A study could be mounted where one of these claimants was asked to stand in the same position at the same time of day for several weeks and yet no other violet sunsets might occur. Or, perhaps a few violet sunsets would appear, but their repetitive frequency would have no obvious pattern. The color of sunsets, like many other aspects of ostensible nature, is not yet predictable, even for those of us with optical vision.

Therefore, if a human being possessed sensory capability outside of the range of most other humans, and if the stimulus they received was not predictable or testable by current tools, their claim would likely be rejected by science.

Some animals have been born with two heads; some people have been born with eleven fingers; some people have been born incapacitated in practical functions but with innate genius in areas such as music or math (idiot savants). The evidence suggests that there is no reason to blindly reject the possibility that such anomalies could occur in other areas of nature that we do not yet perceive.

The possibility that some people may have extended sensory capabilities cannot be dismissed simply because the majority cannot perceive them, or because they do not seem to manifest in an easily detectable or repeatable manner.

Following are a few examples of research in anomalous areas by organizations that might surprise some people.

As a result of the U.S. Freedom of Information Act, It now is fairly well known that in the 1970s and 1980s, the U.S. and Soviet governments researched, trained and utilized “remote-viewers” for political and military purposes.⁶⁴ Remote viewers attempt to telepathically “see” distant locations.

For several years in the 1990s Sony Corporation ran an “Extrasensory Perception and Excitation Research” lab, where scientists experimented with various psychic phenomena. In

1998, Sony spokesman Masanobu Sakaguchi told a reporter for the South China Morning Post “We found out experimentally that ESP exists...”⁶⁵

Today, researchers at the Princeton (University) Engineering Anomalies Research lab are testing the capability of people to influence the behavior of objects “without recourse to any known physical processes.” Their results so far suggest that some people can affect remote objects even when they are separated by thousands of miles.⁶⁶

Chapter 5

The New Bubble Machines

*Within thirty years, we will have the technological means to create superhuman intelligence. Shortly after, the human era will be ended. – Vernor Vinge, 1993*⁶⁷

*Will robots inherit the earth? Yes, but they will be our children. – Marvin Minsky, 1995*⁶⁸

*By the year 2099... There is no longer any clear distinction between humans and computers. – Ray Kurzweil, 1999*⁶⁹

Our nascent explorations of genetic engineering, nanotechnology, biocomputing and other emerging fields have prompted discussions about whether humans might be rendered obsolete by newly emergent beings that out-think us and have the capacity to procreate. Current evidence and logic suggests that this may, and ostensibly should happen.⁷⁰

Today, my very crude (circa 2000) computer can devour and store the complete contents of a large technical text in a few seconds with perfect recall, complete indexing and no degradation. It would take me many hours to read the same text and I would be very fortunate to remember 10% of the details. Furthermore, I would need to periodically review this material in order to maintain just fractional recall.

Earlier I mentioned a very generalized perception-bubble concept of intelligence as the ability of any object to acquire, synthesize and apply information. In certain aspects of acquisition, my crude computer is already far superior to me. All that is ostensibly missing are more sophisticated synthesizing methods and sensory devices. I have little doubt that subsequent technologies will easily surpass all of my alleged intellectual abilities.

Inventor and computer pioneer Ray Kurzweil has suggested that a single, low cost computer will match the computational ability of the human brain by 2019.⁷¹ In his book *The Age Of Spiritual Machines*, Kurzweil suggests a future where we stop thinking of technology as something separate from ourselves.

In a very literal sense, technology is our progeny - the child of collective humanity and an inextricable member of Omniversal evolution, just as humans are. In a way that is similar to other species in nature, perhaps this child has been produced to become the teleological successor of its parents. Under this perspective, we could consider humanity as an evolutionary “stepping stone,” whose collective macro-legacy was to facilitate the development of our successor species.

In 1993, mathematician Vernor Vinge wrote about a concept he called Singularity. Singularity describes the moment in time where technology would surpass human “intelligence.” As Vinge put it: “From the human point of view this change will be a throwing away of all the previous rules, perhaps in the blink of an eye, an exponential runaway beyond any hope of control.”⁷²

Current trends clearly indicate that we are headed in this direction, and that there will be an increasing blurring of distinctions between biological and technological entities.⁷³

As the mind is being recategorized the body is in the process of being replaced. Cochlear implants, bioinic limbs, artificial retinas, stem cells grown into blood cells, heart muscle cells, and neurons-the list is endless.....The future is roaring down the road like a giant steamroller, and flattened beneath its greasy wheels is our notion of ourselves as individuals – Robert Burton, M.D.⁷⁴

If we retain our current biological form, it is easy to foresee a not-very distant perception bubble where humans could be considered obsolete or inconsequential. The most ostensibly logical way for us to continue evolving will be to merge with computers: to create a new hybrid generation of homo-sapiens and biocomputers. Perhaps they will be called techno-sapiens.

It may be the only feasible way for us to advance – to expand our bubbles of perception at a dramatically faster velocity. From my perception-bubble this is a very good proposition. I would be excited by the possibility of upgrading my brain capacity and expanding my sensory perception.

Following are some brief comments about two potential catalysts that could greatly facilitate such changes. Although these ideas have been around for a while, I suspect that their importance will dramatically increase as we move forward.

THE LANGUAGE OF THE BRAIN

Current human languages are fraught with inefficiencies. Words and sentences are subject to various interpretations based upon multiple potential definitions, unique interpretations by individuals and varying situational contexts. These inefficiencies multiply as the quantity of words increases in any communication event. Erroneous interpretations at any point may serve to further distort subsequent parts of the communication which are predicated on accurate understanding of the initially misinterpreted information. Frequently, such problems result in final interpretations that are excessively inaccurate or incorrect in specific details.

Generally, humans compensate for the inefficiency of language in a variety of methods such as additional elaboration, reiteration, restatement and the application of contextual assumptions (as noted in chapter 1). Furthermore, literal definitions of words can be reflexive, ultimately relying on words to describe words (as illustrated in chapter 4).

Verbal repetition of information often results in variations of wording which create additional complications in the area of maintaining accuracy. Finally, translation between various human languages complicates this issue even further, as words and phrases indigenous to one culture do not necessarily have equivalent meanings or direct translations in another culture.

A more productive human language would be one that is more specific, shared by all humans, less prone to misinterpretation and mistranslation, and one that can surpass

transmission speeds of speaking and reading. That language would be the language of the brain.

Although the unique characteristics of individual humans vary, human brains appear to work and be generally constructed in similar ways.⁷⁵ As an analogy consider a group of ten computers from various manufacturers that all use the same basic electronic components. Each computer may be wired in slightly different ways, loaded with different software, performing different tasks and displaying different characteristics, but the core signal processing of each computer's electrical components is essentially the same.

Data received by one computer from another typically requires some translation and interpretation before it can be passed on to the electrical components for processing or storage. Sometimes this process is necessary, but sometimes it is wasteful. If a sending-computer would send data in a "lower level" language that is common to the electronic components, the receiving-computer could receive the data much faster.

The language of the brain would be analogous to the electronic signaling protocols of similar computers: a core biophysical protocol that facilitates discrete transfer of information directly to the brain. Although it is still an undiscovered code, there are indications that biophysical activities of thought are based on a standard protocol that has facilitated the collective development of human brains.⁷⁶ This standard is what would be sought.

I have a hundred times in writing made the reflection that it is impossible in a long work always to give the same meanings to the same words. There is no language rich enough to furnish as many terms, turns and phrases as our ideas can have modifications. The method of defining all the terms and constantly substituting the definition in the place of the defined is fine but impracticable, for how can a circle be avoided? Definitions could be good if words were not used to make them - Jean-Jacques Rousseau⁷⁷

The technical idiosyncrasies of language that were previously mentioned may of course, be interpreted as beneficial in some areas such as poetry and literature, where variety in interpretation can trigger imagination and add subtlety, depth and desired complexity to the individuality of each human experience. Imagine how less interesting Shakespeare might be reduced to a set of computer-like simple and unambiguous statements. What I'm suggesting with the language of the brain is not a refutation of the enjoyable subtleties and creative benefits of human communication. It would not eliminate the capability of multiple interpretations – it would only compliment this ability, and facilitate less ambiguous information exchange when desired.

INPUT-OUTPUT DEVICES

The language of the brain would not attain substantial utilization without a method of transmission that bypasses the currently used methods of human-to-human data exchange. We would require direct input and output devices for the human brain and enhanced sensory capabilities.

For example, in my most productive year so far using eyesight, I was able to read about 40 technical books. Reading is onerous and boring to me. My perception-bubble views it as a

tremendous waste of time that could otherwise be spent synthesizing the data. The excitement of thought for me is in exploring and experimenting with ideas, not in waiting for the raw data to arrive.

With direct input and output devices, and with the utilization of a language of the brain, a person might potentially obtain the information of today's lifetime in a matter of hours or less. A person could potentially have immediate and full access to all of humanity's collected information. We could have a "brain Internet" where all types of information could be shared and continuously updated. People would be free to explore and create at levels that may be unimaginable today. Bubbles of perception would potentially expand at an exponential rate of acceleration.

Concepts of individuality could be challenged in ways far greater than those already discussed here. Identities could be contextually subjective based on the contents of one's brain and the number of networked sensory connections in action at any given time. We could perform brain transfers and downloads, and temporary brain or sensory mergers, creating a single perceptual identity from a collection of contributors. Archaic methods of education could be replaced with simple transfers of information and experience. Perhaps even concepts of physical presence could be challenged, as I might be able to connect with alternative sets of eyes to see, or sets of hands to feel via a body far away.

Imagine the scenario of five people networked via direct brain input/output devices using the language of the brain. Each person might attain the capability to see with ten eyes or hear with ten ears. The implications are extraordinary.

"Who are you?" could become an even more ambiguous question than can currently be perceived. I foresee the perception of individual, static identity being replaced with ever changing Virtual Perceptual Units (VPUs). I will no longer be limited to being "me." I could also be "you," several of us could temporarily merge to become a new VPU, or duplicated remnants of "me" could simultaneously be part of hundreds or millions of other VPUs.

CONCLUSION

Historical human attempts to acquire information have ostensibly been built upon, and suppressed by human perceptual limitations and human based logic. I suggest that our next great perceptual milestone will be to push beyond the limits of human logic, and that the most likely way to facilitate this will be by upgrading our biology through hybridization with computing technologies. Of course, even if we are able to achieve such a milestone, it will only be one in a long and ostensibly endless succession. It is easy to imagine that our successors will be compelled to then push beyond their limitations.

In the meantime, we might be well served to appreciate and factor into all of our day-to-day, practical thinking that from many perspectives, human bubbles of perception appear to be very small.

REFERENCES

- ¹ The somatosensory system is not discussed here because for the purpose of this analysis no distinction is made between what are commonly referred to as 'conscious' and 'unconscious' sensory stimulation.
- ² Vision range: <http://physics.bu.edu/~duffy/PY106/EMWaves.html>
- ³ Wilson, E.O., Consilience, chpt 4
- ⁴ Wilson, E.O. Consilience, chpt 4
- ⁵ seaworld.com
- ⁶ Burton, Robert. Machinery of the Soul. San Francisco Magazine January 2000
- ⁷ There is ostensibly at least one other source of thought stimulus including innate thought and action stimuli or algorithms already programmed into a human being before birth. For example, a baby's brain is seemingly capable of governing all of the body parts necessary for breathing without ostensible cognitive learning and its nervous and muscular system have rudimentary basic capabilities of contraction and expansion. Furthermore, genetic data do not only contain vast amounts of instructions for the newborn body, but the body (including brain) appears to have a built in operating system that can interpret those instructions.) – additional possibilities could include thought alteration by external factors although this could be categorized as a stimulus. Additionally, as suggested by the AS-YET-UNPERCEIVED variable explained in Chapter 1, emerging discoveries may continue to alter perceptions on this subject. As an example, Science Daily reported the following story headline on February 13, 2002: Study Shows Plants Inherit Traits From More Than Gene Sequence Alone Source: Washington University In St. Louis (<http://www.wustl.edu/>)
- ⁸ (A) Dyer, Katheryn, Information and Privacy Coordinator, U.S. C.I.A letter to John Greenewald, ref. F20000-1721, Aug. 24, 2000 (B) Huyghe, Patrick, Closing the Dream Factory, Fortean Times, October 1998 (C) <http://www.princeton.edu/~pear/2.html> (P.E.A.R.) "In these experiments human operators attempt to influence the behavior of a variety of mechanical, electronic, optical, acoustical, and fluid devices to conform to pre-stated intentions, without recourse to any known physical processes....In many instances, the effects appear to be operator-specific in their details and the results of given operators on widely different machines frequently tend to be similar in character and scale. Pairs of operators with shared intentions are found to induce further anomalies in the experimental outputs, especially when the two individuals share an emotional bond. The data also display significant disparities between female and male operator performances, and consistent series position effects are observed in individual and collective results. These anomalies can be demonstrated with the operators located up to thousands of miles from the laboratory, exerting their efforts hours before or after the actual operation of the devices. "
- ⁹ 1898–99 University of Chicago catalogue
- ¹⁰ 1928 speech to the Chemists' Club (New York) source: <http://www.lhup.edu/~dsimanek/neverwrk.htm>
- ¹¹ Kaku, Michio, re: super string theory and the multiverse – interview on Coast to Coast AM, 2001
- ¹² Although I developed this term on my own, I cannot take credit for inventing it. While reference checking this material I performed an Internet search and found a few dozen instances where the word Omniverse was used. Although many of the texts were not explicitly clear it appeared as though the word was being used with the same general meaning as that which I intended.
- ¹³ Kaku, Michio, re: the end of the Universe or Multiverse (other refs: Weinberg, Hawking et al.)
- ¹⁴ Rucker, Rudy, Infinity and the Mind 1995, pages 15 – 27 re: curved tube model of space
- ¹⁵ Pinker, Steven, How the Mind Works: throughout the book there are multiple references for a mechanistic view of all brain perceptions.
- ¹⁶ Dyson, Freeman, Infinite in All Directions, 1985, page 36
- ¹⁷ Weinberg, Steven, Dreams of a Final Theory, Chapter 9
- ¹⁸ Rucker, Rudy, Infinity & the mind 1995 – page 12
- ¹⁹ Rucker, Rudy, Infinity & the mind 1995 – chapter 1
- ²⁰ Wachsmuth, Bert G. Seton Hall University: Interactive Real Analysis re: arguments against Cantor <http://www.shu.edu/projects/reals/history/cantor.html>
- ²¹ (A).Zenkin, Anton A.Zenkin., Russian Academy of Sciences (B) Alexander: 10 Fatal Mistakes of the Cantor's Proof of the Real Numbers Uncountability. http://www.com2com.ru/alexzen/papers/Cantor/10_mistakes.html
- ²² Lakoff, Johnson, Philosophy in the Flesh, Chapter 3
- ²³ Antilogic: Not to be confused with the historical Sophist usage of antilogic, although the general premise of disputing that which is accepted, is the similar.
- ²⁴ Fraser, Lillestol, sellevag, The Search for Infinity, p. 31 "...special relativity overturned common-sense ideas of time and space..."
- ²⁵ Feynman, Richard, Probability and Uncertainty, chapter 6
- ²⁶ Kaku, Micho, 2001, interview with Art Bell
- ²⁷ Fraser, Lillestol, sellevag, The Search for Infinity p. 89
- ²⁸ Wilson, E.O., Consilience ch. 4
- ²⁹ Weinberg, Stephen, Dreams of a Final Theory, p. 65
- ³⁰ 7/2/93 Seattle Times, 1/19/01 Associated Press
- ³¹ <http://www.curtin.edu.au/curtin/dept/phys-sci/sun/rad.htm>
- ³² "In summation, after more than 25 years of research in this field of solar system science, I can say without equivocation that there is very strong evidence that the planets, when in certain predictable arrangements, do cause changes to take place in those solar radiations that control our ionosphere." - John H. Nelson, RCA Communications. Cosmic Patterns. 1974 <http://www.geocosmic.org/articles/weather.shtml>
- ³³ (a) Ecolog Institute: Cellular telephones and Health, May 2001 (b) Reuters Health, Helsinki, 6/19/02, Mobile Phones Cause Human Cell Changes
- ³⁴ Penrose, Roger, The Emperor's New Mind, p. 406
- ³⁵ Penrose, Roger, The Emperor's New Mind, p 407

- ³⁶ Wilson, E.O., *Consilience*, p. 121, also Penrose, Roger, *The Emperor's New Mind*, et al.
- ³⁷ Lockhart, Russell Arthur, 2001, lecture via the Internet
- ³⁸ Radin, Dean, *The Conscious Universe*, p. 234
- ³⁹ Radin, Dean, *The Conscious Universe*, p. 238
- ⁴⁰ Milton, Richard, February 16, 2000 – interview with Laura Lee, *The Laura Lee Show*
- ⁴¹ Science, *History of the Philosophy of*, in *The Oxford Companion to Philosophy*, 809 (Ted Honderich ed., 1995).
- ⁴² Chaitin, G. J., *The Unknowable*, 1999, Chapter 1
- ⁴³ Chaitin, G. J., *The Limits of Mathematics*, 1998, chapter 1
- ⁴⁴ Critical Analysis Workshop, La Trobe University, <http://www.latrobe.edu.au/lasu/services/criticalanalysis%20wksHP.pdf>.
- ⁴⁵ Nietzsche, *On truth and lies in the extra-moral sense*.
- ⁴⁶ Global Development Research Center (www.gdrc.org)
- ⁴⁷ Bloom, Howard, *The Lucifer Principle*, Prologue
- ⁴⁸ Isberger and Sejnowski, 1992, *Recurrent Feedback Loop in Neural Networks*
- ⁴⁹ Schwartz, Gary, *The Living Energy Universe*
- ⁵⁰ Schwartz, Gary, 2001, interview on *The Laura Lee show*
- ⁵¹ Pilkington, Mike. *Where Are You?* *The Guardian Newspaper*, Oct. 2, 2003
- ⁵² Elliot, Carl, MD, PhD. *A New Way to be Mad*, *Atlantic Monthly*, December 2000
- ⁵³ "The patients are running the asylum" is an expression that is sometimes heard in contemporary U.S. culture. It generally implies a situation where "insane" patients are in control of a psychiatric hospital, as opposed to the "sane" doctors who should be in control. Among other interpretations, it may infer a situation where unqualified individuals or practices are governing a particular situation.
- ⁵⁴ (A) Dyer, Katheryn, Information and Privacy Coordinator, U.S. C.I.A letter to John Greenewald, ref. F20000-1721, Aug. 24, 2000 (B) Huyghe, Patrick, *Closing the Dream Factory*, *Fortean Times*, October 1998 (C) <http://www.princeton.edu/~pear/2.html> (P.E.A.R.) "In these experiments human operators attempt to influence the behavior of a variety of mechanical, electronic, optical, acoustical, and fluid devices to conform to pre-stated intentions, without recourse to any known physical processes....In many instances, the effects appear to be operator-specific in their details and the results of given operators on widely different machines frequently tend to be similar in character and scale. Pairs of operators with shared intentions are found to induce further anomalies in the experimental outputs, especially when the two individuals share an emotional bond. The data also display significant disparities between female and male operator performances, and consistent series position effects are observed in individual and collective results. These anomalies can be demonstrated with the operators located up to thousands of miles from the laboratory, exerting their efforts hours before or after the actual operation of the devices."
- ⁵⁵ Frick & Lahey, 1991 (referenced in *The Coincidence of Attention Deficit Hyperactivity Disorder and Creativity*, Bonnie Cramond, Ph.D., The University of Georgia, March 1995).
- ⁵⁶ (A) Fuller, F. Buckminster, *Critical Path*, 1980 – recalled observing in 1913 that velocity of change was increasing - "it was clearly the environment and not the humans that was changing, and though the environmental changes might not alter human genes, changes in their external conditions might permit humans to realize many more of their innate capabilities than heretofore." (B) Russell, Karl, N.Y. Times – publication date unknown, circa 2000-2001, article on history of U.S. patents: year & # of patents granted: 1790-3, 1840-458, 1890-25308, 1940-42237, 1990-90364, 2000-157,497
- ⁵⁷ *Dreamers, Discoverers & Dynamos: How to help the child who is bright, bored and having problems in school* Dr. Lucy Jo Palladino, Introduction
- ⁵⁸ Cramond, Bonnie, Ph.D., The University of Georgia, March 1995 *The Coincidence of Attention Deficit Hyperactivity Disorder and Creativity*
- ⁵⁹ Wilson, E.O., *Sociobiology*, page 8
- ⁶⁰ A general definition: The effects from gene interaction with the environment.
- ⁶¹ Stanford Encyclopedia of Philosophy, <http://plato.stanford.edu/>
- ⁶² Kaku, Michio, *Visions*, p - 34 "The space around our bodies is filled by an invisible electric field, like a spiderweb. This electric field is generated by electrons which accumulate on our skin like static electricity. When our bodies move, this electric-field "aura" moves with it.
- ⁶³ (A) Mitchell Ed. *Nature's Mind: The Quantum Hologram*, *International Journal of Computing Anticipatory Systems*. (B) Gariaev PP, Grigor'ev KV, Vasil'ev AA, Poponin VP, Shcheglov VA, *Investigation of the Fluctuation Dynamics of DNA Solutions by Laser Correlation Spectroscopy*. *Bulletin of the Lebedev Physics Institute*, 1992:11-12;23-30 (research indicating the potential transfer of information relating to an entire organism via a single portion of that organism.) (C) White J. Krippner S. eds.: *Future Science: Life Energies and the Physics of the Paranormal*. 1977
- ⁶⁴ Dyer, Katheryn, Information and Privacy Coordinator, U.S. C.I.A letter to John Greenewald, ref. F20000-1721, Aug. 24, 2000
- ⁶⁵ Huyghe, Patrick, *Closing the Dream Factory*, *Fortean Times*, October 1998
- ⁶⁶ <http://www.princeton.edu/~pear/2.html> "In these experiments human operators attempt to influence the behavior of a variety of mechanical, electronic, optical, acoustical, and fluid devices to conform to pre-stated intentions, without recourse to any known physical processes....In many instances, the effects appear to be operator-specific in their details and the results of given operators on widely different machines frequently tend to be similar in character and scale. Pairs of operators with shared intentions are found to induce further anomalies in the experimental outputs, especially when the two individuals share an emotional bond. The data also display significant disparities between female and male operator performances, and consistent series position effects are observed in individual and collective results. These anomalies can be demonstrated with the operators located up to thousands of miles from the laboratory, exerting their efforts hours before or after the actual operation of the devices."
- ⁶⁷ Vinge, Vernor: *The Singularity*. 1993. Dept of Mathematical Sciences San Diego State University. The original version of this article was presented at the VISION-21 Symposium sponsored by NASA Lewis Research Center and the Ohio Aerospace Institute, March 30-31, 1993.
- ⁶⁸ Minsky, Marvin, *Will Robots Inherit the Earth?* *Scientific American*, 1994
- ⁶⁹ Kurzweil, Ray, *The Age of Spiritual Machines*, p. 280

- ⁷⁰ Kaku, Michio, *Visions*, 266: "What is particularly exciting (and extremely controversial) about nanotechnology is the belief that these machines may be able to scavenge molecules from their environment to reproduce themselves, creating an unlimited number of molecular robots that can perform feats of engineering that defy our imagination."
- ⁷¹ Kurzweil, Ray, *The Age of Spiritual Machines*, p. 278
- ⁷² Vinge, Vernor: *The Singularity*. 1993. Dept of Mathematical Sciences San Diego State University. The original version of this article was presented at the VISION-21 Symposium sponsored by NASA Lewis Research Center and the Ohio Aerospace Institute, March 30-31, 1993.
- ⁷³ (a) Kary, Tiffany, *Nanotech: More than science fiction*, ZDNet News. February 11, 2002 excerpts: "The line (between nanotechnology and biotechnology) is blurring in several ways. Scientists are learning to imitate biological patterns; biological entities are being used in technology products; and in the more distant future, nanomachines may be circulating through our bloodstreams, attacking tumors and dispersing medicine... Nanotechnology is seen by some as the first step on what could be a slippery slope into an apocalyptic pit of "gray goo." The term was popularized in an article that appeared in *Wired* magazine written by Bill Joy, the chief scientist at Sun Microsystems. It is used by nanotech cognoscenti to describe what they believe would result from the creation of self-assembling replicators. . . Joy and others have cautioned that the self-replicating miniature robots, though invisible to the human eye, could result in a kind of gray goo if their multiplication ever got out of control. Armies of "blue goo," or destructive nanomachines, have even been proposed as a law enforcement measure.
- (b) Headlam, Bruce. *The Mind that Moves Objects*. New York Times. June 11, 2000
- ⁷⁴ Burton, Robert. MD, *Machinery of the Soul*. San Francisco Magazine January 2000
- ⁷⁵ (A): From the Howard Hughes Medical Institute - "The receptor neurons in each sensory system deal with different kinds of energy—electromagnetic, mechanical, or chemical. They look different from one another, and they exhibit different receptor proteins. But they all do the same job: converting a stimulus from the environment into an electrochemical nerve impulse, which is the common language of the brain." <http://www.hhmi.org/senses/b/b120.htm>
- (B): Wren, Kathleen, MSNBC News Feb 7, 2002 –When Mind Meets Machine - Researchers forging connections between brain and bionic devices: "As researchers explain in a special bionics issue of the journal *Science*, published Friday by the American Association for the Advancement of Science, there are major challenges but also exciting possibilities ahead for mind-machine communication... Scientists have already demonstrated that it is possible to use electrodes to detect certain patterns of brain activity."
- (C) NY Times, October 15, 2000, Sunday, Week in Review Desk - Ideas & Trends; The Nobels: Dazzled By the Digital Light nytimes By GEORGE JOHNSON: "... But viewed at the most abstract level, both brains and computers operate the same way, by translating phenomena -- sounds, images and so forth -- into a code that can be stored and manipulated, giving both creature and their creations a firmer grip on the world. ... DR. KANDEL has drawn an especially vivid link between the nervous system and electronic circuitry. In classic experiments he showed how learning causes changes in the neurological wiring of a sea slug called *Aplysia*, whose nervous system is so simple that experimenting with it is like tinkering with an old radio. Training the creature to react vigorously to a stimulus, like an annoying squirt of water, causes an increase in the flow of neurotransmitters -- biochemical information -- across certain synapses, a tweaking of the neurological volume controls. The implication is that more complex brain functions are built from millions of these kinds of processes, what Dr. Kandel has called "letters in the cellular alphabet of learning." Next to the brain, the most obvious biological information processor is the genetic machinery of the cell. The design of an organism is encoded into the chemical alphabet of DNA and manipulated to direct the assembly of proteins. Again the trade in ideas flows in both directions: scientists have recently made DNA computers that carry out simple computations inside test tubes. And in the physics labs, experimenters are playing with simple quantum computers in which individual atoms manipulate bits of data. True to form, some theorists argue that it's not only in captivity that matter behaves this way: All the quarks and electrons in the cosmic wilds are exchanging information each time they interact. The brain seems to be able to do this (instantly classify information) in a non-linear fashion. If we could get our sensors to do it just as well and just as fast, then problems might be solved that today defeat even the fastest computers. (D) Office of Naval Research (U.S. Navy) *The Tip Off*, May 2001 issue. Title: *Eavesdropping on the Brain*: "This was the starting point for research at the Salk Institute funded by the Office of Naval Research. How can you separate signals that have been mixed together, without knowing ahead of time what those signals might be? The general approach to this problem, called Independent Component Analysis, had been pioneered in France in the 1990s, but it was Tony Bell, working with Terry Sejnowski in the Computational Neurobiology laboratory at Salk who came up with a fast, practical algorithm, called the infomax ICA. "It's all about the signal to noise ratio, and whether this kind of data can be analyzed and processed using traditional methods," says Dr. Joel Davis, manager of the project in ONR's Cognitive, Neural, and Biomolecular S & T Division. The patented algorithm is now being applied to dozens of applications. It is currently available on the Web for any who wants to explore its use for science and research purposes at: http://www.cnl.salk.edu/~tewon/ica_cnl.html. Users are asked to note their applications. To date, ICA has been applied to over a hundred real world problems including speech and pattern recognition, telecommunications, satellite imagery, sound spectrograms, image processing, de-noising, ultrasound research, spacecraft fault detection, astronomy, brain-computer interfaces, and analyses of climactic data"
- ⁷⁶ From the Howard Hughes Medical Institute - "The receptor neurons in each sensory system deal with different kinds of energy—electromagnetic, mechanical, or chemical. They look different from one another, and they exhibit different receptor proteins. But they all do the same job: converting a stimulus from the environment into an electrochemical nerve impulse, which is the common language of the brain." <http://www.hhmi.org/senses/b/b120.htm>
- ⁷⁷ *Emile Or On Education* by Jean-Jacques Rousseau

Selected Excerpts

*...what I am about to present may disturb you. Such disturbances may be the necessary first-steps in allowing us to break free from **THE MENTAL PRISON** of human perception.*

*...there is **A GREAT REVOLUTION** awaiting us in the evolution of logic... In order to unveil it, we will have to break free from our current biological limitations.*

*We can **NEVER SAY**, "We have found the basic building blocks of logic."*

***PERCEPTUAL IMPERIALISM:** an assumed notion that humans are capable of evaluating and judging things in any way that should be considered absolute.*

*"What is consciousness?" is an **IMPOTENT QUESTION**.*

*...our successor species will look back and consider current human mental capacity much in the same way that contemporary humans consider **THE MENTAL CAPACITY OF TURTLES**.*

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