
~ Order and Chaos ~
(On the Nature of Cosmic Polarity)
Copyright 1995 - Oil on Canvas - 42 x 42 inches

Yin and Yang

The transcendent absolute and the immanent contingent. The infinite and the finite. Eternal perfection and temporal process. The ethereal sublime and the material profane. Static and dynamic. Beauty and power. *Order and chaos*.

The primary visual motif in this image, the *T'ai chi T'u* ("diagram of the Supreme Ultimate"), is said to have been revealed to *Fu Hsi* (c. 2850 B.C.), the legendary first emperor of China. His system of philosophy and divination was later elaborated in the *I Ching* (Book of Changes), one of the oldest and most venerated books in the world (roughly the cultural equivalent of the Bhagavad Gita or the Bible). Fu Hsi saw that for every concept there is an opposite concept, and that the entire universe is an endless interaction of such opposites in mutually interdependent tension. The Chinese called these general principles that together define all the specific forms and processes of the world, *Yin and Yang*. This simple duality represents the self-regenerating rhythm of all things and, as we shall see, the origin and fate of creation.

Yin is the *Archetype of Stillness and Beauty*: creative and nurturing, quiet, intuitive and compassionate. It is the Lunar ethos of endless cycles, the enduring collective, and eternal regeneration. The dark and mysterious *Passive Principle* is a quiescent state of being - a timeless, immutable resolution. The *motivator* beckons inward, attracting and receiving. The grace and purity of repose is absolute, because eternal necessity is perfectly self-contained and infinitely self-consistent.

Yang is the *Archetype of Action and Power*: protective and challenging, aggressive, rational and strong. It is the Solar ethos of linear will, the fleeting individual, and the impulse to conquest - before conquest by death. The illuminated and obvious *Active Principle* is a dynamic process of becoming - an aspiration, evolution, and change. The *motivated* pushes outward, penetrating into the unknown. The hard experience of action is relative, because motion is contingent upon the relentless change of everything everywhere.

The T'ai-chi depicts these universal energies in perfect and harmonious balance, each disappearing into the other in the eternal dance of the living cosmos. And within the heart of each distinct aspect lies the seed of the other: there is no exclusively negative or positive polarity - there is only the balance of the two in a timeless rhythm of expansion and contraction. All things of the cosmos are a manifestation of the pull and push tension between two interdependent and interpenetrating halves of a single whole. Each exists only in relation to and by virtue of the existence of the other. To endure, *power needs beauty and beauty needs power*: without protection, one part is consumed; without purpose, the other part consumes itself. This philosophical view - of the world as an ontological ballet of two universal principles (of which woman and man are merely *partial* incarnations) - has become, after centuries of refinement, a fundamental constant of Chinese and East Asian thought.

The Western View of the Two

The philosophy of a fundamental and universal duality has taken several different forms in western thinking also. Plato believed that the world was a projection, a degraded shadow-world within a beautiful Realm of Ideas beyond the threshold of our gross perceptions. Only concentrated contemplation, he believed, could reveal the true nature of the domain of eternal forms. He called such contemplation *philosophy*: "love of Sophia" - the mysterious Goddess of all Knowledge and Wisdom, who is like a bottomless well that contains all the unknown secrets of the world. In contrast with that compelling image of intellectual desire, Plato believed, was the *Demiurge* ("half-cause"), a brutish builder-god who labors away within the processes of nature, building, destroying, and building again, the illusory world of

the here and now.

Duality took another form in ancient Persia, when Zoroaster (6th-c. BC) gathered all the consumptive aspects of creation - the creeping decay that is an inevitable consequence of life, the myopic avarice that festers in times of want, the sudden brutality that explodes when mortal interests collide (between men or between nations), the casual cruelty that paranoiacly metastasizes in an isolated and indolent leadership, etc. - into a ravenous and bloodthirsty god of suffering and death. That was Angra Mainyu - the first god of *evil*. Standing against him was a luminous god of limitless virtue, Ahura Mazda - the *good*. This idea, of a supernatural pain-eater somehow infecting and affecting the actions of man to satisfy his curious dietary requirements, clearly has considerable emotional power. From a purely political standpoint, the idea is so useful to the ruling class that its widespread success was assured. Regardless of whether the idea is valid or otherwise, it is certainly true that the concept of evil provides a directionless leader with all the rhetorical ammunition they need to distract an angry mob from the failures of a poor domestic policy: "Those deviant people over there are working for the Pain-Eater; they want to satisfy their unholy hunger by feeding upon the our suffering of our children! We must crush them! (And steal their land and gold and women...)"

This idea - of a cosmic battle between good and evil (between us and *them*) - did indeed seep into the fertile imagination of the middle east, and subsequently into the religious systems that have expanded over half of Asia and Africa, and all of Europe and the Americas. This model of the universe (of a destroyer aspect that derives nourishment from human suffering, and a creator aspect that does not) does, in some ways, look like the poorly-fed, disease-infested, crime-ridden, war-torn world we see. But it presents some paradoxes too. Is evil a cause or an effect? Is it an infection that causes rapacious behavior? And if so, what is the source of the infection and can it be medically treated or removed? Is there a vaccine? Or is it a congenital condition among all sentient beings capable of exercising choice? And if so, how then do we explain the "non-evil" choices of the overwhelming majority of us? Or is one who is not evil then virtuous simply because they are fortunate enough not to live under the murderous compulsions of an evil despot? Is one forever tainted by a single evil act, or can one bounce back and forth between good and evil at will? Saying that everyone is evil but only a few choose to act on it, doesn't really explain very much, and suggesting (by omission of alternative explanation) that it can be imbibed and then, as suddenly, dispelled by a moment's reflection says nothing interesting at all. But surely the monstrous acts with which we are all familiar *have* an explanation?

We have come together in the great community of civilization and found some partial refuge from the "eat or be eaten" truth of primal nature (of which we are still a reluctant part). We have seen that such isolation from the rest of nature has many benefits, and so we have said, "There are certain things that are in our mutual interest; we will *protect* this mutual interest from certain nature-made inclinations by imposing our own *man-made* rules. Anyone who breaks these rules by pursuing a personal interest inimical to the mutual interest is *evil* and will be stopped." It's a good system for the administration of human affairs, but less successful in its ontological attempts to explain *why* the world is the way it is...

What is Evil?

A brief digression might be useful here, to address a difficult subject that has inspired much writing in the sad history of civilization - brief because this much used and abused concept does not seem, upon thoughtful examination, to actually correspond to any *real* phenomena immanent in the world. In fact, the way we commonly use the word is almost entirely oblivious to the maddeningly elusive meaning it nominally intends. *Evil* is certainly a useful word, and it does indeed simply and effectively describe the unpleasant events we see on the evening news, but it has no more reality than Santa Claus or the Easter Bunny, and about as much explanatory power.

If I am killed and eaten by a jungle beast, we do not call such an act evil; the hungry animal is compelled by nature to eat and it must act accordingly. We accomplish little by calling acts that *must* happen, evil. But what if the beast in question is a chimpanzee - with whom I share more than 98% of my DNA? No, we still say the chimp cannot choose to live in any state other than a state of nature and so cannot be evil. Not even a really smart chimp. How about a really dumb person? But how dumb do you have to be to get off the hook? At what precise IQ-score does one become capable of transcending from the state of nature where evil does not exist, to the state of civilization where it does (or so it is often said)? Whatever evil is, it seems to come bundled with intelligence.

How involved in the crime must one be to bear the burden of evil? I live in North America. Life is good here. We have an abundance of space and natural resources. But this is a stolen land, taken by European colonists from the indigenous people who lived here before. It is generally believed that those white-skinned settlers killed off as much as 90% of the indigenous people in the Americas when they arrived here 500 years ago, with guns and European diseases to which native Americans had no immunity. Slavery and indentured labor built the early infrastructure of this land. And still, we purchase mountains of cheap consumer products made in the third world under appallingly wretched conditions; the desperately poor and underfed workers of the world literally slave their lives away to keep us in the fat and pampered lifestyle to which we have become undeservedly accustomed. I own many things that are beyond the dreams of the impoverished people who made them; I have personally profited from a long brutal history of theft at the point of a gun. So who am I to point my accusing finger at somebody else? The circle of culpability is large indeed, but it is not interesting to say *everyone* in the developed world is evil.

I think most of us understand that most of us are capable, in a moment of rage, of questionable behavior. A sudden crime of passion in the heat of the moment can be explained psychologically or sociologically, and so there's no need to invoke the machinations of some invisible causal agent to make sense of the crime. The law-abiding citizen who kills after a lifetime of exemplary action certainly deserves to be punished for their crime and restrained from commiting further socially destabilizing acts, but we don't call them evil. Their brutal act was an unacceptable lapse into to a primal state of nature - a state that we all accept is utterly incompatible with civilized society - but they might be redeemed after appropriate punishment.

I can easily imagine a situation in which I might kill: I believe I could kill to defend myself and my family, and I can even imagine killing in retaliation for some great injustice or an intolerable affront. But I would not *enjoy* such violence and would quite likely feel profound remorse afterwards; some creatures, however, are not similarly limited, and this is the critical distinction. We can understand killing *for a reason* (and there could be many, good and bad); it is *purposeless* killing - slaughter for the shear wanton joy of it - that we seek to explain with this elusive and slippery concept.

Although we do not forgive one-time crimes of passion, we can certainly understand them and cannot truly consider ourselves to be more moral than some accidental criminal in whose place we could have been had the circumstances of life been different. It is by good luck far more than good planning that most of us avoid such moral Rubicons, and so it is pointless to invoke mysterious spirits to explain lapses in judgment of which everyone could be guilty, in an appropriately challenging or desperate situation. The civilized part of us is merely the small exposed tip of a great unseen iceberg of nature below, and any honest person can imagine descending to that primitive state in a moment of extreme duress. We see the ordinary people of a civilized society collapsing into an anarchic state of nature every day on the evening news. It is the crimes we *can't* imagine that are at the heart of the matter. Evil is a word we properly reserve for those crimes we can't explain any other way, for brutality that is entirely beyond understand-

ing or redemption. What motivates a person who derives pleasure from the pain of others, who tortures and kills those who are innocent of any crime? How do we explain serial killers? Invoking the existence of a supernatural pain-eater is one way; invoking the *chaos in complexity* is another.

An automobile has several thousand parts. My experience with such complicated machinery (and yours too, probably) has demonstrated that such complex systems rarely work at optimum efficiency. Most cars are merely functional, and very few operate at the level of racecar performance because there are just too many things that can get misaligned in day-to-day use. Without constant care and attention, *things fall apart*. It is often the case, however, that cars are able to go on about their people-moving business oblivious, keeping their increasingly misaligned parts hidden away under the hood, until some fragile piece finally exceeds it tolerance and fails under the strain of overuse. One hundred billion brain cells bound in a neural network of a thousand-trillion synaptic connections is unimaginably more complicated than any fallible machine of human design. We should be astounded that people work as well as they do. Mostly.

There was a story some years ago about a man named Jeffrey Daumer, who had tortured, killed, and eaten several dozen children. Such monstrous brutality is beyond comprehension and seems to qualify as evil, but a far more informative and useful explanation is that serial killers are simply *defective*. Some are born defective and others are made defective by their experience of the world, but either way, they're broken and can't be fixed (unless we one day figure out how to "open up the hood" of these wrecks). A mechanistic - psychological or neurological - description of the condition has far more explanatory power than supernatural causation. And supernatural causation is indeed what we are claiming if we cannot explain the mechanism by which evil compels human action - and we cannot. It is much simpler to say Jeffrey Daumer's brain, like those of other even more bloodthirsty mutants, wasn't assembled right - which is certainly the case.

Which brings me to the most difficult example. We understand that nature - weather, geological processes, hungry beasts that kill to survive - reacts the only way it can to present conditions; it is machine-like and devoid of intent. But men *do* have intent, and so we are entirely justified in our bewildered desire to understand the age-old question: what causes war? Why do millions of people rise up full of wrath to annihilate other millions? What causes *nations* to become machine-like, grinding up human life as blindly as any tsunami or earthquake? The volcano has no choice or awareness in its actions, but the genocidal despot and his soldiers seem to have both choice and awareness. And yet, these makers of life nevertheless become bringers of death.

Surely *this* is evil? Perhaps. But I think something else is at work, a gruesome compulsion written into the very operating code of the cosmos, one that is apparent at every scale of observation. In human physiology this universal imperative is manifest in the cellular destruction caused by cancer. This consumptive dynamic, even present in processes smaller than cellular, also compels the destiny of much larger systems: nations, worlds, stars, galaxies, and whatever other cosmological processes there might be beyond that. It is a subject to which I will return in the final essay of this book.

Are Two Gods better than One?

Most of the facts we experience in the world are highly variable things that could have been other different facts. Facts are *so* variable that, if we were able to go back in time and do *The History of Earth* over again, we could not reasonably expect events to occur in the same way twice. Any proposition of fact that is derived from, influenced by, or subject to external factors that could be (or could have been) different, is called *contingent*. The features and processes of Nature are contingent propositions.

There are some facts, however, that can only exist as they are and cannot be otherwise. Any propo-

sition of fact that is impervious to external influence, is immutable (it cannot change over time), and explains itself without reference to any other external fact, is called *necessary*. The timeless *Laws* of Nature (and the ethereal mathematics that define them) are necessary propositions.

From contingent propositions only contingent propositions follow; likewise, from necessary propositions only necessary proposition follow. It is logically impossible to derive a fact that can only exist in one way from a fact that can exist in an infinite variety of ways; it is equally impossible to get contingency from necessity. Something is either changeable or it is unchangeable; it cannot be both. These two classes of propositions, then, are mutually exclusive and cannot be integrated into a single proposition - like the cosmos. Nature cannot issue from natural law; nor can natural law be an extension of nature. And yet, surely they are indivisible: the eternal laws that govern the behavior of everything in the universe cannot be imagined to exist without something material upon which to impose themselves; and the material universe cannot be imagined to exist without the conceptual foundation that makes the existence of such material possible. Each seems to become manifest only by virtue of the other.

The universe came from something (but what?) or the universe came from nothing (but how?). It seems there is no escape from the paradoxes inextricably attached to the condition of our existence in the *uni*-verse. But there is a solution to the problem of a cosmos that must somehow be both *ever*-changing and *never*-changing: perhaps the cosmos is not *one* thing, but *two*, an indivisible weave of two aspects - an infinite domain of Truth, Beauty, and Quiescence, and a finite domain of Illusion, Power, and Struggle. *One Dance of Two Gods*.

A Domain of Activity and Change

A moment's consideration will confirm that the cosmos is a chaotic place. In the deep of the celestial ocean, great suns half the size of our entire planetary system can either explode with a radiance that outshines whole galaxies, or implode with such catastrophic ferocity that they crush themselves to infinite density and right out of existence. The universe is a *violently* chaotic place. In fact, the laws of quantum mechanics (rules that govern the interactions of sub-atomic particles like electrons, protons, and photons) state that the material of the universe is *fundamentally* erratic and random. Existence in the domain of the very small is a probabilistic, intermittent, and "fuzzy" property. But we do not need physicists to tell us that all we see is, in essence, chaos; all we have to do is look around us to know that this is a crazy, unpredictable world. The only certainty seems to be change. Whether one views the world as progressing or retrogressing (that is, descending from or ascending toward a single perfect moment of Unity), it is indisputably in a perpetual state of flux, always evolving in one direction or the other.

From the free particles created in the infinitely hot explosion of the big bang, to the heavy elements forged in the supernova deaths of stars, to the complex organic compounds cooked up in the boiling cauldrons of volcanic pools, to reasoning consciousness and civilization built upon the war-ravaged ruins of our predecessors, the entire history of the universe has been a story of violent activity - one kind of thing subordinated and made to serve within structure of a larger, different kind of thing. Everything in the universe is in a process of becoming - changing from one state to another over time. The cosmos itself is expanding dynamically as it charges ever outward from the explosive point of its creation, penetrating ever deeper into the oblivion that waits eternally to receive it. It is brutal and ambitious, aggressively building structures of greater size and complexity, always aspiring to some distant objective, ever seeking some higher purpose in an unknown future. For these reasons, I have chosen to represent the chaos of the material universe as the *Earth-Father* - a manifestation of the *Yang principle*.

A Domain of Eternal Stillness

There are other things quite near to our universe that *never* change. The fundamental particles of matter and energy exist in a timeless, eternal state of being: at the instant of their creation they are all they will ever be. These dimensionless points have mass, spin, and charge, despite the fact that they have no size, and seem to sit upon the boundary between this world and womb of eternity that lies beyond. Quanta possess no component parts subject to change or revision. The mysterious electron - which is reckoned finite only by the mathematically dubious process of renormalization (multiplying by a negative infinity) - can never evolve or modify in any way. From its birth at the beginning of time, through the hundred billion-year journey around the universe, to its final consumption at whatever form of cosmic resolution might prevail, it shall remain infinitely identical to itself, and all other electrons in the cosmos. (So identical, in fact, that Nobel Laureate Richard Feynman once suggested that it might be meaningless to think of them pluralistically: perhaps they are just *one* electron - a single speck which zips back and forth through space and time to give the *appearance* of a cosmos assembled of many!)

Of course electrons combine with other particles to make things that do change, but the *method* by which these accumulations of matter-stuff transform themselves does not. The laws of physics are immutable, and thus unerringly predictable. The mathematical rules of gravity, time, thermodynamics, chemistry, electro-magnetism, etc., are always regulating the affairs of the world exactly as they always have. Why should these laws be the same all the time? Why do they not degenerate over time like every aspect of the *material* cosmos? Where did these laws come from? Why should a notion as numinous and abstract as *number*, be able to describe and predict the mechanical "nut-and-bolts" operation of the cosmos with such success? How can it be that we find such delightfully ordered and harmonic relationships in the idea-world investigation of quantities? Where do these eternal, mathematical truths exist? And why should these subjective, incorporeal truths manifest themselves in every chaotic part of the objective, physical world?

We are obliged, it seems, to address such unanswerable questions with a concept that is in marked contrast to the hard experience of the senses: we have a soft and nebulous notion that there must be some mysterious *source* from which all things came. This one concept is known by many different names, and each one is merely a mask towards which we might direct our awe and bewildered questions. It seems that we are not permitted to look behind the mask and experience the presence of this celestial prestidigitator directly. We can only observe little islands of inexplicable order in an endless sea of chaos and thereby infer the existence of a divine order-*maker*. And beauty - the pleasurable harmony of patterns of symmetry - is the highest expression of order.

This Creator is thought of as the Architect-Designer of the universe, yet transcendent and beyond it. This Watcher is not changing or evolving in any way, for the Absolute is utterly whole and complete. The inviolable laws of nature are limitless in the perfection of their design and infinitely durable - they are flawless and eternal. The empyrean dimension of geometry and mathematics is mysterious, alluring, beautiful, sublime. And this Divine Way of Archetypal Forms, this maternal womb from which physical nature emerges, is clearly antecedent and external to such nature. All that is in the cosmos is temporal and temporary and will return to that nameless Eternity whence it came. In the distant future when all energy is spent and time has consumed even itself, the Force in the Void that has drawn existence ever forward - as gravity draws all things toward the center of the sphere - will receive the seed of the cosmos. The genealogical sum of all that has ever been will pass into the incubating embrace of Cosmic Resolution - that realm where Ideas gestate before realization. For these reasons, I have chosen to represent the ethereal order that creates the material universe as the *Sky-Mother* - a manifestation of the *Yin principle*.

Sky Mother?

In the religious tradition of the west, the Creator of the universe is understood as all-powerful - *Omnipotent*. This is an entirely reasonable expectation of the masculine God-in-Heaven that much of the world recognizes. In the ontology of the Divine Feminine, however, the transcendent plane is *not* the dimension of power; it is rather the immanent, material universe that is all-powerful. Power dwells in the here-and-now, in the active processes slowly building the cosmos through bloody, unrelenting labor. The Eternal Creatress (beyond space and time, beyond energy and matter, beyond action and power) is all-beautiful - *Omnibellus*.

The laws of nature possess no substance, no innate power, of any kind; and yet it is She - Law Incarnate - who is the guiding influence over all things in the cosmos. She is the Essential Catalyst that *empowers* power, mediating every action of matter and energy in the field of space and time. By Her will, it is *we who possess power* to employ in the service of Her objectives: Life, Evolution and the Building of the Cosmos. She is inviolable, immutable, irresistible. It is Her beautiful perfection that motivates the evolving universe to aspiration and transformation. She is the Primary Impulse to Action that waits silently for the resolution of Her great and terrible task...

When first contemplating this notion, it may seem that a transcendent God made of Law and Number is rather cold and impersonal. How could such a God have a mind and unique identity? How can *Idea* be alive? How can pure geometric form have will and intent? *Chemicals* don't possess a "mind and unique identity" either, and yet here we are: bags of thinking, feeling, chemicals. The human body is a collection of simple particles - bits of energetic matter with positions, velocities, and trajectories - that dreams and imagines. Apparently, a sufficiently sophisticated arrangement of simple forms allows for the emergence of complex forms infinitely beyond the reckoning of the simple, constituent forms. How much greater, then, is the sum of all Law, all Number, all Form, all Idea? Something grand and beautiful enough to dream and imagine a universe.

And if there is one who imagines what is possible, then there is another who will build it: the gravity of Her Sphere of Perfection permeates the body of the living cosmos like a thought, suffusing His limbs with longing and resolve, beckoning the Warrior-Builder to His task of constructing the Cosmic Temple. As in the story of The Grail, She is the Inspiration, the Quest; He is the one who seeks...

The Realm of Chaos

In this painting the circle of the T'ai-chi, which encloses Yin and Yang, reads clockwise. Time begins with the *big bang* at 12 O'clock. The trail of Yang is meant to correspond to the evolution of the universe. These concentric rings within the tail of Yang represent the vibrations of the dimensionless particles of which all matter is composed. These particles exist in lattice-like quantum fields that permeate all of space; therein they form - with impenetrably complex (chaotic) interactions and vibrations - everything that is (atoms, molecules, brain cells, you and me). The warm colors of these vibrations - painted against the cool, background colors of chaos - mirror the way of order. Cold, dark blues and purples seemed the natural choice to represent the cold, dark universe. Yet these colors are, appropriately, in the more energetic wavelengths of light. The rings also symbolize the laws of physics. In the same way that the colors seem to progress and interact in a random fashion but upon closer inspection yield the pattern that allows one to predict what should happen next, so too is this the way of the rules that govern the universe. Superficially inscrutable, the way in which the laws of physics interact to form a comprehensible whole is actually discernable - when we discover the proper way to perceive the pattern.

Within the sphere of Yang (the universe), existing perpetually at the extremity in dynamic asymmetry, is *Lord Chaos*. He is the manipulator, the changer, the destroyer. He is power, action, mover, builder. He is also entropy - the second law of thermodynamics - compelling all things to degenerate from an initial state of order to a final state of chaos. He is pictured here as the forces that determine a stellar lifetime. The star at the center is the Seed of Order in the domain of chaos. As the source of heat and light (which allows order - life, for instance - to flourish and grow), and the forge of the naturally occurring elements heavier than helium (thus providing the necessary materials for order to propagate), a star is the natural symbol for order. This star, however, is nearing the end of its existence. Under the wrathful ministrations of chaos, its fuel is being siphoned off by a black hole. On the T'ai-chi clock, this *big crunch* is at the bottom of the cycle: 6 O'clock - the end of space, the end of time, the end of the cosmos.

Traversing the Divide

Modern cosmology describes our 4-dimensional universe (three dimensions of space, and one of time) as space-time, and even in an endless and unbounded cosmos, there is an edge of space and an edge of time. The boundary of space can be thought of as the Planck-Wheeler length (1.62×10^{-33}cm). At most places in the macroscopic (large-scale) universe, the shape of space is thought of as generally flat (that is, light travels in a straight line, the shortest distance between any two points is a straight line, and the laws of Euclidian geometry apply); or it is only locally warped, as when distended by some massive object such as a planet or a star. At the Planck-Wheeler length, however, the predictable, linear geometry and topology of space explodes into a probabilistic effervescence called *quantum foam*. The secrets that wait in smaller realms than this we shall never know, for the laws of physics break apart with the space-time continuum at this scale. The infinitesimally small is another domain: contained yet containing, connected to and supporting, yet separate and removed from the cosmos. And this spatial boundary, this edge of existence, is every infinitesimal point in the entire universe: in your hand, in the earth, and in the sky.

The boundary in time can be thought of as Planck time, or 10^{-43} seconds after the big bang explosion that created space-time. At that moment, differentiated space, time, gravity, energy, and matter exploded as the infinitely hot, but quickly cooling fireball of material reality. But our knowledge shall never venture prior to that moment, to the perfect symmetry of the unified forces (the strong and weak nuclear forces, electro-magnetism, and gravity) that existed before. Our understanding of physics requires a time at (or in, or perhaps even *on*) which an event takes place, and it requires a cause that preceded that event in time. But physics comes into being *with* time. The magnificent mathematical equations that have produced the scientific and technological miracles of our age can only theorize back to Planck time and then say: *there was nothing before*. Once again the threshold of physical law will forever forbid our inspection of the absolute.

And there are more dramatic boundaries. When a star of sufficient mass (many times larger than our sun) uses up its available hydrogen fuel, it can no longer generate enough heat to counteract the attractive force of gravity. It begins to violently contract under its own weight with so much power that, at the end of this process of contraction, gravity will overwhelm the electro-magnetic force (that keeps electrons apart) and the nuclear force (that keeps nucleons together but in close proximity apart). In fact, the star will actually collapse, dragging space and time along with it, creating an infinite distension of the fabric of existence. The *event horizon* is a spherically shaped

region of intense gravity (around a *singularity*, where matter has been crushed beyond the Planck-Wheeler length to zero size) from within which nothing - not even light - can ever escape. The event horizon might have a diameter of ten miles, but its radius - the distance from the perimeter to the center - is *infinite*. If a celestial explorer wished to leap off the edge of the universe, this is the only place it can be done.

(Among Einstein's many important realizations is the fact that the effect of gravity is equivalent to acceleration. The mass of the earth creates a distention in space-time, that we feel as gravity. The gravity-field of the earth is equal to a certain acceleration; one needs to exceed a certain speed upward to escape the downward accelerating gravity of the earth - a speed known as *escape velocity*. For earth, this speed is more than 25,000 mph. To escape from the much smaller gravity-well of the Moon, the speed required is only about 5,300 mph; for much larger Jupiter it is over 133,000 mph, and for the sun it is 1,381,600 mph. The enormous mass and density of a collapsed star creates a despression in space-time that is so deep, and the corresponding acceleration is so fast, that escape velocity is actually *faster than the speed of light* - about 670,000,000 mph! And nature does not allow anything to go faster than this universal absolute. This is why light cannot escape from a black hole.)

General Relativity (Einstein's field equations that describe the geometry of gravity) explains that mass bends our 3-dimensional space, or more accurately, our 4-dimensional space-time. In the same way that one cannot bend a 2-D piece of paper within the confinement of two dimensions (any bending can only be specified by a third set of co-ordinates perpendicular to the other two - our *third* spatial dimension), the suggestion that our universe is warped by gravity demands that there is something greater beyond it, *into* which it bends. For example, a 2-D piece of paper is completely contained by a third dimension that surrounds it on all sides, and touches it at all points - in fact, any and every point on the plane is the edge of that 2-D universe. So, too, must it be with a 3-dimensional universe: any infinitesimal point anywhere in the vast cosmos, exists at a precipice - *the abyss at the end of the universe*. If a 2-D being could just look "up" (a direction that simply does not exist in his universe), he might discern that a 3-D "space universe" surrounds his 2-D "plane universe." If we could look "up" into *hyperspace* (the fifth dimension, beyond 4-D space-time) what might we see? A black hole is a place where we get to look "up." When our imaginary explorer finally leaps off the edge of the universe, into *what* will he fall?

The Realm of Order

We cross that boundary at the edge of the universe as we move into the left side of the painting - the domain of *Goddess Order*. The rows of spheres that diminish in size as they get nearer to the sphere of Order are meant to be a stylized representation of *quantum foam* - the turbulent end of space-time. At the Planck-Wheeler length near the singularity inside the black hole, space-time begins to boil and froth. Once an apparently seamless continuum, space-time now starts to rip and pull apart. The laws of quantum mechanics forbid physical investigation, but in a purely *meta*-physical idealization we can imagine zooming down to inspect the haphazard topological features of a speck of quantum froth at, say, 10^{-100} cm. And then we might zoom down, ever smaller, to the froth fizzing above the froth at, say, 10^{-1000} cm. At this infinitesimal, *sub-physical* scale, Order acquires supremacy over Chaos, and imposes Her will upon the chaotic bubblings of space-time at the Great Boundary between the fleeting immanent and the Eternal Transcendent. (This sub-quantum imposition of order upon vanishing chaos is represented here by the geometric regularity of the receding/diminishing quantum-foam spheres.)

Yin and Yang represent the fundamental po-

larities in the dance of the cosmos, but Yin is thought of as unchanging stillness. For this reason, *another* way to read the T'ai-chi T'u (as opposed to the customary reading of two swirling or rotating "tadpoles") is to place the center of the diagram in the heart of Order. Yin is the *still center* around which Yang, the *moving periphery*, revolves in the cosmic dance. When the resulting pattern is perceived in the right way (one 360 degree rotation, captured in 24 distinct increments), the *Lotus* becomes apparent (seen in the overlapping arcs of circles making the petal-like forms).

The Lotus is a symbol associated with mythogenetic creation in all eastern mythology, from ancient Egypt and Persia to Modern China and Japan. It is the golden flower, the flower of light, the cosmic womb, beauty incarnate. The Lotus grows out of the unknown water's depths, like the universe grew out of the primordial sea of nothingness. The Lotus, like an elemental union of earth-water (matter) and sun-fire (spirit), represents self-regenerative totality. Because it opens with the sunrise, and closes with the sunset, it suggests creation, renewal, and immortality. Like the First-Being, the Lotus is believed to be the creator of its own creation. Rising from the murky depths of timeless darkness to unfold with perfect enlightened beauty in the sunlight, it symbolizes the awakening of awareness, the understanding of the true nature of reality. And within the unfolding petals of the Lotus, is pictured the Creator of the cosmos, seated in blissful repose. Enthroned upon the Lotus in eternal paradise is Order the Infinite, She who wears the starry robes of the universe as a cloak to conceal Her mystery.

In India, a tripartite nature of divinity, a Holy Trinity, is represented by Brahma the Creator, Vishnu the Preserver, and Shiva the Destroyer. And they are popularly shown in this aspect: Shiva, as the ouroboric (self-consuming) World-Serpent, is coiled around the feet of beautiful Vishnu. The serpent which sheds it skin and is reborn anew - like Life which consumes life and is reborn anew, like the moon which is consumed by darkness and is reborn anew, like the earth which is consumed by the solar coil of the seasons and is reborn anew in spring - is symbolic of the cycles of time, which consumes all things, and yet is also the source of their renewal. And from Vishnu's navel grows a lotus blossom upon which is seated a tiny Brahma. We know that things do not grow from navels. Navels attach us to *that from which we are grown*. And so, in this beautifully symbolic representation, it is not the Lotus that grows from Vishnu's navel, but rather Vishnu that grows from the Lotus: *Devi* - Mother of space, time, and the entire universe. She is the source of all things, of all the Gods. And all the Power of the Gods of Space and Time grow from, and labor in the service of, her Eternal Beauty.

The Perfection of Number

Returning now to the image, the lotus petals expand outward into the composition, and are meant to indicate the transcendent realm that is both within and beyond the material universe. The within and beyond regions are tiled in this representation by a hexagon field, the geometry of which is specified by the revolving T'ai-chi. The resulting three lines that intersect at a common axis create the hexagons. The three lines symbolize the quantum fields that permeate all of space. There are many interpenetrating fields, but they can be classified in three main categories: the lepton field (which forms electrons and neutrinos), the quark field (which forms protons and neutrons), and the boson field (which forms force-carrying particles: photons for electro-magnetism, gluons for the strong nuclear force, W and Z particles for the weak nuclear force, and gravitons). It is this matrix, this "trinity" of particle/wave fields, that gives substance and form to the shape-shifting universe, and prevents it from falling into the emptiness of which it is almost entirely made. This quantum veneer of dimensionless points, this shimmering foundation of mathematical ethereality, is the exquisite skin of the *LotusMaiden*. And upon Her is draped the ever-fluttering Robes of

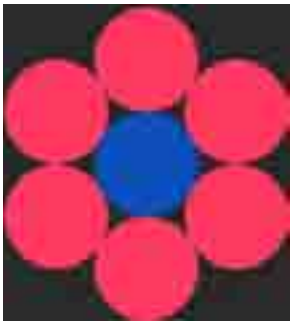
Chaos - the universe itself.

The glowing light in the center of each hexagon serves two functions: one, it represents the potential for another axis, another particle (or virtual particle); two, it is the light of eternal order which exists at the center of all things: every protean atom, every living cell, every contemplating consciousness.

In this painting, the center is always circumscribed by a six-sided structure. The number six has, since early pre-history, been associated with utility in the service of order. Because of its many divisors, six and multiples of six were the ideal, easy-to-use values with which to quantify the affairs of man, and map the dominions of space and time. This predisposition to the number six, to in fact see a basic "sixness" in the structure of the world, was prevalent across Eurasia and Africa, as well as in the Americas. In places all around the globe, man sought to emulate the mathematically ideal order of the cosmos, by re-creating its essential sixness on earth:

12 inches to the foot, 36 inches to the yard, and 6 feet to the fathom. 360 degrees to the circle of the horizon, 60 minutes to 1 degree, and 60 seconds to each minute of arc. In our reckoning of time there are 60 seconds to the minute, 60 minutes to the hour, and 24 hours to the day. 30 (6 x 5) days to the month, and 12 months to the year (and 12 zodiacal divisions in the sky).

The atomic number of carbon - the element of life - is six, and its crystal structure is hexagonal. The bible describes God creating the universe in six days (or rotations of the earth), and resting upon the seventh. This became the model for the western week: six days of activity enclose a passive seventh day in the center. This human-made reckoning is a reflection of a simple geometric truth: six perfect circles (or rotations of a line) arranged edge to edge in a larger perfect circle, exactly circumscribes a seventh circle of equal size. That is, a six-fold structure surrounds the master seventh component in the center. (And we shall see that there is something strange and wonderful about this *6-around-1* motif.)



Lucky seven (statistically, the most likely roll of two six-sided dice) is a divine number in many ancient belief systems around the world. Light, the most enduring symbol of divine creation, is composed of six visible colors: red, orange, yellow, green, blue, and violet (the three primary and three secondary colors seen in the rainbow); when combined, these six colors of light make a glorious seventh - pure and luminous white. All that we will ever see is a combination of these six colors (white is all visible light together; black is the absence of light, and not a color).

There are some unusual, purely arithmetical properties of the number seven: 1 x 2 x 3 x 4 x 5 x 6 x 7 and 7 x 8 x 9 x 10 both equal 5040. And 1 x 2 x 3 x 4 x 5 x 6 and 8 x 9 x 10 both equal 720. Whether the number seven is included or deleted, it acts as the pivot or center of the Dekad (the sacred Tetrakus of the ancient Greeks) - the foundation of our decimal system of mathematical notation. Of all the polygons in the Dekad (triangle, square, pentagon, hexagon, etc.), only the seven-sided heptagon cannot be captured precisely. The angle that specifies its construction is 51.42857142857..., an infinitely repeating decimal that can only be approximated - it does not exist with precision in the real world. Its place shall only ever be in the eternal realm of the Ideal. It is this mysterious otherworldly quality that led the ancients to associate seven with the Sacred Virgin - pure, untouchable, unattainable, transcendent and beyond.

Symbol Loops

The receding hexagonal field spherically surrounding the Goddess is a geometrical idealization of an infinite plane contained within a finite region (known as Lobachevskian, or *hyperbolic* geometry). When viewed in the right way, the arced lines of this hexagonal tiling form the diagram of a lithium atom, the international symbol for things atomic (and sub-atomic). Furthermore, the three

ellipses that comprise this symbol also form a Star of David (or Seal of Solomon). This symbol - the union of the downward-pointing (vaguely yonic) triangle of feminine repose, and the upward-pointing (vaguely phallic) triangle of masculine action - is yet another symbolic representation of the mysterious and the manifest in harmonious conjunction. (This diamond-shaped painting is also the union of two oppositely-oriented triangles). The six-pointed star, a multi-national illustration of the same philosophy contained in the T'ai-chi T'u of eastern Asia, is also found in ancient Persia (the *Star of Ishtar*), and Tantric Buddhism (the *Shri Yantra*). In India this symbol is known as the *Mark of Vishnu*. It is also the symbol for the *Anahata*, or heart chakra (the central of seven mystical energy centers in the body - a balancing point of transformation between terrestrial and celestial energies).

Whereas the line is representative of the bi-directional experience of beasts, who know only the pursuit of reward or the flight from pain, the *triangle*, the first polygon pushing out into the new dimension of the plane, is representative of Man, whose free will pushes out into greater dimensions of experience utterly beyond the lives of beasts. Two distinct and separate triangles, one oriented to things above and the other a mirror-image oriented to things below, becomes a beautiful new *unity* when they find the delicate balance of those otherwise conflicting orientations. The perfect radial symmetry of this difficult entanglement, the 6-pointed star, is a representation of Life - the awkward but precise union of inanimate matter and animating spirit. And this lotus of geometry (like the blossom it so resembles) is an unfolding seed: the central hexagonal emptiness *within* the star is a 6-pointed introversion of the 6-around-1 extroversion of creation that surrounds it, a *singular* potential that opens up to become *many* realizations. The divided, variegated manifold around the center of origin, is the Creator…in bloom. We will encounter the interesting symbolism of this geometry again.

These self-referential, auto-causal loops contain patterns within patterns, symbols within symbols, worlds within worlds - each existing only by virtue of all the rest. A first component creates another, which, in turn, creates the first component; remove a single part, and the entire edifice comes tumbling down - creation and destruction, beginning and ending, all interwoven into a single cosmic tapestry. By indicating a succession or hierarchy of meanings, of interdependent levels of interpretation and understanding, symbols sometimes look very much like the inscrutable cosmos itself.

The LotusMaiden of Eternity

Within the star of transformation is the Goddess Order, residing in perfect symmetry and eternal tranquility. Around Her head is a halo centered upon the sixth chakra - the chakra of visualization. The halo itself is a divine imagining of all creation, an infinite regression wherein God and the Universe are *auto-catalytic* in their own creation: the Creator dreams of a creation which has a Creator dreaming of a creation that, in turn, has a Creator...

The axis of the entire composition is the little purple amulet between Her breasts. There at the heart chakra of transformation is the seed of Chaos (the tiny Brahma) within the domain of Order. Here is where the inward-oriented *noumenal* becomes the outward-oriented *phenomenal*. Although the stillness of eternity does not act or change, She possesses in the seed of Chaos an agent of potential, a *proxy* for action and change. Here is

the ghost of contingency within the Absolute. Here is the engineer that would build the Architect's dream. *Here is the Power that Beauty needs to create Power*. In this view of the universe, there is no beginning, no ending - they are the same Place, the same Moment. This is the Eternal Cycle: Order creates Chaos, Chaos creates Order, which creates the Chaos that created the Order...

It is only from our tiny and remote vantage point that the Two Domains - the Immanent and the Transcendent - appear separate and distinct, divided by the Gulf of Infinity. In some unknown, even greater aspect they flow though one another like a river in the desert: an emptiness that beckons, and a fullness that ventures forth. There are two Dancers, a Question who seeks and an Answer who waits, but there is only one Dance...

* * *

Personal Notes on *Order and Chaos*

OK, this is not one of my better paintings. If I were to paint this image again (and who knows what crazy thing I might do someday?), I would certainly *not* make the mysterious aspect of the cosmos the illuminated half of the painting, leaving the manifest aspect of the here and now shrouded by shadow. And it's so *orange*...what was I thinking?

I had some fun in the execution though. I designed an elaborate compass that was anchored to the canvas upon a small piece of plastic that I attached to the canvas between the breasts of the Goddess. By rotating either a piece of wood or a length of string, each equipped with a paint-loaded brush, I could make fairly confident strokes to establish with some precision the basic geometry of the section I was working on. Once the geometry was roughed in correctly, I could refine the painting as required, freehand. And it seemed like I spent *weeks* painting those Yang dots!

For some strange reason, my initial idea with this painting was to paint *both* figures as women. There wasn't going to be any science and philosophy (which, come to think of it, might have been better). It was just going to be a simple representation of a refined, dignified Order and a crazy, wanton Chaos (or something like that). And then a few debates about science and religion with my brother and my best friend lead me in another direction. "You should paint about this stuff," they said. It seemed like a good idea at the time...