

Z – Zen of Zero & Dynamics of the Dao

Dear: Way back in the *Preface*, I introduced my plan to try to emphasize positive consequences of a naturalistic (or scientific and humanistic) worldview rather than dwell on negative consequences of religious views of the (nonexistent) “supernatural”. In outline, my method was to show you what I review in my “meditation” as I daily walk in the desert, reviewing ideas that I associate with the letters ‘A’ through ‘Z’. When I get to the letter ‘Z’ I usually remember something similar to:

Z – The Zen of Zero. The two big zeros: death and the Dao. They give meaning to ones, both one’s self and our (one-turn) universe.

In this chapter, I’ll try to explain my meaning for the above. I’ll start by trying to show you a little of the meaning of Zen; in essence, it means ‘awareness’. I’ll then try to show you a few ideas about life and death (of people and of the universe) promoted in a number of ancient religions and philosophies, and compare those ideas with more modern ones.

If I’m successful, I hope you’ll become aware (possibly with aid of the expression “*the Zen of Zero*”) that being dead can have no significance to you (since “*you can’t be aware of a lack of awareness*”), but consistent with the complementariness of opposites, one’s death is required to give meaning to one’s life. I also hope that you’ll become aware of the possibility that “totally nothing” (i.e., zero) is a very complicated “thing”: it seems to be what ancient Chinese (Daoist) philosophers referred to as “the Dao” and seems to have given rise to our universe, which literally means “one turn”. Mostly, however, I hope you’ll become aware that it doesn’t really matter where you (or the Earth or the universe) came from (or where they are going); what matters is what you’re going to do while you’re here.

1. ZEN = AWARENESS

As in many earlier chapters, I’ll start this one with some definitions. If you’ll check your dictionary, you’ll probably find a definition for ‘Zen’ similar to the one given in the *New Oxford American Dictionary*, which relays that ‘Zen’ is the Japanese word for ‘meditation’, derived from the Chinese word *chán* meaning ‘quietude’, in turn from the Sanskrit word *dhyāna* meaning ‘meditation’. That “definition”, however, is more a description of the etymology of the word ‘Zen’ than its effective meaning.

The ‘Sanskrit’ mentioned in the above-referenced dictionary definition of ‘Zen’ was the common language of India during the period from about 1200–400 BCE, when Hinduism was the primary religion in India. During the lifetime of the Buddha (Siddhartha Gautama, c.563 – c.483 BCE), a method to “concentrate one’s spirit” (called *yoga*) was common among Hindus, leading to such famous activities as walking barefoot on hot coals. After practicing *yoga* for a dozen years, the story is that the Buddha:¹

... sat down quietly, crossed his legs, and observed his breathing. During the dawn of the eighth day of [his] *Zazen* [i.e., this form of meditation], he attained a higher level of consciousness... discover[ing] his true nature in the universe...

He subsequently became known as “the Buddha”, i.e., “the awakened (or enlightened) one”. As described in the Wikipedia article on the Buddha:²

According to Buddhism, at the time of his awakening he realized complete insight into the cause of suffering, and the steps necessary to eliminate it. These discoveries became known as the “Four Noble Truths,” which are at the heart of Buddhist teaching [“that suffering exists, that the origin of suffering is attachment to desires, that suffering ceases when attachment to desire ceases, and that freedom from suffering is possible by practicing the Eightfold Path (i.e., right understanding, right thought, right speech, right action, right livelihood, right effort, right mindfulness, and right concentration)”. Through mastery of these truths, a state of supreme liberation, or Nirvana [“free from ignorance, greed, hatred and other afflictive states or ‘defilements’ (*kilesas*)”], is believed to be possible for any being.

That is, according to the Buddha, anyone can become a Buddha – if they’ll become aware. To do so, however, you must, as he said:

Be a lamp unto yourself... Work out your liberation with diligence.

As originally taught by the Buddha, what’s now known as Buddhism had, of course, no “scripture”. Essentially on his own, the Buddha developed many aspects of what we can now describe as a sound, humanistic psychology, including sound aspects of interpersonal relations. More than 500 years later, some of his ideas were incorporated into the Bible’s New Testament by Christian clerics who interacted with Buddhists living in ancient Alexandria. For example, the Buddha taught:

Hatred does not cease by hatred, but only by love; this is the eternal rule.

¹ From http://www.karate.butsu.net/onzen/zen_history.html.

² From http://en.wikipedia.org/wiki/Gautama_Buddha.

Subsequently, after the Buddha's followers recorded many of his ideas, then just as occurred in Christianity (and essentially all other religions), many different sects emerged. Among these different sects, Zen Buddhism was apparently especially attractive to the Chinese Daoists and subsequently to the Japanese – and many Westerners. The reason why Zen Buddhism (or simply “Zen”) was so attractive (and still is) can be inferred from the following description written by Richard Hooker:³

Zen Buddhism is based on a single, esoteric idea: all humans have a Buddha nature inside them, and to realize this nature, all a human being has to do is search his or her inner self. The key to Buddhahood in Zen is simply self-knowledge. The way to gain self-knowledge is through meditation (which is what the word ‘zen’ means).

Now, ‘meditation’ is one of the cornerstones of Buddhism, where, under the [Sanskrit] name *dhyāna*, it forms the final and most important aspect of gaining enlightenment. But Zen (in Chinese, *Chán*) or Meditation Buddhism granted meditation an exclusive importance not ascribed to it in other Buddhist schools. This is indicated by its very name: all other Buddhist schools either take their names from important Scriptures (such as the Lotus sect, which takes its name from the Lotus sutra) or from a philosophical position (such as the Consciousness-only sect) or an individual philosopher (such as Nichiren), whereas Zen takes its name from the practice of meditation.

Meditation, which was a means to an end in other Buddhist schools, became the end in itself in Zen: meditation was Truth realized in action. As a result, Zen readily dispenses with the Buddhist scriptures and philosophical discussion in favor of a more intuitive and individual approach to enlightenment. Meditation, however, is a strict religious discipline: the mind must be made sharp and attentive in order to intuit from itself the Truth of Buddhahood. Part of this discipline involves waking up the mind of the disciple, making it aware of the things around it...

1.1 Becoming Aware

As already mentioned, becoming aware is called “enlightenment” or “awakening” (called *satori* in Japanese and *wu* in Chinese). Such enlightenment is usually achieved through meditation, which simply means focusing one's mind. It can be achieved in many different ways. As I tried to illustrate in the first chapter (entitled *A–Awareness*) a common way to meditate is to start by first concentrating on your breathing, until your mind becomes free from its many distractions.

³ From <http://www.wsu.edu/~dee/FEUJAPAN/ZEN.HTM>.

Many times throughout this book, I've tried to encourage you to become aware, both of your thoughts and of the environments in which you're immersed. For example, starting in the first chapter, I encouraged you to try to be aware of your physical and biological environments. Thereby, I hope that you'll become aware that, as Rolf Edberg wrote:

On a little speck in the universe, there is a species in which billions of years of evolution have led up to a mind through which the cosmos can experience itself, and nature can investigate her own nature.

Alternatively, as Alan Watts wrote and as I tried to explain in the first chapter, each of us is the universe "I'ing." Being thus aware is perhaps the ultimate awareness of one's physical and biological environments. But becoming aware of one's thoughts is more challenging, since our thoughts can be so numerous and varied.

In examining one's thoughts, applying two negative concepts realized by the Buddha can yield positive benefits. One of the Buddha's realizations was that we're not just our thoughts. Instead, each of us is the observer or witness of our thoughts – or can be, if we become aware. To gain benefit from observing your thoughts, Dear, then the next time you're angry, for example, just watch your angry thoughts – as an observer.

Another of the Buddha's realizations was that he wasn't "ego all enclosed" (as I wrote in my "poem" entitled *What am I?* and included in Chapter **Ia**, entitled *Awareness of Ideas*). He described a positive benefit of that conclusion as follows:

Crushing out the conceit "I am" – this is the highest happiness... "As I am, so are others; as others are, so am I." Having thus identified self and others, harm no one nor have them harmed.

Yet, even with the realizations that you're not your thoughts (but can be the observer of your thoughts) and that you're not "ego all enclosed", it can still be daunting to examine and understand all your thoughts. To assist, it can be useful to organize your thoughts into different types, e.g., rational, emotional, instinctual, and cultural, as I illustrated in Chapter **B**.

Already in this book I went to considerable effort to try to help you examine and evaluate your different types of thoughts. In Chapter **C1**, entitled *A Collection of Connected Concept*, I encouraged you to examine thoughts

from your cultural heritage, from “quilts and spoons to quantum mechanics.” The six chapters running from **D** through **H2** dealt mostly with emotional thoughts. The ten “**I**-Chapters” dealt with rational thoughts, as did the seven chapters starting with Chapter **R** (entitled *Reason vs. Reality*).

1.2 Becoming Aware of Cultural Ideas

Most of the book, however, has been directed toward evaluating cultural ideas to which you’ve been exposed (e.g., the 25-chapter Part 3 of this book and the 35 **X**-chapters of Part 4). In addition, at least a little of the origins of cultural ideas about “the supernatural” were traced in the 11-chapter “excursion” **Ix**, some cultural ideas contained in various “holy books” (the Bible, the Book of Mormon, and the Koran) were reviewed in the 30-chapter “excursion” **Qx**, and in the 39-chapter “excursion” **Yx**, I tried to dig out some historical roots of “Your Indoctrination in the Mountainous God Lie”.

For this final chapter of the book, therefore, I don’t plan to dig deeper into details about origins, nature, and evaluations of different types of cultural ideas. Instead, I want to focus on just two ideas, namely, birth (particularly the “birth” of the universe) and death (particularly one’s own). In both cases (birth and death), your culture has indoctrinated you with its “general-consensus” ideas; every culture has done similar for its members; in this chapter I want to show you at least a few ideas about birth of the universe and about death revealed by science.

In the case of the birth (and death) of the universe (and consequently, of life as we know it), many of the relevant scientific ideas are speculative and therefore tentative. In the case of birth and death of individuals, however, scientific ideas are really quite secure. In any case, when considering ideas in this chapter, I hope you’ll follow the Buddha’s famous recommendation:

Do not believe in anything simply because you have heard it. Do not believe in anything simply because it is spoken and rumored by many. Do not believe in anything simply because it is found written in your religious books. Do not believe in anything merely on the authority of your teachers and elders. Do not believe in traditions because they have been handed down for many generations. But after observation and analysis, when you find that anything agrees with reason and is conducive to the good and benefit of one and all, then accept it and live up to it.

1.2.1 Becoming Aware of Cultural Ideas about “the Supernatural”

As I’ve described in earlier chapters and as is the case with everyone, your cultural has infused your mind with an enormous number of ideas. Relying

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on some of your culture's ideas, you've formed your worldview, leading to your views about your purpose in life, your fate in an assumed "afterlife", God, and so on. In this section, I want to help you to again become aware of such ideas about "the supernatural", by briefly reviewing their origins and by beginning to evaluate if they are reliable. But if I'm to help you, Dear, you must be willing to consider some basic questions.

For example, where did you get the ideas that God exists and that, if you do what your clerics and your "holy books" tell you to do, then you'll live eternally in paradise? Further, that question leads to even more basic questions: What is God? What is existence? What is death? What would "eternal paradise" be? And more importantly: Are such ideas reliable? Is there any evidence to support them? Are they testable by other than dead people? Do they reflect knowledge or merely speculation?

Please, Dear, try to answer such questions. I suggest that you start with the simple question: Why do you believe in God? Is it because you examined and evaluated your own thoughts (as practiced in Zen) or because you succumbed to your emotions (as promoted in your religion)? In either case, what are the origins of your thoughts and emotions? Isn't it a fact that, first your parents, then essentially all of your acquaintances, and of course, all your clerics promoted the god idea? Thousands upon thousands of times, weren't you told that God made the universe and created life, that He sent communications in your "holy books" about how to live, that people who believed such things and followed God's rules were "good", that only such "good people" would live eternally in heaven, while disbelievers were "bad" and would suffer for their disbelief?

As a minimum, surely you agree that you didn't conceive such ideas by yourself. Surely you agree that, instead, you learned about such ideas from other people. But then, where did they get such ideas? Surely you agree that such ideas have been passed down from generation to generation for ages. So, a place to start your inquiry is with the question: how did such ideas start? Below, I'll first briefly review the consensus answer to that question.

1.2.2 Apparent Origins of Ideas about Souls, Spirits, and Afterlives

In the "excursions" **Ix** and **Yx**, I tried to at least outline what appears to be the consensus answer to the question about how people began to believe in "the supernatural", i.e., souls, spirits, afterlives, gods, etc. I tried to show

you that both archeological data and anthropological studies suggest that the first “supernatural” concept adopted by primitive people was the idea that people had “souls” or “spirits”, which didn’t die. From trinkets and implements found in graves, archeologists have concluded that the idea of an “afterlife” is certainly at least 10,000 years and perhaps 100,000 years old! Anthropological studies suggest that the origin of the idea that people had undying “spirits” or “souls” was derived from primitive people trying to understand their shadows, their images (e.g., in pools of water), and especially their dreams and hallucinations, the latter either from mental disorders or from ingesting mind-warping herbs, mushrooms, etc.

From such experiences, primitive people apparently concluded that their shadows or images (spirits, souls) could leave their bodies (e.g., in their dreams and hallucinations) to engage in various activities, including interacting with dead people. No doubt, primitive people came to such conclusions because, even though the imagined people were dead, memories of “the dead” persisted in the minds of the dreamers and hallucinators. And since people had such interactions with “the dead”, no doubt the people considered it obvious that they, too, would experience an “afterlife”.

1.2.3 Apparent Origins & Evolution of Ideas about “the Gods”

As thousands of years rolled by, experiences with (and associated speculations about) dreams and hallucinogens apparently led to the general belief (passed down in tribal customs) that everything possessed “spirits”, including people, animals, and special, natural features and processes, from waterfalls to the wind, which became the “gods” of the mountains, valleys, winds, storms, etc. And as more thousands of years rolled by, most tribes assumed that, among all such spirits, one was greatest – in some cases an especially important ancestor (perhaps such as Osiris in ancient Egypt) and in other cases, the spirit of the natural process most important to a particular group (e.g., a volcano “god” or the “Great Spirit” of Native Americans). It was apparently common to assume that this “greatest god” was the ruler of all the lesser gods, similar to how each tribe had its leader; i.e., not the astrologers’ claim “as above, so below”, but “as below, so above”!

Many tribes (especially in southern, sunny climates) apparently identified the Sun god as the primary god; many other tribes (especially in more northern, inclement climates) identified the Great Spirit to be the sky god, assumed to control not only the weather but also the strange lights in the sky, including the Sun, Moon, and stars. Some examples follow.

- Just as still occurs in some areas of Indonesia, primitive people living near volcanoes, for example, probably worshiped “the volcano god”, worshiping ignorance, “thinking” that they could propitiate the powerful volcano god, similar to how they would try to win favors from powerful tribal leaders by showing deference.
- The ancient Greeks (and similarly, the ancient Mesopotamians and northern Europeans) worshiped the gods of thunder and lightning, worshiping ignorance, for surely it seemed “wise” to display obeisance to the gods who controlled such powerful storms. Examples include the Greek god Zeus and the northern European god Thor – who is still “honored” in Germanic languages every Thursday, i.e., Thor’s Day!
- The ancient Egyptians (and many others, including ancient Americans, Babylonians, and Romans) worshiped the Sun (still “honored” every Sunday!), worshiping ignorance, because the Sun seemed to control the crops; so, the people tried to win favors from the sun god by bribery.
- The ancient Arabs (and other desert nomads) didn’t worship the Sun (the Sun was a daily enemy); instead, they worshiped the Moon (still “honored” every Monday!), worshiping ignorance, because it seemed to govern the blessed, cool nights; so, the people tried to gain control over their environment by paying homage to “the” (Arabic, “Al”) Egyptian moon god (“Lah”), i.e., Al-Lah or Allah.
- Relative to the possibility of “life-after-death”, a particularly interesting example occurred in the case of ancient northern Europeans (and ancient Mesopotamians), who among other gods worshiped the wind god (in northern Europe called *Woden* or *Odin* whom we still “honor” every Wednesday = Woden’s Day!), worshiping ignorance, convinced that the wind represented the rushing of souls through the air – and it was “thought” to be wise to be in good favor of the god who controlled the souls of the dead.
- As their thoughts, experiences, and territories expanded, ancient Europeans, Egyptians, Hebrews, Mesopotamians, Persians, and Indians worshiped the great sky god (creator of the universe, life, and even time), worshiping ignorance, because they “thought” it wise to show deference to such a powerful god (and, in some cases, his consort). Such gods are still “honored” in the Germanic names of the other days of the week: *Tiw* or *Tiu* (“honored” every Tuesday!) was the Germanic sky god (in turn possibly named after the Indo-European sky god *Tyr*), *Freya* or *Frigg* or *Frig* (“honored” every Friday!) was the mother of the Germanic gods, and *Saturn* (“honored” every Saturday!) was the Roman god of time [represented by the slow moving planet Saturn (whose son was assumed to be the faster moving planet Jupiter); *Saturn* was called *Cronus* by the Greeks and *Yahweh* by the Hebrews (whose son was assumed to be, respectively, the planet *Jupiter* = *Zeus* = *Jesus*).

And although few people today worship “the gods” that allegedly controlled volcanoes, winds, storms, etc., yet still today, approximately half of all people in the world (including religious Jews, Christians, Muslims, Mormons, etc.) worship “the creator god” (commonly called just “God”), the alleged creator of the universe and of people.

Clerics of the resulting religions claim that their various “holy books” contain communications from this “creator god”. From childhood, people are trained by clerics and their parents (who were, themselves, trained by clerics and their parents) to “believe” that what’s contained in their “holy books” is “true”. But as I’ve described in earlier chapters (e.g., in Chapters T1 & T2), the clerics either don’t know what ‘truth’ means, or do know – and are running con games, to capitalize on the people’s fears and ignorance.

If these “modern” people who are “God believers” are asked how their god was created, most of them respond with the same claim that’s contained in the ~3500-year-old *Egyptian Hymn to the Sun God*, calling their God the “creator uncreated”. Some “believers” add that their creator god is “eternal”, “beyond space and time”, “not subject to the laws of nature and logic”, “the ground of all being”, and similar. Such claims are just another way of saying (in the vernacular): “I dunno.” That is, their god is just one more in a long, long list of “gods of the gaps” – in people’s knowledge.

1.2.4 Apparent Origins of Ideas about People’s Fates in Their “Afterlives”

It’s difficult to discern the speculations of primitive people about what might happen to them after they died, but the trinkets and implements found in ancient graves suggest that people thought that activities in “the next life” would be similar to activities of people who were still living. Of course, if in their dreams and hallucinations people “encountered” people who had died, perhaps such imagined people could participate also in fanciful activities, such as moving mountains or flying like birds! What we do know is that, by the time writing began in Mesopotamia and Egypt about 5,000 years ago, different ideas about “the afterlife” had developed.

Thus, as I reviewed in Chapter Ix11 (entitled *Changing Ideas about “Life after Death”*), the general Sumerian idea (which persisted for the first 500-or-so years of Judaism) was that death was “a dark and dreary place”, “the horror-filled house of death”, “the road of no return”. In Egypt, in contrast, the “souls” of first the pharaohs (entombed in pyramids by 2500 BCE, in preparation for becoming stars) and then later (by 2000 BCE) also the

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“souls” of all the people were assumed to be capable of experiencing a glorious “afterlife” – provided that, during their lives, the people did what their clerics demanded.

As subsequently developed, the vast array of clerical concoctions about “the afterlife” are mind boggling, especially since all were (and continue to be) clearly invented balderdash, without a shred of evidence to support them. Yet, clerics of each religion (or each sect of each religion) demanded (and still demand) that their followers “believe” that the clerics’ concoctions are “true”. And true enough, they’re all truly “make believe”!

What’s truly amazing is how anyone can believe a particular story! For a convenient survey of the many different stories about “the afterlife” promoted in different sects and religions, Dear, have a look at the webpage entitled *The Great Unknown – Some Views of the Afterlife*.⁴ How could any rational adult believe that the story promoted in, e.g., Catholicism is “truer” than the story promoted in, e.g., Hinduism or by Mormons or by...? All such stories can’t be true! And why does anyone believe a particular religious story rather than the much more entertaining stories about the afterlife told in a huge number of movies?! During the past 15 years, approximately ¼ of all movies made in the U.S. have been in the category “[fantasy, science fiction, and superheroes](#)”.⁵

But I don’t want to again review reasons why people are religious: I already devoted two “**X**-chapters” to the subject and the four final “**Yx**-chapters”. Besides, the dominant reason is obvious, namely, childhood indoctrination. Further, I certainly don’t want to lead you on another “excursion” to show you the enormous number and variations of pure, unsubstantiated balderdash about what happens after people die. In the “excursion” **Yx** (entitled *Your Indoctrination in the Mountainous God Lie*) I tried to show you at least some of the origins of the (many different) speculations about “life after death” peddled by clerics of our culture’s Abrahamic religions, i.e., Judaism, Christianity, Islam, Mormonism, etc. Nonetheless, later in this chapter it will be useful to have mentioned that, during the first millennium BCE, speculations about reincarnation “developed” in India.

⁴ At <http://library.thinkquest.org/16665/afterlifeframe.htm>.

⁵ See <http://www.the-numbers.com/market/CreativeTypes/>.

Although such speculations were (and still are!) appealing to many Hindus, the idea of being “condemned” to an never-ending treadmill of reincarnations was apparently a major reason why the Buddha began to search for release from such a treadmill. Subsequently, different sects of the Buddhist religion (as opposed to the Buddha’s philosophy and psychology) have “developed” their own wild speculations about gaining release from the (purely speculative!) reincarnation treadmill.⁶

It will also be useful to have mentioned that, during the second millennium BCE, speculations about “the afterlife” in China seem to have been similar to those in Egypt a thousand years earlier, with only the rulers gaining a glorious afterlife.⁷ But also similar to what happened in Egypt, political necessities led Chinese clerics about a thousand-or-so-years later (i.e., by the middle of the first millennium BCE) to “permit” everyone to believe in such balderdash. Subsequently, when religious aspects of Buddhism spread to China, ideas about reincarnation (and how to avoid it) polluted China.

Wild speculations about “the afterlife”, however, didn’t pollute everyone. Those Zen Buddhists who adopted the best of the psychology from the Buddha and the best philosophy from Chinese Daoism remained honest skeptics. Illustrative is the following reported exchange from about 400 years ago:⁸

A samurai once asked Zen Master Hakuin where he would go after he died.
 Hakuin answered, “How am I supposed to know?”
 “How do you NOT know? You’re a Zen master!” exclaimed the samurai.
 “Yes,” Hakuin answered, “but not a dead one.”

But for those whose minds were polluted by fanciful tales about “the afterlife”, the ancient clerics from Egypt to China thereby gained enormous power over people, by controlling their imaginations. This control was summarized by the Greek historian Polybius (c.200 – 118 BCE) who wrote the following about even more ancient clerics and politicians:

Since the masses of the people are inconsistent, full of unruly desires, passionate, and reckless of consequences, they must be filled with fears to keep them in order. The ancients did well, therefore, to invent gods and the belief in punishment after death.

⁶ See, e.g., http://www.mythicarts.com/writing/Buddhist_Awareness.html.

⁷ See <http://www.qugs.org.au/queensland-wargamer/afterlife.htm>.

⁸ From http://en.wikiquote.org/wiki/Zen_proverbs.

Notice that Polybius realized that all such ideas were just “invented”! Yet, although clerics thereby gained power by manipulating people’s fears and ignorance, most ancient people (similar to approximately half of all “modern” people!) probably considered it reasonable that fates in “afterlives” should depend on behaviors during life, because (as I tried to explain in the “J-chapters”, dealing with Justice) Nature taught (and still teaches) everyone (and animals, too) the essence of natural justice (that effects have causes) and of personal justice (that generally one gets what one deserves). It was then “reasonable” (or at least consistent) to speculate that, when people died, finally they’d experience the justice they deserved, either in some imagined “Happy Hunting Ground” (Heaven) or elsewhere.

1.3 Skepticism of Clerical Claims

Not everyone, however, agreed with Polybius that, “[the ancients did well... to invent gods and the belief in punishment after death](#)”: some people (whom clerics labeled as skeptics, unbelievers, infidels, etc.) considered such ideas to be terrible, as do essentially all skeptics (such as a certain grandfather) to this day. Other skeptics (such as Polybius) simply realized that it was all balderdash. An example of such skepticism in ancient Egypt is contained in *The Song of the Harper* (dated to be from between about 2650 to 2600 BCE), which includes:

[There is no one who can return from there \[the “afterlife”\], to describe their nature, to describe their dissolution, that he may still our desires... no one goes away and then comes back.](#)

Other skeptics expressed their ideas more forcefully. For example, the Buddha stated:

[Our theories of the eternal are as valuable as are those that a chick that has not broken its way through its shell might form of the outside world.](#)

The Buddha’s ideas were well summarized by Walpola Rahula in his 1959 book *What The Buddha Taught*:⁹

[Two ideas are psychologically deep-rooted in man: self-protection and self-preservation. For self-protection man has created God, on whom he depends for his own protection, safety, and security, just as a child depends on its parent. For self-preservation man has conceived the idea of an immortal Soul or *Atman*, which will live eternally.](#)

⁹ From http://en.wikipedia.org/wiki/Walpola_Rahula.

In his ignorance, fear, weakness, and desire, man needs these two things to console himself. Hence he clings to them deeply and fanatically. The Buddha's teaching does not support this ignorance, fear, weakness, and desire, but aims at making man enlightened by removing them and destroying them, striking at their very root.

According to Buddhism, our ideas of God and Soul are false and empty. Though highly developed as theories, they are all the same extremely subtle mental projections, garbed in an intricate metaphysical and philosophical phraseology. These ideas are so deep-rooted in man, and so near and dear to him, that he does not wish to hear, nor does he want to understand, any teaching against them. The Buddha knew this quite well. In fact, he said that his teaching was “against the current”, against man's selfish desires.

Stated in what are reported to be the Buddha's own words:

So, then, owing to the creation of Supreme Deity, men will become murderers, thieves, unchaste, liars, slanderers, abusive, babblers, covetous, malicious, and perverse in views. Thus, for those who fall back on the creation of a God as the essential reason, there is neither the desire to do, nor the effort to do, nor the necessity to do this deed or abstain from that deed.

In China, the social philosopher Confucius (or Kung-fu-tse, i.e., “the master Kung”, 551–479 BCE) reacted similarly:

While you are not able to serve men, how can you serve spirits [of the dead]?...
While you do not know life, how can you know about death?

Perhaps most amazing is that records of such skepticism survived, since even clerical records show essentially all religious leaders (especially in the Abrahamic religions) not only advocated the destruction of evidence of skepticism, but encouraged that skeptics be killed. Thus, for reasons detailed in the “excursions” **Qx** and **Yx**, Ezra, Constantine, Muhammad, Joseph Smith, et al. should be identified as accomplices in murder.

A particularly brave and intelligent skeptic who escaped murder but not malignity by many clerical groups (Greek, Jewish, Christian, Muslim, etc.) was the Greek philosopher Epicurus (341–270 BC). In **Yx28**, I detailed some of his ideas and how he was maligned; here, I'll re-quote just a few of his ideas about death and speculations about any “afterlife”:

[People] either foresee their deaths as eternal suffering, as depicted in myths, or they fear the very lack of consciousness that accompanies death as if it could be of concern to them. They suffer all this, not because there is a reasonable basis, but because of

their wild imagination – and by not setting a limit to suffering, their level of turmoil matches or exceeds what they would suffer even if there were a reasonable basis... When the whole body is destroyed, it no longer possesses sensation, because the soul is dissolved... Those who say that the soul is incorporeal are talking nonsense.

1.4 Modern Scientific Ideas about “the Supernatural”

It’s easy to summarize modern scientific ideas about “souls”, “the afterlife”, “gods”, and so on. Science deals with evidence; there’s zero reliable evidence of anything “supernatural”; therefore, any scientist worth her salt considers all such ideas to be just silly speculations, make believe, fairy tales, entertaining stories and movies – or con games concocted by those planning to bilk people.

For an illustration of recent scientific investigations of claims dealing with immortality and other “paranormal” or “psi” phenomena, including “Out of Body Experiences” (OBEs), “Near Death Experiences” (NDEs; such as “seeing a tunnel of light”), “past-life memories”, “mediumship”, and so on, see the article by Keith Augustine entitled “The Scientific Case Against Immortality.”¹⁰ It ends with the following quotation from the 1990 book by Corliss Lamont entitled *The Illusion of Immortality*:

We do not ask to be born; and we do not ask to die. But born we are and die we must. We come into existence and we pass out of existence. And in neither case does high-handed fate await our ratification of its decree.

Three hundred years ago, Goethe (1749–1832) summarized it well:

This occupation with ideas of immortality is for people of rank... who have nothing to do. But a [person] of real worth who has something to do here, and must toil and struggle to produce day by day, leaves the future world to itself, and is active and useful in this.

1.5 Becoming Aware of the Meaning of Death

Far more fruitful than inquiries into immortality have been inquiries into the meaning of death – physiologically, psychologically, and philosophically. Again it was the Greek philosopher Epicurus who lit the way:

[It follows that] death is nothing to us. For all good and evil consist in sensation, but death is deprivation of sensation. And therefore a right understanding that death is nothing to us makes the mortality of life enjoyable, not because it adds to it an infinite

¹⁰http://atheism.about.com/gi/o.htm?zi=1/XJ&zTi=1&sdn=atheism&cdn=religion&tm=86&f=11&tt=14&bt=0&bts=0&zu=http%3A//www.infidels.org/library/modern/keith_augustine/scientific_case.html.

span of time, but because it takes away the craving for immortality. For there is nothing terrible in life for the man who has truly comprehended that there is nothing terrible in not living... [Death should not] concern either the living or the dead, since for the former it is not, and the latter are no more.

As I mentioned in an earlier chapter (F, dealing with Feelings, Fears, and Freedom), I came to a similar conclusion as Epicurus by myself. He stated: “[Death should not] concern either the living or the dead, since for the former it is not, and the latter are no more.” I remind myself of a similar conclusion when I get to the letter ‘F’ in my meditation by remembering the line from one of my “poems” (better, “versifications”), namely: *Death you’ll find you’ll never know – you can’t be aware of a lack of awareness.* And I mentioned that, on my own, I reached a conclusion similar to Epicurus, not to stimulate a comparison of mental abilities, but as the Buddha saw, to emphasize that such insights are available to all of us, if we think about them quietly and deeply, pushing aside all “learned, cultural” ideas, relying only our own evaluations – which is the essence of Zen.

When walking in the desert and I get to the letter ‘Z’ in my meditation, part of what I remind myself is:

Z – The Zen of Zero: Death, the big zero, which gives one meaning.

With the above, I remind myself of three concepts: 1) the psychological concept that “*death is the spice of life*”, 2) the mathematical concept that without zero, unity would be meaningless, and 3) the philosophical concept that existence has meaning only relative to nonexistence. Below, I’ll try to explain what I mean, starting with “*death is the spice of life.*”

Actually, the idea that death is the spice of life is partially contained in the above quotation from Epicurus. He rightly said that dismissing “*the craving for immortality*” can make “*the mortality of life [more] enjoyable.*” By “*death... gives one meaning*”, however, I mean more. Thus, I maintain that, rather than dismissing death, it’s important to appreciate it. Recently, the same idea was described well in an essay written by Clemson University philosophy professor Todd May and published in the 2 November 2009 edition of *The New York Times*:

In the spring of 2004 I took a flight from my home near Greenville, S.C., to New York to visit my dying step-grandmother. We had been close, and it would be one of the last times I would get to see her. As the flight was about to land, it abruptly

ascended and headed toward the Empire State Building. The passengers on the plane became quiet; the aura of 9/11 was hanging in the air.

We flew over the Empire State Building (but too close to the antenna for my comfort) and circled back to La Guardia. As it turned out, a small commuter plane had decided to land without taking account of our aircraft, so the pilot had had to make a quick move. But in those moments when it seemed I was aboard another human missile, I revisited my life. I realized, almost to my surprise, that I would not have traded it in for another life. There had been disappointments, to be sure, but my life appeared to me to have been a meaningful one, a life I did not regret. This is not to say that I was not nearly paralyzed with fear. I was. At the same time, strangely, my life appeared to me as worth having lived.

There are two lessons here. The first, and most obvious one, is that death is terrifying. Here in the United States, we have the technology to defer death, so we often pretend it will never really happen to us. There is always another procedure, always a cure in sight if not in hand. But in our sober moments we recognize that we will indeed die, and that we have precious little control over when it will happen.

The harm of death goes to the heart of who we are as human beings. We are, in essence, forward-looking creatures. We create our lives prospectively. We build relationships, careers, and projects that are not solely of the moment but that have a future in our vision of them. One of the reasons Eastern philosophies have developed techniques to train us to be in the moment is that, that is not our natural state. We are pulled toward the future, and see the meaning of what we do now in its light.

Death extinguishes that light. And because we know that we will die, and yet we don't know when, the darkness that is ultimately ahead of each of us is with us at every moment. There is, we might say, a tunnel at the end of this light. And since we are creatures of the future, the darkness of death offends us in our very being. We may come to terms with it when we grow old, but unless our lives have become a burden to us, coming to terms is the best we can hope for.

The second, less obvious lesson of this moment of facing death is that in order for our lives to have a shape, in order that they not become formless, we need to die. This will strike some as counterintuitive, even a little ridiculous. But in order to recognize its truth, we should reflect a bit on what immortality might mean.

Immortality lasts a long time. It is not for nothing that in his story "The Immortal" Jorge Luis Borges pictures the immortal characters as unconcerned with their lives or their surroundings. Once you've followed your passion – playing the saxophone, loving men or women, traveling, writing poetry – for, say, 10,000 years, it will likely begin to lose its grip. There may be more to say or to do than anyone can ever accomplish. But each of us develops particular interests, engages in particular pursuits. When we have been at them long enough, we are likely to find ourselves just filling time. In the case of immortality, an inexhaustible period of time.

And when there is always time for everything, there is no urgency for anything. It may well be that life is not long enough. But it is equally true that a life without limits would lose the beauty of its moments. It would become boring, but more deeply it would become shapeless. Just one damn thing after another.

This is the paradox death imposes upon us: it grants us the possibility of a meaningful life even as it takes it away. It gives us the promise of each moment, even as it threatens to steal that moment, or at least reminds us that some time our moments will be gone. It allows each moment to insist upon itself, because there are only a limited number of them. And none of us knows how many.

I prefer to think that the paradox of death is the source not of despair but instead of the limited hope that is allotted to us as human beings. We cannot live forever, to be sure, but neither would we want to. We ought not to mind the fact that we will die, although we really would rather that it not be today. Probably not tomorrow either. But it is precisely because we cannot control when we will die, and know only that we will, that we can look upon our lives with the seriousness they merit. Death takes away from us no more than it has conferred: lives whose significance lies in the fact they are not always with us.

Our happiness lies in being able to inhabit that fact.

Albert Camus (1913–60) said similar but in a different way:

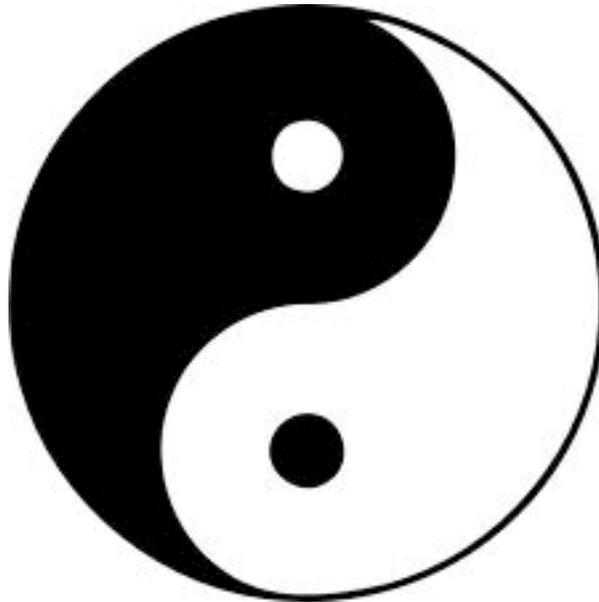
If there is a sin against life, it consists perhaps not so much in despairing of life as in hoping for another life and in eluding the implacable grandeur of this life.

And now, to explain my additional meaning of “**death... gives one meaning**” (and in preparation for the rest of the chapter’s emphasis on the birth of our universe), I want to remind you of the ancient Chinese idea of Yin and Yang (or Yin-Yang), i.e., the “interconnectedness” or “complementarity” of opposites. By the way, after the Yin-Yang philosophy of Daoism was combined with the psychology of the Buddha in about 500 CE, the result became known in China as Chán Buddhism. In about 1200 CE the combination spread to Japan, where it’s called Zen Buddhism or just Zen.

1.6 The Yin and Yang of Life and Death

Back in chapters **A** (dealing with “Awareness”) and **C1** (dealing with “Connected Concepts”), I reviewed the idea of the connectedness (or complementariness) of opposites. This is the ancient Chinese principle of Yin-Yang.

As described in the Wikipedia article on Yin and Yang,¹¹ the concept “is used to describe how polar or seemingly contrary forces are interconnected and interdependent in the natural world, and how they give rise to each other in turn... Yin yang are complementary opposites that interact within a greater whole, as part of a dynamic system.... The concept of yin and yang is often symbolized by various form of the Taijitu symbol [shown below]...”



As I already quoted in C1, Aaron Hoopes wrote in his 2007 book *Zen Yoga*:

The Taijitu is one of the oldest and best-known life symbols in the world, but few understand its full meaning. It represents one of the most fundamental and profound theories of ancient [Daoist] philosophy. At its heart are the two poles of existence, which are opposite but complementary. The light, white Yang moving up blends into the dark, black Yin moving down. Yin and Yang are dependent opposing forces that flow in a natural cycle, always seeking balance. Though they are opposing, they are not in opposition to one another. As part of the [Dao], they are merely two aspects of a single reality. Each contains the seed of the other, which is why we see a black spot of Yin in the white Yang and *vice versa*. They do not merely replace each other but actually become each other through the constant flow of the universe.

Applied to the case of the opposites known as ‘life’ and ‘death’, the idea is that the concept of ‘life’, itself, would be meaningless without the reality of ‘death’. For example, Dear, rocks don’t die – nor do they live.

¹¹ At http://en.wikipedia.org/wiki/Yin_and_Yang.

Thus, extrapolating from common, everyday observations of the complementarity of opposites (light and dark, day and night, wet and dry, hot and cold, male and female, life and death, existence and nonexistence, etc.), ancient Chinese philosophers known as Daoists saw that nothing has meaning without its complement; they're polar opposites of a continuum. This general, "complementarity principle" was (and still is) called Yin and Yang (or Yin Yang or Yin-Yang). And as I'll now try to show you, Yin-Yang seems to be applicable, also, to the birth and death of our universe.

2. BIRTH & DEATH OF OUR UNIVERSE

In earlier chapters (especially those in the "excursions" **Ix**, dealing with "the Origin of the God Idea", and **Yx**, dealing with "Your Indoctrination in the Mountainous God Lie"), I reviewed a few of the many genesis myths concocted by ancient people. It's essentially impossible to know when most such myths were concocted; those of the major, early societies (in Egypt, Sumer, India, and China) were finally put in writing generally during the second millennium BCE. All such myths – save one – invoked some "supernatural" agents and processes to "explain" the creation of the universe and life. As I'll soon outline, the one exceptional genesis myth was proposed by ancient Chinese Daoists, applying their Yin-Yang principle. First, however, a brief survey of the historical setting seems appropriate.

In ancient India, the genesis myths to which the Buddha was exposed were no less fanciful than most such myths, but at least the Hindu clerics didn't (and still don't) demand that others believe their speculations – and to this day, Hinduism continues to be the most tolerant of all the world's major religions. The following is a succinct summary:¹²

... it is important to first note that, unlike many "western" traditions, the Hindu traditions espouse views of time as cyclical and conceptions of space as infinite and multi-layered. Therefore, because of its cyclical notions of time, Hinduism holds that the world is created many times, over and over again, and not just once and for all. Further, this universe is considered to be just one of many; other universes (and other forms of life) exist on many different planes. Therefore, there are often several creation accounts for each of these different realms. Finally, though there are many creation accounts in Hinduism, unlike the creation stories of the western dualistic traditions (like Christianity, for example), Hindu creation accounts do not generally contain stories of a divine god/goddess creating a mundane/profane world separate

¹² From <http://www.patheos.com/Find/Answers-to-Frequently-Asked-Religion-Questions/What-is-the-creation-story-in-Hinduism.html>.

from himself/herself. Instead, most Hindu creation accounts articulate a fundamental nondualism, wherein the material world – which is either fully divine or is, at least, infused with divinity –emanates from (as opposed to being created by) the principal deity.

In addition, ancient Hindus had the humility to admit that they didn't really know how the universe came into existence. Thus, as Carl Sagan noted, the Hindu's *Rig Veda* asks:

Who knows for certain? Who shall here declare it? Whence was it born, whence came creation? No one knows whence creation arose; and whether god has or has not made it. He who surveys it from the lofty skies, only he knows – or perhaps he knows not.

In contrast to the creation myths in Hinduism and other religions, the creation myth of the Daoists of ancient China was based entirely on natural processes. It was apparently the first genesis-story that didn't invoke any gods, but dating such ideas is difficult. According to ancient Chinese tradition, the idea that the universe came into existence spontaneously, subject to the Yin-Yang complementarity principle, is attributed to the legendary emperor Huang Di (or Huangdi), also called “the Yellow Emperor” (because of the color of the soil where he reigned). He may have reigned some time around 2600 BCE, i.e., about the time when Gilgamesh ruled in Mesopotamia and the pyramids were built in Egypt. Similar to Osiris in Egypt, however, Huang Di is also credited with developing most aspects of civilization; therefore, attributing specific ideas to Huang Di may have been just the traditional way in ancient China to say: “It happened a long time ago.” According to tradition, Huang Di allegedly said:

The principle of yin and yang is the foundation of the entire universe.

Approximately 2,000 years later, on the other side of the known world, the ancient Greek philosopher Heraclitus (c.535 – c.475 BCE) proposed similar. He reportedly said:

The structure of the universe was arranged by one harmony through the blending of opposite principles... All things come into being by the conflict of opposites.

Recently, at the ruins of China's Shang Dynasty (1766–1050 BCE) at Yinxu, archaeologists found the first known reference to the concept of Yin-

Yang carved into “oracle bones”.¹³ Approximately 1,000 years later (the time period is variously estimated to be from the 6th to the 4th Century BCE), the ideas were recorded in a book entitled *Daodejing* (or *Dao Te Ching* or *Tao Te Ching*) attributed to the philosopher Lao Tzu (whose name is also written as Laozi, Lao Tse, or other variations, literally translated as “the venerable master”).

As well as documenting the Yin-Yang complementarity principle, Lao Tzu had the amazing insight to realize the inability of words to express concepts beyond human experiences. Thus, he wrote something similar to the following, with uncertainties reflecting difficulties in translating ancient Chinese script into English:

The Way [or the Dao or the Tao] that can be told of is not an unvarying way;
The names that can be named are not unvarying names.
It was from the Nameless that Heaven and Earth sprang...

The Wikipedia article on Daoism adds:¹⁴

These famous first lines of the *Tao Te Ching* state that the Tao is ineffable, i.e., the Tao is nameless, goes beyond distinctions, and transcends language. However this first verse does not occur in the earliest known version [of the *Tao Te Ching*] from the Guodian Chu Slips and there is speculation that it may have been added by later commentators. In Laozi's *Qingjing Jing* (verse 1–8) he clarified the term Tao was nominated as he was trying to describe a state of existence before it happened and before time or space... This is the Chinese creation myth from the primordial Tao. In the first... words in Chapter One, the author articulated an abstract cosmogony...

In summary, the “something” that was assumed to be at the base of all such complements (or the complementarity principle, itself) was called “the Dao”, with recognition that, “The Dao that can be spoken of is not the true Dao.”

2.1 Some Continuing Limitations

If one attempts to describe the “birth of the universe” (cosmogony) in modern terms, similar limitations of language become immediately apparent. In fact, limitations of not only language but also of knowledge (especially my own!) immediately arise. Therefore, Dear, before attempting to proceed, I should call your attention to such limitations, which I’ll organize under subsections entitled *Physics and Metaphysics* and *Ontology and Linguistics*.

¹³ See <http://en.wikipedia.org/wiki/Yinxu>.

¹⁴ From <http://en.wikipedia.org/wiki/Daoism>.

2.1.1 *Physics & Metaphysics*

For the rest of this chapter, Dear, please be mindful of the following caveats. For one, be aware that the science that I'll be trying to address is outside my area of expertise. Believe it or not, I do (or did!) have a reputation for expertise in certain, delineated areas of physical science, but in what follows, I'll be sketching ideas in cosmology, elementary particle physics, and quantum field theory, and in these areas, I'm incompetent. Not quite so incompetent as the clerics who tell you that, “**In the beginning** [Of what?], **God** [Hello?]. . . **created** [Out of what?]. . .”. I am, however, sufficiently incompetent in the relevant science to recommend that, if the topics interest you, you should study them yourself – and then, you tell me what this universe is “all about”!

Moreover, not only is much of the physics beyond my limited range of expertise, much of it is beyond current knowledge in physics, i.e., literally, it's ‘metaphysics’. As a general rule, I try to avoid metaphysics: it involves speculations about natural processes (viz., physics), and everyone should be skeptical of claims unsupported by evidence. Nonetheless, in the formulation of any physical theory, speculation is essential: if we can't imagine where we're going, it's less likely that we'll get there! In all such metaphysical speculations, however, we're well advised to conform to well-established physical principles, and in the speculations that follow, I'll do my best to conform to what is known about nature – in contrast to the wild speculations contained in all of the world's “holy books”!

In an interview on NOVA, the physicist Sylvester Gates summarized the situation well:¹⁵

The power of science is an acceptance and openness to the notion that we are fallible and must therefore be corrected by nature herself. Many other human belief systems start off with the assumption that the answer is already known. In science, it's precisely the opposite; we start out admitting to not knowing the answer. So, as we struggle with our marriages of space and time [in string theory], our addition of extra dimensions, our paradigm shifts from little billiard balls to little pieces of spaghetti, these exercises are all subjected to a single question: Is it there in the laboratory? Can you find its evidence? Until that happens, I am of the opinion that you should be skeptical. . .

¹⁵ From <http://www.pbs.org/wgbh/nova/elegant/view-gates.html> .

2.1.2 *Ontology and Linguistics*

Ontology is (literally) “the theory of existence”. As I mentioned in earlier chapters (starting way back at Chapter **Ia**, entitled *Awareness of Ideas*), I think that ontology is usually a waste of time and mental effort. That is, ‘existence’ should generally be investigated phenomenologically rather than theoretically.

Thus, if someone claims that something ‘exists’, then this “existence hypothesis” should be examined in the same way that any hypothesis should be examined, i.e., by testing associated predictions. For example, if a tree is claimed to exist, then test the prediction that, if you kick it, it’ll hurt your foot! Similarly, if you claim that you exist, then test the prediction that you should then be able to continue reading!

In general, if predictions of some existence hypothesis are validated, you can tentatively adopt the “useful working-hypothesis” that the thing exists – until you find that its predictions fail. In that way, most of us have adopted and find useful the working hypotheses that the universe and we exist.

Yet, even if we adopt such useful working-hypotheses dealing with existence, the question remains: how did our universe come into existence? And then, more questions arise. What (if anything) existed before our universe existed? Nothing? Could such a “nothing” exist? What does it mean to ask if such a “nothing” exists? If our universe was created from “nothing”, how could such a “nothing” lead to “something”?

Such questions not only suggest that some studies of the theory of existence (ontology) might be useful (which I’ll get to, in later paragraphs) but also suggest failures in our language. Thus, if you say that a thing called “nothing” exists, you can bet that some linguist, logician, philosopher (or other troublemaker!) will mock you. Einstein saw it, and mocked back:

Once you can accept the universe as matter expanding into nothing that is something, wearing stripes with plaid comes easy.

Look again at what Einstein said: “**nothing that is something**”! How can ‘nothing’ be ‘something’?!

To try to make sense of what may appear to be nonsensical, we should re-examine the meaning of the word ‘existence’. We have distinct impressions

that we exist (and can validate our hypotheses with various tests), but what tests are available to investigate the hypothesis that, for example, space (or “the vacuum”) exists? Space can be neither detected with any of our senses (it can’t be seen, heard, smelled, tasted or touched) nor detected with any measurement device that enhances our senses. So, then, what does it mean to say that space exists? And then, what about the even more elusive “total nothingness”? What does it mean to claim (as Einstein did) that “**nothing... is something**”?

One way to try to circumvent such linguistic problems (at least temporarily) is to invent new words. Remember that words are just mutually agreed upon meanings for grunts, hisses, and other sounds that we make. Thus, instead of using the word ‘nothing’ or “total nothingness” or “the original nothing”, we could adopt a new word. For example, we could call “total nothingness” the quintessence (literally meaning “the fifth essence” – following after the four assumed by the ancient Persians and Greeks, i.e., earth, air, water, and fire). Another option (which I pursued in a blog post)¹⁶ is to call total nothingness “split-been soup”, where notice I called it “split-been soup”, not “split-bean soup”! Still another possibility is to follow the lead of ancient Chinese philosophers and call “the original nothing” the Dao. In what immediately follows, though, what I’ll do is use familiar words, but to indicate that their meanings must be extrapolated from current understanding of the words, I’ll put them in ***bold italics***.

2.2 A Simple Genesis Story: Speculated Dynamics of the Dao

Thus, Dear, please consider the following “genesis story”, which starts with:

Before the beginning of our universe, total nothingness existed everywhere.

In that first line of this proposed genesis story, I put essentially every one of those words in bold italics for the following reasons:

- 1) I put the word ‘beginning’ in bold italics, because (as you’ll learn if you study more physics), time apparently has no meaning in the absence of energy. Consequently, if in “the ***beginning***” there were totally nothing (e.g., no energy), then there would be no ‘beginning’ (of time): time can’t begin until energy exists.
- 2) In “***Before the beginning...***”, I put ‘before’ in bold italics, because ***before*** energy and time existed, ‘before’ has no meaning.

¹⁶ At <http://meansnends.blogspot.com/2010/02/god-is-total-nothingness.html>.

3) I put “total nothingness existed” in bold italics, because new ideas of ‘existence’ must be considered (which I’ll get to, soon) to understand how *nothingness* can *exist*.

4) I put the word ‘everywhere’ in bold italics, because as you’ll also learn if you study more physics, the concept of ‘location’ (e.g., ‘everywhere’) has meaning only if some momentum exists. But if there were *totally nothing* (with no momentum), then the concept of ‘everywhere’ is meaningless.

With similar extrapolations from familiar words (although I won’t continue to go into such detail as I did in the list immediately above), the proposed genesis story could then be as follows:

Genesis: The Dynamics of the Dao

Before the beginning of our universe, *total nothingness existed everywhere*. This *total nothingness* (which in Daoism could be called “the Dao”) had two options: either just *sit there, everywhere*, for *evermore*, or start fluctuating. After a long, long *time* of doing nothing, *total nothingness started* to fluctuate, similar to the way that quantum mechanical systems are now known to behave.

That’s not to suggest that *total nothingness* (or “the Dao”) is governed by quantum mechanics. Quantum mechanics may be just a subset of a larger set of dynamics, which for want of a more meaningful term, we could call the *zigblat mechanics of zero*. What the *dynamics of the Dao* actually entails is unknown, but for now, it’s assumed that it includes random fluctuations.

Returning to the *Dao*, it’s assumed that it engaged in such fluctuations (a huge number of them, e.g., $10^{10^{10^{10}}}$...) for a long, long, *time*, and in each and every fluctuation, everything was perfectly symmetrical: a positive fluctuation in anything (be it energy, *fenergy*, *genergy*, *henergy*, or whatever) was exactly balanced by a negative fluctuation of exactly the same thing. (In Daoism, this would be described as the original Yin-Yang.) As a consequence of the perfect symmetry of these fluctuations, *still and in total, nothing existed*.

Then it happened. Of the innumerable fluctuations, one broke its symmetry. No one knows how it happened. Perhaps what we now call a positive fluctuation in energy precipitated as a string or as a particle of energy (i.e., it became a mass of “solidified, positive energy”) and was then unable to recombine with its negative counterpart. This symmetry-breaking, quantum-like fluctuation could be called the “original swerve”, which Epicurus (341–270 BCE) postulated and which Lucretius (c.94 – c.55 BCE) later called the *Clinamen*.

Whatever it’s called and however it happened, once the symmetry was broken and some bit of positive energy was unable to recombine with its negative-energy partner, then not only did time begin (since, now, positive energy was present and persisted) but also, “all hell broke lose”.

Details aren't known. Perhaps all positive-energy levels below those levels of the first precipitated string or particle of positive energy, finding a void at a higher energy level (i.e., from where the first energy precipitated as a particle or string of energy), no longer could balance corresponding negative-energy levels. Apparently, all the negative-energy levels remained intact, and continue to be intact, in what we call 'space' or "the vacuum". But whatever the details, the dam broke, positive energy flooded out, leading to what's called "inflation" (or the Big Bang) and eventually to our universe and us.

Now immediately, Dear, please perform a perfunctory comparison of the above, speculated genesis "story" with your religion's genesis myth. Can't you already agree that the above genesis story is at least as plausible as genesis myths that assume some god snapped his fingers (or whatever) and created the universe?

Further, consider some unanswered questions associated with your religion's genesis myth. Where did such a "creator god" come from? How did he (or she or it) gain such power? If he's so powerful, why did he want to create such pathetic little creatures as humans? If he wanted company, why didn't he create beings comparable to himself? And if he's so powerful (usually claimed to be 'omnipotent', i.e., "all powerful"), then how could he *want* anything? Wants are unfulfilled desires, common to pathetic little creatures like humans; it seems dangerously insulting to their god for religious people to say that their god "wants" something!

Moreover, Dear, as I've repeatedly applied in earlier chapters, there's the general principle known as Occam's razor (named after William of Occam, c.1285–1349), which states: "in explaining a thing, no more assumptions should be made than are necessary", or more succinctly, "the fewer the assumptions, the better." For the above genesis story, the only assumptions needed are to postulate that something called "nothing" exists and that it behaves similar to other quantum mechanical systems, i.e., it fluctuates.

I'd agree that the assumption that something called "nothing" (or the Dao) exists is quite an assumption, but notice that, in contrast, your religion's genesis myth contains a much more "fantastic" assumption, namely, that an astoundingly complicated "creator god" exists and that it (or he or she) can do absolutely anything, including create our universe!

Related to Occam’s razor is the “principle of parsimony”, which states: “things are usually connected or behave in the simplest or most economical way.” On the face of it, isn’t “absolutely nothing” the simplest possible “thing”?! And isn’t the assumption that something called “nothing” engages in fluctuations (as does everything else in nature) vastly simpler than the religious assumption that some creator god had the ability to snap his fingers (or whatever) to create our universe? So, isn’t it parsimonious to assume that our universe was created from the simplest possible “thing” (i.e., “nothing”) than *via* the most complicated thing imaginable (i.e., God)?

Next, please consider some additional differences between the above genesis story and religious genesis myths. In the **Ix** “excursion” I reviewed a number of ancient genesis myths. In particular, in Chapter **Ix5**, I tried to show you how the Bible’s genesis myth (developed by Zoroastrian priests and subsequently adopted in Judaism, Christianity, Islam, Mormonism, etc.) conflicts with scientific findings in fields from astronomy to zoology, especially with biology and geology. In contrast, the above genesis myth is consistent with all known science – and if it isn’t, it should be modified! That is, religions require that their devotees believe their genesis myths to be “true”; in contrast, the genesis story proposed above is only a suggestion – that should be improved wherever new scientific results recommend!

Of course, it wouldn’t be surprising (or upsetting!) if new scientific results recommend changes to the above, simple, genesis story. Already, one of the world’s most competent cosmologists, A.A. Starobinsky, mentions:¹⁷

... any inflationary stage [commonly called “the Big Bang”]... cannot be the very beginning of our Universe. Something was before, that was the origin of the inflationary stage. The most well known proposal [by Edward Tryon, which I quoted in Chapter A], put forward long before the inflationary scenario was introduced in 1979–1982, was the “creation of the Universe from nothing”. Here nothing means literally nothing, in particular... no space-time before our Universe was created. This idea does not work without some inflationary state following the creation, so it was forgotten for some time and was revived only after the development of the inflationary scenario. However, at the same moment the idea of “creation from nothing” was renewed, it was pointed that this is not the only possibility to create an inflationary stage. Let me present an incomplete list of other alternatives [which, Dear, I don’t expect you’ll understand; therefore, just skim the following list, to gain the impression that other possibilities seem to exist]:

¹⁷ From a paper by Starobinsky (with references omitted) entitled “Future and Origin of our Universe: Modern View”, available at <http://arXiv:astro-ph/9912054v1 2 Dec 1999>.

1. Quasi-classical motion of space-time from a generic inhomogeneous anisotropic singularity to the de Sitter attractor solution.
2. Decay of less symmetric, higher curvature self-consistent solutions of gravity equations with all quantum corrections included (e.g., the Bondi-Nariai solution).
3. Stochastic drift from a singularity with the Planckian value of curvature along a sequence of de Sitter-like solutions (this is what actually occurs in the so called “eternal chaotic inflation”).
4. Quantum nucleation of our Universe from some other “Super-universe”, in particular, even from some asymptotically flat space-time (the latter possibility includes “creation of the Universe in a laboratory”).
5. Creation of the Universe from a higher-dimensional space-time.

Evidently, many more possibilities remain not mentioned. It seems that they are all indistinguishable from observations. That is why, in order to tackle this great ambiguity, a completely different principle of “creation of the Universe from anything” was put forward in [an earlier paper coauthored by Starobinsky]. Namely, it states that:

“Local” observations cannot help distinguish between different ways of formation of an inflationary stage.

By “local” I mean all observations inside the presently observed Universe, and even all observations made along our future world line in arbitrary remote future. “Creation from anything” intrinsically includes all ways of creating the de Sitter (inflationary) stage, with the “creation from nothing” being only one (and therefore, scarcely probable) way among them.

Yet, Dear, I disagree with Starobinsky’s conclusion

... “creation from nothing” being only one (and therefore scarcely probable)...

As I see it, two major problems with the alternative “creation from anything” are: 1) Where did the supposed “anything” come from? (Or is it being proposed that it has always existed?), and 2) Science has taught us that the best procedure is always to start with the simplest possible hypothesis, complicating it only when data demand – and the simplest possible hypothesis is that the universe popped into existence out of totally nothing.

2.3 Comparisons with Religious Genesis Myths

Again, Dear, please think about what your parents and clerics told you. Is the genesis myth of your religion reasonable? Is it logical? Is it consistent? Can it be shaved with Occam's razor? Is it parsimonious? Is it supported by data? Does it conform with scientific understanding? Are its predictions testable? So then, what's the probability that your religion's model is true?

To be sure, your religion's genesis myth is simple: it's easily "understood" by children (and adults with childish minds). But even a child asks:

Where did God come from?

The usual, clerical response to that question is either "God always existed" or "God was self created." But on the one hand, rather than assume that "God always existed", why not just assume that the universe always existed? With such an assumption, there's no need for any "creator god". And on the other hand, if it's claimed that "God was self created", then how could such a being create itself?

If it's assumed that God just popped into existence out of nothing, isn't it more reasonable to assume that the first bit of positive energy popped into existence (maybe in the form of a single string or particle of energy), leading to the Big Bang, then to more particles that eventually coalesced into stars, some of which exploded, their remnants formed planets around other stars, eventually leading to life, which then evolved? Surely you agree that such a scenario is more plausible than the proposal that some God snapped his fingers (or whatever) and created everything –including even himself!

Asked differently, what's the probability that the founders of your religion (and the clerical leaders who still promote such "patently infantile" ideas) did so (and continue to do so) to gain (and maintain) power over people – and over their money? Ever since you were a baby, have you been set-up to be swindled in a con game? Why is it that your clerics' model requires that you work for a living and then pay them your tithes, while they simply continue to mouth the same old, familiar platitudes, "like parrots, on a dead branch of knowledge, endlessly repeating the same old lines"?

Yet, although there are obviously many questionable aspects of the genesis myths of your religion (and of all religions that invoke "gods"), major questions also arise about the above, proposed, godless "creation story"

dealing with the “Dynamics of the Dao”. In most of the rest of this chapter, I’ll address some of the questions, starting with a survey of some stunning scientific achievements.

2.4 Questions about Something from Nothing

Dear, when I consider all the scientific data collected and principles discovered that I’ve studied during the past ~60 years (and that have led to so many benefits, including the huge benefit of understanding nature better!), then for me, one idea stands out as being the most amazing. It’s not the path-breaking ideas about mechanics discovered by Galileo, Newton, and others, and similarly, it’s not the revolutionary ideas about thermodynamics developed by a host of people, from Fourier through to Boltzmann and Prigogine. Nor is it the amazing discoveries about electricity, magnetism, and electromagnetism by Coulomb, Ampere, Faraday, Maxwell, et al.

Granted, Darwin’s idea of evolution by natural selection was amazing, as were the subsequent understandings of genetics and the DNA molecule, culminating in the recent deciphering of the human genome. As well, there were Einstein’s amazing ideas in his relativity theories (e.g., that time isn’t absolute, that mass is a form of energy, and that mass warps space-time). Also amazing have been the discoveries in quantum mechanics (by Planck, Einstein, Schrödinger, Heisenberg, Dirac, et al.), particle physics, astrophysics, cosmology, etc.

Yet for me, the most astounding discovery (which of course depended on prior discoveries in mechanics, thermodynamics, relativity, quantum mechanics, particle physics, cosmology, etc.) is that, as I reviewed in the first chapter (A): **In total in this universe, there’s nothing here! It all sums to zero!! Zip!!!**

If you’re not similarly impressed with the result that there’s nothing here (i.e., that, in the universe, each of the total electric charge, the total linear and angular momentum, the total energy... sums to zero), then I’d ask you to think about it for a little while. I expect that, soon after we humans came down from the trees, one of the first series of perplexing thoughts was something similar to: “What am I?”, “Why do I exist?”, “Why do things exist?”, “What is this thing called ‘existence’?”, “Why is there something rather than nothing?”, “How could something come from nothing?”

* Go to other chapters *via*

And now, although difficulties remain in trying to answer some of those questions (as I'll soon address), we can finally answer the question described by Gottfried Leibniz (1646–1716; the co-developer of calculus) as the fundamental question of philosophy: “**Why is there anything at all and not simply nothing?**” The answer is:

Actually, the question contains an incorrect premiss:
in reality and in total, there's nothing here!

Thereby, the ancient Greek philosopher Anaxagoras (c.500–428 BCE) and much later, Epicurus, were right – but for the wrong reason. Aristotle wrote:

The theory of Anaxagoras... was probably due to his acceptance of the common opinion of the physicists that *nothing comes into being from not-being* [my italics].

Epicurus (341–270 BCE) and, later, the Roman poet and Epicurean philosopher Lucretius (99–55 BCE) wrote: “**Nothing can be created from nothing.**” Still later, various Latin authors echoed: *Ex nihilo nihil fit*, i.e., “**Out of nothing comes nothing**”. It has taken us a long, long time to realize the correct interpretations of such statements: they claimed that “**nothing can be created from nothing**” – **and it was!**

Of course, if you do mention to others that, in total in our universe, there's nothing here, you can bet that at least some troublemaker will respond with something similar to:

That's ridiculous! If there's nothing here, then you're not here! So, there's no point in my paying any attention to anything you say!

I've received such responses – such attempts to ridicule – many times. And I admit that most of us do have the definite impression that something is here, including ourselves! Therefore, given the likelihood that someone will challenge you if you claim that there's nothing here (as well as the really quite firm result that, in fact and in total, there's nothing here), it may be useful for you to consider the reason why so many people have the mistaken impression (!) that something is here.

The key, of course, is not that there's nothing here but that, **IN TOTAL, there's nothing here.** What seems to have happened to produce our universe is that the original “total nothingness” split into positive and negative “somethings”.

To describe the process symbolically let $N = \text{Nothing} = \text{Zero}$ (i.e., 0) and let $S = \text{Something}$. Then similar to how chemical or nuclear reactions are described symbolically, our universe seems to have come into existence *via* the reaction (the original, fundamental reaction of the Yin-Yang complementarity principle, in which $N = 0$ is the Dao!):

$$N = 0 \rightarrow S + (-S) ;$$

i.e., nothing became something plus its negative – although in total in our universe, there's still nothing here. The fundamental “something” (i.e., S) that came into existence (in equal amounts, positive and negative) is apparently energy, E , but then, just what energy is remains a mystery!

The question, “**What, in reality, is energy?**” seems impossible to answer in words. As I mentioned in an earlier chapter (**W**, dealing with “Words of Wisdom”), ‘energy’ is one of what I call “base words”, unexplainable in more fundamental (or more basic) words. It seems that the most fundamental statement that we can make about our universe is “**energy exists and transforms**”. Maybe someday, people will be able to explain that fundamental fact as “**gluck glicks**” (or similar), but for now, we're stuck at “energy exists and transforms”. To say more, we'll probably need to develop a deeper understanding of what ‘existence’ means, which is a topic that I'll soon address.

But whatever it is, most of the energy with which we're familiar has “solidified” into what we call mass (recall Einstein's result that, for a stationary mass m_0 , its energy $E = m_0c^2$, in which c is the speed of light). Additional (positive) energy is contained in the motion of various masses (i.e., kinetic energy, including thermal energy); some of the positive energy is carried by light (which has no mass, but does have momentum). But that's certainly not the whole story about energy:

Whatever energy is, it can also be negative!

Perhaps the easiest way to see that energy can be negative is to consider a system in which a substantial amount of positive energy must be added to bring the system's energy up to a value of zero – and if you need to add more of something to increase it to zero, then originally, it must have been negative.

* Go to other chapters *via*

To illustrate, consider the question: how much energy would need to be added to the Earth to remove it from the gravitational influence of the Sun? I won't do the calculation to show you what (a huge amount of) energy would be necessary; I trust you agree that the amount of energy you'd need would be enormous. And if you added such an enormous amount of energy, then what would you have? Answer: our Earth, floating around in interstellar space, with essentially zero (gravitational) energy. Consequently, since it would be necessary to add an enormous amount of energy to the Earth to free it from the Sun's gravity, then currently, in its orbit, the Earth-Sun gravitational system must contain an enormous amount of negative energy.

The fact that energy (whatever it is!) can be negative is not “just a convention” – and in fact, it says something about what energy is. In physics, what's known as a ‘scalar’ is just a (positive) number, such as the number of letters in a word, the number of words on a page, the number of pages in this chapter... the temperature at each point in your room, the number of molecules there, and so on. Such (physically real) scalars are also called “[zeroth-order tensors](#)”. In contrast to scalars, the simplest (physically real) things that can also be negative are vectors (or “[first-order tensors](#)”): they have magnitude and direction. Examples are velocities (e.g., the wind), forces, momenta, and electric and magnetic fields. Therefore, since energy can be both positive and negative, then it's not a scalar but a vector (or at least, a component of a vector).

In fact, as Einstein showed, energy is the time-component of the four-dimensional (space-time) momentum vector. Einstein also showed that the energy and the magnitude of the space-component of momentum, p , were related by

$$E^2 = (p c)^2 + (m_0 c^2)^2,$$

in which, again, m_0 is the “rest mass” of the body (i.e., its mass when it's at rest relative to the observer). Therefore, if a mass is at rest relative to an observer (i.e., if it's momentum, p , is zero relative to the observer), then upon taking the square root of Einstein's equation it becomes, not $E = m_0 c^2$, but

$$E = \pm m_0 c^2,$$

* Go to other chapters *via*

i.e., energy can be both positive and negative, which is a strange result!

For example, returning to the result that the Earth-Sun gravitational system has an enormous amount of (negative) energy, an obvious question is: where's all the negative energy? Stranger still is the answer: the huge amount of (negative) energy doesn't "reside" in the Earth or in the Sun; it resides in the gravitational field between the Sun and the Earth, i.e., **the (negative) energy resides in space (or the vacuum), itself.**

That's weird. Most people think that, if space (or the vacuum) is devoid of particles, then it's empty. But that's not so: even the "empty space" between the atoms of your body, or between the Earth and the Sun, or between galaxies (even if such space contained no cosmic ray or other particles) is "filled" with (at least) gravitational energy.

2.5 The Nature of Nothing

To be sure, space ("the vacuum") is strange stuff: certainly it's not nothing! In fact, much of modern physics (especially cosmology and high-energy physics) consists of trying to understand the vacuum and the "force fields" (such as gravity) that it can host. For an overview of current ideas, see the video by Kim Greist entitled "The Mystery of Empty Space".¹⁸

When Dirac introduced his ideas about the vacuum in the 1930s, he started from Einstein's general result between energy, momentum, and rest mass (given on the previous page), cast into an appropriate quantum mechanical form, and tried to solve the resulting equation for the energy states in which a single electron could reside (or the energies that a single electron could possess). With hindsight, it's now unsurprising that he found that such an electron could have both positive and negative energy: the result basically came from taking both the positive and negative square roots (as shown above). But as I mentioned in Chapter A, Dirac stated in his original paper that he didn't understand the result: how could an electron have negative energy? As I also mentioned in Chapter A (on p. 6), Dirac was concerned about his mathematical result. If there were negative energy states available, then why wouldn't all electrons in the universe fall down into those lower-energy states, releasing an incredible amount of (positive) energy? If they did, the universe would explode!

¹⁸ At http://www.youtube.com/watch?v=Y-vKh_jKX7Q.

To resolve that “embarrassment”, Dirac applied the Pauli exclusion principle (that no two electrons can occupy the same quantum state) to conclude that all negative-energy states must be already filled with electrons: that the vacuum was (in my words) “filled to the brim” with electrons with negative energy. He further reasoned that, since all the energy states were occupied and therefore uniform (a perfectly uniform “sea” of negative-energy electrons), we wouldn’t notice them, but if one of the negative-energy electrons were given a substantial burst of positive energy, a hole would develop in the vacuum, and we’d detect that hole as an anti-electron (or positron), i.e., the hole appears to us as something with the mass of an electron but with a positive charge. The essence of that Nobel-Prize winning idea was confirmed experimentally, as were his predictions that all particles would have antiparticles.

Such ideas made space (or the vacuum) seem even weirder. Subsequently, some of the brightest minds in the world have wrestled with its weirdness – reaching no consensus – beyond agreement that space is weird! As already mentioned, during the early 1930s, Dirac had extended the Schrödinger equation of quantum mechanics to include special relativity and solved it for single, charged particles; during the next 30-or-so years, many physicists developed quantum electrodynamics (a quantum theory of electromagnetic fields), culminating in the award of the 1965 Nobel Prize in physics to Tomonaga, Schwinger, and Feynman.

More recently, the quantum theory of fields has been extended to both the weak and strong nuclear force fields. In these newer theories, the various force fields are perceived to be “carried” by various “virtual particles” or “fluctuations of vacuum energy”. For example, in an electromagnetic field (e.g., in an atom, in the space between a nucleus and its surrounding electrons), the vacuum is apparently a bubbling sea of virtual electrons and positrons. Similarly, in the strong nuclear field within a nucleus, the vacuum is a bubbling sea of virtual quarks and other particles and their antiparticles.

Such particles are “virtual” in the sense that they aren’t detected with direct measurements, only through their average effects. They are the (virtual) photons of the electromagnetic field, the mesons of the weak-nuclear field, the gluons of the strong-nuclear field (binding quarks together), and possibly virtual gravitons whose exchange is assumed to govern the gravitational force field.

* Go to other chapters *via*

In his 2010 book *Student Friendly Quantum Field Theory*, Robert Klauber summarize the current, majority opinion that “[the vacuum is a seething caldron of virtual quanta](#).”¹⁹ A daunting problem with such an idea, however, is that it predicts that the vacuum contains an enormous “zero-point (positive) energy”, more than 10^{100} times larger than the estimated energy density of space! As Klauber mentions,²⁰ the result is “[the biggest discrepancy between theory and experiment in the history of science](#).” In the same reference, Klauber shows that one way to correct this discrepancy is to admit solutions to the equations in the vacuum that admit not only positive but also negative time (i.e., time running in the opposite direction from what we normally consider to be positive): the vacuum’s future is our past! Later in this chapter, I’ll return to this idea.

For now, I’ll conclude this section with the summary statement that space (the vacuum) is not only weird, it’s definitely not understood. One thing that’s clear is that the vacuum is definitely not “nothing” (as had been assumed for thousands of years). Instead of “nothing”, the vacuum is a bubbling caldron of “virtual particles” (the bosons, including photons, mesons, gluons, and possibly gravitons) that interact with the “real particles” with which we’re familiar, i.e., the fermions (including electrons and muons), neutrinos, and the quarks that form protons and neutrons.

Without the vacuum, truly nothing would be here. In particular, the consensus view is that it’s the interaction with the vacuum that causes particles to have mass – which is the idea behind the current search for the Higgs boson at the Large Hadron Collider.²¹

2.6 The Nature of ‘Existence’

Although uncertainties about the nature of the vacuum remain, the consensus view among competent physicists appears to be that, in total in our universe, there’s nothing here. The possibility that the separate, positive and negative “somethings” of our universe came into existence from an unknown, original “total nothingness” is still being debated.

¹⁹ At <http://www.quantumfieldtheory.info/>.

²⁰ At <http://arxiv.org/abs/astro-ph/0309679>.

²¹ See, e.g., http://en.wikipedia.org/wiki/Large_Hadron_Collider.

An even weirder alternative (from String Theory or M-Theory)²² is that our universe is an 11-dimensional membrane, one of an indefinitely large number of membranes in a “multiverse” of membranes, which have always existed, and that the Big Bang was a result of a collision between two such membranes.²³

Yet, whatever theory eventually receives experimental support, I expect it’ll be necessary to re-examine the meaning and nature of ‘existence’.

Please, Dear, think about it: What is ‘existence’? Is it a “thing” (e.g., a noun) or a “process” (e.g., a verb) or what? (Although remember: a noun is just a slowly moving verb!) Since other things (e.g., people) seem to come in and/or go out of existence, then ‘existence’ seems to be an attribute of other things (e.g., I maintain that I exist, i.e., that I have this property known as ‘existence’). But if existence is a property of some things, then what sort of property is it? It appears to be a more fundamental property of things than their color or mass or temperature or... In fact, ‘existence’ seems to be the fundamental property, without which color, mass, temperature, etc. seem meaningless. If so, if existence is the fundamental property, then a reasonable question would seem to be: how can existence be measured?

Back in Chapter **W** (and earlier) I suggested that ‘existence’ is a “root word”, which can’t be defined in terms of more fundamental concepts. I continue to think that such a claim is valid, but notice that the claim doesn’t address the question: how can existence be measured? – assuming it can be!

For example, if you claim that a certain tree ‘exists’, it doesn’t seem appropriate to suggest that its existence depends on the magnitude of your kicking-foot’s pain (since the pain would depend on the momentum you imparted to the tree and not on whether the tree exists). In fact, such a phenomenological approach suggests that, if the property called ‘existence’ can be measured at all, then “the measure” is extremely simple: either “Yes, it (some particular thing or process) exists” or “No, it doesn’t exist” – although one could again easily get in trouble if someone then asks: “**If it doesn’t exist, then what’s this ‘it’ that you’re talking about?**”

²² See, e.g., <http://www.youtube.com/watch?v=Bo3g9yrahP8&feature=related>.

²³ See, e.g., <http://en.wikipedia.org/wiki/Ekpyrotic>.

To make progress understanding how to measure something's existence, it seems useful to briefly consider how other properties of things can be measured. For example, if you give me a blue block of lead and ask me to describe its properties, I could: 1) immerse it under water in a graduated beaker to find the volume of water the brick displaces, providing you with a number for the brick's volume (e.g., 1.05 liters), 2) use a balance to compare its weight against some standard weights, providing you with a number for the block's mass (e.g., 11.9 kg, which then would suggest that the block is, in fact, lead, since the density would be $11.9 \text{ kg}/(1.05 \text{ l}) = 11.3 \text{ kg/l}$ or 11.3 gm/cm^3 , which is approximately the density of lead), and 3) expose the block to white light and provide you with the wavelength of the radiation emitted by the block (e.g., that it peaks in the range from about 450 to 500 nm, i.e., that the block is blue).

Thus, properties of things can be measured by comparing against standard values (e.g., of dimensions, masses, wavelengths, charges, etc.) and reporting the results as numbers with units, e.g., meters, kilograms, Coulombs, etc. In the case of measuring something's existence, then, we could use an amazingly simple measure: we could assign the number unity (i.e., 1) to something if it exists and assign the number zero (0) to convey the concept that "it" doesn't exist. The number needn't have units, although if desired, we could call the units "things", e.g., I'm one "thing", you're another, my mother and father (who are no longer alive) are zero "things" – save for memories! But if we use just the measure unity (1) to signify 'existence' and the measure zero (0) to signify 'non-existence', then immediately we encounter a major difficulty.

To see the difficulty, consider again the fundamental Yin-Yang of the universe describing how something, S , can come into existence from nothing, $N = 0$, i.e.,

$$N = 0 \rightarrow S + (-S).$$

Rewritten as a statement about existences, using the measure unity (1) to signify existence, the above becomes:

$$0 \rightarrow 1 + (-1).$$

I trust you agree that the above is a reasonable way to describe coming into existence from nothing, but simultaneously, the result seems to demand that we recognize that existence can also be negative!

If we then inquire about the possible meaning of “negative existence”, then two aspects become obvious. One is that, from the experimental result that energy (the “fundamental stuff” of our universe) can be negative, then it follows that, to be consistent, we should recognize that existence can also be negative. And the second aspect of the result is also obvious: since scalars (or zeroth-order tensors) can’t be negative, but existence can be, then the property that we call ‘existence’ must be the components of (at least) a vector (a first-order tensor), if not a higher-order tensor.

That existence isn’t just a scalar seems obvious – and not just because of the existence of negative energy. An obvious case in point occurs in specifying the existence of electrical charge, since it’s of course necessary to state if the charge is negative, positive, or zero. Therefore, recognizing the existence of electrical charge is recognizing that this existence is at least a vector, i.e., a first-order tensor. (In fact, charge is the time-component of the electric-field vector in four-dimensional space-time.) Further, though, in describing the existence of a charged elementary-particle, it’s necessary to specify its spin, which is an (anti-symmetric) second-order tensor. And so on, it would seem, for the complete specification of the ‘existence’ of anything. As a result, ‘existence’ may be a quite a high-order tensor.

Well, Dear, at this point in earlier drafts of this chapter, I tried to go into details to explain what I meant by suggesting that ‘existence’ can’t be a scalar but must be a higher-order tensor. As you probably expect, my explanation went on and on and on (!), because I felt the need to provide you with so much “background” information. I then began writing another “excursion” (or appendix) to provide you with the needed information, but I became weary of the task, especially since you’ve decided not to pursue science. Consequently, for the next-to-last section of this last chapter of this (my last!) book, I’ve decided to just list and briefly outline some speculations on topics that perhaps youngsters who have decided to pursue physics might want to investigate further. Of course, I don’t know if any of the following ideas are useful (let alone correct!); it’s just that, if I had another life to live, I’d like to explore them.

2.7 Speculations about the End of the Universe

Dear, to investigate what seems to be the most reliable speculation about how our universe might end, I recommend that you start by watching Lawrence Krauss' video "The Universe from Nothing".²⁴ He provides available theory and data (primarily from redshift data)²⁵ to support the idea that the universe will just "fade away". That is, because of the expansion of space, the distances between galaxies, between stars, between anything will steadily increase, until if anyone is still living about 100 billion-or-so years from now, stars will no longer be visible. And so, as T.S. Eliot might have said, our universe will have its "hollow" end, "not with a bang but a whimper."

Such a possibility, however, follows from the interpretation that the redshift is caused by the expansion of space. Many other possible causes of the redshift have been proposed.²⁶ One (which I haven't seen discussed) is the possibility: it's not space that's expanding, but instead, what's increasing is the size of the entire universe, e.g., because at its outer "edge", "total nothingness" is still being separated into positive and negative energies. If such is occurring, then the distance out to the "plasma curtain" (at the "edge" of the universe, and through which light can't pass) is steadily increasing. And if it's thought that such would have no effect on light observed on Earth from sources within the universe (or even of the Cosmic Microwave Background Radiation, CMBR, which started toward us approximately 14 billion years ago),²⁷ then I'd respond that we don't know enough about light or about time to reach such a conclusion.

Light is strange: for it (i.e., moving with a photon), there's no time, no past or present, only "now". And if, within the negative energy (and negative entropy?) of space, time runs in the negative direction,²⁸ then, e.g., for the CMBR, detecting it is the first event, followed 14 billion years later by its emission! Thereby, if it's only the plasma curtain that's expanding, then all light in the universe could shift to lower frequencies (i.e., be "red-shifted"), similar to how elastic waves on a drum decrease in frequency as the drum's size increases. If such is the case, the universe would end with neither a bang nor a whimper; the frequency of the drumbeats would simply decrease.

²⁴ At <http://www.youtube.com/watch?v=7ImvIS8PLIo> .

²⁵ See, e.g., <http://en.wikipedia.org/wiki/Redshift> .

²⁶ See, e.g., http://www.plasma-universe.com/index.php/Redshift - Alternative_redshift_theories .

²⁷ See, e.g., http://en.wikipedia.org/wiki/Cosmic_microwave_background_radiation .

²⁸ See papers by John Cramer at <http://faculty.washington.edu/jcramer/talks.html> .

But if you're not too keen on the possibility that our universe ends either with a whimper or a slowing beat, many other speculations are available. To have a cursory view of one, start with Alan Guth's simplified description of his inflationary theory,²⁹ in which he suggests the possibility of essentially an infinite number of Big Bangs and subsequent "multiverses". The first "verse" (meaning 'turn') presumably arose from a quantum mechanical fluctuation in "total nothingness" (or the "true vacuum") that led to a "false vacuum", which inflated in the Big Bang.

Meanwhile, though, such a false vacuum is metastable, not only because of its inflation but also because it would seek a lower energy state, if necessary, tunneling through any intervening energy "hill", in a manner similar to radioactive decay. [For a schematic of the process, see the Wikipedia article on the false vacuum.³⁰] Then, however, when "pieces" of the false vacuum decay, the result would be regions of "true vacuum", in which new inflations could occur, creating new verses. If so, then as stated in the referenced Wikipedia article:

The possibility that we are living in a false vacuum has been considered. If a bubble of lower energy vacuum were nucleated, it would approach at nearly the speed of light and destroy the Earth instantaneously, without any forewarning. Thus, this vacuum metastability event is a theoretical doomsday event.

Many other scenarios have been speculated. For example, I've toyed with the idea that, within Black Holes, positive energy is "repacked" to sufficient density that it can recombine with (negative-energy) space to reform "total nothingness" – within which, new "verses" could eventually inflate!

Such a speculation may seem to be silly, if it's thought that the gravitational attraction of Black Holes would disappear if, within them, there's "totally nothing", but I question if gravity is an attraction between masses rather than a repulsion of positive-energy mass by negative-energy space. It's easy to see that such repulsion would yield Newton's principle of gravity (as a first approximation) and would provide a physical explanation for how mass warps space-time. It even seems capable of explaining why particles have mass, because moving any particle requires "pushing aside" the repulsive force on the particle from the vacuum.

²⁹ See, e.g., http://www.pbs.org/wnet/hawking/mysteries/html/uns_guth_1.html .

³⁰ At http://en.wikipedia.org/wiki/False_vacuum .

And from such speculations, Dear, I trust that you'll reach the really quite firm conclusion that, actually, not only do I (and probably essentially all physicists) not know how the universe will end (or how it began), but that it doesn't really matter!

2.8 Does It Matter?

Dear, be reasonable: does it really matter that we don't know how the universe began (if it did!) or how it will end (if it will!)? What difference would such knowledge make to you for how you'll live your life?

It's great that some of the most intelligent people in the world are trying to answer such questions (and I'm certainly glad to continue to support their explorations financially), but to be blunt, for the rest of us to concern ourselves about such matters is a form of mental masturbation. Leave it to brilliant physicists to have intercourse with nature, and request of them only to describe to us mere mortals (in language that we can understand) the ecstasies they've experienced.

What has made a huge difference to the lives of an enormous number of people, however, is the damnable clerics who claim that they know how the universe began (and what will happen to you after you die). In fact, no one knows the correct answers to those questions. But what IS known with certainty is that clerical con artists have gained enormous power over a huge number of people by claiming that they do know. Once again I strongly recommend that you tell all clerics of the world: **“Blow it out your ear!”**

Almost certainly, kid, this is your one and only chance for existence, and it's up to you to decide how you want to experience it. Perhaps you want to check out what others (e.g., a certain old grandfather) recommend – provided you're certain that they're committed to your best interests and not to their own. Personally, I recommend that you try to stay aware as long as you can. But in any case, the decisions are yours.

3. THE END

Finally, setting aside my speculations about the beginning and end of the universe, it's now time to end this long book to you. I began writing it when you were four years old and your grandmother and I were celebrating our 36th wedding anniversary; now, you're almost 21 and will soon graduate

* Go to other chapters *via*

with your bachelor's degree from college (congratulations!), and we just finished celebrating our 52nd anniversary. I hope you have found (or will find) at least some of the ideas in this book to be useful.

To end the book, I thought about re-listing my entire “meditation mantra” that I associate with the letters from ‘A’ through ‘Z’ and that I use to remind myself of my (scientific humanist) “philosophy”. But I decided against doing that, since I already provided you with such a review in Chapter Y4 entitled *Your Principles and Policies*; there, the only one missing is my “Z-mantra”:

Z – The Zen of Zero. The two big zeros: death and the Dao. They give meaning to ones, both one's self and our (one-turn) universe.

I also thought of pursuing further both the “Z-theme” and arguments against religion (e.g., emphasizing that [the Zeitgeist is Zerotheism](#)), but if I haven't been able to convince you of that by now, it seemed pointless. Then, I thought about having a little fun, “proving” to you that God is nothing.

Thus, I could go to some lengths to show you that [nothing is omnipotent](#) (e.g., even God couldn't both obey logic and make a stone so heavy that he can't lift it), [nothing is omniscient](#) (because for any nonlinear system such as the universe and humans, uncertainties in initial conditions, e.g., the uncertainties from Heisenberg's uncertainty principle, will eventually grow so large as to overwhelm any prediction), [nothing created our universe](#) (it seems to have created itself from total nothingness, i.e., a true *Creatio ex Nihilo* = “creation out of nothing”), and therefore, that [nothing is “the ground of our being.”](#) Consequently, [God is nothing!](#)

But setting aside my meditation mantra, more Z-themes, and having fun with amphiboly [“throwing (meaning) around”], I finally decided to end this book by pointing out another aspect of this book's title (i.e., *Love Letters from Grampa – about Life, Liberty, and the Zen of Zero*), namely, another meaning for “love letters”. To do so, I'll simply quote the following, which is an idea created by Zen master Ikkyū (1394–1481). This quote is from the book *Ikkyū and the Crazy Cloud Anthology*, translated by Sonya Arutzen.³¹

³¹ From http://www.panhala.net/Archive/Love_Letters.html.



*Every day, clerics minutely examine the Law
And endlessly chant complicated sutras.
Before doing that, though, they should learn
How to read the love letters sent by the wind
and rain, the snow and moon.*