The Flow of Existence

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Note

I began this paper because one requirement for my black belt was to write a 15-page paper on *The Flow of Existence*. That existence flows seems self-evident. Things change. We all know that.

But writing S-H-I-T H-A-P-P-E-N-S, one letter to a page, while having the virtue of brevity, would not have demonstrated the knowledge, character, or effort my instructors were looking for. And I still would have been four pages short.

Before starting this paper I re-read many of the philosophy, religion, and science books I had accumulated over the years. I was fifty years old and knew in a general way what I thought about life, but I began to see this paper as an opportunity – a chance to examine my philosophical beliefs more critically. And an opportunity to re-learn some concepts I had forgotten, now having the benefit of fifty years of life experience to draw on in evaluating them.

I began the paper and soon found myself engrossed in it. I wanted to stay up and work on it rather than go to bed. I wanted to devote my time to it rather than perform the work that generates our family's income. I am a lawyer and writer. I enjoy organizing ideas and using my skills to help make complex concepts easier to understand.

Philosophy has fascinated me since college. By and large our secondary schools do not teach students to ask big questions, so I had no exposure to many of these ideas until I went off to college in 1976. In 1993, after ten years of practicing law in Omaha, I entered a graduate program in philosophy, but I left after less than one year because I was unable to simultaneously practice law and do justice to my courses. Practicing law paid better. And to be honest studying philosophy in an academic setting was not as enjoyable as studying it on my own, but I would not have realized that if I had not tried it.

Philosophical writing is often dry. After starting this paper I sometimes noticed an impulse to interject humor. Initially I resisted, but after a few days I changed my mind. Something was coming together. This paper was not just an opportunity to examine my beliefs and re-learn concepts I had forgotten; it was a chance to use my writing skills, my knowledge of philosophy, my familiarity with logic, my life experience, and my humor to help introduce others to some key philosophical issues in a concise and entertaining way.

When my children are older – about fourteen or fifteen – I will let them read this paper. This will enable them to know me better, but more importantly it may open their minds. They may even find some practical advice – the result of lessons I learned late and sometimes the hard way. Perhaps other karate students will read this or some future variation of it. Maybe it will even serve as an outline for a book in the future.

This is not an objective paper. I'm pretty sure I will conclude that of all the established religions and philosophies, some beliefs associated with Taoism come closest to describing reality. Or what I understand reality to be. But, we're not going to jump straight to eastern mysticism. Instead, we will take "the long and winding road" through western thought.[1] This is necessary because for westerners to appreciate eastern thought, we must first come to see how little we know.

I quote liberally from other sources and make no apology. Some readers may not have the time or desire to read all the wonderful books and articles I cite, so I have included some particularly good passages from some of them. If someone else has already said it better than I can, it makes sense to use his or her material.

With regard to some assertions about science I have not always cited my sources because scientists have reached a consensus on some issues and sources are not necessary in a paper like this. One scientist may assert that Earth is four billion years old while another insists it is 4.5 billion years old. For my purposes a difference of half a billion years is not significant. The point is that scientists agree the Earth has existed for billions of years.

This paper provides more questions than answers. My goal is that readers come away with a sense of wonder and a dose of humility. They may then seek their own answers.

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[1] The Beatles, Let it Be (album), 1970.

"God is a circle whose center is everywhere and circumference nowhere."

- Empedocles

Part I. PRELIMINARY MATTERS

A. Assumptions

When you write a paper like this you realize that simply by starting the paper you are making some assumptions. One concerns reality itself:

> Once upon a time, I, Chuang Chou, dreamt I was a butterfly, fluttering hither and thither, to all intents and purposes a butterfly. I was conscious only of my happiness as a butterfly, unaware that I was Chou. Soon I awaked, and there I was, veritably myself again. Now I do not know whether I was then a man dreaming I was a butterfly, or whether I am now a butterfly, dreaming I am a man. Between a man and a butterfly there is necessarily a distinction. The transition is called the transformation of material things.[2]

Most of us dismiss this without really analyzing it. We think it 'obvious' that we are really people.[3] "Dreams are not reality," we say, "They are a neurological phenomenon." I am like most people in viewing Chuang Chou's tale this way. I believe that right now I am a man writing a paper on the flow of existence, not a butterfly dreaming I am a man writing a paper on the flow of existence.

Nevertheless, before writing more, I should acknowledge the possibility that I may be wrong. I believe I am really a man because I recall many times when I woke from a dream to find that I was a man, but I cannot recall ever waking as a butterfly (or

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[2] *The Wisdom of Laotse*, p. 238, translated by Lin Yu-Tang (1948).

[3] Kids, when a person asserts that a proposition is obvious, be skeptical. It sometimes means the person is unable to construct a more persuasive argument. When someone asserts something is obvious and you disagree, consider responding with something like, "It is not obvious to me, so please articulate your second best argument." It was not long ago that people though it obvious that the Earth is flat.

anything other than a man) to find that I had been dreaming. I believe I am really a man because at this moment it seems to me that that is what I have been doing every day for fifty years. I have memories of being a man that provide me with a sense of continuity as a man, but few memories of my dreams. But how do I know with certainty? If butterflies can dream, and if their dreams can seem as real to them as the dreams of people seem to people, is it not possible that the reason I believe I am a man is because I am a butterfly having a dream so vivid that it seems real?[4]

The story of Chuang Chou raises some fun questions about what "I" means, what "reality" means, and what "now" means. In writing this paper I assume I am a man. I also assume there is only one "I," one reality or existence for all of us, and one now for all of us. But I could be wrong.

Whether I am a man or a butterfly, my task is to write a righteous[5] paper on the flow of existence, and to that I now turn.

B. Why Study The Flow of Existence?

This title of this paper pre-supposes that (1) existence exists; and (2) existence flows. Both propositions appear obvious – a glance in any direction seems to confirm them. The man strolling down the street exists, and with each step his location changes

[4] Interestingly, we always assume I must be a man or a butterfly, but we never consider that I may be both. Perhaps we create our own reality; I am a man when I believe I am a man, and I am a butterfly when I believe I am a butterfly.

[5] During the 1970's 'righteous' was a slang term meaning 'excellent.' It was a favorite expression of Linc on the TV series *The Mod Squad*. It is not in vogue now. Slang flows, like everything else. My point is that I intend to write a good paper. If it is worth doing, it is worth doing well. Kids, you will not go wrong if you strive for excellence in your all your endeavors, including your writing. I once had a professor who tasked his students to write a paper; after articulating the requirements for the paper, his final remark to the class was, "Don't turn in a piece of shit." It is sad that a professor felt compelled to say that to his students, but I believe it was a response to the mediocre effort he saw from students he knew could do better. Successful people strive for excellence, not because they want admiration, but because they expect it from themselves. It is an uncomfortable feeling to know you did not do your best.

slightly. The woman on the park bench exists as do the flowers she observes, the birds she hears, and the breeze she enjoys. The newborn baby exists; with luck she will grow a little each day and mature into a healthy adult. With a bit more luck she will enjoy all the stages of life until one day her body's deterioration is complete. These are examples of the flow of existence from the perspective of a human observer, and because the available examples appear limitless it may seem odd to devote a paper to the topic.

One reason to examine the subject more closely is that existence consists of more than what our limited senses tell us. There is a subatomic world we cannot see. What exists on that level? Does it flow or is it static? Scientists believe the diameter of the universe[6] is more than one hundred billion light years.[7] What exists out there? Does it flow or is it static?

A second reason to look beyond the obvious examples is that existence may include phenomena that our senses – even if all-powerful – cannot perceive. There are experiences that lack an obvious scientific explanation and may be above science's current ability to know or measure. We call these experiences paranormal and they include phenomena such as ESP and Déjà vu. Even people who have never had such experiences may have experienced synchronicity – the experience of two or more

[6] When I refer to the universe I mean the totality of everything that exists in what we call space-time. I also assume there is only one universe, but some respected scientists believe many universes exist, perhaps an infinite number. We think of our universe as three-dimensional, or four-dimensional if time is a dimension, but some physicists believe there may be ten or eleven dimensions. The number of dimensions may be infinite. At this moment a dinosaur in another dimension may be standing right in front of me. More on this later.

[7] A light year is the distance light travels in one year. If you had a 1974 Javelin AMX capable of traveling at the speed of light, as well as an infinite supply of Coca-Cola and M&Ms, it would take one hundred billion years to drive from one end of the universe to the other, assuming no stops for gas. By the way, men, at the speed of light your penis will become much shorter. And take it from me, when you piss at the speed of light you definitely want to aim away from the direction of travel.

causally unrelated events occurring together in a meaningful manner that are unlikely to occur together by random chance.[8] A thorough study of the flow of existence should at least acknowledge the possibility that existence includes such phenomena.

Another reason to move beyond observable examples in considering the flow of existence is that existence seems to consist of more than the physical universe. Putting aside paranormal experiences, concepts exist, at least for humans. The concept of numbers exists, to use the most obvious example. The concepts of north, south, east and west exist. You can't touch these concepts, but they exist.[9] Where they exist is a different issue. They may be embedded in our brain tissue, but do they have some independent existence?

Finally, to provide concrete examples of the flow of existence from our vantage point now on Earth is not enough. The examples are easy, but what do they tell us about existence? If the very nature of existence is that it flows, what are the implications of that? What does that tell us about how to live our lives? What does that tell us about what happens to us after we die? Is there any 'us' after we die?

Mystics appreciate the flow of existence intuitively, but modern man relies heavily on words to communicate and others may find value in a paper that employs language in an attempt to shine light on the concept. Unfortunately, the very attempt to use words to explain the flow of existence necessarily limits our understanding of it. So before we continue, let us acknowledge the limits of language.

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[8] I have had numerous experiences driving, with the radio off, singing or humming a tune from the 1960's or 1970's. I turn the radio on for no particular reason and the station is playing that song. If the song is "Satisfaction" by the Rolling Stones, you might chalk it up to coincidence. If the song is "Silver Bird," by Mark Lindsay, that is synchronicity.

[9] I have intentionally omitted reference to arguably subjective concepts such as justice and beauty. That would just complicate things.

C. Language and its Limitations

One problem with language is that we use words to refer to things (tangible objects and intangible ideas) we think of as having an existence separate and apart from us. It is easy to lose sight of the fact that I am always a part of the picture I am trying to describe.[10]

Another potential pitfall of language is that we sometimes confuse the word with what it represents. We tend to forget that, as semanticist Alfred Korzybski wrote, "The map is not the territory."[11] Fritjof Capra made a similar point in *The Tao of Physics*:

> For most of us it is very difficult to be constantly aware of the limitations and of the relativity of conceptual knowledge. Because our representation of reality is so much easier to grasp than reality itself, we tend to confuse the two and to take our concepts and symbols for reality.[12]

A third aspect of language we should be alert to is that it enables us to comprehend the vast universe by breaking it into smaller, more manageable parts. In truth, though, these parts are all interlaced. R.G.H. Siu wrote:

> This interrelatedness in actuality leads to an infinite abstractive hierarchy, in which all members are involved. It is impossible to describe an actual situation exhaustively. There is associated with it a limitless chain of

[10] This reminds me of the riddle: "If a tree falls in the forest and no one is around to hear it, does it make a sound?" The tree striking the ground will generate sound waves, but if there is no ear to transform those waves into electrical impulses and no brain to receive those impulses, some would say there has been no 'noise' as humans use that word – only sound waves. This riddle (not unlike a zen koan) is but one example of a larger metaphysical debate that has gone on for centuries between *materialism* and *immaterialism* (also called *realism* and *idealism*) about the very nature of reality. Materialism, as articulated by Hobbes, holds that physical matter is the only reality and that everything, including thought, feeling, mind, and will, can be explained in terms of matter and physical phenomena. Immaterialism, as articulated by Berkeley, holds that existence is tied to experience and objects exist only to the extent that someone perceives them. Where you stand on the so-called mind-body problem often determines your outlook on other philosophical issues. Realists say some things exist independent of the mind; idealists maintain all things are constructions of the mind. More on this in footnote 18.

[11] Korzybski founded the discipline known as General Semantics. Korzybski developed some rules to help people avoid the pitfalls of language. One such rule was to avoid use of the verb "to be" when possible. When we say, "The cat is white" we do not mean that "cat" and "white" are the same thing; it is more accurate to say, "The cat has white fur."

[12] Capra, *The Tao of Physics*, Third Edition, Shambhala, 1991, page 28.

> concepts with all degrees of complexity… There is an infinite intermingling.[13]

A fourth aspect of language to be mindful of, closely related to the third, is that language requires us to set forth our thoughts in linear terms, but existence is not organized (if it is organized at all) in a linear manner. It is, as Siu put it, "a spontaneous agglomeration."[14]

Aldous Huxley summed it up well when he wrote:

> Every individual is at once the beneficiary and the victim of the linguistic tradition into which he has been born - the beneficiary inasmuch as language gives access to the accumulated records of other people's experience, the victim in so far as it confirms him in the belief that reduced awareness is the only awareness and as it bedevils his sense of reality, so that he is all too apt to take his concepts for data, his words for actual things.

Recognizing that language can never adequately describe the ultimate reality, I hope this paper helps others as they ponder the flow of existence. Just as physicians give patients tiny amounts of viruses or bacteria to help the immune system produce antibodies that will attack the virus or bacteria to prevent disease, perhaps a paper that employs a relatively small number of words will immunize readers from the inadvertent thought disorders that may arise when they rely solely on language in considering and forming their views on the flow of existence.

PART II. THE FLOW OF EXISTENCE AS SEEN FROM THE WEST

As stated above, the title of this paper pre-supposes that (1) existence exists; and (2) that existence flows. Let us briefly examine each proposition.

[13] Siu, *The Tao of Science*, The M.I.T. Press, 1957, page 58.
[14] Siu, *The Tao of Science*, The M.I.T. Press, 1957, page 88.

A. Existence Exists

To assert that existence exists is to assert that there exists some 'thing' we call existence. In western culture we think of that 'thing' as the phenomenon of being. Because "to be" is a synonym for the verb "to exist," this definition, while not circular in the strict sense, reflects the circular nature of many of our definitions.[15]

Alternatively, we can (and often do) think of existence as the entire physical universe. It cannot be the case that nothing exists. Can it? Our senses plainly tell us that something exists. Case closed, right? "Not so fast," says Rene Descartes (1591-1650), a mathematician and philosopher. "What if my senses deceive me?"[16]

Descartes wanted to bring to philosophy the same certainty that mathematics had found in his time. He refused to take his existence or the existence of anything at face value. As part of his method he decided to doubt his senses, his memories, the existence of the world around, and even the existence of his own body. He then asked "What can I know?" and answered "Cogito, ergo sum," which translates, "I think, therefore I am."

Descartes' logic appears sound. If he is thinking, he must exist as a thinking being, even if his thinking is distorted and even if his body and the physical world are illusions. So something exists. And it thinks. If nothing existed, Descartes would not have existed as a thinking being and would not have been able to conceive of the

[15] Strictly speaking, a circular definition is one that uses the term being defined as part of the definition. For instance, to define "existence" as "having the quality of existing" would be a circular definition. To define "existence" as "having the quality of being" would not be circular in the strict sense, but given that our language contains a finite number of words at any point in time, any comprehensive list of definitions must be circular or leave some terms undefined.

[16] Readers familiar with the subject will recognize that by starting with Descartes I have skipped about two thousand years of western philosophy. We may go back and pick up one or two earlier philosophers, but for the most part philosophy between the death of Aristotle and the emergence of Descartes is the study of the Catholic Church, a topic of little interest to me. I therefore ignore it.

methodological skepticism that led him to ask the question that resulted in his, "Cogito, ergo sum."[17]

Once Descartes proved to his satisfaction that he existed as a thinking being, he then offered proofs of the existence God and of the physical universe, which he saw as entirely separate from the mind. His writings also led to the development of rationalism[18] and opened the door to centuries of scientific growth that have seemingly given man unparalleled control over nature.[19] By the same token, Descartes' view of the world – consisting of two separate substances (mind and matter) – also led to a mind/body dualism[20] that so dominates the modern world that we may not see the forest for the trees. Capra explains:

> The philosophy of Descartes was not only important for the development of classical physics, but also had a tremendous influence on the general Western way of thinking up to the present day. Descartes' famous sentence 'Cogito ergo sum' – 'I think, therefore I exist' – has led Westerners to equate their identity with their mind, instead of with their whole organism. As a consequence of the Cartesian division, most individuals are aware of themselves as isolated egos existing 'inside' their bodies. The mind has been separated from the body and given the futile

[17] Like Chuang Chou, Descartes considered the phenomenon of dreams, but for Descartes the fact that he might be dreaming did not change the fact that he was a being capable of having dreams. He could have just as easily said, "I dream, therefore I am."

[18] *Rationalism* is the belief that reason alone can provide knowledge of the existence and nature of things. It is also used to describe the view that reality is a unified, coherent and explicable system. Rationalists tend to be *idealists* (immaterialists). Rationalist philosophers include Descartes, Spinoza, and Leibniz. Rationalism is often contrasted with *empiricism*, the view that we gain all our knowledge through our senses. Empiricists tend to be *realists* (materialists). Some empiricists included Locke and Hume. Kids, whenever you find yourself in the middle of a philosophical debate such as this you can be nearly certain it is a false dilemma. The debate between rationalism and empiricism ignores that there may be other sources of knowledge such as intuition, and in any event rationalism and empiricism are not mutually exclusive.

[19] I say "seemingly" because man's control over nature is always temporary and because man's efforts to control nature frequently lead to examples of the law of unintended consequences. To give but one example, Paul Hermann Muller won the Nobel Prize in Physiology in 1948 for his discovery of the efficiency of DDT as a contact poison against arthropods, and DDT became widely used as an agricultural insecticide such that some felt it might help eliminate hunger around the world. The United States banned DDT as a carcinogen in 1972. Things change.

[20] *Dualism* is the belief that reality consists of two substances, one mental and one physical. It stands in contrast to *monism*, the view that reality consists of only one substance. Those who maintain that reality consists of only substance may not agree on whether that substance is mind or matter.

> task of controlling it, thus causing an apparent conflict between the conscious will and the involuntary instincts…
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> This inner fragmentation mirrors our view of the world 'outside' which is seen as a multitude of separate objects and events. The natural environment is treated as if it consisted of separate parts to be exploited by different interest groups. The fragmented view is further extended to society which is split into different nations, races, religious and political groups. The belief that all these fragments – in ourselves, in our environment and in our society – are really separate can be seen as the essential reason for the present series of social, ecological and cultural crises. It has alienated us from nature and from our fellow human beings…
>
> The Cartesian division and the mechanistic worldview have thus been both beneficial and detrimental at the same time. They were extremely successful in the development of classical physics and technology, but had many adverse consequences for our civilization.[21]

R.G.H. Siu also questioned the mind/body dualism prevalent in western thought:

> If we proceed along the dualistic attack, we would attempt to find the edge of discontinuity between mental and physical properties. But as we descend the ladder of the animal and the plant kingdoms, at what point does a given mental character disappear? Does an ass exercise free will when it refuses to budge? Does the plant show mental activity as it winds its tendrils around the supporting trellis and twists its shoots toward the light? Does the virus emulate the stoicism of the mystic? Here again, we find not means of conclusive differentiation.[22]

Descartes used reason to prove that he existed as a thinking being (and thus that something exists), but this might have amused Lao Tzu, the father of Taoism, who would never have thought to ask the question. By asking "What can I know?" Descartes assumed he was an entity separate and apart from anything that he might know. Words that describe always create dichotomies, but Tao is always a unity:

> When people see beauty, they think, "that's beautiful".
> Thinking of something as beautiful makes you think other things are ugly.
> Calling something "good" forces you to call some other things "evil."

[21] Capra, *The Tao of Physics*, Third Edition, Shambhala, 1991, pages 22-23.
[22] Siu, *The Tao of Science*, The M.I.T. Press, 1957, pages 63-64.

The ideas "difficult" and "easy" support each other.
"Long" and "short" define each other.
"High" creates "low"
"Tone" creates "noise"
"Before" creates "after"
"Have" creates "don't have"

This is why the Sage acts without effort and teaches without words.
New things are created and the Sage just accepts them.
Things fade away and the Sage accepts that too.
A Sage can have things without feeling they "own" them.
The Sage does things without putting an emotional stake into the outcome.
The task is accomplished, but the Sage doesn't seek credit or take pride in the accomplishment.
Because the Sage is not attached to the accomplishment, the accomplishment lasts forever.[23]

B. Existence Flows

To say existence flows is to say it has the property of flowing – the property of being in a state of continuous change. The notion that our world changes continuously is not new. Heraclitus is reported to have stated, "All is flux, nothing is stationary."[24] He died in approximately 475 B.C., and would be amazed to see our world a mere 2,500 years later – a planet inhabited by six billion people, a world with electricity, skyscrapers, air travel, motor vehicles, computers, television, and supermarkets.[25]

Change since Heraclitus' death has not been limited to technology. Our knowledge of our world has changed. We know Earth is not the center of the universe; it is a tiny planet in a small solar system that orbits a single star in galaxy filled with billions of stars in a universe containing billions of galaxies.

[23] *Tao Te Ching*, Chaper 2, as translated on http://www.thetao.info/english/page2.htm.
[24] This assertion by Heraclitus is often contrasted with the assertion, allegedly held by Parmenides, that nothing changes. I do not believe Parmenides meant to imply that nothing in the physical world changes; he meant that there is but one reality, and it never changes. All things change, and *that* never changes. This is very much like the Taoist view.
[25] 2,500 years is an insignificant length of time given that scientists believe the Earth is more than four billion years old and that the universe is at least twelve to fourteen billion years old.

Even man's theology has changed. So-called primitive peoples often believed in a multitude of gods. The Greeks recognized many deities, including Zeus (the king of gods), Apollo (the god of light and truth), and Athena (the goddess of wisdom). Today's major religions posit that there is one God.[26] [27]

Things are changing even as I craft this paper. Cells in my body are dying and being replaced. Electricity is flowing into my laptop. My children grow older with each tick of the clock. My desk appears to be a solid, inanimate object, but science tells me it is really a collection of subatomic particles zinging around at incredibly high speeds.[28]

We will explore the concept of time later, but for now note that to accept the concept of flow or change it appears we must accept the concept of time. The very definition of change (as a noun) is that some thing (object, circumstance, etc) exists in a certain way at one point in time and in a different way at another point in time. If time is an illusion, as some suggest, what are the implications for the concept of change?

C. The Flow of Existence (Microscopic)

We have focused largely on the flow of existence from the perspective of a human observer on Earth, but science tells us that existence also flows on the microscopic level.

For centuries man struggled to identify the fundamental "stuff" of the universe. Heraclitus believed fire to be the primordial element. Thales theorized that all things are

[26] The belief that there is one God is called *monotheism*. The belief that there are many gods is *polytheism*. The belief that everything is god is *pantheism*.

[27] Theologians classify Christianity as a monotheistic faith, but a key Christian doctrine is the trinity – the assertion that God exists as the father, the son, and the Holy Spirit.

[28] Actually, scientists are not as certain of this as they once were. When you ask what those particles are made of, scientists tell you they are made of smaller particles, and when you ask what those are made of, scientists tell you they may not even be made of matter – they may be waves or fields or even probabilities. They also tell you some of those 'particles' can be in several places at the same time.

made of water. Anaimenes said air is the fundamental element. Democritus later postulated that all things are made of atoms, and most accepted this theory in one form or another until the early part of the Twentieth century.

In 1911, Ernest Rutherford, a New Zealand physicist, concluded experiments and published a paper asserting that atoms were not solid – they consisted of vast regions of 'empty' space in which extremely small particles – electrons – moved around a central charge (which we call the nucleus, made of protons and neutrons), bound to it by electric forces.[29]

Today's scientists recognize that those vast regions are not just empty space and they are as important as the subatomic particles that travel through them. You cannot have one without the other. Scientists now speak of fields – gravitational fields, electrical fields, quantum fields. The gist of field theory is that matter and space are inseparable and interdependent parts of a single whole. Scientists now believe material objects not only determine the structure of the surrounding space but are, in turn, influenced by their environment in an essential way. Einstein wrote:

> We may therefore regard matter as being constituted by the regions of space in which the field is extremely intense… There is no place in this new kind of physics both for the field and matter, for the field is the only reality.[30]

For thousands of years man sought to identify the fundamental particle from which all matter is constructed. The prevailing view today is that there is no fundamental particle:

> With the concept of the quantum field, modern physics has found an unexpected answer to the old question of whether matter consists of indivisible atoms or of any underlying continuum. The field is a continuum

[29] Capra, *The Tao of Physics*, Third Edition, Shambhala, 1991, page 65.
[30] Quoted in M. Capek, *The Philosophical Impact of Contemporary Physics*, page 319.

> which is present everywhere in space and yet in its particle aspect has a discontinuous, 'granular' structure. The two apparently contradictory concepts are thus unified and see to merely different aspects of the same reality. As always in a relativistic theory, the unification of the two opposite concepts takes place in a dynamic way: the two aspects of matter transform themselves endlessly into one another.[31]

Capra continues:

> The field theories of modern physics force us to abandon the classical distinction between material particles and the void. Einstein's field theory of gravity and quantum field theory both show that particles cannot be separated from the space surrounding them. On the one hand, they determine the structure of that space, whilst on the other hand they cannot be regarded as isolated entities, but have to be seen as condensations of a continuous field which is present throughout space. In quantum field theory, this field is seen as the basis of all particles and of their mutual interactions.[32]

After explaining field theory, Capra points out that it has similarities to the worldview of the eastern mystics. Both see physical things as transient manifestations of an underlying fundamental entity. Capra explains:

> In the eastern view, the reality underlying all phenomena is beyond all forms and defies all description and specification. It is therefore often said to be formless, empty or void. But this emptiness is not to be taken for mere nothingness. It is, on the contrary, the essence of all forms and the source of all life. Thus the *Upanishads* say,
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> > Brahman is life. Brahman is joy. Brahman is the Void…
> > Joy, verily, that is the same as the Void.
> > The Void, verily, that is the same as joy.
>
> Buddhists express the same idea when they call the ultimate reality *Sunyata* – "Emptiness', or 'the Void' – and affirm that it is a living Void which gives birth to tall forms in the phenomenal world. The Taoists ascribe a similar infinite and endless creativity to the *Tao* and, again, call it empty… In spite of using terms like empty and void, the Eastern sages make it clear that they do not mean ordinary emptiness when they talk about *Brahman*, *Sunyata,* or *Tao*, but on the contrary, a Void which has infinite creative potential. Thus, the Void of the Eastern mystics can easily be compared to the quantum field of subatomic physics. Like the

[31] Capra, *The Tao of Physics*, Third Edition, Shambhala, 1991, page 215.
[32] Capra, *The Tao of Physics*, Third Edition, Shambhala, 1991, pages 221-222.

> quantum field, it gives birth to an infinite variety of forms which it sustains and, eventually, reabsorbs… The phenomenal manifestations of the mystical Void, like the subatomic particles, are not static and permanent, but dynamic and transitory, coming into being and vanishing in one ceaseless dance of movement and energy…. In Chinese philosophy, the field idea is not only implicit in the notion of Tao as being empty and formless, and yet producing all forms, but is also expressed explicitly in the concept of *ch'i.*[33]

D. The Flow of Existence (Macroscopic)

Not all that long ago most western people believed God created the universe in about 5,000 B.C., and that he did it in six days.[34] Most people believed in an essentially static universe, and therefore the question of whether it had a beginning was really one of metaphysics or theology.[35]

But then one day in 1929, Edwin Hubbell, a lawyer and pretty good heavyweight boxer who sometimes messed around with telescopes, noticed that another galaxy was moving away from ours at an impressive speed. He turned his telescope in a different direction and saw another galaxy speeding away from ours. This happened several more times. No matter what direction he looked in other galaxies were zooming away from us. "Hey Grace," he shouted, "the universe is expanding."

"That's nice, dear," his wife said.

Hubbell theorized that there might have been a time when things in the universe had been a lot closer together. And so the question of the beginning of the universe was thrust into the realm of science.

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[33] Capra, *The Tao of Physics*, Third Edition, Shambhala, 1991, pages 211-213.

[34] James Ussher (1581-1656), the Archbishop of Ireland in the seventeenth century, declared that the world was created in 4004 BC. Ussher assumed the Bible was the only reliable source of chronological information for the time periods covered in it. For events before this time, Ussher relied solely on data from the Bible to erect his historical framework. He chose the death of King Nebuchadnezzar as a reliable date upon which to anchor all the earlier biblical dates. Working meticulously backward from there, he ended up with his date for creation of October 23, 4004 BC.

[35] Hawking, *A Brief History of Time*, 10th Anniversary Edition, Bantam Books, pages 8-9.

Today,[36] because of the insights of Hubbell and those who followed him, we know that the universe began about 13 billion years ago.[37] At that time all of the matter and energy of space was contained in a single infinitesimally small point. It was infinitely hot and infinitely dense.[38] Then there was a Big Bang.

> But as the universe expanded, the temperature of the radiation decreased. One second after the big bang, it would have fallen to about ten thousand million degrees. This is about a thousand times the temperature at the center of the sun, but temperatures as high as this are reached in H-bomb explosions. At this time the universe would have contained mostly photons, electrons, and neutrinos… About one hundred seconds after the big bang, the temperature would have fallen to one thousand million degrees, the temperature inside the hottest stars. At this temperature protons and neutrons would no longer have sufficient energy to escape the attraction of the strong nuclear force and have started to combine together to produce the nuclei of atoms of deuterium nuclei (heavy hydrogen), which contain one proton and one neutron… Within only a few hours of the big bang, the production of helium and other elements would have stopped.[39]

Hawking continues to explain the early stages of the universe in detail, but for our purposes it is sufficient to say that as the universe expanded and cooled the hydrogen and helium formed stars and galaxies. Later more elements, such as carbon and oxygen, developed. Gases and dust were flying through space and sometimes they collected and gravity held them together, forming planets.

One such planet was Earth, which is about 4.5 billion years old. The average life span of an American man is about 75 years. Because the geology of the Earth does not change significantly during our short lives, we tend to view our planet as permanent and unchanging, but this is an illusion. Four billion years ago the Earth was too hot to

[36] I just want to point out that I have now satisfied the 15-page requirement.
[37] The exact date was January 1st, in the year 13,071,233,495 B.C.
[38] Yes, I could make a joke about a number of Hollywood starlets here, but I am better than that.
[39] Hawking, *A Brief History of Time*, 10th Anniversary Edition, Bantam Books, pages 121-125

support life. 600,000,000 years ago a vast ocean covered Colorado. Colorado's most recent ice age may have ended as recently as 10,000 years ago. Even today the mountain pine beetle is wiping out the tall pines that have dominated Colorado's mountain forests for generations. As these trees die sunlight will be better able to penetrate the forests and aspen, spruce, and fir trees will replace the pines.

Our sun, the mass of gases that keeps us warm and enables life on Earth is no more permanent than our planet. Born at roughly the same time as the Earth, our sun is about 1/3 of the way through its expected life. Scientists now predict the following events during the remaining life of our star. In the next one billion years the sun's brightness will increase by 10%. This will super-heat our planet, the oceans will boil away, and all life will die. In about 6.5 billion years, our sun will double in brightness and use up all of its supply of hydrogen fuel in its core. This will cause the sun to begin swelling as it uses hydrogen from the layers surrounding the core. In about 8 billion years the sun will swell to more than one hundred times its present size. This giant star will swallow up Mercury, Venus, and maybe even Earth. Our sun will then be what astronomers call a Red Giant. After all hydrogen fuel is used, the sun will begin to use helium as its fuel. This will burn very quickly and only last about 100 million years. In about 12 billion years, the sun will eject much of its outer layers and become a smoldering, collapsed core that scientists would call a White Dwarf.

Once our sun becomes a White Dwarf, the solar system will be gone. Any remaining planets not destroyed by the Red Giant will probably orbit around the White Dwarf along with a great many asteroids. Our White Dwarf will die a lingering death that

could last 100 trillion years. The same will happen to most other stars, although a few will end their lives as blazing supernovas.

That is the fate of our solar system, but what will happen to our galaxy, the billions of solar systems we call the Milky Way? It will collide with the Andromeda galaxy, but astronomers believe the universe is expanding and most of the galaxies that we see now are flying away and will eventually be out of range for us. The stars in our own galaxy will burn out, one after the other. The only thing that will remain is a dull graveyard of cold planets, dead suns and black holes. In about one hundred trillion years, the Milky Way will go black. And eventually, even this graveyard decays. One after the other, the dead stars and planets are eaten by black holes, or kicked out of the Milky Way by collisions. Astronomers expect that in one hundred to one thousand billion billion years, our galaxy will have dissolved.

What about the universe? The universe contains billions of galaxies. What happens when Porky Pig finally pokes his head through the last galaxy and says, "That's all folks"? Nobody knows with certainty, but this passage provides one plausible answer:

> Time goes on. After a while (more trillions of years) something else will kick in. You'll notice that even the very stuff nature is made of, isn't stable. A proton, the particle you'll find in the core of atoms, has an average lifetime of 100,000,000,000,000,000,000,000,000,000,000,000 years. Wait long enough, and it will suddenly vanish. Poof, gone. The same goes for light particles, the so-called 'photons'. They're expected to last a few zero's longer, but in the end, they too will kick the bucket, one after the other. Isn't that just bizarre? The light will go out, literally.
>
> The last thing that survives, are the black holes. But in the end, they too will vanish. They will evaporate in a puff of radiation.
>
> So there we are, at our unimaginable one googol years.[40] Finally, the

[40] A Googol is 10 to the hundredth power, a 1 followed by 100 zeros.

Universe is totally and utterly empty. You won't see any light or spot any planet -- in fact, you won't even find the tiniest speck of dust. The Universe has sterilized itself. All there is left, is emptiness, and darkness. Total oblivion. And worst of all: there's nothing we can do to stop it. We can build fancy machines or futuristic devices all we like -- but in the end, they'll all get kicked out of existence, when the matter they are made of simply vanishes. So there you have it: infinity. Booooring, we must add. But don't sob. There's an upside.

As the quadrillions of years pass by, something very odd should happen. In eternity, even the rarest events get a chance to occur. Weird, bizarre phenomena that only happen once in a zillion years or so, become quite normal.

For example: the nothingness should yield a few surprises. Already, physicists know that in a vacuum, there are sometimes tiny little energy 'blobs'. Little, random fluctuations of the so-called 'quantum vacuum'. Out of nowhere, tiny particles pop in and out of existence. But theory predicts that on very, VERY rare occasions, the fluctuations should be a bit larger. Out of nowhere, an entire atom might appear! Or hey, the vacuum may even spit out a few of them!

Think of it like the static on TV. Wait long enough, and out of the random fuzz, a recognizable image might materialize. Wait REALLY long, and one day a complete episode of The Bold And The Beautiful should accidentally show up!

In the vastness of eternity, even things that are almost impossible become real. Like the sudden appearance of, say, a light green buste of Napoleon Bonaparte.

In the Universe, this should give some really surprising results. With eternity at hand, the vacuum should begin to yield all kinds of objects. Incoherent lumps of random garbage, most of the time. But on very, very rare occasions, you'll see other objects popping into existence. The Eiffel tower. A purple camel. A golden parking garage filled with chocolate Cadillacs. Napoleon Bonaparte sitting next to Mike Tyson on top of a stack of comic books. As the googols of years pass by, it's all there.

In the VERY, VERY, VERY long run, the vacuum will even belch up complete planets, and beautiful stars, burning and all. Theoretically the vacuum should even churn out a complete solar system one day, identical to ours, with a planet Earth inhabited by people. "In an infinite amount of time, one day, I will reappear", as physicist Katherine Freese of Michigan University once put it. "A crazy thought, but true." One day the black nothingness should even produce a new Big Bang. Admittedly, we'll

> have to wait really long for it to happen. Researchers of the University of Chicago once tried to calculate it. And according to their best estimates, it should happen somewhere over the next 1 000 years. That's a one with 1056 zero's. You can count them, if you like. Given enough "TIME" everything that can happen, will and must happen.[41]

Physicists do not know how our universe will end, but most believe the ending will be BIG. That is why they have theories such as the Big Crunch, the Big Rip, the Big Freeze and the Big Bounce. No matter what happens, it is difficult to ignore the possibility that the universe itself is part of a continuous, unending form of reincarnation. Maybe we are in the middle of one Big Bang in an un-ending series of Big Bangs.

Finally, before completing our macroscopic tour of the flow of existence, consider that there may be more than one universe. The multiverse (or Many Worlds)

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[41] This passage appears on several websites, with citations to one book and one article. It may have been written by a retired engineer named Alan McDougall. The book cited is Govert Schilling, *Evolving Cosmos* (Cambridge University Press, 2004). The article is *The Final Unraveling of the Universe* by Stephen Battersby, in New Scientist, February 5, 2005.

hypothesis states that our universe is but one universe among infinite parallel universes, some of which may have different physical laws. Whatever the ultimate fate of our universe may be, all parallel universes will have different fates.

The possibility that many universes may exist is not just science fiction, and finds some theoretical support in subatomic physics. Physicists believe particles on a quantum level may take different forms, perhaps appearing as particle at one time and as a wave at another time. This came to be known as the Heisenberg Uncertainty Principle when physicist Werner Heisenberg suggested that just by observing quantum matter we affect the behavior of that matter. Thus, we can never be fully certain of the nature of a quantum object or its attributes, like velocity and location.

Niels Bohr theorized that quantum particles don't exist in one state or the other, but in all of their possible states at once. The sum total of possible states of a quantum object is called its wave function. The state of an object existing in all of its possible states at once is called its superposition. Bohr says that when we observe a quantum object, we affect its behavior. Observation breaks an object's superposition and essentially forces the object to choose one state from its wave function. This theory, now known as the Copenhagen interpretation, accounts for why physicists have taken opposite measurements from the same quantum object: The object "chose" different states during different measurements.

Back in 1954 a young grad student at Princeton named Hugh Everett III theorized that parallel universes exist, exactly like our universe:

> These universes are all related to ours; indeed, they branch off from ours, and our universe is branched off of others. Within these parallel universes, our wars have had different outcomes than the ones we know.

> Species that are extinct in our universe have evolved and adapted in others. In other universes, we humans may have become extinct.[42]

Everett agreed with much of what Bohr had suggested about the quantum world, but disagreed with Bohr on one issue. Everett suggested that measuring a quantum object does not force it into one state or another. Instead, he theorized, a measurement taken of a quantum object causes an actual split in the universe. The universe is literally duplicated, splitting into one universe for each possible outcome from the measurement:

> For example, say an object's wave function is both a particle and a wave. When a physicist measures the particle, there are two possible outcomes: It will either be measured as a particle or a wave. This distinction makes Everett's Many-Worlds theory a competitor of the Copenhagen interpretation as an explanation for quantum mechanics.
>
> When a physicist measures the object, the universe splits into two distinct universes to accommodate each of the possible outcomes. So a scientist in one universe finds that the object has been measured in wave form. The same scientist in the other universe measures the object as a particle. This also explains how one particle can be measured in more than one state.
>
> As unsettling as it may sound, Everett's Many-Worlds interpretation has implications beyond the quantum level. If an action has more than one possible outcome, then -- if Everett's theory is correct -- the universe splits when that action is taken. This holds true even when a person chooses not to take an action.
>
> This means that if you have ever found yourself in a situation where death was a possible outcome, then in a universe parallel to ours, you are dead. This is just one reason that some find the Many-Worlds interpretation disturbing.
>
> Another disturbing aspect of the Many-Worlds interpretation is that it undermines our concept of time as linear. Imagine a time line showing the history of the Vietnam War. Rather than a straight line showing noteworthy events progressing onward, a time line based on the Many-Worlds interpretation would show each possible outcome of each action

[42] Josh Clark, Do Parallel Universes Really Exist?, http://science.howstuffworks.com/parallel-universe.htm

taken. From there, each possible outcome of the actions taken (as a result of the original outcome) would be further chronicled.[43]

Everett and his followers are not the only physicists who believe that parallel may universes exist. Physicist Michio Kaku, originator of string theory, says that the essential building blocks of all matter and forces in the universe exist on a subquantum level. These building blocks resemble tiny strings, and they make up quarks, electrons, atoms, cells, and so on. What kind of matter is created by the strings and how that matter behaves depends on the vibration of these strings.[44] String theory states this is how our entire universe is composed. And according to string theory, this composition takes place across 11 separate dimensions.

String theory says our own universe is like a bubble that exists alongside similar parallel universes. Unlike the Many-Worlds theory, string theory supposes that these universes can come into contact with one another. String theory says gravity can flow between these parallel universes. When these universes interact, a Big Bang like the one that created our universe occurs.

A variation of the idea that many universes exist is that one universe exists, but it is like a hologram.[45] A hologram is a picture that changes when looked at from different angels. Now, if a picture appears to depict one thing when viewed from one angle and an entirely different thing when viewed from another angle, is it not possible that the universe may appear different to people (or beings) with different levels of consciousness and/or different sense perception tools? Don Juan stated:

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[43] Josh Clark, Do Parallel Universes Really Exist?, http://science.howstuffworks.com/parallel-universe.htm

[44] If reality is constructed on vibrating strings, the notion that humans (and other creatures or objects) can receive and transmit "good vibes" does not seem quite as wacky as it sounds. In his book, *Rolling Thunder*, Doug Boyd tells the true story of his time with a native American medicine man – Rolling Thunder – who was able to communicate with plants and animals by tuning into their vibrations.

[45] The leading book on this subject is *The Holographic Universe* by Michael Talbot.

> We are perceivers. We are an awareness; we are not objects; we have no solidity. We are boundless. The world of objects and solidity is a way of making our progress on earth convenient. It is only a description that was created to help us. We, or rather our *reason*, forget that the description is only a description and thus we entrap the totality of ourselves in a vicious circle from which we rarely emerge in our lifetime.[46]

Put differently,

> Contrary to what everyone knows is so, it may not be the brain that produces consciousness, but rather consciousness that creates the appearance of the brain – matter, space, time and everything else we are pleased to interpret as the physical universe.[47]

A similar belief is shared by Dan Millman, author of *Way of the Peaceful Warrior*:

> Consciousness is not *in* the body; the body is *in* consciousness. And you are that consciousness – not the phantom mind that troubles you so. You are the body, but you are everything else, too… Only the mind resists change. When you relax mindless into the body, you are happy and content and free, sensing no separation. Immortality is *already* your, but not in the way you imagine or hope for. You have been immortal since before you were born and will be long after the body dissolves. The body is Consciousness; never born; never dies; only changes. The mind – your ego, personal beliefs, history, and identity – is all that ends in death.[48]

A Native American medicine man named Rolling Thunder made a remarkably similar statement to a researcher from the Menninger Foundation:

> I am beginning to think that all of one's condition, including one's body and one's environment, is in the mind and that the changes that take place in the external world occur first in the mind.[49]

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[46] Carlos Castaneda, *Tales of Power*, (New York: Simon & Schuster, 1974), page 100.
[47] Marilyn Ferguson, "Karl Pribram's Changing Reality," in *The Holographic Paradigm,* ed. Ken Wilber (Boulder, CO.: New Science Library, 1982), page 24.
[48] Millman, *Way of the Peaceful Warrior*, page 82.
[49] Doug Boyd, *Rolling Thunder*, page 11.

PART III. BOOT CAMP

"We still do not know one thousandth of one percent of what nature has revealed to us."

- Albert Einstein

Modern man can erect tall buildings, make powerful weapons, and communicate over great distances. We are more technologically advanced than any of our ancestors could have imagined. Consequently, we sometimes think we know more than we do. We understandably value reason and science, but this sometimes prevents us from appreciating life and its mysteries. In case you missed it in your earlier educational endeavors, much of what you believe to be true is either not true or highly questionable. This part of my paper (Part III) is a bit like boot camp in that my intent is to help readers adapt to a new culture – one that takes away the comfort they felt before coming to realize how little they know.

A. Perception

What is the shape of a penny? Did you say 'round' or 'circular'? Are you certain? Read this passage from C.E.M. Joad's *Guide to Philosophy*?

> Let us consider the shape of a penny. Common sense supposes the shape to be circular, but from almost any point of view from which the penny is looked at, the penny appears, as we quickly find out when we try to draw it, to be elliptical, the ellipses which we perceive varying in degrees of fatness and thinness according to the angle of vision from which we view the penny. From two positions only does the penny appear to be circular, and these, namely, the position vertically above and the position vertically below the penny, are rather peculiar positions which are comparatively rarely occupied by the human eye.
>
> If the shape of the penny normally appears to be elliptical, why do we call it circular? It is not easy to say. In the first instance, perhaps, because of

the prevalence of a general belief to the effect that it *is* circular, a belief so widespread and deep-seated that anyone who questioned it outside a philosophical discussion would be regarded as imperfectly sane. But how did this general belief arise? On what is it based? Probably it rests at bottom upon the fact that the penny conforms in respect of many of its attributes to the definition of a circle. There is, for example, a point on its surface such that all lines drawn from that point to the circumference are of equal length… But, if we take our stand on this definition, similar difficulties arise to those which we considered [in a previous example]. What we want to know is the nature of the shape to which these mathematical properties belong? If we answer that it is a *circular* shape the question arises, does a penny have it? Unfortunately, the penny as usually seen does not. Nor does the penny as touched; to feel a penny is not to feel a circular shape but either a flat surface or, if a finger is crooked round its edge, a curving line of metal. Hence, to touch and to site the penny does not normally *appear* to be circular. But to what, then, does it *appear* circular? Presumably to a pair of compasses. But why should its appearance to a pair of compasses, or if the expression be preferred, the reaction of a pair of compasses to it, be presumed to acquaint us with its *real* shape, in some sense in which its appearance to eyes and fingers does not acquaint us with its real shape? Why in fact are the compasses privileged "observers"? Moreover, what are we to say of the properties of the pair of compasses? Can we, when the existence of physical objects possessing properties in their own right is in question, steal the answer to the question in the case of the compasses in order not beg it in the case of the penny?

As it is with texture and temperature, as with size and shape, so is it with most, if not all, of the qualities which apparently belong to objects in the external world. In regard to most, if not to all, of these apparent qualities we can truly say that in the last resort they turn out to be relative to ourselves…

If X sees a carnation blue, and Y, who is colour-blind, sees it green, it is very difficult to suppose that the carnation is both green and blue at the same time. On the other hand there seems to be no good ground for affirming that it is *really* blue because it is blue to normal vision, and that its appearance to the colour-blind man is not, therefore, its *real* appearance, merely because the colour-blind man is in a minority. The plain implication seems to be that the difference between the apparent colours is due to a difference in the physiological machineries of the two perceivers.[50]

This passage provides a wonderful example of the significance of the debate

[50] C.E.M. Joad, *Guide to Philosophy*, Dover Publications, pages 28-37.

between idealism and realism, and the problem of sense perception.

B. Logic

Have you heard of Zeno's Paradox of the Arrow? Zeno said that at any given moment of its flight an arrow must either be where it is or where it is not. If it is where it is, it cannot be moving, since, if it were, it would not be there; and it cannot be where it is not.

Zeno also had a friend named Achilles and a tortoise, and just to mess with people he used both of them in another paradox – the Paradox of Achilles and the Tortoise:

> Achilles and the tortoise run a race – Achilles, as is proper, seeing that he is so much the faster, giving the tortoise a start. But Achilles will never catch the tortoise, since by the time that Achilles has reach the point (P1) where the tortoise was, the tortoise will have moved forward to another point (P2). By the time Achilles has reached P2, the tortoise will be at P3. By the time he is at P3, the tortoise will be at P4, and so on *ad infinitum.* Admittedly the distance between Achilles and the tortoise continually diminishes; but, so the argument maintains, it can never be entirely abolished, since, whatever point Achilles reaches, the time which he occupies in reaching it will have enable the tortoise to move forward to a further point.[51]

Paradoxes are fun, but they also demonstrate the limits of logic as we strive to understand our universe and our reality.

C. Identity

Plutarch told the story of Theseus:

> Theseus is remembered in Greek mythology as the slayer of the Minotaur. For years, the Athenians had been sending sacrifices to be given to the Minotaur, a half-man, half-bull beast who inhabited the labyrinth of Knossos. One year, Theseus braved the labyrinth, and killed the Minotaur.

[51] C.E.M. Joad, *Guide to Philosophy*, Dover Publications, page 173.

> The ship in which he returned was long preserved. As parts of the ship needed repair, it was rebuilt plank by plank. Suppose that, eventually, every plank was replaced; would it still have been the same ship? A strong case can be made for saying that it would have been: When the first plank was replaced, the ship would still have been Theseus' ship. When the second was replaced, the ship would still have been Theseus' ship. Changing a single plank can never turn one ship into another. Even when every plank had been replaced, then, and no part of the original ship remained, it would still have been Theseus' ship.
>
> Suppose, though, that each of the planks removed from Theseus' ship was restored, and that these planks were then recombined to once again form a ship. Would this have been Theseus' ship? Again, a strong case can be made for saying that it would have been: this ship would have had precisely the same parts as Theseus' ship, arranged in precisely the same way.
>
> If this happened, then, then it would seem that Theseus had returned from Knossos in two ships. First, there would have been Theseus' ship that has had each of its parts replaced one by one. Second, there would have been Theseus' ship that had been dismantled, restored, and then reassembled. Each of them would have been Theseus' ship.
>
> Theseus, though, sailed in only one ship. Which one?[52]

The Ship of Theseus Paradox raises the question of whether an object that has had all its component parts replaced is the same object. Philosophers call this the problem of identity.[53]

D. Time

"Time is a hallucination purveyed by the inventors of space."

[52] http://www.logicalparadoxes.info/theseusship.html

[53] One solution to this paradox may come from the concept of four-dimensionalism. David Lewis and others have proposed that these problems can be solved by considering all things as 4-dimensional objects. An object is a spatially extended three-dimensional thing that also extends across the 4th dimension of time. This 4-dimensional object is made up of 3-dimensional time-slices. These are spatially extended things that exist only at individual points in time. An object is made up of a series of causally related time-slices. All time-slices are numerically identical to themselves. And the whole aggregate of time-slices, namely the 4-dimensional object, is also numerically identical with itself. But the individual time-slices can have qualities that differ from each other.

In our world we reason that if I woke at 6:00 a.m. and it is now 6:00 p.m., it follows that twelve hours have passed. Is that correct?

What is time? One definition is that time is a component of a measuring system used to sequence events, to compare the durations of events and the intervals between them, and to quantify the motions of objects.[54]

Among philosophers there are two distinct viewpoints on time. One is that time is part of the fundamental structure of the universe, a dimension in which events occur in sequence. Time travel, in this view, becomes a possibility as other "times" persist like frames of a film strip, spread out across the time line. Isaac Newton subscribed to this view, and hence it is sometimes referred to as Newtonian time. The opposing view is that time does not refer to any kind of "container" that events and objects "move through", nor to any entity that "flows", but that it is instead part of a fundamental intellectual structure (together with space and number) within which humans sequence and compare events. This second view, in the tradition of Leibniz and Kant holds that time is neither an event nor a thing, and thus is not itself measurable nor can it be travelled. In other words, time is not real; it is a human invention we find convenient to use during our finite lives.

Debates about whether time is real often center around what it means to be 'real.' Modern physicists generally consider time to be as real as space. Spatial measurements are used to quantify how far apart objects are, and temporal measurements are used to quantify how far apart events occur.

[54] http://en.wikipedia.org/wiki/Time

If I woke at 6:00 a.m. and it is now 6:00 p.m., it is convenient (for me) to say twelve hours have passed. Given that my life is finite, it may even be true, at least for me. If we assume I will live to the age of eighty-five, my life will last 744,600 hours (24 x 365 x 85). Thus, I can compare those twelve hours to my total expected life (in hours) and conclude that those twelve hours consumed .0000016116 % of my life.

But if I step outside myself and try to answer the question from the standpoint of existence itself, did twelve hours really pass? If existence has no beginning or end, the concept of twelve hours is meaningless for existence. Existence just exists.

E. Space-Time

Newton believed in an absolute time that was the same for everyone, everywhere. If it is 5 o'clock on earth, it is 5 o'clock on the most distant star. Similarly, Newton believed in a universal space such that objects could be measured using the same yardstick anywhere in the cosmos. Newton's view on time kept it separate from space.

When Einstein introduced his Theory of Relativity in the early 20th century, he posited that time was not separate from space, but was connected to it. Time and space combined to form space-time:

> When Albert Einstein burst onto the scientific scene in 1905, he completely overturned our concept of time. At the end of the 19th century, one of the most important goals of research in the physical sciences was to understand the interferometric measurements of Michelson and Morley… This experiment showed that the motion of light doesn't follow Newton's laws of motion—the firmament of all physical sciences of the era. What was wrong with the existing theory that made light behave differently than expected?
>
> One possibility, that objects change their length depending on how they are moving, challenged the very meaning of velocity, or the rate of motion

> through space. Since velocity is measured as a distance interval divided by a time interval (for example, a mile per hour or a meter per second), the nature of time became part of the discussion. If length could change with motion, could time do the same?
>
> In his first landmark paper on relativity, Einstein explained that any measurement of length or time depends on the motion of both the "measurer" and the "measuree." Well, if length changes when you move, and time changes when you move, then it's natural to consider length and time to be the same sort of physical construct. That means that time is a dimension, the way that length, width, and height are dimensions. Space and time are inextricably linked—they're both relative, not absolute—and when we think about space, we must also think about time. We aren't three-dimensional creatures that occupy space; we're four-dimensional creatures that occupy space and time together. Time is the fourth dimension![55]

F. Relativity

I am not a physicist, but this paper concerns the flow of existence. Existence appears to include matter, and flow is synonymous with change. If we are to understand the flow of existence, we should try to understand how our universe works.

To explain relativity I will quote heavily from several sources, but here is a simple way to think of it. If I am driving down the road at 55 miles per hour, we tend to think I am moving at 55 miles per hour and the road is not moving at all. However, I could just as easily state that that I am not moving at all and that the road is moving at 55 miles per hour. In truth, *relative* to the road, I am moving at 55 miles per hour, but *relative* to my vehicle I am not moving at all. It's all relative, which is why Einstein – being a genius – called it relativity.[56]

If you want to dive deeper into relativity, here is a portion of an essay that does a good job of explaining it:

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[55] Dr. Charles Liu, Concept: What is Time? http://www.amnh.org/learn/courses/space_resource1.php

[56] To make the concept simple I have conveniently ignored the fact that while I am driving at 55 miles per hour the earth is spinning on its axis and orbiting the sun.

In 1905 Einstein published his theory of special relativity, which introduced the then radical idea that different observers see different events occurring at the same time and place. For example, Bill and Sally may see two firecrackers that they ignite explode at exactly the same time, while Jane (in motion at a distance) may see one of the very same firecrackers explode a few seconds before the other one.

Einstein used the concept of relationships between frames of reference to explain how these "crazy" observations are real and actually do occur. Frames of reference may be thought of as invisible "coordinate map grids", like the letters and numbers on the sides of roadmaps, attached to every observer so that the observer can measure the position of surrounding objects.

Special relativity tells us that observers who are in a state of uniform motion with respect to one another are in "inertial frames of reference", and that they cannot use the laws of physics to distinguish the frame of reference of one observer from the frame of reference of any other observer. In an inertial frame of reference, there is no physical experiment whatsoever that you can perform that can distinguish between a state of rest and a state of constant velocity (if you are in an elevator, when it starts moving downward a ball released from your hand does not fly to the ceiling). If you are in a windowless room, there is no experiment that you can perform in that room that will tell you if the room is stationary, or is moving in some direction at a constant velocity, or is in uniform "free fall" acceleration.

Think about being in a silent electric car with all the windows painted black (you can't tell if you are moving relative to the road by looking outside or listening to the engine). If the car is standing at a red light, and you put a coffee cup on the dashboard, the cup will not move. If the car is going a steady 120 miles an hour (you did not feel the acceleration because you were asleep), and you put the cup on the dashboard, the coffee will not fly back and hit you in the face. There is no experiment that you can do inside the car (which is your inertial frame of reference) that will tell you if you are standing at a red light, or going down the road at 90 miles per hour, or even 90,000 miles per hour! What happens when a car accelerates after the red light turns green? The same thing that would happen if the car fell (smoothly) off the edge of a cliff, as the car falls toward the ground below the coffee will still remain in the cup on the dashboard (until you reach the valley floor).

Note that Newton's first law of motion, which in essence states that an object in motion will remain in motion unless acted on by an external force, is consistent with this result. So long as Newton's laws are applied only where relative velocities do not approach the speed of light,

Newton's law of motion give us "close enough" results, even in a relativistic universe. That is why they are still taught in schools as "true" physical laws.

You cannot determine if the car is moving at constant velocity, or is standing still, or is in a uniformly accelerating gravitational free fall. That does not mean that you cannot determine non-uniform acceleration. If you press the accelerator so that the car "speeds up", or if you swerve from a straight path, you will feel the acceleration and be able to measure it. None-the-less, there is no physical experiment whatsoever that can distinguish between a state of rest, a state of constant velocity, and a state of gravitational free fall. Our solar system is located on a spiral arm of the Milky Way galaxy, which rotates at a constant velocity (creating a nearly inertial frame). If motion was not relative, and we could do an experiment to measure the motion, then every time we got out of bed the speed of our earth / solar system rotating around the Milky Way (about 155 miles/sec or 250 km/sec) would knock us to the floor! Every time we set the coffee cup down in our moving car, the coffee would hit us in the face!

One startling conclusion that we reach from all this is that the velocity of light must have the same value for all inertial observers, even if they are moving toward or away from the source of the light. If this was not true, an observer could perform an experiment using the speed of light to measure the velocity of their inertial reference frame, and then use that result to determine which of several frames of reference (frames in constant motion) they were actually in. The disastrous results of a speed of light that is additive (not constant in all frames) would include being hit in the face by the coffee, and, even worse, being plastered to the floor by the speed of the earth flying through space.

Experimental results fully support the counterintuitive predictions of special relativity. Clearly, the idea that the speed of light is constant is inconsistent with an absolute space that is distinct and separate from an absolute time. Modern physics replaces Newtonian space and time with a single entity, space-time. Minkowski, who along with Einstein formalized the math of Spacetime, said, "…henceforth, space by itself, and time by itself, have vanished into the merest shadows and only a kind of blend of the two exists in its own right."

Space-time is essentially a "curved" geometric construct that allows for the relativity of simultaneity. In other words, if one observer correctly concludes that two events occur simultaneously, the same events would appear to take place at different times to an observer who was in motion relative to the first observer. Both the observer who measures the two events to be taking place simultaneously, and the observer who

measures the events as taking place at different times, are right! Our example above is correct, one observer will see a firecracker they light and a second firecracker that a friend lights explode at exactly the same time, while a third observer moving relative to the other two will see one firecracker explode before the other firecracker. Relativity tells us that both are right!

Both time and space are relative, and are "different" for observers in relative motion to one another. For one observer the firecrackers actually did explode at precisely the same time, while for the other observer the explosions of the firecrackers actually did occur seconds apart. The time and distance measured by each observer is different, both are right, neither is wrong!

Relativity tells us that time and distance change depending on the relative motion of the observers. If Observer A measures the passage of one hour on their clock, another observer B who is in relative motion to observer A may measure the passage of 30 minutes on their clock. If Observer A measures a distance of one mile on their ruler, another observer B who is in relative motion to observer A may measure a distance of 1/2 mile on their ruler. We don't see time or distance shrinking on earth because the effect is virtually undetectable until the relative motion of the two observers approaches the speed of light (299,792,458 meters per second). None-the-less, the time and distance measured by two observers in relative motion to each other is different, only the speed of light measured by all observers is the same.

Einstein-Minkowski space-time is made up of three spatial dimensions x, y, and z, and one time dimension t. Space-time is commonly thought to be the history of the entire universe, containing every "event" that ever happens. A "world-line" is the history of an object in "space-time". Special relativity allows us to define a distance from the origin for all the points on a world-line, allowing the world-line to be a set of points that have physically distinguishable properties. Therefore, we can identify each of the events on a world-line as distinct points in space-time. Each point on the world-line is a particular event that happens at one place in space (represented by the values of the x, y, z coordinates) at one particular time (represented by the value of the t coordinate). Each point on the world-line of a human being is generally thought to be a real physical event that represents a unique sequential moment in the life of that individual, from birth to death.

The space and the time measured between events in Spacetime is relative, with different distance and time being measured by observers

depending on the motion of the observers relative to the events. This is what SpaceTime is all about![57]

Here are portions of another essay on relativity:

Einstein also suggested that space-time wasn't flat, but curved or "warped" by the existence of matter and energy. Large bodies in space-time, like the Earth, aren't just floating in orbit. Instead, imagine an apple resting on a stretched out blanket -- the weight of the apple warps the sheet. If the Earth is an apple, then we can imagine the Earth's blanket as space-time.

This means that someone moving through space-time will experience it differently at various points. Time will actually appear to move slower near massive objects, because space-time is warped by the weight. These predictions have actually been proven. In 1962, scientists placed two atomic clocks at the bottom and top of a water tower. The clock at the bottom, the one closer to the massive center of the Earth, was running slower than the clock at the top. Einstein called this phenomenon time dilation.

A further explanation of the bending of space-time and time dilation came in the form of a thought experiment called the twin paradox, devised in 1911 by French physicist Paul Langevin. If one twin lives at the foot of a mountain and the other lives at the top, the twin closer to the Earth will age more slowly. He or she would turn out younger than the other twin, though by a very small amount. If you sent one twin in a spaceship accelerating close to the speed of light, however, he or she would return much younger than the other twin, because high acceleration and large gravitational masses are the same in relativity. Of course, no one's gone so far as to send somebody's twin into high-speed orbit, but scientists proved the hypothesis true in the '70s by sending an atomic clock into orbit. It returned to Earth having run much slower than grounded atomic clocks.[58]

Nobody said boot camp would be easy. If you are still struggling to understand relativity, let me supply one more passage from another source.

Einstein found that what you measure for length, time, and mass depends on your motion relative to a chosen frame of reference. Everything is in motion. As you sit in your seat, you are actually in motion around the center of the Earth because of the rapid rotation of the Earth on its axis. The Earth is in motion around the Sun, the Sun is in orbit around the

[57] http://www.ws5.com/spacetime/
[58] Article by John Fuller at http://science.howstuffworks.com/time-dilation1.htm

> center of our Galaxy, the Galaxy is moving toward a large group of galaxies, etc. When you say something has a *velocity,* you are measuring its change of position relative to some reference point which may itself be in motion. All motion is *relative* to a chosen frame of reference. That is what the word ``relativity'' means in Einstein's Relativity theories. The only way observers in motion relative to each other can *measure* a single light ray to travel the same distance in the same amount of time *relative to their own reference frames* is if their ``meters'' are different and their ``seconds'' are different! Seconds and meters are *relative* quantities.
>
> Two consequences of Special Relativity are a stationary observer will find (1) the length of a fast-moving object is *less* than if the object was at rest, and (2) the passage of time on the fast-moving object is slower than if the object was at rest. However, an observer *inside* the fast-moving object sees everything inside as their normal length and time passes normally, but all of the lengths in the world outside are shrunk and the outside world's clocks are running slow.[59]

G. The Limits of Knowledge

Man's study of physics on the microscopic and macroscopic levels during the past hundred years or so has produced some unexpected results. One consequence has been to call into question our traditional concept of objectivity:

> The concept of scientific objectivity rests upon the assumption of an external world which is "out there" as oppose to an "I" which is "in here." According to this view, Nature, in all her diversity, is "out there." The task of the scientist is to observe the "out there" as objectively as possible… The new physics, quantum mechanics, tells us clearly that it is not possible to observe reality without changing it… According to quantum mechanics there is no such thing as objectivity. We cannot eliminate ourselves from the picture.[60]

Fritjof Capra made a similar point in *The Tao of Physics*:

> The realm of rational knowledge is, of course, the realm of science which measures and quantifies, classifies and analyses. The limitations of any knowledge obtained by these methods have become increasingly apparent in modern science, and in particular in modern physics which has taught us, in the words of Werner Heisenberg, 'that every word or

[59] http://www.astronomynotes.com/relativity/s2.htm
[60] Zukav, The Dancing Wu Li Masters, Bantam Books, 1979, pages 30-31.

> concept, clear as it may seem to be, has only a limited range of applicability.'[61]

For most of us it is difficult to be constantly aware of the limitations and of the relativity of conceptual knowledge. Because our representation of reality is so much easier to grasp than reality itself, we tend to confuse the two.

H. Post Relativity

For those who like certainty it may be comforting to believe that Einstein had figured it all out once and for all. But, in another example of the fact that existence flows, Einstein's ideas did not answer man's ultimate question – it generated still more questions:

> Newtonian physics describes why a rolling ball eventually stops. Relativity explains why you don't fly right off the spinning Earth and into space. Quantum mechanics explains why the same force that keeps you firmly planted on Earth doesn't tear you to shreds. The only problem is, none of these physical theories fully -- entirely -- explains every single aspect of the universe. What's more, while we know that the universe is influenced by four forces – gravity, electromagnetism, and strong and weak nuclear forces -- we don't know how gravity works in conjunction with the other three. But there must be one common thread that binds them all together: A theory of everything.
>
> Physicists have searched for the thread that unites relativity and the standard model of quantum physics. If uncovered, this same thread is expected to reveal what constitutes the fabric from which our entire universe is woven. In the 1970s, physicist Michio Kaku postulated string theory. This theory of everything predicts that small, vibrating strings serve as the building blocks of all matter, and that their vibrations create all four of the forces in our universe.
>
> But Kaku's theory requires the existence of 11 dimensions to work and, so far, we only know of four dimensions. Despite the fact that it can't be readily proven true, string theory has breathed life into the pursuit of the theory of everything, and the world of physics has invested deep inquiry into the theory.

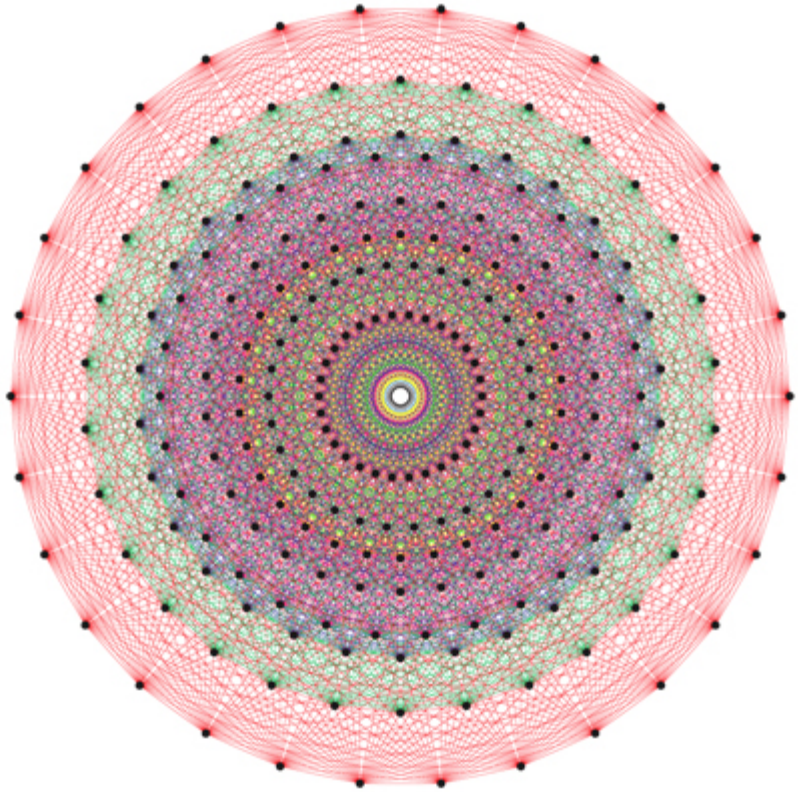
[61] Capra, *The Tao of Physics*, Third Edition, Shambhala, 1991, page 28.

> Using yet-undiscovered aspects of physics to make scientific predictions is nothing new. The fact that scientists have yet to find tiny strings through scientific observation doesn't rule out string theory. And Einstein's special relativity mathematically predicted the existence of black holes long before any evidence of them had been observed.[62]

Now, four dimensions make sense. I can buy that the universe is four dimensional. I am having a little trouble with the concept of a universe that has eleven dimensions. But there may be as many as 248 dimensions! A California surfer with a doctorate in physics, A. Garrett Lisi, believes a mathematical object with 248 dimensions may provide the basis for a theory of everything:

> Mathematics is the language of the universe. Absolutely everything, from a plane crash to your skin pigment to the shape of a sphere can all be expressed using mathematical equations. This last example is most important to Lisi's pursuit of the theory of everything. It is using a description of a symmetrical geometric object that Lisi may have uncovered the relationship between the standard model of quantum physics and relativity.
>
> In the 19th century, the mathematician Sophus Lie created algebraic formulas to describe the shape of symmetrical objects. These are called Lie fields**.** His work was built upon by succeeding mathematicians, and in the 1890s, Wilhelm Killing found a set of Lie fields that described perhaps the most complex shape in our universe, the E8 group. The E8 group, an interrelated 248-dimensional symmetrical object, is an extremely complex one.

[62] Josh Clark, Has a Surfer Discovered the Theory of Everything? http://science.howstuffworks.com/theory-of-everything.htm



John Stembridge /Atlas of Lie Groups Project
The E8 Lie group, a 248-dimensional object

This dense object is so complex, in fact, that it was plotted by computer for the first time in 2007. It took a team of 18 mathematicians -- the Atlas of Lie Groups project at the American Institute of Mathematics -- four years to calculate and plot the formula for E8. The group spent two years on the calculations, and two more dedicated to figuring out how to calculate the shape on the computers available today.

Ultimately, the Atlas project broke the E8 calculations into sections and assigned them to different computers. They took the incomplete answers from each section and pieced them together into the Sage Supercomputer, which took 77 hours to complete the task. This is no comment on Sage's ability: Were the E8 formula and resulting answer written in small print on paper, the paper would cover a 7 square-mile area.

While the Atlas project was the first to actually plot E8, mathematicians have known about the existence of the symmetrical shape for years. So, too, have physicists. Some have even approached the E8 as a possible theory of everything, but none have come as close as Lisi.

So how can a symmetrical shape be the key to the universe? First remember that a geometrical shape is merely the graphic representation of mathematical formulae. This holds true for a rhombus you construct in high school math class or a racquetball. It is a pattern that is expressed in math and forms a shape when plotted. In this sense, the E8 could be the framework into which everything -- all forces and particles -- fits in our universe.

Confused? Consider yourself part of the club. Garrett Lisi, E8 and the theory of everything is pretty heady stuff. But Lisi actually used relatively basic math to use E8 as the possible key to the theory of everything.

Lisi is not the first physicist to look to the E8 -- an interrelated 248-dimensional symmetrical object -- as the possible key to the theory of everything. But he's come up with a clever method that may overcome the tricky problem of adding gravity to the mix. Prior to his attempt, physicists generally held that gravity couldn't be expressed mathematically in the same way as electromagnetism and strong and weak nuclear forces could. It's somewhat like combining paragraphs of Mandarin Chinese and Spanish and attempting to translate the resulting document into English using only an English-Spanish dictionary.

But Lisi had heard about a mathematical way of expressing gravity uncovered in 1977, called MacDowell-Mansouri gravity. He used this method to add an English-Mandarin appendix to the dictionary. Using this expression, Lisi can use mathematical expressions to plug gravity into E8, along with electromagnetism, and weak and strong nuclear forces.

All four of the forces in the universe create a distinct effect on all of the most basic subatomic forms of matter -- called elementary particles. When these particles interact with force carriers (called bosons), they become different particles. For example, when one of the most basic quantum particles -- the lepton -- encounters a weak-force boson, it becomes a neutrino. A lepton interacting with a photon (a boson that carries an electromagnetic charge) becomes an electron. So while there are limited numbers of the most basic particles, when they encounter the different forces, they change to become other, distinct particles. What's more, for every particle, there is an equally distinct anti-particle, for example an anti-quark or anti-neutrino. In total, these make up the elementary particles, and there are 28 of them.

Each of these distinct elementary particles has eight quantum numbers assigned to it, based on the charges each particle has. This brings the number of distinct particles to 224. These numbers helped Lisi make the particles fit into the E8 model. While the E8 is expressed as a 248-dimensional object in one way, it can also be expressed as an eight-

dimensional object with 248 symmetries. Lisi used E8 within eight dimensions for his calculations. For the remaining 24 places unfilled by distinct known particles, Lisi used theoretical particles which are yet to be observed.

Lisi assigned each of these 248 points to a particle, using the eight numbers based on their charges as coordinates within the eight dimensions. What he found was that, like the symmetries in the E8 group, quantum particles share the same relationship within the symmetrical object. He has hope that he has figured out a way to crack the theory of everything, because when he rotated the E8 filled with the force-influenced (including gravity) quantum particles, he found patterns emerging between particles and forces -- photons interacting with leptons, for example, created electrons. The connections shown within points on the E8 match up to real, known connections between particles in our physical world.

If Lisi's method is proven correct, then evaluating the E8 could show physicists how macro-scale gravity interacts with the other, highly-localized three forces.

Congratulations on completing boot camp! You now possess at least the basic knowledge and humility necessary to intelligently consider the flow of existence.

PART IV. THE FLOW OF EXISTENCE – EASTERN STYLE

The truth knocks on the door and you say, “Go away, I’m looking for the truth,” and so it goes away.

Zen and the Art of Motorcycle Maintenance

Questions about reality and our universe are not new. Western man typically approached these questions by looking outward and applying science and reason to what was observed. Eastern philosophy, on the other hand, assumed science and reason could never fully explain the wonder of the universe. Whereas westerners focused on breaking the universe down into smaller and smaller parts, eastern

philosophers went the other way and asked whether the parts might be an illusion, a concept that hinders our ability to see the unity of all things:

> The most important characteristic of the Eastern world view – one could almost say the essence of it – is the awareness of the unity and mutual interrelation of all things and events, the experience of all phenomena in the world as manifestations of a basic oneness. All things are seen as interdependent and inseparable parts of the cosmic whole; as different manifestations of the same ultimate reality.[63]

Eastern thought is interested in intuitive wisdom as well as rational knowledge. Acknowledging the limitations rational knowledge, eastern philosophy attempts to lead beyond it. This is one thing Buddhism, Hinduism, and Taoism have in common.

Mistrust of conventional knowledge and reasoning is stronger in Taoism than in any other school of Eastern philosophy. It is based on the firm belief that the human intellect can never comprehend the Tao. Chuang Tzu writes:

> A dog is not reckoned good because he barks well, and a man is not reckoned wise because he speaks skillfully.

Perhaps the most important insight of the Taoists was the realization that change is an essential feature of nature:

> The Taoists saw all changes in nature as manifestations of the dynamic interplay between the polar opposites yin and yang, and thus they came to believe that any pair of opposites constitutes a polar relationship where each of the two poles is dynamically linked to the other. For the Western mind, this idea of the implicit unity of all opposites us extremely difficult to accept. It seems most paradoxical to us that experiences and values which we had always believed to be contrary should be, after all, aspects of the same thing…
>
> When we talk about the Taoist concept of change, it is important to realize that this change is not seen as occurring as a consequence of some force, but rather as a tendency which is innate in all things and situations. The movements of the Tao are not forced upon it, but occur naturally and spontaneously. Spontaneity is the Tao's principle of action,

[63] Capra, *The Tao of Physics*, Third Edition, Shambhala, 1991, page 130.

> and since human conduct should be modeled on the operation of the Tao, spontaneity should also be characteristic of all human actions. Acting in harmony with nature thus means for the Taoists acting spontaneously and according to one's true nature…
>
> If one refrains from acting contrary to nature… one is in harmony with the Tao and thus one's actions will be successful.[64]

Taoism appeals to me more than the other eastern religions because of the number one. Taoism does not ask us to accept the multiple gods or the caste system of Hinduism, nor does it ask us to accept Buddha's Four Noble Truths or his Noble Eightfold Path.[65] One is an easy number to work with. It's uncomplicated. And it is often the case that the least complicated hypothesis is correct.[66]

The only other number that Taoism embraces is two. Because within that one great whole know as the Tao there are complimentary opposites, e.g., dark and light, male and female, high and low. These complimentary opposites – the yang and the yin – constantly interact and give rise to each other. This is how reality (or the Tao) is built.

Taoism sounds a lot like what western theologians call pantheism – and it is, but the concept it is not exclusively eastern. Benedict de Spinoza (1632-1677) was a seventeenth-century philosopher born in Amsterdam and raised as an orthodox Jew. He maintained that there is only one substance in the universe and that it is God. For putting forth this heresy (that God did not create the universe, God is the universe) the Jewish community expelled him and thereafter he earned a living polishing lenses.

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[64] Capra, *The Tao of Physics*, Third Edition, Shambhala, 1991, pages 114-117.
[65] The Four Noble Truths and the Noble Eightfold Path may be useful models, but they are man-made.
[66] This principle is known as Ockham's Razor and is attributed to William of Ockham, a 14th Century English logician. Ockham said that when competing hypotheses are equal in other respects, you should select the one that introduces the fewest assumptions and postulates the fewest entities. To this day few people know that Williams of Ockham was actually a Taoist – not a Franciscan friar.

An important concept in Taosim is chi. Easterners belief chi to be the life force contained within matter:

> However one conceives the Taoist concept of chi, there is general agreement about what it does: Chi animates matter, infusing it with life. As a result, it is often described as the "life force." It not only permeates the empty spaces between material objects in Taoism, it is part of their composition.
>
> In people and animals, for example, chi is responsible for the functioning of the organs, including the cardio-respiratory system. This life force circulates throughout the body with the blood so that it can provide its own particular form of nutrition to the myriad cells.
>
> Every living organism has some way to assimilate chi. Human beings, animals, and plants alike ingest chi along with the air they breathe, the water they drink, and the food they eat.
>
> Once inside, chi moves to various locations and begins to perform its many functions. The most common of these functions are generally related to the proper functioning and continued operation of the body or plant.
>
> There are hints here and there in our culture that we in the Western world once did recognize the mysterious life force of Taoism called chi. Have you ever wondered, for example, why a mother kisses her child's wound to try and make it better? It's remarkable that after her kiss, the pain does often vanish.
>
> Psychologists may tell you this phenomenon has nothing to do with the kiss itself. Its effectiveness, they say, is a result of the suggestion placed in the child's mind: The pain disappears as a result of a type of hypnosis induced by the mother.
>
> But anyone who understands the Taoist concept of chi will say that the mother passed some of her life force into the child's damaged tissue. The life force not only repairs the wound, it also serves as an anesthetic.
>
> Another example can be found in many of the devotional paintings created by our finest artists. In these works, you can often find a halo surrounding the heads of Christ, the Madonna, the disciples, visiting angels, cherubs, and many other members of the heavenly host.
>
> Some believe this aura to be simply a fanciful symbol created by the artist for effect. Others, however, believe they can actually see these

emanations radiating from holy people and others who have cultivated the chi to a high degree.

Some gifted artists, who were especially sensitive to color and light, may have taken their inspiration for the idea of halos directly from a particularly radiant person.

Most people are understandably skeptical about this energy called chi until they actually experience it for themselves. After all, in the West we have been well trained to deny even the possibility of such phenomena. While some people will never be able to sense the chi, many others do -- some on their first encounter with it.

Try this experiment with a partner, such as your child, spouse, or friend, to see if you are able to feel the chi. Both of you should either sit or stand approximately two arms-length away from each other.

Ask your partner to close his eyes and take a deep breath. Relax your shoulders and back muscles as completely as possible. Try to imagine an energy rising from the ground into your body.

When you think you can almost sense this imaginary force, ask your partner to extend an arm toward you until it is level with the floor. The palm of the hand should be facing downward.

Slowly raise your own arms and extend your fingers until they are within a few inches of your partner's outstretched hand. Using your mind, direct the imaginary energy -- what we call the chi. Move it further up through your body until it passes along your arms and out from your fingertips.

It's helpful to imagine a current of energy passing from your body into your partner's. Whether you think this is an imaginary force or not, some people feel the chi right away, even with their eyes closed.

More powerful demonstrations of the application the Taoist concept of chi can be found in Chinese medical centers, where acupuncture techniques are used on patients ready to undergo surgery. The acupuncture is used to stimulate the chi, which then induces anesthesia. Using these techniques, patients regularly undergo major operations without drugs.[67]

The Tao and Chi are eastern concepts, but if you look closely you can find western philosophers who have described something similar. For instance, the French philosopher Henri Bergson (1859-1941) posited a vital impulse, *elan vital*, which is the

[67] Taoism and Chi, http://people.howstuffworks.com/taoism-and-chi1.htm

fundamental reality through which cosmic power is experienced. This life force is what brings about the creative evolution of everything. Bergson's ideas have a close affinity with those of William James who described Bergson as advising us to:

> dive back into the flux itself… if you want to *know* reality, that flux which Platonism, in its strange belief that only the immutable is excellent, has always spurned: turn your face towards sensation, that flesh-bound thing which rationalism has always loaded with abuse.[68]

PART V. THERE IS NO END

The last portion of a book or paper is often called the "conclusion," but by now we should be open to the possibility that there is no end. Writing this paper was just part of a process that will continue. I wanted to write a paper that would inspire humility and wonder, and I think I did that. I will continue to study karate and live my life. Some day my body will die. I don't know whether I have an existence apart from my body, but I'm keeping an open mind. If our entire universe originated from something smaller than a golf ball, anything is possible.

As for the flow of existence, it's a paradox. Things are constantly changing, and that never changes.

[68] See, Passmore, *A Hundred Years of Philosophy* (Penguin, Harmondsworth, 1968), p. 106.