



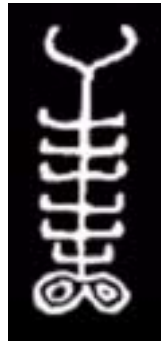
THUNDERBOLTS OF THE GODS

David Talbott
Wallace Thornhill

*A radical reinterpretation of human history
and the evolution of the solar system*

THUNDERBOLTS OF THE GODS

David Talbott and Wallace Thornhill



Mikamar Publishing
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To the scientists and historians of the future

Thunderbolts of the Gods

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David Talbott and Wallace Thornhill

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“It is the thunderbolt that steers the universe!”
Heraclitus, fifth century B.C.

INTRODUCTION

On a spiral arm of a galaxy called the Milky Way, nine planets move in peaceful, clock-like procession around a yellow dwarf star called the Sun. The planets move on highly predictable paths, and by all appearances nothing has changed in a billion years. The inhabitants of the third planet, the Earth, can see five of their celestial neighbors without the aid of telescopes. Surrounded by the background stars, these objects do little to distinguish themselves in the night sky. And few of us today have learned to identify the five visible planets against the starry dome.

Earlier cultures were not so complacent about the planets. They invoked these bodies with fear and reverence. In ancient Mesopotamia, astronomer-priests insisted that the planets determined the fate of the world. In their prayers to the planets they summoned memories of heaven-shattering catastrophe. What was it about these celestial objects that inspired this cultural anxiety? And why did so many ancient accounts insist that the movements of the planets once *changed*? That was Plato's message more than 2300 years ago. The Babylonian chronicler Berossus said it too: the planets now move on different courses. But these are only two of the more familiar voices amidst a chorus of ancient witnesses.

In archaic texts the planetary gods were a quarrelsome lot. They were giants in the sky, wielding weapons of thunder, fire, and stone. Their wars not only disturbed the heavens but threatened to destroy the earth. Driven by reverence and fear, ancient cultures from Mesopotamia to China, from the Mediterranean to the Americas, honored the planets with pomp and zeal, seeking to placate these celestial powers through human sacrifice. The best English word for this cultural response is *obsession*.

From the Sun outward, the nine planets of our solar system are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto. Astronomers believe that the order of the planets has remained unchanged over the eons. But this uniquely modern belief rests on assumptions about gravity that predate the discovery of electricity and the arrival of the space age.



The authors of this book have each spent more than thirty years investigating the ancient message, and this has led us to question a pillar of theoretical science today—the "uneventful solar system." Following quite different research paths, we arrived at the same conclusion: the ancient sky was alive with activity. The evidence suggests that only a few thousand years ago planets moved close to the earth, producing electrical phenomena of intense beauty and terror. Ancient sky worshippers witnessed these celestial wonders, and far-flung cultures recorded the events in the great myths, symbols, and ritual practices of antiquity.

A costly misunderstanding of planetary history must now be corrected. The misunderstanding arose from fundamental errors within the field of cosmology, the "queen" of the theoretical sciences. Mainstream cosmologists, whether trained as physicists, mathematicians, or astronomers, consider gravity to be the controlling force in the heavens. From this assumption arose the doctrine of eons-long solar system stability—the belief that under the rule of gravity the nine planets have moved on their present courses since the birth of the solar system. Seen from this vantage point, the ancient fear of the planets can only appear ludicrous.

We challenge this modern belief. We contend that humans once saw planets suspended as huge spheres in the heavens. Immersed in the charged particles of a dense plasma, celestial bodies "spoke" electrically and plasma discharge produced heaven-spanning formations above the terrestrial witnesses. In the imagination of the ancient myth-makers, the planets were alive: *they were the gods*, the ruling powers of the sky—awe inspiring, often capricious, and at times wildly destructive.

Cosmic lightning evolved violently from one discharge configuration to another, following patterns observed in high-energy plasma experiments and only recently revealed in deep space as well. Around the world, our ancestors remembered these discharge configurations in apocalyptic terms. They called them the "thunderbolts of the gods."



PART I

THE COSMIC THUNDERBOLT IN MYTH AND SCIENCE



- Chapter One: *Convergence*
- Chapter Two: *Mysteries of the Cosmic Thunderbolt*
- Chapter Three: *Electrical Encounters in Space*



Recovering the lost messages of world mythology. . .

"Perseus Releases Andromeda," painting by Joachim Wiewael, 1630. When king Cepheus offended Poseidon, the god sent a flood and a sea monster to devastate the land. Cepheus hoped to appease the dragon by sacrificing his daughter. But Perseus, riding the winged horse Pegasus, defeated

the monster, winning the king's permission to wed Andromeda.

Beautiful princess, chaos dragon, warrior-hero, and lost kingdom: the themes are commonplace in world mythology. But the historic roots of the themes continue to elude the experts who study them.



. . .with new tools and perspectives in the sciences

Beginning many centuries ago, a rebellion against traditional myth and magic led to the emergence of the scientific method. Experiment and systematic observation of nature replaced belief in the gods of antiquity, leading eventually to an explosion of space age discovery. Yet today many scientists

are re-examining mythology, wondering if ancient stories of disaster have a scientific explanation. Could the mythic "dragon's assault," for example, refer to a natural catastrophe affecting the entire earth? The answer to such questions will come from the surprising role of electricity in space.



The Roman warrior Mithras (Persian Mithra) emerges from the cosmic egg, carrying a lightning bolt in his right hand and a staff in his left. Around his body entwines the cosmic serpent, a prototype of the mythic dragon.

I. CONVERGENCE

The Lens of Human Perception

When we gaze up at the stars, do we believe what we see, or see what we believe? Our beliefs and assumptions are like eyeglasses: they can help us see more clearly, but they can also limit our field of view.

Today, most astronomers assure us that the solar system is both stable and predictable. But new vistas in the sciences often expose flaws in notions that once seemed obvious. Only a few decades ago, all well-trained, feet-on-the-ground scientists “knew” that—

- Space is empty and cannot conduct electricity;
- Magnetic fields do not exist in space;
- The tails of comets are pushed away from the Sun by the pressure of light;
- Jupiter and Saturn have been cold and inactive since the early history of the solar system;
- The planet Mars has been geologically dead for more than a billion years;
- Venus is our "sister planet," with temperatures close to those of the Earth;
- There are no other galaxies outside our own;
- There is no evidence for planet-wide geological disturbances of the Earth in the past.

Before new findings disproved these beliefs, they were so "obviously true" as to discourage challenges. It is easy to confuse theoretical assumption with fact. And today the tendency often conceals a tacit belief that, despite the mistakes of previous generations, *we* have the big picture right and the remaining task is simply to tidy things up a bit.

The actual situation in the sciences calls for openness to new possibilities. Our vision of the universe is changing more rapidly than ever before, as space exploration fuels an explosion of discovery. Before the advent of the space age, we could view the universe only in the few wavelengths of visible light seen from the surface of the Earth. Now we have expanded our vision into the ultraviolet, x-ray, and gamma-ray in the short wavelengths of the



The monstrous Tarantula Nebula, named for its many spidery filaments, is one of innumerable pointers to magnetic fields in space, the result of electric currents.

New Lenses for Viewing the Universe

Galileo's telescope could see eight times better than the unaided eye. It was strong enough to see four of the moons of Jupiter and the phases of Venus, but not the rings of Saturn. Yet the new data Galileo collected in his first few weeks of telescopic observations, combined with his powerful insight, overthrew the Ptolemaic view of the universe—a view accepted for more than a thousand years.

In the past 50 years, the observing power of astronomical instruments has expanded to levels inconceivable in the sixteenth century. Our optical



Galileo's Telescope

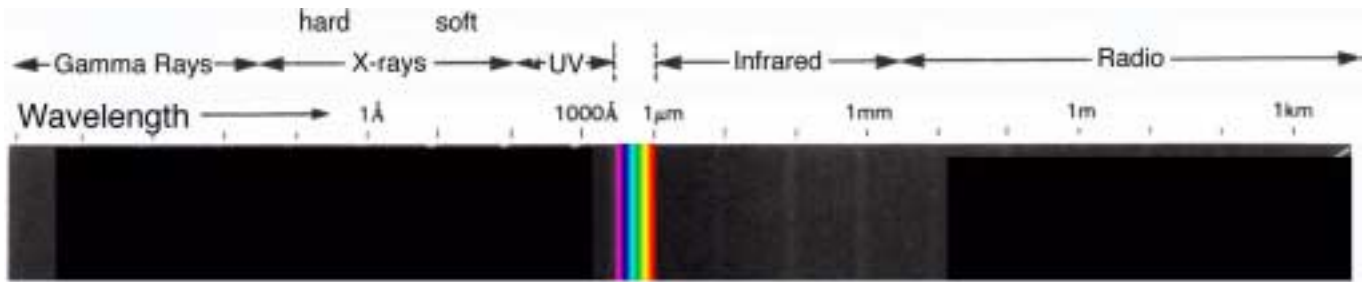
telescopes are many times more powerful than Galileo's, and we have added instruments that detect the cosmos in wavelengths our eyes cannot see—radio, microwave, infrared, ultraviolet, x-ray, and gamma-ray. Also, for the first time in human history, we can see both the Earth and the universe from viewpoints no longer confined to the surface of the Earth.

Today, we have enormous telescopes on the ground and telescopes riding high-altitude balloons. We have telescopes in orbit: around Earth, Mars, and Jupiter—even around a point in space where gravity between Earth and Sun is in balance. The recent flood of data from space not only sheds new light on traditional views of the universe, but introduces fundamentally new possibilities as well.



ABOVE, left to right: 100-meter radio telescope at Green Bank, West Virginia; launch of the microwave balloon TIGER; Jupiter probe from the Galileo mission to Jupiter and its moons. BELOW: Hubble Telescope, revealing com-

plex structures in remote space. Chandra x-ray telescope, capturing high-energy stellar and galactic systems; SOHO telescope, observing the Sun from an equilibrium position between the Earth and the Sun.



electromagnetic spectrum and into infrared, microwave, and radio in the long wavelengths. We can view at close range the surfaces of planets, moons, asteroids and comets. We can even touch and chemically "taste" them.

The new discoveries accent the *unexpected*—a sign that something is wrong at the level of first assumptions. In fact, two of the most far-reaching discoveries of the past century came as great surprises: the pervasive role of charged particles in the universe; and the signature of planetary catastrophe throughout our solar system. The "big picture" of space has changed.

For centuries astronomers assumed that gravity is the only force that can give birth to stars and planets or can direct the motions of celestial bodies. They assumed that all bodies in the universe are electrically neutral, comprised of equal numbers of negative and positive particles. With this assumption astronomers were able to ignore the extremely powerful electric force. It was a fatal mistake. From the smallest particle to the largest galactic formation, a web of electrical circuitry connects and unifies all of nature, organizing galaxies, energizing stars, giving birth to planets and, on our own world, controlling weather and animating biological organisms. There are no isolated islands in an "electric universe."

The medium for this more "holistic" view of the universe is *plasma*, a highly conductive state of matter, distinguished by the presence of freely moving charged particles. We now know that plasma fills all of space—a fact *unknown* to the pioneers of gravitational theory. Except for the Earth and a few rocky planets, moons, and wandering solid objects, most bodies in space are *composed* of plasma. Moreover, a crescendo of evidence reviewed in this volume (and those to follow) makes clear that distant stars, our Sun, and the planets are *charged* bodies. Immersed in a conductive medium, they interact continuously—and sometimes explosively—with their celestial environment.

Today, nothing is more important to the future and credibility of science than liberation from the gravity-driven universe of prior theory. A mistaken supposition has not only prevented intelligent and sincere investigators from seeing what would otherwise be

A logarithmic chart of the electromagnetic spectrum reveals how narrow is the range of visible light. The shorter wavelengths emitted by celestial bodies (most ultraviolet light, X-rays and Gamma Rays) do not reach the surface of the Earth and can only be measured by instruments placed in space. On the other hand, radio waves between about a centimeter to 10 meters in wavelength find the atmosphere transparent. As a result, earth-based radio telescopes have become an important adjunct to traditional astronomy.

Celestial Objects Seen Up Close



Crab Nebula as viewed in the mid-20th century.

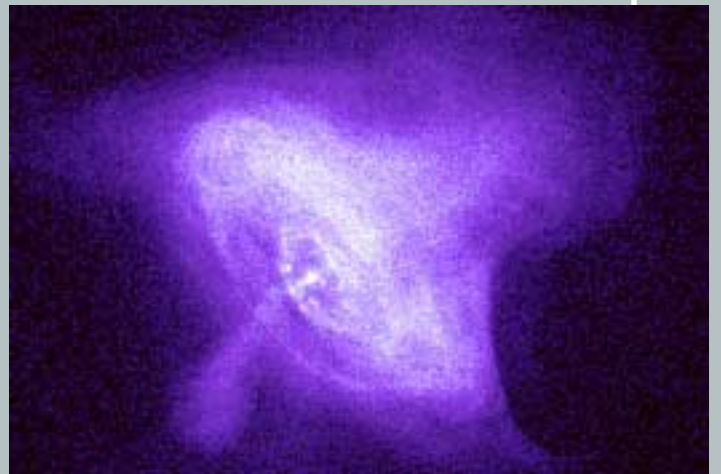
On July 4, 1054 AD, Chinese chroniclers recorded an apparent supernova they called a "guest star" in the constellation Taurus, near the star Zeta Tauri. It was bright enough to be visible in daylight, but faded and disappeared again about a year later. In 1731 astronomer John Bevis discovered a bright nebula in the same location. When Charles Messier saw it in 1758, he first thought this "fuzzy object" might be a comet, but he found that it never moved.

Using a larger telescope in 1844, Lord Ross thought the nebula resembled a crab's claw, and the description stuck. More than ten light years across, the Crab Nebula is thought to be the remains of a star that exploded in 1054.

Today's astronomical instruments see much more than Messier's fuzzy patch. They see filaments and complex structures, in colors and wavelengths that highlight newly discovered phenomena. For example, the star at the center of the nebula blinks 30 times a second. We now call such stars "pulsars."



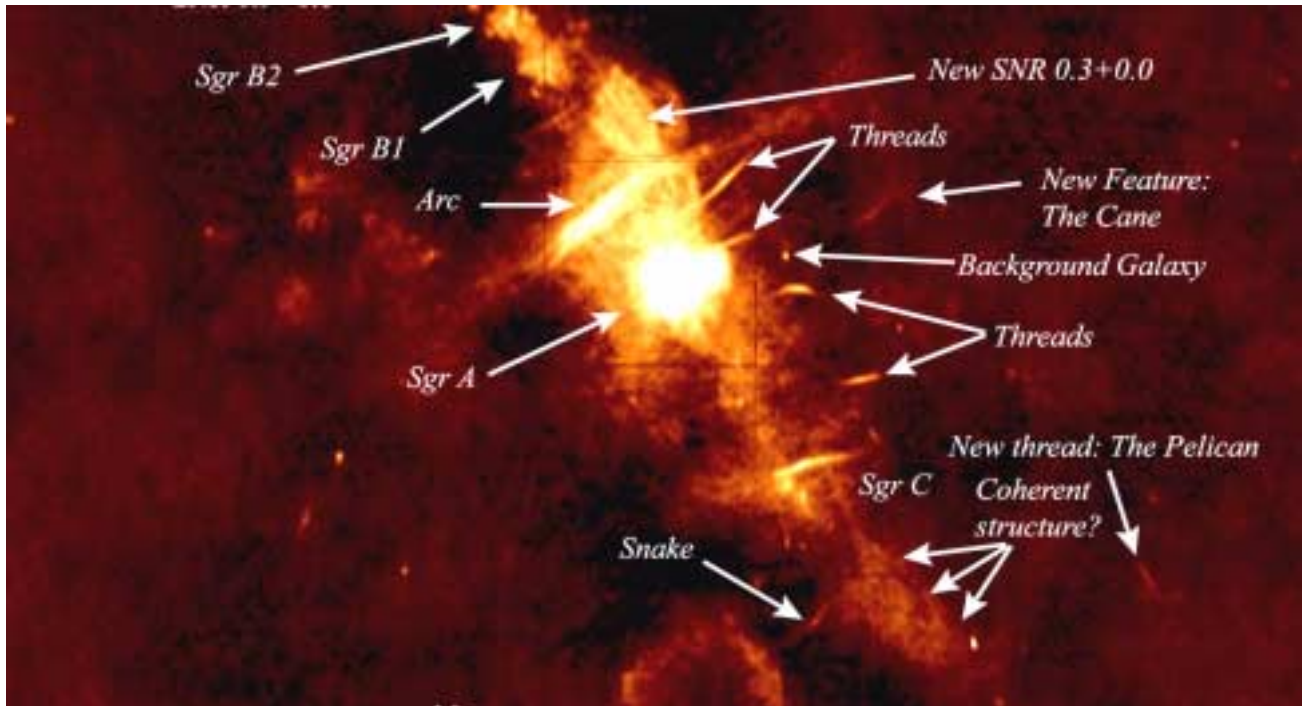
This high-resolution picture of the Crab Nebula, taken by the Very Large Telescope (VLT), shows the filamentation produced by magnetic fields and electric currents, with material racing outward at "higher speed than expected from a free explosion," according to NASA reports. Acceleration of particles is a trademark of electrical activity.



In this photograph taken by the Chandra X-Ray Telescope, we see the internal structure and dynamics of the Crab Nebula—a torus around a polar column, or a "doughnut on a stick." Plasma physicists find this of particular interest because x-ray activity always accompanies high-energy electrical interactions.

One of a series of Hubble Space Telescope images showing filamentary material racing away from the core of the Crab Nebula at half the speed of light, giving rise to what NASA spokesmen call "a scintillating halo, and an intense knot of emission dancing, sprite-like, above the pulsar's pole." Though gravitational theories never envisioned the polar "jets," "haloes," and "knots" depicted in the accompanying images we can now recognize these configurations as prime examples of electrical forces in the universe.





obvious, it has bred an indifference to possibilities that could have inspired the sciences for decades. It has also obscured the link between new findings in space and the human past, a link with implications far beyond the physical sciences.

Plasma Phenomena in Ancient Times

The discovery of the “electric universe” does not just change the picture of the heavens. It also changes what we see and hear in messages from the ancient world. Over the past century and a half, archaeologists have unearthed huge libraries of archaic texts, many of them describing great spectacles in the heavens. But the specialists set aside these descriptions as “untrustworthy” because they accepted *a priori* the uneventful solar system assumed by astronomers. Most historians do not doubt that the ancient sky looked almost exactly like our sky today. Consequently, they give little or no attention to the “extravagant” or “nonsensical” claims of early sky worshippers.

But were it possible for us to stand alongside our early ancestors, to witness the events that provoked the age of myth-making and the birth of the archaic religions, the celestial dramas would exceed anything conceivable in our own time. The sky was *electric*, filled with luminous clouds, threads of light, and undulating rivers of fire. To today’s observer the events could only appear too vast, too improbable for anything but a dream.

A portrait of the center of our Milky Way galaxy constructed from radio data. NASA spokesmen note “the arcs, threads, and filaments which abound in the scene. Their uncertain origins challenge present theories of the dynamics of the galactic center.” Arcs, threads and filaments are typical forms of electrical discharge in plasma.

Yet to a modern-day witness the formations in the sky would also seem eerily familiar, as if *remembered*.

In these pages we contend that humans living today *have* seen the events before, through their universal reflection in art and storytelling. Formations now known to be characteristic of electric discharge in plasma are the core images of the antique world, recorded on papyrus and stone, mirrored in the sacred symbols of the great religions, reenacted in mystery plays, and embodied in monumental construction on every habitable continent. Once recognized, the images leap from every ancient culture. The sky was once a theater of awe and terror: on this the ancient witnesses speak with one accord.

Unique Behavior of Plasma

Although plasma behavior follows simple electromagnetic laws, the resulting complexity continues to astonish the specialists who study it. Because plasma exhibits characteristics not found in solids, liquids, or gases, it has been called "the fundamental state of matter." It can self-organize into cells of differing electrical characteristics. Electric currents in plasma form filaments that attract each other at long distances and repel each other at short distances. These filaments tend to braid themselves into "ropes" that act as power transmission lines, with virtually no limit to the distances over which they can operate.

In the rarefied plasma of space, the subtle flow of electricity is not easily measured, but these currents leave a definitive signa-

Solar prominences reveal the powerful influence of magnetic fields. However, magnetic fields require electric currents, and the fields alone do not *cause* the prominences. The picture on the right is direct evidence of electrical discharge on the Sun.



ture—a network of magnetic fields throughout the observed universe. Astronomers detect these fields but give no attention to the electric cause: *magnetic fields are produced only by electricity*. The complex magnetic fields we observe are evidence that plasma is carrying electrical energy across galactic and intergalactic space, powering secondary systems, including galaxies, stars, and planets. Exceedingly subtle charge imbalances, across the immense volume of space, are quite sufficient to configure and animate cosmic structures at all scales of observation. The reason for this power of electricity is very simple: the electric force is 10^{39} times (a thousand billion, billion, billion, billion times) more powerful than gravity. Contrary to popular belief nature does not rely on the trivially weak force of gravity to do the “really big jobs” in the cosmos.

To see the connection between plasma experiments and plasma formations in space, it is essential to understand the *scalability* of plasma phenomena. Under similar conditions, plasma discharge will produce the same formations irrespective of the size of the event. The same basic patterns will be seen at laboratory, planetary, stellar, and galactic levels. Duration is proportional to size as well. A spark that lasts for microseconds in the laboratory may continue for years at planetary or stellar scales, or for millions of years at galactic or intergalactic scales.

The scalability of plasma events enables researchers, utilizing laboratory experiments and supercomputer simulation, to replicate stellar and galactic evolution, including many enigmatic formations only recently discovered in deep space. Gravitational models do not achieve comparable success, and often fail completely.

Many of astronomy’s most fundamental mysteries now find their resolution in plasma behavior. Why do cosmic bodies spin,



Spiral galaxy M81, in one of the first images returned by NASA’s new Spitzer space telescope. The telescope can detect extremely faint waves of infrared radiation, or heat, through clouds of dust and plasma that have blocked the view of conventional telescopes.

asked the distinguished astronomer Fred Hoyle, in summarizing the unanswered questions. Plasma experiments show that rotation is a natural function of interacting currents in plasma. Currents can pinch matter together to form rotating stars and galaxies. A good example is the ubiquitous spiral galaxy, a predictable configuration of a cosmic-scale discharge. Computer models of two current filaments interacting in a plasma have, in fact, reproduced fine details of spiral galaxies, where the gravitational schools must rely on *invisible* matter arbitrarily placed wherever it is needed to make their models "work."

It is worth noting also that plasma experiments, backed by computer simulations of plasma discharge, can produce galactic structures without recourse to a popular fiction of modern astrophysics—the Black Hole. Astronomers require invisible, super-compressed matter as the center of galaxies because without Black Holes gravitational equations cannot account for observed movement and compact energetic activity. But charged plasma achieves such effects routinely.

Planets, Comets, and Plasma Discharge

The new revelations of plasma science enable us to see that planets are charged bodies moving through a weak electric field of the Sun. Astronomers do not recognize planetary charge because the planets now move on nearly circular orbits. The change in electric potential during a revolution is so minimal as to produce no obvious effects. (We take up the subtle indicators of planetary circuits in our second monograph; these indicators include auroras, weather patterns, lightning, dust devils, water spouts, and tornadoes.)

It is easier to see the electric force in action when a comet approaches the Sun on an elongated orbit that carries it quickly into regions of greater electrical stress. Plasma will form a cell, or "sheath," around any object within it that has a different electric potential. If the potential difference is low, the plasma sheath will be invisible. This is the case with the planets, whose plasma sheaths are called "magnetospheres" because the planetary magnetic field is trapped inside. Unlike a planet, however, a comet spends most of its time far from the Sun and takes on a charge in balance with that region of the Sun's electric field. As it speeds toward the Sun, its charge is increasingly out of balance with its surroundings. Eventually, the plasma sheath glows in response to the electric stresses. This is what we see as the coma and ion tail of a comet. The dust tail is formed when more intense discharge—in the form of an electric arc to the comet nucleus—removes surface material and



Photograph of the comet Hale Bopp, taken April 7, 1997 as it receded from the Sun, passing in front of a star cluster in the constellation Perseus. In addition to the dust tail of the comet, the filamentary bluish ion tail (positively charged particles) testifies to electrical behavior of comets only recently recognized.

launches it into space. The internal electric stress may even blow the comet apart—as often and "inexplicably" occurs!

Our claim that comets are electrical in nature can be easily tested. Are comet nuclei "wet" or "dry"? The standard model of comets explains them as "dirty snowballs" sublimating under the heat of the Sun. Escaping water vapor generates the coma and is "blown" away by the solar wind to produce the diffuse tail spanning up to millions of miles. In the electrical model a large *rock* containing no volatiles (ices) but on an elliptical orbit will still generate a coma and tail as electric discharge excavates material from the surface. The standard comet model, however, will not survive the discovery of a comet nucleus free of volatiles.

Already, the comet question *is* being answered. As the spacecraft Deep Space 1 flew by the nucleus of Comet Borrelly, it found that the surface was "hot and dry." Instruments detected not a trace of water on the surface. The only water discovered was in the coma and tail, where it could easily be explained by reactions of negatively charged oxygen from the nucleus with positively charged hydrogen ions from the Sun. These reactions are, in fact, *observed*. But with no other model than that of the dirty snowball, astronomers could only assume that water *must* be present on the nucleus but hidden beneath the surface.

Then, NASA's Stardust probe to comet Wild-2 (pronounced *vilt* 2) startled investigators with the best pictures ever of a comet. In its approach to the comet, short but intense bursts of microscopic dust from the comet blasted the spacecraft as it crossed two jets. "These things were like a thunderbolt," said Anthony Truzollino, a Senior Scientist at the University of Chicago's Enrico Fermi Institute. To the bafflement of project scientists, the pictures showed sharply defined "spires, pits and craters"—just the opposite of the attenuated relief expected of an evaporating snowball. The discovery was more than surprising, "it was mind-boggling," the scientists said. But a ruggedly etched landscape is *predicted* by the electric model.



Comet Wild 2, in a composite of the nucleus and a longer exposure highlighting the comet's jets. Stardust mission scientists expected "a dirty, black, fluffy snowball" with a couple of jets that would be dispersed into a halo. Instead they found more than two dozen jets that "remained intact"—they did not disperse in the fashion of a gas in a vacuum. Some of the jets emanated from the dark unheated side of the comet—an anomaly no one had expected.

Plasma Cosmology—The Leading Edge of Science

Two early twentieth century pioneers whose work leads to a deeper understanding of plasma and electricity are Sweden's Kristian Birkeland and America's Irving Langmuir. Experiments inspired by Birkeland's work showed how current filaments in plasma join in entwined pairs, now called "Birkeland currents." (See illustration and discussion, page 24.) Langmuir's experimental work gave rise to the word "plasma," due to the life-like behavior of

this conductive medium, and he demonstrated how the plasma “sheath” insulates a charged sphere from its plasma environment. This sheath is now crucial to the understanding of the so-called “magnetospheres” of planets, though few astronomers take into account the electrical implications.

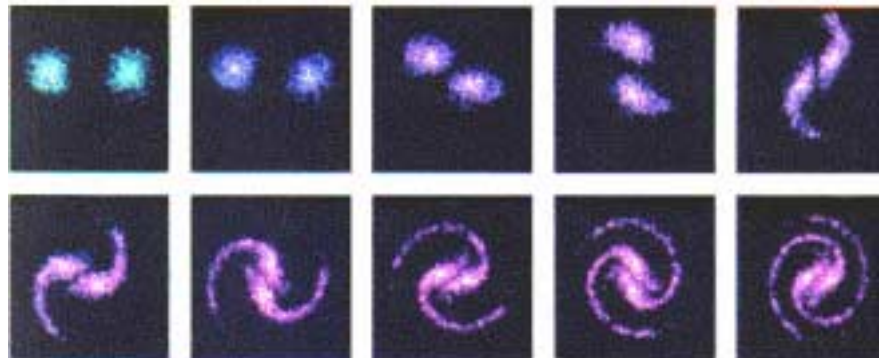
One of the most respected innovators was Nobel Laureate Hannes Alfvén, honored as the father of “plasma cosmology,” an approach to cosmic evolution based on electric forces. It was Alfvén who developed the first models of galactic structure and star formation rooted in the dynamics of electrified plasma, and his challenges to the “pure mathematics” of modern cosmology arose from experimental evidence that has grown increasingly persuasive in recent years.

Alfvén’s close colleague, Anthony Peratt, later extended his investigation, conducting experiments with far-reaching implications for the understanding of galaxies, stars, and the evolution of planetary systems. From graduate school until Alfvén’s death in 1995, Peratt worked with the pioneer to define the frontiers of plasma cosmology, a subject highlighted in the physicist Eric Lerner’s popular book, *The Big Bang Never Happened*. Peratt’s



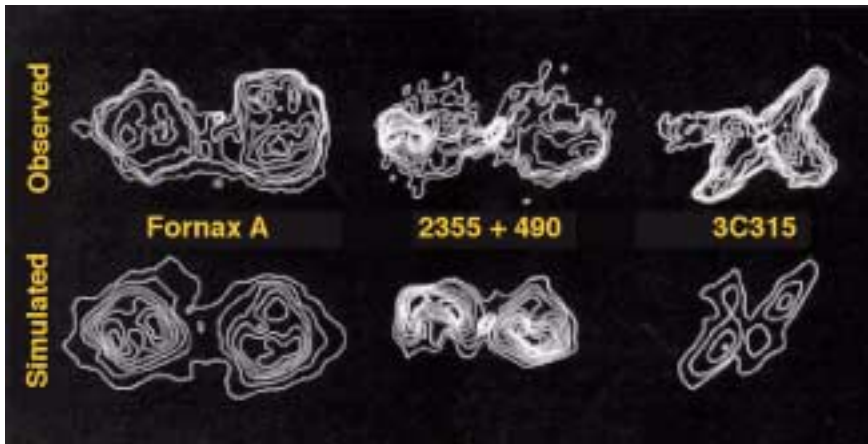
Plasma scientist Anthony Peratt.

RIGHT: Snapshots from a computer simulation by Peratt, illustrate the evolution of galactic structures. Through the “pinch effect,” parallel currents converge to produce spiraling structures.



work included unprecedented three-dimensional simulations of galaxy evolution and of other plasma structures in space. Today he is internationally recognized as an authority on plasma discharge instabilities and their three-dimensional simulation

Using equations that describe the interactions of electric and magnetic fields (Maxwell-Lorentz equations), Peratt developed a super computer program to mimic the effects of electric discharge within a large volume of charged particles. His “Particle in Cell” (PIC) simulations have produced formations that are virtually indistinguishable from the energetic patterns of actual galaxies, as can be seen in the graphic below.



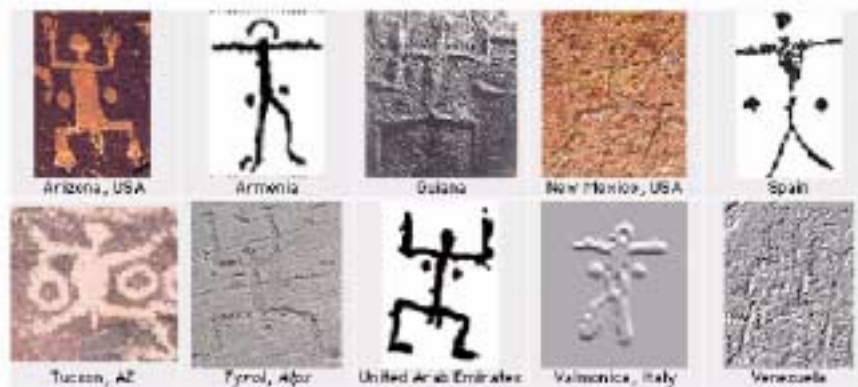
Anthony Peratt's "Particle in Cell" (PIC) simulations have demonstrated the way electric forces generate galactic structure. In the examples of three galaxies shown here, the simulated energy patterns match observed patterns with surprising accuracy.

Peratt's book *The Physics of the Plasma Universe* has led the way to a new understanding of high-energy plasma behavior and the role of electricity in the cosmos. Due in large part to the Coalition of Plasma Science, of which Peratt is a member, the Institute of Electrical and Electronics Engineers, the world's largest scientific and technical society, announced that it would recognize "Plasma Cosmology" as an official discipline in science.

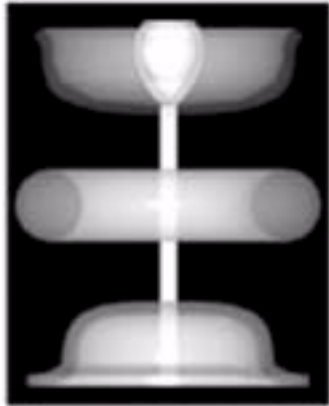
Plasma Discharge Incribed on Stone

For over three decades Peratt's laboratory research concentrated on the unstable formations that develop in high-energy plasma discharge, and he recorded the evolution of these configurations through dozens of phases. Some of the most elaborate discharge forms are now called "Peratt Instabilities" because he was the first to document them.

His most recent work has taken him in a new direction, and the results offer the strongest link between plasma science and things once seen in the sky. In September, 2000, in response to communications with the authors of this monograph, Peratt became intrigued by the striking similarity of ancient rock art to plasma discharge



These rock art examples of the "squatter man" from around the world illustrate one of the many global patterns. Samples gathered by Anthony Peratt.



Peratt's graphic representation of a plasma configuration produced in laboratory experiments. The geometry relates directly to the rock art "squatter man" discussed on these pages.

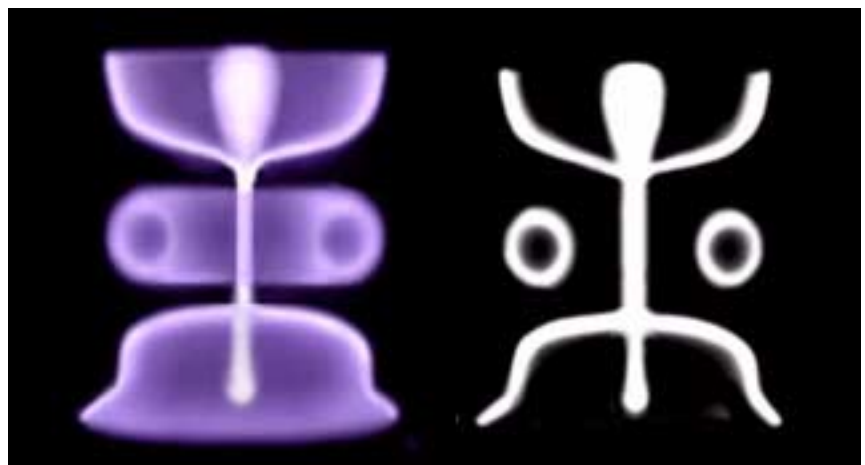
formations. Suddenly he was seeing, carved on stone by the tens of thousands, the very forms he had documented in the laboratory. The correlations were so precise—down to the finest details—that they could not be accidental. The artists were recording heaven-spanning discharge formations above them.

In his investigation of rock art themes, Peratt concentrated his field work in the American Southwest and Northwest, but he also gathered data internationally. For his on-site study he used GPS longitude and latitude positions, always noting the probable orientation or field of view. A team of about 30 volunteers, including specialists from several fields, assisted Peratt in the investigation, and he has since gathered more than 25,000 rock art images. While the recorded formations correspond to nothing visible in the heavens today, they accurately depict the evolution of plasma instabilities. Peratt reports that "some 87 different categories of plasma instabilities have been identified among the archaic petroglyphs and there exists nearly none whose whole or parts do not fit this delineation."

A plasma instability found globally in rock art is a stick figure with a circle or dot on each side of its torso. In plasma experiments, this "squatter man" configuration appears when a disk or donut-like torus is bent by magnetic fields induced by the current flow. From the viewpoint of the observer, the edges of the upper disk may appear to point up (forming "arms") and those of the lower torus may appear to point down (forming "legs"). The underlying "hour-glass" pattern, with many subtle variations, occurs around the world.

Virtually all of the variations in the ancient drawings correspond to known evolutionary aspects of the basic plasma form. To appreciate the potential evolution, it is essential that one visualize the configuration three dimensionally, as illustrated by the idealization of the form below—

A three-dimensional idealized representation of the transparent "hour-glass" discharge pattern, together with a white-on-black image of the same configuration. Were such a formation to have appeared in the ancient sky, a rock drawing of it would probably look like the image on the right, similar to the "squatter man of worldwide rock art.



The graphic image of the discharge configuration above utilizes a tonal gradient to indicate the structure of a *transparent* plasma discharge, where this structure would not be self evident in a rendition carved on rock.

Our idealized formation shows slight variations between the upward-pointing and downward-pointing components, consistent with common variations in the laboratory and in rock art. The upper “champaign glass” form results from a distortion of a flattened toroidal disk as the edges curve upward. In the warping of the disk below, the downward curvature is interrupted at the extremity, which bends outward to create a “squashed bell” appearance. The rock art images given on page 21 include other variations as well.

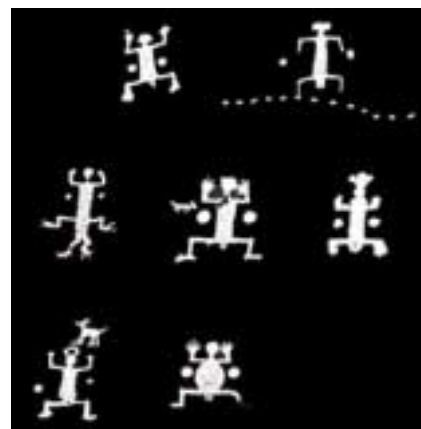
Often, the “arms” and “legs” of the “squatter man” are more squared than in our graphic representation here (examples on right), but this variation too is characteristic of laboratory discharge.

Our illustration of the hourglass discharge form accents the central torus and its visual relationship to the two symmetrical dots or circles seen in the corresponding rock art images. But many other nuances of such discharge configurations must be taken into account. It is unlikely that this torus would have always been visible, for example, and a great number of “squatter man” rock art images do not display the two dots or spheres. Also, the warping of the upward and downward extremities of the hourglass form can occur in almost limitless variations. A more comprehensive treatment of this subject would require systematic analysis of the global variations in the rock art forms, comparing the wide-ranging patterns to the implied discharge evolution.

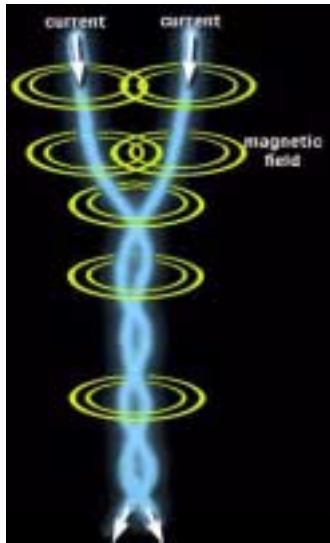
A New Approach to Rock Art

Peratt’s findings are particularly significant in their contrast to traditional explanations of rock art. The majority of rock art authorities, particularly those with primary interest in Native American sources, argue that only images of the sun, moon, and stars reflect actual celestial phenomena. Apart from such associations, most authorities claim that *global patterns do not exist*. Peratt’s investigations say the opposite, confirming numerous universal patterns of rock art. Through massive labors, some apparently taking whole lifetimes according to Peratt, the ancient artists recorded immense discharge phenomena in the heavens.

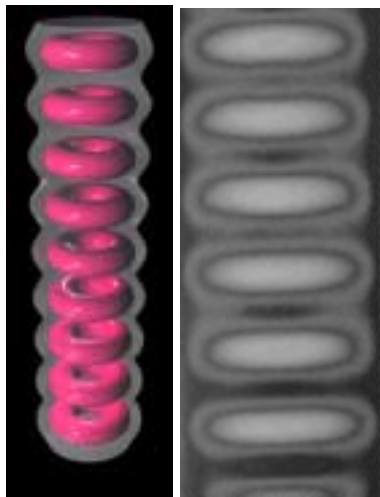
Following an intensive investigation, Peratt began summarizing his findings. He wondered if the ancient artists might have witnessed an episode of high-energy plasma incursion into Earth’s atmosphere, what he called an “enhanced aurora.” His first article, “Characteristics for the Occurrence of a High-Current, Z-Pinch



Examples of the “Squatter man” figures, with twin dots or circles of the left and right, from the American southwest.



Electric currents in plasma naturally form filaments due to the squeezing or "pinch effect" of the surrounding self-generated toroidal magnetic field. Complex electromagnetic interactions cause the filaments to rotate about each other to form a "Birkeland Current" pair. In high energy discharge sequences these rotating currents can evolve violently into a stack of disks or toruses around the discharge axis.



ABOVE: Graphic illustration of the stacked toruses in the Peratt Instability on the left. Computer simulation of the experimental results on the right.

Aurora as recorded in Antiquity," was published by the Institute of Electrical and Electronics Engineers, in its *Transactions on Plasma Science* for December 2003. Here he states his conclusion forthrightly: the recurring petroglyph patterns "are reproductions of plasma phenomena in space."

Stacked Toruses

In laboratory experiments and in computer simulations, Peratt demonstrated how electric forces in a plasma discharge generate rapidly changing configurations. One of the most common and fascinating patterns is a stack of disks or toruses (donut-like rings) around a central axis, a configuration that evolves through many variations. This dynamic sequence culminates in a highly energetic collapse. But according to Peratt, the prior phases of the stacked toruses are relatively stable and numerous variations were inscribed on stone everywhere in the world.

The discharge sequence leading to the stacked toruses begins with two braided current filaments ("Birkeland currents," named after Kristian Birkeland), as illustrated on the left. Under the magnetic forces generated by the currents, the two filaments tend to draw closer. As they do so, they rotate about each other faster and faster. If the current is strong enough, it may "pinch off" in what is known as a "sausage" instability, forming a series of cells that look like a string of sausages or a string of pearls.

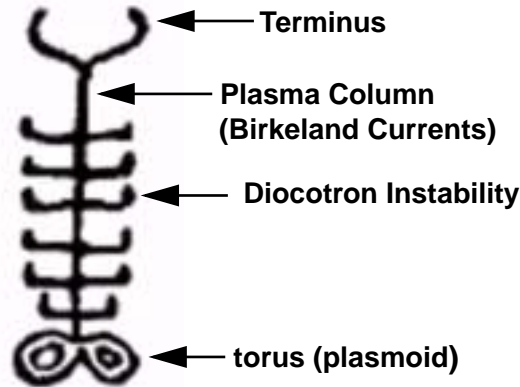
The sausage "links" then form spheroids that evolve into disks or toruses (thick rings or "donuts") of electrical current circling the initial line current (two images on the right). This formation remains stable for a relatively long period, accreting matter at the center of each torus.

As the sequence progresses, the disks or toruses will flatten and the outer edges will begin to curve upward or downward like the rims of a saucepan. To an observer looking through the transparent toruses they will have the appearance of stacked "arms" or "legs" strung along the axis of the discharge. Of such a configuration, thousands of examples exist around the world.

Eventually the formation reaches a threshold point and explosively breaks apart. This culminating phase of the discharge sequence is so energetic that direct human observation of such a configuration close to Earth would likely be deadly.

Nevertheless, an exceedingly rare but precise replication of this phase is given in a petroglyph from Kayenta, Arizona (above). When Peratt received this image from one of the authors (Talbot),

he had no doubt of its significance. The configuration's unique features make the plasma explanation definitive, Peratt reported.



Pictograph from Kayenta, Arizona.

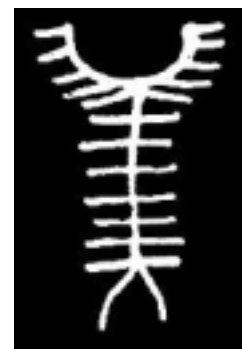
The upper terminus shows the twin filaments of tightly bound Birkeland currents of the plasma column below. In high energy discharge, the terminal filaments typically flare out as the discharge column evolves. The flat disks or toruses with upturned edges (“saucepan” formations) are typical of *diocotron* instabilities, rapidly revolving plasma contained and configured by magnetic fields. At the “base” of the formation is a larger, thicker and transparent torus, permitting the observer to see through the inner shells, presenting a view that might be compared to an automobile tire cut in half and viewed edge on.

Peratt writes—

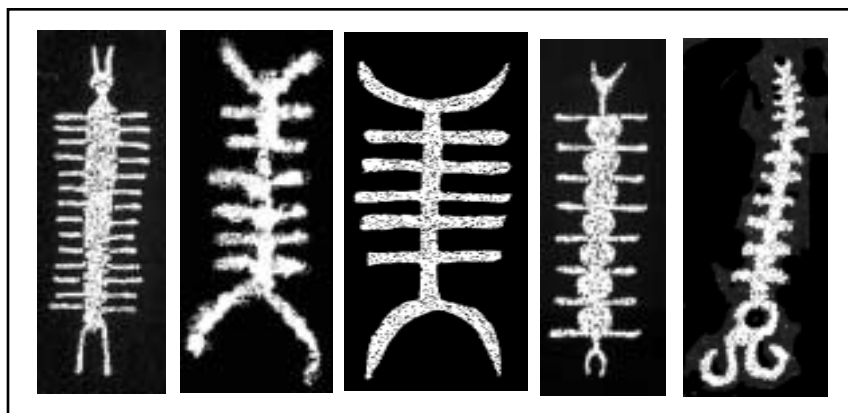
Six flattened tori [toruses] are depicted ... whose features can be shown to be exact in detail. The spacing and the shape of the ‘bars’ as well as the fine structure at the tips of the disks are precise. Slight curvature in the ‘bars’ indicates that state transition is imminent. It should also be noted that the lowest disk is about one-half the size of the stack above. The stack also opens out slightly in the direction of



ABOVE: illustration of the suggested three-dimensional appearance of the plasma form that inspired the Kayenta petroglyph on the left.



ABOVE: In this Australian rock art image, the upper twin filaments have spawned secondary radial filaments, a characteristic feature of intense plasma discharge.



LEFT: These enigmatic rock art images from the American southwest represent a few of the thousands of examples capturing the complex evolution of toroidal formations, or “Peratt Instabilities.”

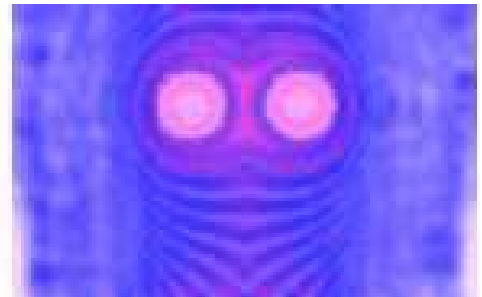
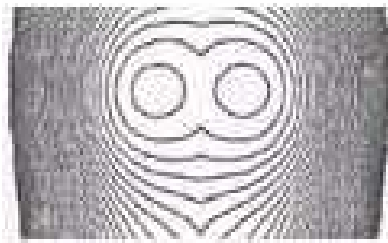
the terminus. The geometrical shape of the terminus ... is an exact representation of experimental data.

Peratt reports that this pictograph represents "the onset of a chaotic change of state." This is the most energetic phase, meaning that humans would have needed to shield themselves from the intense radiation at all cost. It is not surprising that direct pictorial representations of this phase are almost non-existent, in contrast to earlier phases recorded by the tens of thousands.

Eye Mask

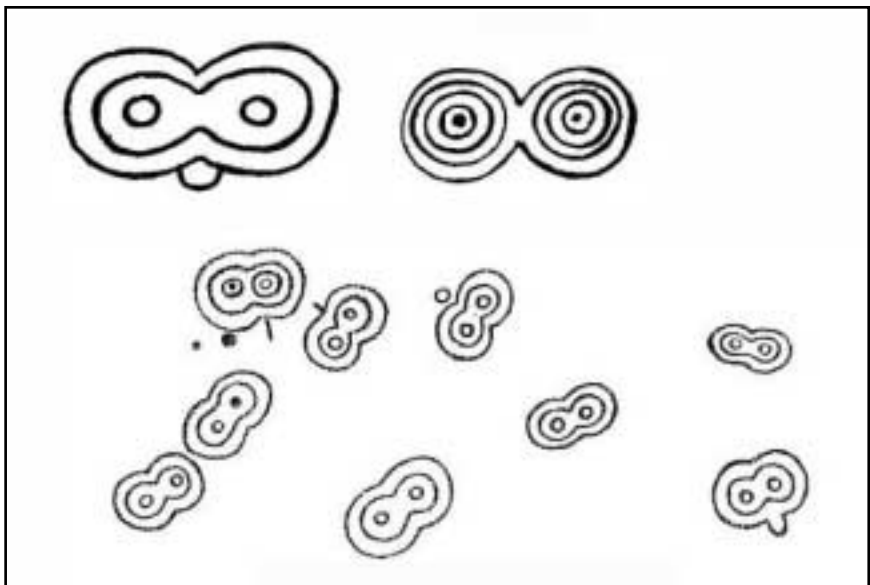
A key component in the Kayenta pictograph above is the "eye mask" seen at the base of the image. For decades this elementary form has intrigued symbolists and rock art specialists, but no consensus was ever reached as to its meaning.

Peratt's computer simulations of the plasma torus reveal the dynamics of the ancient "eye mask" form, while also giving a new perspective on the "owl" in cross-cultural symbolism (below).



ABOVE: "eye mask" formation stands in intimate connection to the archetype of the mother goddess, often called the "eye goddess" and sometimes taking the form of an "owl." Here we see the owl form of the Greek goddess Athene.

RIGHT: drawings of the "eye mask" from Easter Island.



Peratt immediately identified the eye mask as a "low opacity torus," or thick ring, seen from a vantage-point not too far from the plane of the torus. The most intense currents in a plasma torus are concentrated at the center and surrounded by a number of concentric "shells." Because the outer shells have a low opacity, an observer can see deeply inside the torus. The center of the torus cross-section becomes more visible at optical wavelengths as the outer plasma shells become less opaque. In addition, the torus tends to flatten with increasing current, a characteristic revealed by innumerable instances of the eye mask globally and as seen in the ancient Sumerian symbols of the goddess Inanna (right) and the Native American "She Who Watches" below—



"Eye-idols" of the Sumerian goddess Inanna.



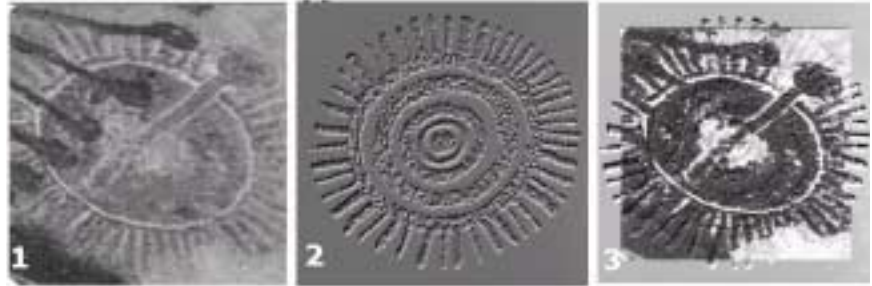
"She Who Watches," a popular eye goddess of the Columbia River region in the northwestern U.S.

A "Complete Match"

Peratt was impressed not only by the precise accord of rock art images to experimental and simulated forms, but also by the detailed correspondences between images in different parts of the world. He only needed to adjust for the different lines of sight to obtain remarkably accurate overlays. An example of this is seen below, in a category of images Peratt calls the "Stonehenge" type. Here, Peratt overlays a "Wandjina" pictograph in Northeastern Australia (1) with a carved granite petroglyph in northeastern Arizona (2). To adjust for divergent lines of sight, he digitally tilted the latter 45.3 degrees. Then the fit was perfect (3), despite the fact that the radiating streamers in the two images were *not symmetrical*.

The overlay is so exact that the only way I could illustrate this was to extrude the Arizona petroglyph (in white) and lay a flat black Wand-

jina on top. That is, everywhere you see black on white, even the edges, is the overlay. This technique still does not do the overlay justice My claim that at least a lifetime was spent carving some of these petroglyphs in granite with stone instruments is based on both the overlay factor and comparison to experimental data.



The presence of identical images around the world is a common theme in Peratt's cataloging of ancient art. "An appreciable number of the categories contain petroglyphs that overlay to the degree that they are 'cookie cutter' templates of each other," he states. Through computer processing his data enable him to project what was seen in the sky in three dimensions. The pictographs themselves can be arranged to form animation cells, enabling him to produce an animation of the laboratory sequences using only the pictographs—a complete match between the images on stone and the complex evolution of the plasma instabilities.

It now appears that dating of the events is also possible. Where various figures have been painted on stone and the pigments have leached into the rock, leaving a residue that is still present, a technique called "plasma extraction" may yield valuable estimates as to when the events occurred. Indeed, Peratt exudes confidence on the matter, saying that if plasma scientists can cross reference the dates from plasma extraction with laboratory data on the discharge sequence, "extracting dates seems certain." He presently estimates that the 87 categories generally fall in a range from 7,000 BC to 3,000 BC. This brings the rock art expressions directly in line with the formative phase of the first civilizations, raising profound questions about the antique cultures. What were the cosmic influences shaping human imagination in this enigmatic period of human history?

Today, more than a dozen qualified individuals, constituting an interdisciplinary nucleus, are working to reconstruct details of the ancient celestial dramas. Though the individuals come from diverse fields of inquiry, all agree that the accord between ancient images and plasma configurations is too detailed and too specific to be explained as accidental convergence. All have concluded that

immense discharge formations appeared in the sky of ancient witnesses and that the violent evolution of these formations must have instilled overwhelming terror.

A New Approach

In the present inquiry science and historical testimony converge, requiring a radical reassessment of each in the light of the other. Laboratory experiments not only offer a new perspective on the physical universe, they connect the leading edge of science to a critical phase of human history. Disciplines that previously developed in isolation now require *interdisciplinary* communication. The physical sciences on the one hand, and the study of archaic human memories on the other, are brought into alignment by questioning the assumptions that have affected *both*. What, for example, can the reconstructed plasma formations tell us about the origins of ancient religions, mythology, and symbolism? How might they explain the mystery to which we alluded in the first pages of this monograph--the recurring themes of the mother goddess, the hero, and the chaos dragon?

Our hope is that doors will open to more holistic approaches within the sciences, encouraging even specialists, confident in their long-held assumptions, to wonder again about our universe, the evolution of Earth, and the influence of cosmic events on human history.



“On the mountainside Anzu and Ninurta met ...Clouds of death
rained down, an arrow flashed lightning. Whizzed the battle force
roared between them.

“Anzu Epic,” tablet 2, in S. Dalley, *Myths from Mesopotamia* (Oxford - New York,
1989), p. 21.

CHAPTER TWO

MYSTERIES OF THE COSMIC THUNDERBOLT

If Anthony Peratt's conclusions are correct, then only a few thousand years ago the terrestrial sky was ablaze with electrical activity.

The ramifications of this possibility will directly affect our understanding of cultural roots. What was the impact of the recorded events on the first civilizations? What was the relationship to the origins of world mythology, to the birth of the early religions, or to monumental construction in ancient times?

The relatively sudden appearance of the rock art themes discussed in the previous chapter interrupted an *earlier* phase in the evolution of artistic expression. In the remote Paleolithic epoch, we see remarkable human skill in representing the natural world. Many observers have marveled at the realism of primitive depictions on the walls of caves in Europe and elsewhere, showing antelope and bison and other animal and plant forms, with great attention to natural detail. Many of the most impressive examples are conventionally dated around twenty to thirty thousand years ago.

Later, however, in close connection to the beginnings of civilization, we observe an explosion of human energy devoted to the utterly fantastic: cosmic serpents and dragons, winged bulls in the sky, mountains, towers, and stairways reaching to the center of heaven, "sun" disks with heaven-spanning wings, cosmic "ships" sailing about the sky. In fact, most researchers have grown so used to these preposterous images that only rarely do they pause to notice the enigma. How did it happen that human consciousness shifted from artistic accuracy and natural representation in the more "primitive" (Paleolithic) stage, to such bold "defiance of nature" in a later (Neolithic) stage? From any conventional vantage point, a collapse of artistic "skill" also occurred.

But now, there is reason to believe that rock art can illuminate a critical turn in human history. Before the work of Peratt, many of the petroglyphs appeared to be little more than "stick figures" with



UPPER: Paleolithic cave painting of a horse, Lascaux, France.

LOWER: Images such as these carved on stone in the southwestern U.S., accent the enigma: the task of chiseling such images required an immense investment of human time and energy, yet the forms appear to be little more than doodling. Plasma physics will tell us otherwise, however.

preposterous attributes, all easily dismissed as random “hallucination” or “doodling.” Peratt’s work assures us that the basic forms have a direct explanation in plasma science.

There is also a provable connection to the evolution of mythical archetypes. Archaic rock art depictions came first, but were followed by an outpouring of conceptual elaborations, as ancient artists gave imaginative expression to the celestial forms and events that *inspired* the myth-making epoch. Both the rock artists and the myth-makers had true perils on their minds. The rock artists *recorded* and the myth-makers *interpreted* electrical events in the sky, as plasma discharge sequences moved through discrete phases, some of celestial beauty, others intensely violent and terrifying.

Our world was once a vastly different place—that is the message written on stone and concealed within the archetypes of world mythology. It is only necessary that we see past the imaginative expressions to the events behind them. What were the events that provoked an explosion of human imagination prior to the rise of civilization? All of the archetypes are, in fact, *extraordinary*. And not one, when traced to its roots, answers to familiar events in our sky today.

The Dragon, the Hero, and the Thunderbolt

As if speaking with a single voice, ancient cultures declare that fantastic beasts once roamed the heavens and the gods went to war. In the story’s most common form, the upheaval began when a great serpent or dragon attacked the world, bringing darkness and universal devastation. A legendary warrior then set out to engage the monster in direct combat. The battle raged amid earthquake, fire, wind, and falling stone, and it appeared that all would be lost. Then the hero’s magical weapon, fashioned by gods or divine assistants, flew between the combatants, turning the tide of battle and vanquishing the monster.

From this encounter, the ancestral warrior earned his title as “hero.” He defeated chaos and saved the world from catastrophe. But how did the divine weapon accomplish this feat? The storytellers’ own words and symbols, when traced to root meanings, make clear that the hero’s weapon was no ordinary sword, arrow, or club. It was a *thunderbolt*—and not the familiar lightning of a regional storm, but a bolt of cosmic dimensions. Though this original identity may not be apparent in many of the later versions of the story, it can be confirmed through cross-cultural comparison, with closest attention to the memory’s more archaic forms. When the great civilizations of the ancient world arose, the dragon, the hero, and the cosmic thunderbolt already dominated human consciousness.



"Hercules Battling Achelous," the Louvre, Paris, France.

The Great Serpent Typhon

Greek poets, historians, and philosophers often spoke of the great dragon Typhon, Typhaon, or Typhoeus whose attack nearly destroyed the world.¹

Our oldest source for the Typhon story is Hesiod, whose account is tentatively dated to the eighth century B.C. In his *Theogony*, "The Origins of the Gods," Hesiod sets the stage against a backdrop of cosmic turmoil in the formative phase of earth history. Typhon was the child of Gaea and Tartarus, conceived after Zeus had driven from heaven the former rulers of the sky, the Titans. At birth, the monster sprouted a hundred snake heads spitting fire and venom, their whistles, roars and bellows, and every sort of horrible sound shaking heaven to its foundations.

Without the intervention of Zeus, the poet says, the great dragon would have become the master of gods and of mortals. To meet the monster, Zeus rose with a clap of thunder. Then "the earth groaned beneath him, and the heat and blaze from both of them were on the dark-faced sea, from the thunder and lightning of Zeus and from the flame of the monster, from his blazing bolts and from the scorch and breath of his stormwinds."²

The power of Zeus lay in his lightning-weapons:

...Seizing his weapons, thunder, lightning, and the glowering thunderbolt, he made a leap from Olympus, and struck, setting fire to all those wonderful heads set about on the dreaded monster. Then, when Zeus had put him down with his strokes, Typhon crashed crippled, and the gigantic earth groaned beneath him, and the flame from the great lord so thunder-smitten ran out... and a great part of the gigantic earth burned in the wonderful wind of his heat... and melted in the flash of the blazing fire.

Over the centuries scholars have wondered what natural experience could have provoked tales of an earth-threatening event in which the agent of destruction is a serpent or dragon. Was the story a fabulous echo of ancestral confrontations, when early races struggled to subdue creatures of the desert or swamp?³ Or did the story capture, in the archaic language of myth, a traumatic event—perhaps an eruption from a nearby volcano, or a hurricane or tornado?⁴ Some have suggested that the Greek memory of Typhon points to a particularly frightful *comet* approaching the earth.⁵ The ancient Roman scholar Pliny mentions the appearance of a "terrible comet" or a "ball of fire" during the reign of a legendary Egyptian *king* named Typhon.⁶

But these naturalistic speculations take the ancient stories one at a time, in isolation, and too frequently disregard the parallels within and between cultures. Hesiod's version offers many clues that can be followed backward to the earlier religions of the Medi-



Greek vase painting depicts Zeus' conquest of Typhon.



What is a Dragon?

For several millennia dragons have occupied the minds of storytellers the world over, and modern theories, explanations, and rationalizations are as abundant as the cultural variations on the theme.

Our word for "dragon" comes from the Latin *draco*, the Greek *drakon*, related to the verb *derkomai*, "to see." In many cultures the dragon appears as the "seer" or "watcher," the guardian of the sacred precinct. But such concepts hold little meaning for the modern mind. To recover the fullness of the original idea, we must explore notions long forgotten or easily distorted as the myth-making epoch receded into a remote past.

For those who seek to identify the dragon zoologically, the monster is forever elusive. No such biological species ever existed. That itself is part of the mystery, since the dragon is an archetype of global distribution. The closest kin is the serpent. Although it is often impossible to distinguish between the two symbols, much evidence suggests that it was the mythic serpent that gave the dragon its common reptilian features. Yet we find other animal features attached to the monster as well, including hair, wings, or feathers, a fact that can only underscore the many dragon paradoxes.

Literary references to dragons often suggest that they lived far from the homes of those tell-

ing the stories. Yet for thousands of years, cultures the world over lived in the shadow of the dragon, fearing the return of the dragon-borne catastrophe recounted in their myths. Even in our own day, the symbols of that anxiety clutter human consciousness, visiting us in nightmares, erupting as apocalyptic visions, or dancing by as the anachronisms of our holiday celebrations.

To find the roots of the theme, we must follow it back to the earliest recorded images. When the great civilizations emerged, serpents and dragons were already commonplace and the core themes well established. Of these themes, none endured more persistently than the combat between the dragon and a far-famed warrior.

The dragon, it seems, has a long ancestry indeed, one tracing to prehistoric events that became increasingly difficult for later story-tellers to comprehend. But how might our ideas about dragons change, were we to see past all later adaptations of the theme to

the core of the original human experience? Is it possible to consider the question through the eyes of human *witnesses*?



TOP: Greek serpent-dragon Typhon, whose attack nearly destroyed the world before he was vanquished by Zeus. CENTER: A "friendlier" Chinese dragon displaying lighting-like emanations.



Typhon as three-headed monster with entwined serpent-tails.

terranean, the Near East, and beyond. By this line of investigation, we see how the cosmic serpents and dragons of archetypal mythology were progressively diminished and localized through regional storytelling.

The hero's combat with the chaos-serpent or dragon is a global theme of the ancient cultures, and a failure to recognize this fact will doom any attempt to comprehend the Typhon story. A ludicrous monster alien to all natural experience today, but given cosmic proportions, is indigenous to all cultures' mythologies. The creature is a flaming, bearded, feathered, or long-haired serpent, often embellished with multiple heads and mouths, whose writhing form appears in the sky as chaos and darkness overtake the world. The power and consistency of the images persist across millennia of human history, and the collective memory cannot be rationalized away. What human experience produced the myth of the dragon? Who was the hero? And what was the cosmic thunderbolt, the weapon that left the monster, in the poets' words, "thunderstruck," or "lightning-scarred"?

Chaos and the Primeval Rebellion

In ancient Egypt, the serpent Apep was the archenemy of the creator Ra, and his plotting against Ra produced a tempest in the heavens. Harking back to these events, numerous Egyptian rites commemorated the victory of Ra over Apep. At the temple of Ra in Heliopolis the priests ritually trod underfoot images of Apep to represent his defeat at the hands of the supreme god. At the temple of Edfu, a series of reliefs depict the warrior Horus and his followers vanquishing Apep, or his counterpart Set, cutting to pieces the monster's companions, the "fiends of darkness." It is worth noting as well that the Greeks translated Set as Typhon.

In Hindu legends the great warrior Indra, the most revered god of the Vedas, employed lightning in his combat with the monstrous Vritra or Ahi—a giant serpent who had swallowed both the cosmic



Hindu *vajra*, the cosmic thunderbolt.

"waters" and the sun, leaving the world in darkness and despair. "Indra, whose hand wielded thunder, rent piecemeal Ahi who barred up the waters..."⁸ "Loud roared the mighty hero's bolt of thunder, when he, the friend of man, burnt up the monster."⁹ "Moreover, when thou first wast born, o Indra, thou struckest terror into all the people. Thou, Maghavan, rentest with thy bolt the dragon who lay against the water floods of heaven."¹⁰

The Hebrews, too, preserved an enduring memory of Yahweh's battle against a dragon of the deep, marked by lightning on a cosmic scale. "The voice of thy thunder was in the heaven: the lightnings lightened the world: the earth trembled and shook."¹¹ Here the adversary was alternately named Rahab, Leviathan, Tannin, or Behemoth—dragon-like forms representing both the waters of chaos and the rebellion of the "evil land" vanquished by Yahweh in primeval times.¹²

The battle is echoed in Job 26—

The pillars of heaven shook and were astounded at his roar. By his power he stilled the sea, and by his understanding he smote Rahab ... By his wind the heavens were made fair, his hand pierced the twisting serpent... Lo, these are but the outskirts of his ways; and how small a whisper do we hear of him... But the thunder of his power who can understand?"¹³

The Hebrew accounts reflect a connection to early Canaanite traditions in which the lightning-wielding god Baal defeated the monster Lotan, whose name is a linguistic cognate of Leviathan.¹⁴

Marduk and the Resplendent Dragon

When the Babylonians, the world's first astronomers, looked back to the age of the gods, they spoke incessantly of disaster. The astronomer priests recounted the events of a former time, when the dragon Tiamat assaulted the world and it appeared that heaven itself would fall into chaos. The "resplendent dragon" spawned a horde of dark powers with "irresistible weapons"—"monster serpents, sharp-toothed, with fang unsparing," their bodies filled with poison for blood. "Fierce dragons she has draped with terror, crowned with flame and made like gods ... so that whoever looks upon them shall perish with fear."¹⁵ This was not a disaster on a local scale, but a universal disaster—a catastrophe so great that the gods themselves were immobilized by fear, and even Anu, the sovereign of the sky, fled the scene in terror.



Marduk's dragon with serpent head, leonine front feet, avian hind feet, and scorpion's tail. Though distinguished from Tiamat, it cannot be entirely separated from her.

The protagonist in this narrative is the god Marduk. When all else had failed, it was Marduk who rose to confront Tiamat and her



Babylonian cylinder seals depicted the subdued dragon as the vehicle or carrier of the god, a common theme in the ancient world.

companions. The god took possession of his "matchless weapons" and—

In front of him he set the lightning,
With a blazing flame he filled his body.

Mounted on his storm-chariot and turbaned with a "fearsome halo," the god set his course toward the raging Tiamat. On the approach of Marduk, the dragon-goddess was "like one possessed; she took leave of her senses. In fury Tiamat cried out aloud..."

Then joined issue Tiamat and Marduk, wisest of gods,
They swayed in single combat, locked in battle.
The lord spread out his net to enfold her,
The Evil Wind, which followed behind, he let loose in her face.
When Tiamat opened her mouth to consume him,
He drove in the Evil Wind that she close not her lips.
As the fierce winds charged her belly,
Her body was distended and her mouth was wide open.
He released the arrow, it tore her belly,
It cut through her insides, splitting the heart.
Having thus subdued her, he extinguished her life.

In the Babylonian cylinder seals below, the thunderbolt of Marduk appears as an arrow launched against Tiamat. The "trident" form of the arrow/thunderbolt is a mystery yet to be resolved by specialists.



The Kingship of Gods and Heroes

What was the *kingship* of the warrior-god? No one seems to know why every ancient tribe and nation revered a former generation of heroic, semi-divine conquerors. Within western cultures the pre-eminent example of the hero is the Greek Heracles (right), the Roman Hercules, whose labors to free ancient lands of destructive monsters qualified him as “king.”

The son of Zeus and the “mortal” Alcmena of Thebes, as an infant he is said to have strangled two serpents sent by the goddess Hera. Later he made a career of battling chaos powers, from the Nemean lion to the seven-headed Hydra.

The mysteries surrounding such popular heroes can only be resolved by finding the historic antecedents. While Greek poets celebrated Heracles as a great “man,” his feats and personality direct our attention back in time to the exploits of earlier warrior-gods such as the Egyptian Horus (below).

In this detective work surprises will arise at every



Ancient Egypt, one of the oldest civilizations in the world, offers many clues as to the nature of the warrior-hero archetype. Standing well above all other Egyptian warrior gods is Horus (left), whose battles with the dark powers Set and Apep colored every dimension of Egyptian culture.

One fact beyond dispute is that Horus was originally a *cosmic* power, whose victory over the destroyer Set provided every pharaoh with the celestial model for the warrior-king on earth.

Across the centuries, however, Egyptian storytellers gradually reduced Horus to human dimensions, treating his adventures as *local* history. This evolutionary principle will prove to be a valuable clue as to the nature of the great heroes honored by later cultures. Indeed, in many ways, the feats of the Greek Heracles mirror those of Horus and other warrior gods of the ancient Near East.

He cast down her carcass to stand upon it.
After he had slain Tiamat, the leader,
Her band was shattered, her troupe broken up.¹⁶

In this way Marduk vanquished the dragon and her brood. Upon his victory the god established a new cosmic order, the body of the dragon providing the raw material for a great city of the gods.¹⁷

In their annual Akitu festival the Babylonians reenacted both Tiamat's attack and the god Marduk's subjugation of the monster. Commemorative rites such as these were, in fact, the model for ancient New Year's celebrations throughout the Near East, with numerous counterparts amongst ancient cultures the world over, all harking back to the primeval destruction and renewal of the world.¹⁸

The Myth of the Divine Thunderbolt

A thunderstorm can be a terrifying event. The lightning flash and thunderclap may indeed awaken a primal fear, perhaps instilling a newfound empathy for the mythmakers of antiquity. In the presence of a thunderstorm, was it not natural for our ancestors to envisage lightning-beasts roaring in the heavens or celestial armies hurling lightning-spears across the sky?

Common suppositions have prevented investigators from examining the underlying patterns of lightning symbolism. Cross-cultural comparison reveals numerous global images of lightning in ancient times, but these are a far cry from the phenomena we experience today. The lightning of the gods altered the order of the heavens and the history of the world.

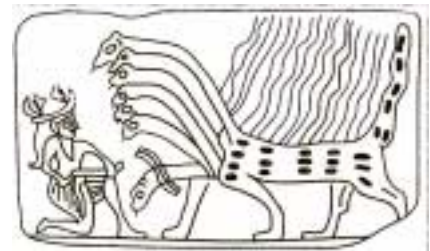
Ancient chroniclers employed a wide range of natural and man-made symbols to describe the cosmic "thunderbolt." The breadth of images will make no sense until we find a new vantage point, one permitting us to discern the *archetype*, the original form that preceded the symbols and gave them their mythological context. Terrestrial lightning was but one of many hieroglyphs used to describe the celebrated weapon of gods and heroes.

Here the distinction between archetype and symbol becomes crucial. Viewed in isolation from the archetype, the symbol presents blatant contradictions; when illuminated by the archetype, it acquires integrity. The symbol can then be seen in reference to something once *visible* in the sky, but no longer present. From this new vantage point, the investigator can subject the implied human experience to rational and scientific tests.

To confront the symbols under discussion is to meet the deepest fear of humanity, the Doomsday anxiety, the expectation that a prior world-threatening disaster will occur again. Doomsday arrived sud-



Statue of the god Marduk with his dragon.



The Babylonian seven-headed dragon, a familiar but enigmatic theme in ancient times.



Greek coins shown on this and the following page depict the thunderbolt of Zeus with many variations. Yet certain patterns stand out, and none seem to suggest the familiar form of lightning today.

denly and without mercy, and across the millennia the memory of catastrophe haunted every culture on earth. The historic impact of the memory is, in fact, *evidence* for the events implied by cross-cultural testimony. As remarked by the Greek poet Sophocles, the thunderbolt of Zeus always meant disaster: the terrifying bolt "never shoots forth for nothing, nor without catastrophe."¹⁹

To offset this anxiety, each tribe or nation cherished its own account of the ancestral warrior, the bearer of lightning and thunder and the victor in the primeval contest. The combat story, told in thousands of variations, gave the early cultures their celestial models for war and defense. Through ritual and symbolic *imitation*, cultures sought magical protection against chaos. Thus, the narratives, symbols, pictures, hymns, rites, and commemorative monuments offer countless clues as to the nature of the upheaval and the magical "weapons" featured at the most critical juncture. What were the thunderbolts of the gods?

To illustrate the scale of the enigma, we list below seven of the most common lightning themes recurring from one culture to another—images too specific, too peculiar, and too widespread to be rationalized as mere exaggerations or make believe. The symbols direct our attention to natural phenomena far more powerful and more terrifying than anything occurring in our own time—

Motif #1: Hero's Weapon. Lightning takes the form of a frightful sword, arrow, axe, flail or other weapon in the hands of a great warrior or divine messenger—a god whose identity merges with the lightning-weapon itself. Surprisingly, the same "weapon" turns up as an instrument of healing or resurrection as well.

Motif #2: Winged Thunderbolt/Winged Disk. Lightning appears as a radiant disk or sphere in the sky, with heaven-spanning wings. It is a great "thunderbird," or it is launched from the wings of such a bird, or bursts forth as a flash of fire from its eye.

Motif #3: Axis Mundi. Lightning streaks along the world axis, acquiring the form of a towering column that is said to have "separated heaven and earth" in primeval times. This same pillar is the hero's staff, rod, or scepter, and through metamorphosis it passes into other, more complex forms as well.

Motif #4: Lightning Wheel and Flower. Lightning "blossoms" as radiating, symmetrical streamers—the petals of a luminous flower, the awe-inspiring "glory" of a great star, or the spokes of a cosmic wheel turning in the heavens.

Motif #5: Whirling Thunderbolt. Lightning spirals into serpentine coils or winds upward in a helical motion around a central, axial column. It whirls across the heavens as a celestial tornado,

whirlwind, or whirlpool, sometimes graphically recorded as a whorl, swastika, or triskeleon.

Motif #6: Caduceus. Lightning manifests as entwined serpents, ribbons, or filaments whirling upward along a central axis or column. Two entwined filaments signify the lightning-form taken by cosmic twins.

Motif #7: Thunderstones. Lightning arrives with falling stones or boulders. Typically, the falling rocks are flung by warring gods who also brandish, or *are*, the divine thunderbolt.

How did such images of the "thunderbolt" take root around the world? Though the global images have almost nothing in common with lightning today, the cross-cultural *patterns* are remarkably consistent. Hence, a solution to the mystery *must* be possible.

Thunderbolt as Divine Weapon in Primeval Times

Though we cannot pause here to elaborate all of the themes noted above, each will find comprehensive treatment in these monographs.

As for the first motif on our list—the legendary hero's weapon—most mythologists assume that the association with "lightning" is a secondary principle, not a general rule. Our contention, however, is that virtually all forms of the hero's weapon belong to the thunderbolt motif. A unified explanation of the magical sword, arrow, spear, club, or axe is possible, even in instances where the explicit "lightning" identity was lost over time. *At the heart of the theme lie the natural formations taken by plasma discharge.*

In the course of our analysis we intend to show that the essence of the divine thunderbolt was *etheric*—it was wind, water, and fire. It was a whirlwind or tornado, a whirling flame, a devastating flood, even a comet. If it was also a celestial serpent or winged monster, that was because the plasma discharge formations appearing above the ancient witnesses *readily inspired such fabulous interpretations.*

It is the earlier images that illuminate the later fragments and elaborations of the thunderbolt motif. In the Babylonian narrative above, the arrow released by Marduk is the god's thunderbolt. Elsewhere, the god's bolt appears as a *lance*, a weapon by which the god himself was represented in Babylonian iconography. One of the texts also explains that the *firebrands* kindled as part of the festivities represented the god's lightning-arrows.²⁰ On the face of it, the symbolism may seem perfectly natural in reference to familiar lightning. But enigmatic nuances of the thunderbolt stand out in both the Babylonian written narratives and the ritual reenactments



The Rites and Symbols of the Warrior-King

It is no exaggeration to say that every warrior-king who ruled in ancient times promoted himself as the incarnation of the warrior *god*. Just as the divine warrior had defeated world-threatening monsters and “fiends of darkness,” the king would rid his land of demonic forces, conducting ritual “hunts” to purify the realm, and leading expeditions against the “barbarians” beyond the gates.

It was through this identification that the king qualified himself to assume the throne. The blood of the warrior flowed through his veins. He built towers, pyramids and “heaven-reaching” monuments, just as his ancestor had done. He sacrificed victims to the gods. He “irrigated” and “cleansed” the land. And in sacred marriage rites he consorted with the “queen of heaven,” for had not the ancestor himself taken the mother goddess as his consort or bride?

The ancient Egyptians honored Narmer, the “first” pharaoh, as “the incarnation of the hawk-god Horus,” depicting him in the conqueror’s role against the “marsh dwellers,” just as the warrior *god* had defeated the armies of Set in ancestral times. Thutmose III boasted of the same role in defeating the Mitanni. Amidst the enemy armies he claimed to have appeared as a “flashing star in battle,” his fiery breath destroying the armies in an hour. In this devastation, the adversaries were “non-existing ones”—the very Egyptian phrase used for the chaos fiends in the contest of warrior god and attacking dragon.

In a similar vein, the pharaoh Seti I claimed to have vanquished his enemies through the tempestuous “majesty” of the god Amon-Ra. This “majesty” was nothing else than the fiery blast the god himself had sent forth against the hordes of the dragon Apep.

The alignment of king and warrior is vividly portrayed in accounts of the Assyrian king Assurbanipal’s



military adventures. Born as the incarnation of the warrior-hero, Assurbanipal defeated Arabian tribes in a re-enactment of the cosmic conflict. “The warrior god Irra, engaging them in battle, struck down my foes. Urta, the lance, the great warrior, pierced my enemies to the life with his sharp arrow.”

Whether such accounts speak of descending fire, of devastating “breath,” or an irresistible lance or arrow, the language cannot be separated from that of the cosmic thunderbolt. In the Annals of MurÅjili, it is, in fact, the divine warrior’s *thunderbolt* that brings the king’s victory, “. . .The mighty storm god, my lord, showed his ‘divine power’ and shot a ‘thunderbolt.’ My army saw the ‘thunderbolt’ and the land of Arzawa saw it and the ‘thunderbolt’ went and struck the land of Arzawa.”

The thunderbolt and the rites and symbols of “holy war” thus stand together—a field of evidence rarely explored, but teeming with clues too often overlooked.



ABOVE RIGHT: A scene on the wall of the northern palace of Assurbanipal in Nineveh shows the king, armed with his arrow, engaged in the ritual hunt. CENTER: the famous Narmer palette (obverse) depicts the pharaoh subduing the “marsh dwellers.” All components in the scene were designed to accentuate the divine qualities of the warrior king.

of the event. Marduk's weapon appears to overlap with the image of a whirling "cyclone" called *abubu* and rendered pictographically as a *mace* or club—images that make little sense in themselves but will take on increasing clarity in the course of our investigation.²¹

Similar images occur in Sumerian accounts of the great warrior Ninurta's victory over the monstrous "bird" Anzu who, like Typhon, had sought to usurp the powers of heaven.

On the mountainside Anzu and Ninurta met ... Clouds of death rained down, an arrow flashed lightning. Whizzed the battle force roared between them.²²

By his victory, Ninurta became the "strong warrior who slays with his weapon," his lightning arrow or dart having pierced the heart of the monster.

So too, the Assyrian "storm god" Adad (Phoenician and Hebrew Hadad), an alter ego of Marduk, is shown wielding thunderbolts as arrows or spears, though elsewhere he carries a lightning *mace* (right).²³ The great Assyrian warrior Ashur launched arrows from his bow as lightning, in the very fashion of the Babylonian Marduk.²⁴

According to W. M. Muller, the spear or harpoon of the Egyptian Horus was a metaphor for the thunderbolt. "...Lightning is the spear of Horus, and thunder the voice of his wounded antagonist, roaring in his pain."⁷

As noted by Mircea Eliade, the Hebrew Yahweh "displayed his power by means of storms; thunder is his voice and lightning is called Yahweh's 'fire,' or his 'arrows.'"²⁵ The connection is deeply embedded in the language. The Hebrew *baraq*, "lightning," is also used in the sense of "flashing arrow-head."²⁶ Similarly, the feared "sword of God," according to Louis Ginzberg, is the flashing lightning.²⁷

Various Christian traditions appear to have adapted the idea to later images of God's struggle with the "devil." In the legends of Armenian Christians, for example, "the lightning is often a sword, arrow or fiery whip which the Lord is hurling at the devil, who is fleeing, and who naturally and gradually has taken the place of the ancient dragon."²⁸

Few scholars have found any of this to be enigmatic. The fundamental idea may seem so natural that most translators of ancient texts give little attention to the unique attributes and associations of the thunderbolt.

Evolution of the Thunderbolt

One fact relating to the evolution of world mythology is frequently overlooked. The setting of later stories progressively



The dragon of Marduk carries the symbol of his vanquisher—the lightning-weapon—on his back.



Assyrian "storm god" Adad holds in his hand a mace, a form taken by the lightning of the gods.



Zeus launching his thunderbolt, from a Greek vase painting.

changed as storytellers began to locate the gods on earth. In the course of Egyptian history, for example, both the creator Ra and his regent Horus, whose original domain was undeniably celestial, came to be remembered as *terrestrial* kings. In later time, when Greek and Roman poets, philosophers, and naturalists sought to gather knowledge from far flung cultures, Egyptian priests would relate to them many stories of the gods, declaring that the events had occurred in their own city in the time of the "ancestors."

As a bridge between the more archaic world and the fragmented and diluted myths of later times, Greek accounts offer many clues as to the evolution of thunderbolt symbolism. In the hands of the sovereign

Zeus, the nature of the divine weapon is clear. The poet Pindar speaks of Zeus "whose spear is lightning,"²⁹ while Aristophanes invokes lightning as "the immortal fiery spear of Zeus."³⁰ In the words of Nonnus, Zeus is "the javelin-thrower of the thunderbolt." "The spear he shook [in the battle with Typhon] was lightning." "Do thou in battle lift thy lightning-flash, Olympus' luminous spear."³¹

The connection is transparent in the Greek *kerainós*, "thunderbolt," most commonly used for Zeus' weapon and said to stem from a Proto-Indo-European root **ker-*. The same root appears to lie behind the Sanskrit *sháru*, 'arrow' and the Gothic *hairus*, 'sword.'³² As in other cultures, the Greek thunderbolt also found frequent expression as an arrow. The most familiar representations of the "eagle" of Zeus (as, of course, the eagle of the Latin Jupiter) depict the god's lightning as arrows held in the talons of the bird—a representation well preserved into modern times by the symbol of the eagle and its lightning-arrows on the U.S. one dollar bill. Many authorities thus acknowledge that the lightning of the gods found expression as an arrow in plastic art of Greece, Italy, and Sicily.³³

But as we descend to secondary gods and regional heroes, the connection of weapon and thunderbolt becomes more ambiguous. The Homeric Hymn to Pythian Apollo describes the god's confrontation with the chaos serpent Python, whom the chroniclers identified alternately as a form of the dragon Typhon or as the *nurse* of Typhon.³⁴ Significantly, we do not find in the poet's words any explicit acknowledgment that it was a lightning-weapon that brought down the serpent. The Homeric and other accounts



The eagle on the U.S. one dollar bill holds in its talons an olive branch and a sheaf of arrows, the latter tracing to classical images of the eagle of Zeus (Latin Jupiter) with its lightning-arrows.



refer to the invincible "arrow" launched by Apollo, causing the monster to shudder violently and to give up its life in a torrent of blood. But was this "arrow" just an arrow, or did it really mean the thunderbolt which, in the earlier Near Eastern accounts, *took the form of an arrow*?

Many authorities have, in fact, recognized that the arrows or swords of Apollo cannot be separated from the language of the thunderbolt. Apollo bore the epithet *chrysaóros* or *chrysaór*—meaning “of the Golden Sword” (áor)³⁵—and here the lightning connection shines through: according to the distinguished authority, W. H. Roscher, the Golden Sword is a Greek hieroglyph for the thunderbolt.³⁶ Indeed, Zeus himself, the most famous wielder of the thunderbolt, was *Chrysaoreús* or *Chrysaórios*, "He of the Golden Sword."³⁷

Cross cultural comparison makes clear that the hero's connection to the "thunderbolts of the gods" was no accident. We are not dealing simply with a poetic metaphor for ordinary lightning. Rather, ordinary lightning served as a metaphor for something once seen in the sky, but *alien to ordinary experience*. Lightning thus stands alongside other metaphors (arrow, sword, whirlwind, comet, etc.), all pointing to *extraordinary* experience. The archetypal identity of the warrior-hero's weapon can be brought to light only by finding the root forms expressed in a wide array of symbols.

What occurred in the case of Apollo is underscored by many parallels in the language and symbolism of legendary heroes. By following this evolutionary tendency across the centuries, we observe how the poets and historians placed the stories on a landscape familiar to them, as the thunderbolt became a sword, spear, hammer or club of a celebrated warrior, now a “great man” who continued to battle chaos monsters, but no longer in the heavens. The celestial warrior lost his cosmic attributes to become the best of

The two paintings above, both depicting Apollo's defeat of Python, accent the ambiguity as to the mythic setting. The painting on the left, by J. M. W. Turner, suggests a terrestrial occurrence, while the painting by Eugène Delacroix on the right has preserved many nuances of the original celestial context.



Scene on a Greek coin illustrates Apollo's confrontation with the serpent Python.

Achilles: "The Best of the Achaeans"

By following the evolution of the hero archetype across the centuries, the researcher can observe how the cosmic thunderbolt, a centerpiece in innumerable tales of celestial combat, emerged as the magical weapon of a legendary warrior. It became the sword, spear, hammer, or club of a hero who continued to battle chaos monsters, but no longer in the sky.

The diminished hero typically reveals an enigmatic mix of god and man, as in the accounts of the Sumerian and Babylonian hero Gilgamesh, destroyer of the monster Huwawa. Once reduced to human dimensions, the hero could no longer hold onto his original weapon, a weapon claimed to have altered the destiny of heaven and earth.

Localization of the celestial drama had a huge impact on Greek imagination, as can be seen in virtually all Greek epic literature. In the most popular tale of all, Homer's *Iliad*, the ideal warrior is Achilles, whose story provided the fulcrum upon which the poet integrated different tribal memories, bringing together dozens of regional heroes upon the battlefields of a legendary, and entirely mythological, Trojan War. But the more archaic themes, though subdued, are still present.

Achilles' father was the mythic king Peleus and his mother the "sea" goddess Thetis, daughter of Oceanus, for whose affections both Zeus and Poseidon had contended. Bathed by his mother in the river Styx, the river that "joins the earth and Hades," he was tutored by the Centaur Chiron. His armor was fashioned by the god Hephaestus, the very god who fashioned the thunderbolts of Zeus.

The actual terrestrial city of Troy is the modern Hissarlik in Turkey, the site of a fortified palace from the Bronze Age onward. Neither this palace, nor anything uncovered by archaeologists in the region could have inspired the city of which the poets spoke! In the cultures of the Near East and Mediterranean, hundreds of historic kings left unmistakable proof of their lives and their cultural influence. But of the countless kings, warriors, princesses and seers in the *Iliad*, not



one finds historic validity. The reason for this is that the claimed events did not occur on earth. The original subject was a cosmic drama, whose episodes progressively masqueraded as terrestrial history.

In the illustration on the left, from a Greek drinking vessel, Achilles confronts the serpent-guardian of a Trojan fountain. Our question must be: what is the relationship of this image to the archaic contests between warrior gods and chaos serpents?

The similarities shared by mythic heroes are vast, directing our attention to ancient themes that can only appear incomprehensible to the modern world. The poets spoke of Achilles' spear as *forked*, or possessing a "double tongue", as when Aeschylus, in his *Nereids*, writes, "The shaft, the shaft, with its double tongue, will come." Practically speaking, a forked spear-point would likely have doomed an ancient warrior using it. But the image was not rooted in practicality. It comes directly from the well documented forked configuration of the thunderbolt wielded by Zeus. Of Achilles' spear, the poet Lesches of Lesbos (author of the *Little Iliad*), wrote:

"The ring of gold flashed lightning round, and o'er it the forked blade."

The ancestral warrior, bearing the lightning-weapon in battle, was but an echo of the warrior god.



heroes, the esteemed ancestor of the tribe or nation telling the story. Once reduced to human dimensions, the hero could no longer hold onto his original weapon, a weapon claimed to have shaken and forever changed both heaven and earth.

The Lightning-Weapon in Later Times

The evolution of the myth presented an enigma. How would later poets and historians, after localizing the stories, describe the *cosmic* weapon with which, in the more archaic tales, the warrior-god vanquished heaven-spanning serpents, dragons, and chaos monsters?

Of course, mythologists will not normally think of the sword of Perseus (right) or the club of Hercules—much less the healing "staff" of Hermes—as symbols of the cosmic "thunderbolt." World mythology presents such figures by the thousands, and in most instances the original identity of the magical weapon has slipped into the background. Yet only rarely could it be hidden entirely. In most cases, the localized weapon still retained glimpses of the original: it was a "gift" from gods or goddesses, could strike *like* lightning, or was constructed from "flashing" gold or some indestructible material, had the miraculous ability to expand to cosmic dimensions when wielded in combat, or its magical powers traced to an age of gods or semi-divine ancestors. Nevertheless, what we usually see is just a shadow of the cosmic thunderbolt so vividly described in early Near Eastern narratives of primeval order and chaos.

The "shadow," however, is sufficient to establish the original identity of thunderbolt and hero's weapon in other bodies of myth. In the Grail cycle of myths, lightning receives the name Lanceor, or "Golden Lance," an archaic name of Lancelot. Lightning is also linked to the sword Excalibur, which Geoffrey of Monmouth called Caliburn, from the Welsh Caledwvich, Irish Caladbolg, traceable to the archaic Celtic language of lightning.³⁸

The most famous Celtic hero, Cúchulainn, victor over chaos powers, held a weapon granted him by the lightning god Bolga, "the inventor of the missile spear." By acquiring this weapon, "Cúchulainn was greatly strengthened in battle."³⁹ Gaé Bolga is translated as "Bolga's spear" or "a harpoon-like javelin." Sometimes referred to as a "lightning weapon," it had its origin in the Otherworld where it was forged by the divine smith. Its lightning stroke was always fatal.⁴⁰



Perseus, the hero who slew the monstrous Medusa, was celebrated in later times as a *constellation*. The scene here is from the masterful work painted on the ceiling fresco of the Villa Farnese in Caprarola, Italy.



Sagittarius. From Hyginus, *Poetica astronomica* (1485 edition).

In the form of a sword, the lighting weapon bestowed upon Fergus, one of the two sons of Fionn, offered a great advantage in warfare, enabling him (like so many mythic heroes) to single-handedly slay hundreds on the battle field. "This sword was named *In Caladbolg*, a two-handed lightning sword."⁴¹

Again and again, Germanic tribes placed a lightning weapon in the hands of their celebrated heroes. The diverse mythic forms of the thunderbolt, according to H. Bächtold-Stäubli, include "the glowing missiles; as such they are present in all stages of human cultural history, from the rough stone and club of primitive times through the hammer, axe, and spear, to the golden sword wielded by the Hero."⁴²

Gertrude Jobs, a diligent investigator of symbolic themes, affirms that, among the Altaic Tatars, lightning was the "arrow of a mighty hero."⁴³ A common Slavic name for the weapon of the celestial warrior Perun is *strela*, "arrow."⁴⁴ The lightning of the Finnish Ukko appears as "fire arrows" or "copper arrows."⁴⁵ Similarly, the Finnish warrior-hero Jumala, is said to have "wielded thunderbolts in the shape of jagged lightning-spears."⁴⁶

In several parts of Italy *saetta* or arrow is the name for the lightning. In Slavonia the "thunderstone" is called *strelica* (i. e., arrow), on Swedish soil in some places *åskpil* (thunder-arrow), in Mecklenburg *dunnerpil*, etc.⁴⁷

The same language appears in the British Isles. Irish *saign_n*, "lightning," is derived from *saigit*, "arrow," and both this word and *seah*, "thunderbolt," in Breton dialects are based on Latin *sagitta*, "arrow."⁴⁸ Thus our familiar images of Sagittarius, the divine "Archer" of constellation symbolism, clearly belong to an ancient tradition equating the hero's arrow and the divine thunderbolt. Less known is the much smaller constellation Sagitta, "the Arrow," close to the center of the Milky Way. Here the constellation symbol, according to Eratosthenes, harked back to "the arrow shot by Apollo against the Cyclops, who forged the lightning with which Zeus had cut off the life of his son Asclepius."⁴⁹

Among the Tibetans and Mongols lightning is seen as the arrow of a dragon-riding god, and thunder as the voice of the dragon.⁴⁸ So too, the warrior Raiden, in Japanese myth, wielded "fire-arrows"—acknowledged to be lightning—in his battle against the chaos power, Raiju, the "Thunder-beast."⁵⁰

Among the Zulu tribes of Africa, lightning takes the form of a dazzling spear hurled through the air.⁵¹ The African Kikuyu say that God clears his path with a weapon, often described as a sword, and identified as the lightning.⁵²

Numerous equations of hero's weapon and thunderbolts occur in the Americas as well. An Iroquois account tells of a warrior Hé-no, whose thunderbolt vanquished a chaos monster—

Hé-no's name means 'thunder.' A monstrous serpent dwelt under the village, and made his annual repast upon the bodies of the dead which were buried by its side ... he went forth once a year, and poisoned the waters of the Niagara, and also of the Cayuga creek, whereby the pestilence was created ... Hé-no discharged upon the monster a terrific thunderbolt which inflicted a mortal wound.⁵⁴

Essentially the same notions prevailed throughout the Americas. The Navaho say that, long ago, the arrows that defeated the devouring powers of chaos were the lightning.⁵⁵ Zuñi tradition identifies the lightning as "as the arrows of celestial Archers."⁵⁶ The Pawnee and their neighbors recall the great warrior, named Black Lightning Arrow.⁵⁷ Thus, Von del Chamberlain, who ranks among the most informed authorities on Plains Indian mythology, tells us that "the flint-tipped arrows of the Indian correspond to the lightning arrows shot to earth by higher powers ... Pueblo Indian designs also show the lightning, tipped with arrow-heads."⁵⁸

Thunderbolt as Club, Hammer, and Axe

The warrior and his thunder-weapon find explicit illustration in the Germanic Thor, whose name is given to a day of the week—Donnerstag, the day of Thunder, our Thursday. He was the strongest of men and of gods, the victor over giants, dragons and a host of dark or destructive powers. Thor was the "Hurler" (Vingnir) and his weapon was the thunderbolt, with which the great warrior himself seems to have been inseparably identified. "The god is, etymologically, thunder, and his hammer, Mjöllnir (Crusher), represents lightning."⁵⁹

As we should expect, it was Thor who vanquished the terrible Midgard serpent or Jörmungand ("wolf-serpent"), seen thrashing about in the sky while the world reeled under the catastrophe of Ragnarök, the rain of fire and gravel. In confronting the monster, Thor hurled his great stone hammer or mallet Mjöllnir, fashioned by dwarves in much the same way that the Cyclopes fashioned the thunderbolt of Zeus. The power of the blow was sufficient to send the Midgard serpent plummeting into the sea.

Again, both the symbolic associations and the linguistic roots bear out the overlapping identities of hero, hero's weapon, and lightning. It is generally recognized that Thor's "lightning weapon" was originally an independent warrior-god. Amulets dated to the tenth century and presenting the lightning-weapon in human-like



In a field at Cerne Abbas, England, the Celtic hero god Dagda is inscribed in chalk. Wielding a giant club, the figure is almost 220 feet tall.

The Good and Evil Warrior

As cross-cultural investigation exposes the underlying patterns of world mythology and symbolism, we discover ironies that would not be expected from the study of a single culture alone. Despite the overwhelming evidence that the different cultures were describing the *same* events, comparative inquiry reveals surprising paradoxes and role reversals arising from tribal and nationalistic loyalties.

Most surprising is the warrior-hero's hidden identification with the masculine chaos monster he battles. The one turns out to be the alter ego of the other, and all that distinguishes them is the *interpretation* of events. Though the situation is more complex than this due to the role of another archetypal figure (see discussion of the mother goddess, Chapter 3, p. ___), the evidence is sufficiently clear to allow this generalization: the hero and his masculine "enemy" stand side by side, each a mirror image of the other.

In Sumerian and Babylonian traditions, the god Ninurta was said to have battled a "usurper," Anzu. But archaically, in the city of Lagash, the lion-headed Anzu was the symbol of divine rule.

The prototypical power of chaos and darkness in Egypt is the god Set, but in one tradition, it was Set who *harpooned* the chaos powers. Indeed, it is well known that the Hyksos, who ruled Egypt for a time, revered Set as the model of the heroic warrior.

We see the same ambiguities in Hinduism. Ravana, the leader of the Rakshasas, was a prince of great beauty, favored by Brahma. But in the *Ramayana* epic Ravana is the great demon brought down by the warrior Rama.

The Hindus feared and hated Ahi, the demon whom their hero Indra vanquished. And yet, Ahi's Iranian counterpart, Azhi Dahaka or Zohak, appears as an exemplary king, who heroically ousts the usurper Yima Xaeta or Jamshid. In Tibetan traditions the god Indra is not a hero, but a demon.

We meet the same paradox in New Zealand where Maui is the prototypical hero, but Maui-Tiki, his Tahitian counterpart, was a maleficent fiend, the slayer of men.



ABOVE: Archaic Sumerian cylinder, showing the lion-headed eagle of Lagash. This "eagle"-god, revered by priests and poets in Lagash, is in fact Anzu, who appears as the enemy in the story of the warrior Ninurta's confrontation with Anzu.



LEFT: The ancient Egyptian god Horus stood in intimate relationship to his constant enemy Set, a relationship symbolized here by the heads of the two gods on a single body. RIGHT: The Hindu Ravana was both a good king and a demon.

There is more to the paradox, but for now it is sufficient to note that it was not reverence alone that inspired the ancient devotion to the warrior, but terror as well. The warrior's "heroism" stood in balance with his terrible aspect as usurper, murderer, and madman, the bringer of pestilence. The archetype of the warrior-hero and of the destroyer ultimately meet in the same figure.

form, sometimes show the lightning god's beard taking the place of the hammer head.⁶⁰

Numerous authorities, including Jacob Grimm, assure us that the hammer of Thor means the "crushing thunderbolt." Grimm compares the Teutonic Mjölnir with Slavic *molnija*, "lightning."⁶¹ In fact, the widespread linguistic relationship of the stone hammer-head to lightning is now well-established. Welsh *mellt*, Church Slavonic *mluniji*, Serbo-Croatian *munja*, Russian *molnija* and Old Prussian *mealde*, all meaning "lightning," are derived from the same root. So too, the Old Norse *myln*, "fire," and especially Latvian *milna*, are invoked as the "hammer" of the warrior Perkun and acknowledged to be the lightning.⁶² Scholars such as Christopher Blinkenberg who have investigated the general theme. find that the identification of the warrior's "hammer" with lightning is so pervasive as to constitute a bedrock principle.

Also of interest here is the Hindu *vajra*, the illustrious thunderbolt of the warrior Indra, called a "whizzing club" in the sacred texts of the *Rig Veda*.⁶³ Such images of the lightning-weapon invariably lead us backward to the lightning-mace held in the hands of the Near Eastern storm gods noted above.

To these symbols of the divine thunderbolt we must add the *axe* wielded by gods and heroes—a subject already well explored in scholarly studies.

As noted by B Schmidt, the word for the thunderbolt in modern Greek tales of primordial warfare in the heavens is *astropeléki*, the "sky axe,"⁶⁴ though perhaps "star axe" or "stellar axe" comes closer. This is the very term which, to this day, native populations use for Neolithic stone fragments and implements that, when recovered, are venerated as the lightning weapons of the gods.

Authorities who have examined the symbolism of the lightning-axe trace it back to Minoan civilization and farther still to Babylonian cosmology.⁶⁵ But the lightning-axe is not limited to a particular region of the world. It appears as the weapon of the Aztec Tlaloc, the Maya Chac, and numerous legendary warriors of African mythology, finding equally vivid expression in the South Pacific and throughout eastern and southeastern Asia.⁶⁶

The Club of Heracles

Of all the ancient Greek heroes, none achieved greater popularity than the club-wielding warrior Heracles, whose far-famed "Twelve Labors," together with many other adventures, compressed diverse tribal lore into the ordeals of a single hero.

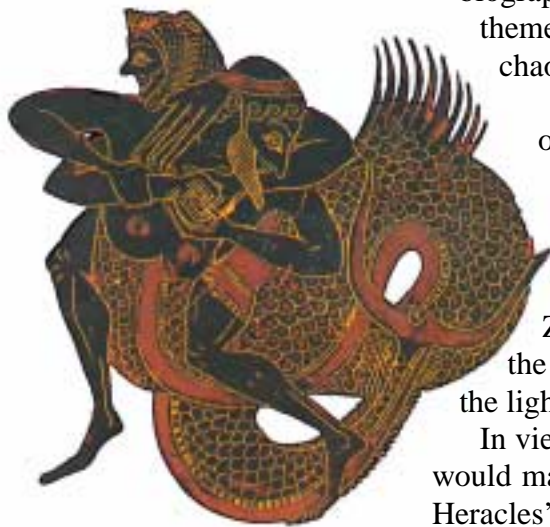
The vase painting on the following page depicts Heracles' defeat of the giant sea serpent Triton. Such exploits typified the



Norse warrior god Thor, wielder of the thunderbolt in battle.



In this scene on a Greek coin, Heracles wears a lion skin over his left arm while his right hand rests on a club; in the field to the left, a thunderbolt.



Heracles vanquishes the sea-dragon Triton.

biography of the hero, with its variations on a single underlying theme, all harking back to the mythic warrior's contests with chaos monsters.

Heracles' own relationship to the thunderbolt may not be obvious, but neither was it forgotten. As seen on the previous page, a Greek coin depicts Heracles standing with a club in his right hand. In the field behind him is the thunderbolt of Zeus. Just as the spear of the celebrated warrior Achilles retained the connection to the thunderbolt of Zeus (it "flashed lightning round"; see sidebar on page 46), the poet Hesiod describes Heracles leaping into battle "like the lightning of his father Zeus."

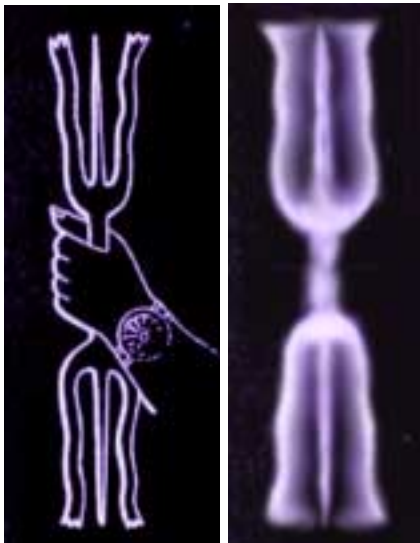
In view of Heracles' acknowledged links to Thor and Indra,⁶⁷ it would make no sense to ignore the cross-cultural implication, that Heracles' giant-slaying club is a Greek variant of the lightning weapon carried by heroes around the world. Of course, most specialists in Greek literature and religion give little attention to cross-cultural comparison. But the lightning-clubs of other heroes globally can hardly be ignored. Even the Dinka of Sudan honored a great ancestor-god Deng, whose club was the thunderbolt.⁶⁸

Cosmic Thunderbolt and Plasma Discharge

The mythic traditions reviewed above pose a question vital to our investigation. What is the cosmic thunderbolt's connection to the plasma discharge forms documented in the laboratory and found in rock art by Anthony Peratt?

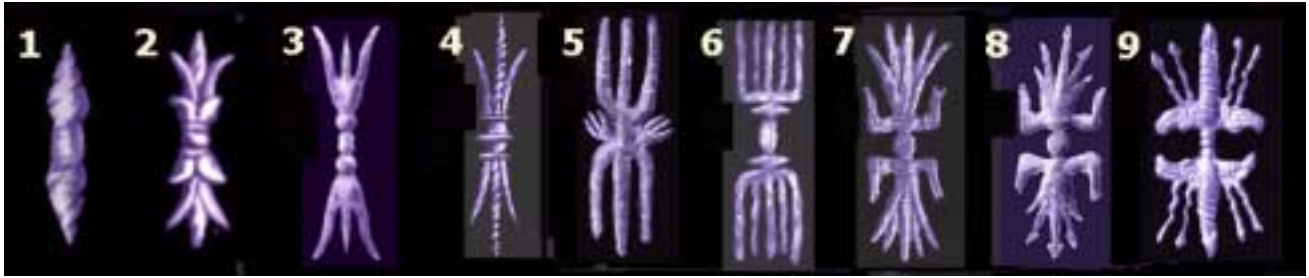
The evidence suggests that before the monumental civilizations arose, intense electrical activity in the sky was the overriding concern of humanity. The events that inspired the myth-making epoch, with its pervasive themes of order and chaos, also provoked a massive collective response within all of the emerging civilizations. Both the natural events and the commemorative symbols they inspired bear a direct relationship to the vast pictographic record carved on stone, pointing back to a time when all of humanity witnessed prodigious plasma formations in the heavens.

The illustration on page 30 shows the Sumerian Ninurta wielding the thunderbolt in his battle with the monster Anzu. For our purpose here, the key is the *form* of Ninurta's thunderbolt (far left). We present alongside this image a three-dimensional representation of the corresponding discharge form suggested by the archaic symbol. It is a variation on the "hourglass" configuration discussed in Chapter One. We offer this idealized configuration to emphasize that, in the plasma interpretation of the thunderbolt, the two outer "prongs" belong to the same transparent, *cylindrical* current sheet. The



LEFT: Thunderbolt in the hands of Ninurta, as he battled the monster Anzu.

RIGHT: Idealization of a bipolar plasma discharge formation, illustrating the three-dimensional structure accounting for the Babylonian image.



ABOVE: Recurring Greek images of the thunderbolt of Zeus.

“warped” look of the cylindrical component of the “hourglass” configuration can be compared to many variations in archaic rock art.

Of all the ancient cultures it seems that the Greeks preserved the most voluminous artistic renderings of the thunderbolt. It is instructive, therefore, to compare the core Greek images to similar variations in laboratory discharge configurations.

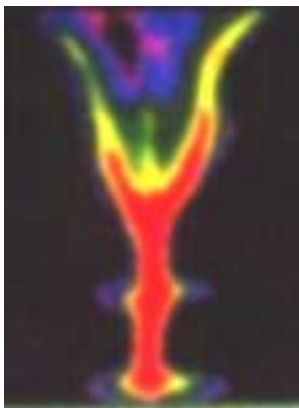
The examples above represent several common thunderbolt forms in Greek art. But it is the three dimensional nuances of the plasma discharge *interpretation* that enable us to see past the limitations of the ancient media and to envision the energetic patterns represented. The Greek themes then fall into place.

In art and literature, the Greek thunderbolt repeatedly shows a central “corkscrew” column, answering to Birkeland Currents entwined around a central axis (see illustration on page 24). In Greek representations this corkscrew column persists through many variations of the thunderbolt, just as it does in similar laboratory discharge configurations.

As the entwined currents in a linear discharge become more tightly bound they may appear as a single glowing column, a principle evident in many Greek illustrations. Indeed, the Greek examples leave no doubt that this axial column *is* the thunderbolt as sword,

BELOW: Greek thunderbolt as sword, spear, missile, or arrow.





Laboratory discharge photograph published by Anthony Peratt.

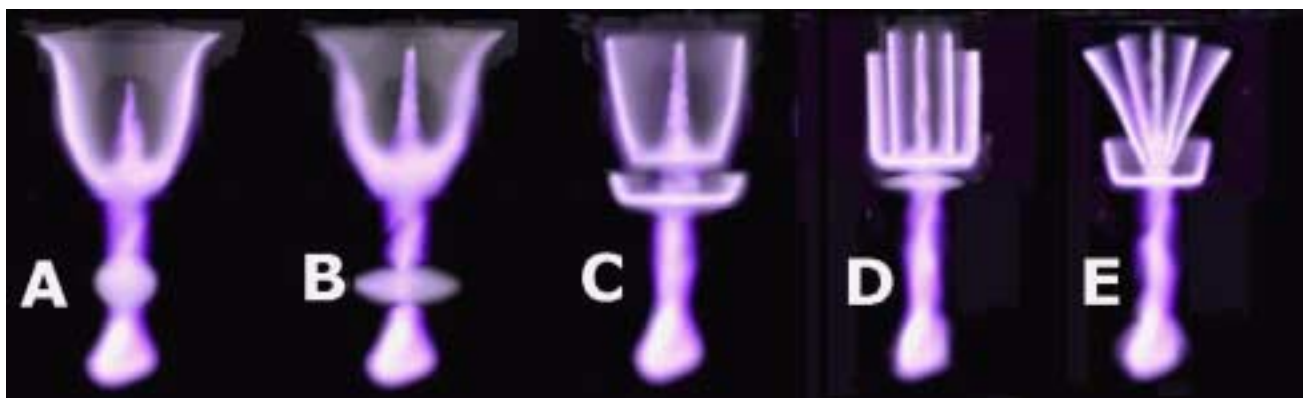
spear, missile, or arrow (examples below).

From any conventional vantage point, the Greek thunderbolt images can only appear to be disconnected from all natural experience. A hallmark of the Greek images is the role of symmetry, both along the axis and to the left and right of the axis—not a feature of familiar lightning, but a feature remarkably consistent with the patterns of plasma discharge.

Greek artists repeatedly show the twisted column sending forth the sepals or leaves of a “lotus”-blossom, these evolving into symmetrically displayed, outstretched horns or wings. Hence, the general accord with plasma discharge configurations is all the more telling (example on left).

Typically, the Greek images depict either the lotus-form or its evolution into horns or wings in bipolar pairs—much like many rock art images associated with the hourglass form (the “squatter man,” etc.). Greek examples of the thunderbolts are dominated by patterns of bipolarity, often with perfect symmetry. But the artists also employed frequent variations between the upward- and downward-pointing components, while only rarely varying the symmetry to the left and right of the axis. We have already noted similar variations in the vertical components of the hourglass or “squatter man” in worldwide rock art. (See discussion of bipolar symmetry in Chapter One.)

The laboratory counterpart of form (3) above was published by Anthony Peratt in his first article on plasma discharge in relation to ancient rock art. The idealized form of the discharge, given for the purpose of illustrating three-dimensional structure and plasma dynamics, is formation (A) below. In this “brandy glass” formation,



The illustrations above interpret the Greek thunderbolt images as plasma discharge, emphasizing the three dimensional contribution of current sheets and cylinders.

the upper termination of the axial discharge column appears as a central spike enclosed within “horns” or outstretched “wings.”

Plasma discharge generates magnetic fields that, in turn, influence the discharge structure and evolution. Current filaments and

sheets can attract each other at larger distances but repel at shorter distances, leading to various forms of equilibrium, all contributing to the non-random or “organized” look of the configurations.

The forms noted here graphically idealize the plasma discharge formations implied by the Greek images. Along the axial column, “pinching” of the entwined Birkeland Currents by the induced magnetic fields will typically produce a spheroid, which then begins to flatten into a disk. As the disk expands, its edges will begin bending upward or downward to form a “saucepan” or “bowl” shape. It is this spheroid-to-disk and disk-to-cylinder evolution that gives rise to the “brandy glass” forms (A) and (B) above.

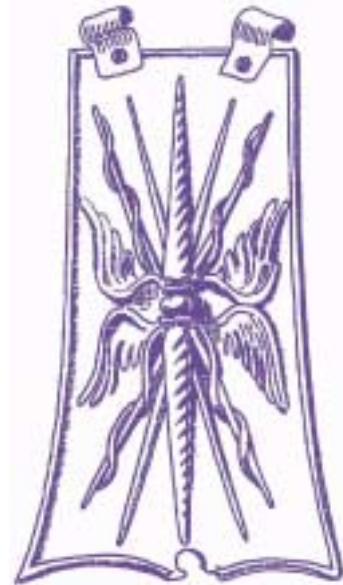
A discharge column can produce multiple disks or toruses stacked along the column. Where conditions foster bipolar symmetry, it is not uncommon for one disk above the pinch point to bend upwards while the disk forming beneath the pinch bends downwards, creating the hourglass form discussed in Chapter One. In high energy discharge an entire stack of disks or toruses may be bent in either direction, a form also noted in Chapter One.

It is important to see the discharge configuration in its three-dimensional aspects. An observer walking around the configuration would continue to see essentially the same form. And while the configuration displays three prongs (a “trident” form), the central column, composed of bound currents, is of a fundamentally different dynamic than the two “horns” of the right and left, which belong to a single rotating (cylindrical) current sheet.

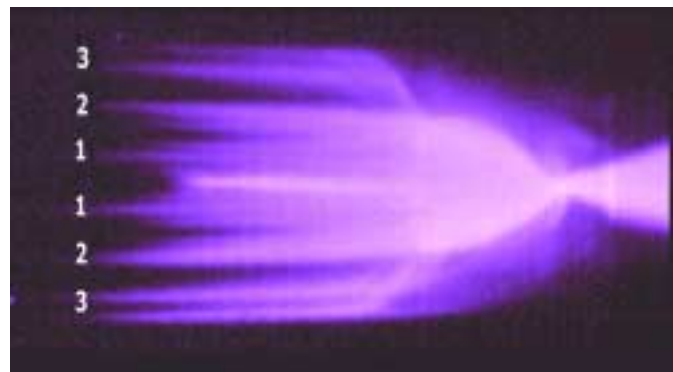
In the second illustrated configuration (B), the spheroid-in-formation of (A) has begun to flatten into a disk, and the central column of the discharge has extended farther upward into the “brandy glass” form of the current sheet.

In image (C) the disk in the discharge column has moved upward and its edges have folded upward as well, to influence—and be influenced by—the magnetic fields configuring the upper “horns.” The “horns” have become more angular, a common occurrence in the evolution of Peratt Instabilities.

Image (D) illustrates the interaction of embedded cylindrical currents held in equilibrium (attraction and repulsion) parallel to the discharge axis. This “pitchfork” appearance answers to the Greek form (6) and to the laboratory discharge configuration given on the right.



This later image of the Greek thunderbolt integrates key design elements from the more archaic designs, retaining the principles of bipolar symmetry and symmetry to the left and right of the axis. The respective elements are entirely alien to those of a terrestrial lightning bolt.



Laboratory discharge, in artificial color, illustrates the “pitchfork” configuration, constituted of cylindrical current sheets in a plasma pinch.

In image (E) the cylinders of (D) are magnetically pinched at their base to form embedded conical cylinders. This is the basis for the discharge interpretation of the Greek form (7).

All of these configurations have one attribute in common. Turn them on their axes, and they would continue to present essentially the same form. The distinctive appearance is due to the luminosity of excited particles along the observer's lines of sight. In the cylindrical components, for example, the greatest brightness occurs on the limbs, where the line of sight passes through the largest volume of excited particles, whereas the more transparent or darker regions are those where the line of sight passes through the lowest volume (the portion of the cylinder perpendicular to the viewer).

Analogues in Space

It is not in the laboratory alone that we observe the unique features of plasma discharge discussed here. The same formations can now be seen in space, though most astronomers remain unaware that electrified plasma generates these observed forms. Of course, the electrical interpretation of the nebulas noted here is not the commonly accepted view among astronomers. Thus, as new telescopes further our ability to see deeply into space, a continuing stream of surprises seems certain.

The "hourglass" discharge configuration has one of its more obvious counterparts in the Hourglass Nebula on the left, and astronomers concede that it is forcing a reconsideration of the physics of nebula formation. According to Raghvendra Sahai, an astronomer at the Jet Propulsion Laboratory in Pasadena, California, "What we thought we understood of planetary nebulae we no longer do. Something different and dramatic is going on."⁷⁴ Astrophysicists offer various guesses as to how a belt of "gas and dust" might form around the equator of a dying star. They imagine that a stellar "wind"—exploding in *all directions*—is somehow "constricted" to create *bipolar jets*. In some discussions of late, they even use the term "pinch," but in contexts that are more gravitational and mechanical than electrical. No mention is made of the far simpler plasma discharge pinch, because that requires a source of electrical energy external to the star. Yet in plasma laboratory experiments, the observed effect is commonplace—not just the pinch but all of the features of "hourglass" formations now seen in space.

A similar mystery is posed by the Butterfly Nebula (or M2-9), and higher resolution Hubble Telescope images have only underscored the unanswered questions. Inside the "hourglass" of both the Hourglass and Butterfly nebulas is a second hourglass form. "It's



The Hourglass Nebula illustrates the powerful effects of the plasma pinch along the axis of a discharge.



Hubble Telescope image of the The Butterfly Nebula, one of the most striking examples of a bipolar formation in space, with collimated jets and embedded cylinders extending distances greater than the diameter of our solar system.

very hard to see how you get it," Sahai states.⁶⁹ But again, glowing coaxial cylinders and cones are not a surprise to experts in plasma discharge phenomena.

Responding to the surprising details of the Hubble image, Lars Christensen of the European Space Agency states: "It's a big mystery to us all—how a round star like our own sun can create this effect, which is so symmetrical. It's amazing."⁷⁰

Struggling to comprehend things never anticipated by prior theoretical models, astronomers have resorted to improbable guesses based on gravitational and mechanical, non-electric forces with no reference to the electrical circuits necessary to generate the *observed magnetic fields*. Some imagine a binary star system with two stars in extremely close proximity exchanging mass. Matter drawn from one of the stars, they suppose, generates a giant disk around the other. Then, the "high-speed wind from one of the stars rams into the surrounding disk, which serves as a nozzle. The wind is deflected in a perpendicular direction and forms the pair of jets seen in the nebula's image."⁷¹

This scenario, using a "jet engine" as its analogy, lacks any plausible mechanism to generate the high-speed wind in the first place. Moreover, the claimed "wind" should generate highly visible effects on the disk, causing it to quickly dissipate. Both the "hourglass" and "pitchfork" components of the nebula are, in fact, replicable in high-energy electric discharges. Illuminated by direct experimental evidence, the Butterfly Nebula can be seen as a "thun-



This image produced by the Very Large Telescope, focused on the pinch point at the hourglass "neck" of the Butterfly Nebula. It shows a toroidal band of dusty plasma occluding the star at the center of a high energy discharge. A torus of this sort, whether visible or not, is predicted by the science of plasma discharge.



ABOVE LEFT: Ant Nebula.
ABOVE RIGHT: the “exploding” star Eta Carinae.

derbolt” form in space, with powerful electromagnetic forces maintaining its integrity across *trillions* of miles. That is not the way a mere cloud of electrically neutral “gas and dust” will behave in the vacuum of space!

Bipolar formations of this type, arising from the plasma pinch, are also well illustrated by the Ant Nebula (above left). Seen in the constellation Norma, its outflow speeds—3.5 million km/hour—surpass those of any other known object of its type. Though similar in appearance to the Butterfly Nebula, its outflow pattern resembles that of the bizarre, “unstable” star Eta Carinae (above right).

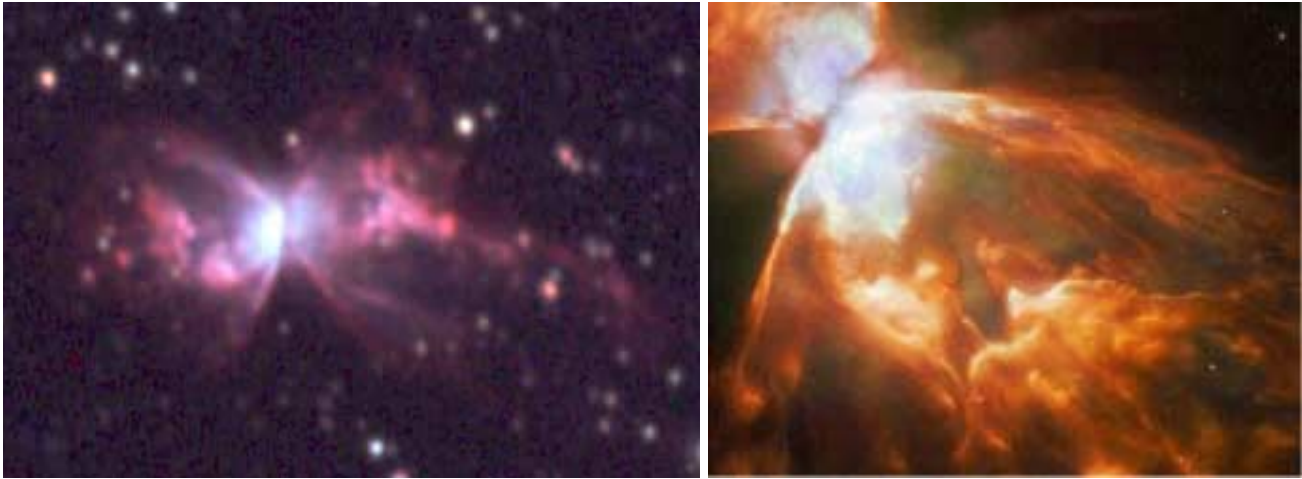
The lobes of Eta Carinae are as wide as our solar system and are observed to be expanding in opposite directions away from a central bright disk at speeds in excess of 1 million km/h (600,000 mph). Many astronomers now accept that the odd shape is due to the star's intense magnetic field channeling plasma. But still the electric *source* of magnetic fields receives no mention. To explain 3 million degree temperatures and x-rays from gas more than a *light-year* from the central star, they resort to purely mechanical “shock waves,” a concept that is completely unnecessary in an electric universe.

As long ago as 1968, Dr Charles Bruce of the UK Electrical Research Association identified planetary nebulae as bipolar electrical discharges from a central star. The nebula of Eta Carinae certainly belongs in that category. If the nebula is a plasma



The “planetary nebula” NGC 2346, revealing the telltale hour-glass form.

heated by electric currents feeding into the star of Eta Carinae then, just as with our own sun, the highest “temperatures” are encountered beyond the star. That is why there is relatively little radiation



from the star at the center. Most of the electrical power focused on the hapless star is being intercepted by gas and dust in the nebula and radiated energetically into space. Thus, Dr. Fred Seward of the Harvard-Smithsonian Center for Astrophysics expressed great surprise at what he saw: "I expected to see a strong point source with a little diffuse emission cloud around it. Instead we see just the opposite—a bright cloud of diffuse emission, and much less radiation from the center."⁷⁸

Though a lot is happening close to the highly energetic pinch point, the hourglass form can be discerned in relation to the pinch, and stands in a predictable relationship to the “pitchfork” configuration of cylindrical current sheets.

These are by no means the only “hourglass” formations exhibited by nebula. In the Bug Nebula above, for example, many indications of electrical activity are evident. The central star is hidden by a dark dust torus. And the shapes within the nebula mimic the twisted filaments, spirals and pillars typical of electrical discharge in plasmas.

Conclusion

In this investigation, converging paths of inquiry demand a reconsideration of popular beliefs in the sciences and social sciences. We can no longer view the history of human consciousness—or the history of our planet—through the lens of twentieth century cosmology.

The myths and symbols of antiquity will have a central place in this reconsideration. Though presented in the language of myth and symbol, ancient accounts of the warrior, the dragon, and cosmic combat are filled with images of electricity. The "thunderbolts of the gods" defy every effort to understand them as references to

ABOVE LEFT: The Bug Nebula, spanning about one third of a light year, but retaining the hourglass form of the plasma pinch. The light of the star is rich in ultraviolet, one of the signatures of electric discharge.

ABOVE RIGHT: A higher resolution Hubble Telescope image of the Bug Nebula.

familiar lightning. They spiral and whirl and entwine. They blossom as a flower, or stand as a great pillar supporting the sky. Their forms are not the forms of regional lightning, but of plasma discharge in plasma laboratory experiments.

The ancient "lightning gods," such as the Greek Zeus or Apollo, move about as fierce and towering forms in the heavens. In their appearance, these gods answer to no recognizable entity or force of nature, and the chroniclers' descriptions will tempt us to regard the myth-makers themselves as relentless liars. But a much different understanding of ancient accounts is possible, if we grant to the original witnesses a certain integrity. We do not need to regard their testimony as "scientifically accurate." We need only acknowledge that the core themes of mythology may have originated in *extraordinary* natural events, for which ancient races had no cultural preparation.

If this was the case, the stories are a form of historic testimony in the only languages that were available to the eyewitnesses themselves. It then becomes clear that around the world many different hieroglyphs and symbols actually described *identical* celestial phenomena. This discovery, in turn, requires that we follow the logical rules for dealing with converging testimony. How do we uncover the forgotten events now hidden behind the symbols they inspired?

As discoveries in plasma science continue, we can be confident that a comparative analysis of ancient sources can stand alongside other fields of evidence. The testimony of ancient witnesses will find many corollaries in laboratory research and in new vistas in space.

Chapter Three



“...And the heat and blaze from both of them were on the dark-faced sea, from the thunder and lightning of Zeus and from the flame of the monster, from his blazing bolts and from the scorch and breath of his stormwinds.”
Hesiod, *Theogony*, describing the dragon Typhoeus' assault on the world.

CHAPTER THREE

ELECTRICAL ENCOUNTERS IN SPACE

Velikovsky's Challenge: An Unstable Solar System

No one investigating the themes of myth and catastrophe can afford to overlook the pioneering work of Immanuel Velikovsky, author of the 1950 best-seller *Worlds in Collision*. Though the book sparked an international scientific controversy, continuing well into the 1970's, few scientists today are familiar with the independent investigations inspired by Velikovsky's insights. As a result, the occasional comment on Velikovsky rarely touches the issues as they now stand, more than 40 years into the space age.

Velikovsky saw in ancient literature a story of planetary disturbance, rich with images of cosmic upheaval and improbable monsters in the sky. A centerpiece of his reconstruction was the planet Venus, the subject of catastrophic images the world over. Velikovsky claimed that about 3500 years ago, Venus appeared in the sky as a spectacular comet, nearly colliding with the earth and bringing wholesale disaster. He also argued that several centuries after this disaster, a series of close encounters of Earth and Mars produced upheavals on a global scale. Less well known is his claim that ancient planetary catastrophes involved bolts of "lightning" or electrical arcing between planets in close approach.

To most scientists the idea of a planet as a comet, or planets jostling with each other like "billiard balls," or lightning on an interplanetary scale, was simply preposterous. Velikovsky's work deserved only ridicule.

It is not our purpose here to analyze the details of Velikovsky's work. Our interest is in fundamental concepts that distinguish his insights from the sweep of modern theory. In *Worlds in Collision* Velikovsky claimed—

1. The present order of the planets is new. In geologically recent times the planetary system was unstable, and at least some planets moved on much different courses than they do today.
2. Erratic movements of the planets led to global catastrophe on the Earth.



Immanuel Velikovsky

3. Through rigorous cross-cultural comparison of the ancient traditions, an investigator can reconstruct the celestial dramas.

Velikovsky brought impressive scholarly credentials to his inquiry, and his approach was interdisciplinary. He used the insights of a psychoanalyst and the methods of a historian to investigate the traditions of diverse cultures. He discerned deeply rooted themes that others had failed to see—descriptions of traumatic events occurring on a global scale.



Immanuel Velikovsky, 1972

In support of his reconstruction Velikovsky found physical evidence from geology, paleontology, and archeology. He also formulated a series of predictions consistent with his hypothesis, but unexpected by previous theories. He predicted that the planet Jupiter would emit radio signals; that the planet Venus would be much hotter than astronomers expected; and that craters on the moon would reveal remanent magnetism and radioactive hot spots. Velikovsky's ability to anticipate scientific discovery produced a surprising statement from the renowned geologist Harry Hess (in an open letter to Velikovsky in 1963):

Some of these predictions were said to be impossible when you made them. All of them were predicted long before proof that they were correct came to hand. Conversely, I do not know of any specific prediction you made that has since been proven to be false. I suspect the merit lies in that you have a good basic background in the natural sciences and you are quite uninhibited by the prejudices and probability taboos which confine the thinking of most of us.¹

The authors of this book believe that Velikovsky was incorrect on many particulars, some of them crucial to a proper understanding of ancient events. But his place among the great pioneers of science will be secure if he was correct on the underlying tenets noted above. For this challenge to customary beliefs Velikovsky was ridiculed and reviled. The most profound implication of that challenge is an insight that is crucial to understanding space age discoveries. He said that the only way the evidence that he presented could be reconciled with current scientific knowledge would be through consideration of electromagnetism. In *Worlds in Collision* he wrote:

I became skeptical of the great theories concerning the celestial motions that were formulated when the historical facts described here were not known to science.... The accepted celestial mechanics, notwithstanding the many calculations that have been carried out to many decimal places, or verified by celestial motions, stands only if the sun ... is as a whole an electrically neutral body, and also if the planets, in their usual orbits, are neutral bodies. Fundamental principles in celestial mechanics, including the law of gravitation, must come into question if the sun possesses a charge sufficient to influ-

ence the planets in their orbits or the comets in theirs. In the Newtonian celestial mechanics, based on the theory of gravitation, electricity and magnetism play no role.²

This was written several years before the space age began. But now, as we argue in this and later monographs, the vital role of electricity and magnetism can no longer be denied. We have, however, gone beyond Velikovsky's observations to identify numerous aspects of the ancient experience never envisioned by Velikovsky. The authors desire to honor Velikovsky here because, while we pursued our work independently of each other for more than two decades—one following historical evidence, the other exploring scientific evidence—we both received the original spark of inspiration from the same pioneering theorist.



An orrery, or mechanical model of the planetary system, now in the British Natural History Museum. The model symbolizes the stable and predictable movements of the planets—a sharp contrast to the insistence of ancient cultures that the heavens were altered catastrophically.

To question modern notions of solar system stability is to raise possibilities that presently have no place in space exploration, geological investigation, or accepted studies of ancient history. Communication in such a case can easily break down, due to the incompatibility of theoretical assumptions. Yet one advantage offered by the interdisciplinary hypothesis we offer in these monographs is its *testability*. The breadth of our subject permits the investigator to cross-reference wide-ranging fields of data, giving primary attention to undisputed patterns of evidence. In numerous instances, the patterns present *acid tests*

- Do the patterns present a unified picture of the ancient world?
- Do the patterns challenge modern assumptions about solar system history?
- Are the patterns *predictable* under a different view?

When the Planets were Gods

Certain beliefs that can only appear outrageous today pervaded the ancient cultures. One of these beliefs is that, at the beginning of time, heaven and earth were united. Prior to the collapse of this primeval order, towering gods moved about in a theater described as either *close* to the earth or *on* earth. What the ancient Sumerians called the “bond of heaven and earth” linked the gods above and

humankind below, when the supreme god Anu ruled with terrifying splendor.

The Egyptians celebrated the “First Time,” or “the age of the primeval gods,” marked by the universal kingship of Atum Ra. For Greek poets and philosophers it was the Golden Age of Kronos who, with his fellow Titans, dominated the heavens. Other cultures called it an age of “giants,” or of “archangels,” or of divine “ancestors” in the sky. Though we have much crucial ground to cover before taking up these traditions, certain facts must be acknowledged at the outset:

The story of Adam and Eve in paradise, as depicted in a painting by the 16th century German artist Cranach.



- Recollections of a prior “age of gods and wonders” occur the world over. Always this lost epoch begins with paradise, or a Golden Age, a stark contrast to “the present time.”
- Archaic mythical and astronomical traditions proclaimed that this former world disappeared in an onslaught of fire or flood.
- Commonly accepted approaches to human history are unable to illuminate either collective memory.

For anyone investigating the roots of ancient themes, these considerations can hardly be a small matter! Nor can they be separated from Velikovsky’s original challenge to science.

Vital clues appear in the early astronomical traditions. Ancient tribes and nations had reason to fear many natural phenomena, from earthquakes and volcanic eruptions to storms and floods. Most had good reason to fear their own neighbors as well, since “barbarians at the gate” periodically overwhelmed one culture after another. But what did the first *astronomers* fear the most? More than anything else on earth or in the sky, they feared the planets.

Significantly, the fear of planets is most emphatic in the birthplace of astronomy, in Mesopotamia. The historian Diodorus Sicu-

lus states the matter explicitly in his report of Chaldaean beliefs: “But above all in importance, they say, is the study of the influence of the five stars known as planets.”³ If the fathers of the science be heard, planets determined the fate of kings and kingdoms, brought devastating upheaval, and reconfigured the sky. One would think that many other forces in nature would have commanded far greater attention than remote planets. But the message of the first stargazers is clear. They venerated and feared the planets as the gods, goddesses, heroes, and chaos monsters of the mythical epoch.

Sumerian astronomer priests invoked the goddess Inanna, the planet Venus, as the radiance or glory of the heavens, but also as a great dragon depositing fiery venom on the “rebel land.”—

Like a dragon you have deposited venom on the foreign lands. When like Ishkur you roar at the earth, no vegetation can stand up to you. As a flood descending upon (?) those foreign lands, powerful one of heaven and earth, you are their Inanna. Raining blazing fire down upon the Land, endowed with divine powers by An, lady who rides upon a beast, whose words are spoken at the holy command of An!⁴

For the Sumerians and Babylonians no celestial power was more consistently linked to earthquake, pestilence, and death than the planet Mars, whom the star-worshippers honored as Nergal “raging flame-god... whose storming is a storm flood.”⁶

Archaic astronomical and magical texts of Mesopotamia are filled with such images. (Other examples are given in sidebars to this chapter.) Sumerian and Babylonian astronomy, with its memories of warring planets, conditioned the fears and expectations of every culture influenced by it. And outside the influence of Mesopotamian astronomy we find remarkably similar ideas, from Australia and the South Pacific to the Americas.⁸ The images boldly defy what is self-evident in our own time and would have been equally self-evident to the mythmakers had they observed the sky that we do today. Without the aid of telescopes we see five planets moving on regular paths around our Sun, and it does not appear that anything has changed. But is it possible that the uneventful solar system to which we are so accustomed is deceiving us?

It is known that early Greek philosophers such as Heraclitus,⁹ Democritus, and Anaxagoras preserved archaic traditions of former worlds that fell into chaos. Two of the most common expressions of the notion were *ekpyrosis* the combustion of the world, and *kataklysmos*, the destruction of the world by flood. Such concepts of universal destruction dominated the thought of Zeno, the founder of Stoic cosmology, and later gnostic systems carried forward simi-



Sumerian vessel shows the goddess Inanna, in the form of a panther, battling a serpent. The goddess herself, however, is known to have taken both feline and serpentine forms.



The Greek philosopher Plato.

lar notions.¹⁰ But most of the early philosophers' works were lost, and the few extant fragments rarely provide a sufficiently complete picture of the claimed events. What, for example, was the role of *planets* in the remembered cataclysms?

Plato, in his *Timaeus*, speaks of world-altering catastrophe caused by the celestial bodies departing from their courses—

For in truth the story that is told in your country as well as ours, how once upon a time Phaethon, son of Helios, yoked his father's chariot, and, because he was unable to drive it along the course taken by his father, burnt up all that was upon the earth and himself perished by a thunderbolt – that story, as it is told, has the fashion of a legend, but the truth of it lies in the occurrence of a shifting of the bodies in the heavens which move round the earth, and a destruction of the things on the earth by fierce fire, which recurs at long intervals.... And when, on the other hand, the Gods purge the earth with a flood of waters, all the herdsmen and shepherds that are in the mountains are saved.¹¹

Such traditions can illuminate the ancient notion, tracing to the birthplace of astronomy, that the paths of the planets have changed. The Greek historian Diodorus, reporting on the longstanding claims of Chaldean astronomy, stated that the motions of planets “are subject to change and variation.”¹² The Roman poet Lucan attributes virtually identical ideas to Nigidius.¹³ More specific is the assertion by the third century Babylonian astronomer-priest Berossus, as reported by Seneca, directly linking the movements of planets to the prior destruction of the world by fire and flood. “Berosos, who translated Belus, says that these catastrophes occur with the movements of the planets... which now maintain different orbits...”¹⁴

As summarized by Franz Boll, Carl Bezold and Wilhelm Gundel, the archaic tradition reflected in the words of Plato and Seneca held that “The flood, the conflagration of the world, and other minor catastrophes were related to planetary motions and are to be interpreted as the result of disturbances in the movements of the planets.”¹⁵

The Greek term for this planetary disturbance is *synodeuein* or *synodos*. “This requires an actual meeting and even a collision on the same plane, hence the planets bump into each other both according to width and height and so bring about the end of the world.”

There is, however, an ambiguity in most of the classical references to world conflagration. The great philosophers had begun to reinterpret the more ancient traditions, seeking to reconcile them with things observed in *their* sky—this despite the fact that nothing

in the regular movements of the celestial bodies could actually account for the earlier themes. Greek philosophy offers a telling example of the dilemma still facing investigators today. How can the consistent memories of universal destruction be reconciled with the stable solar system of modern observation? The answer is that the two cannot be reconciled. Attempts to interpret earlier catastrophic testimony through the lens of present observation lead only to a distortion of evidence and a denial of fact.

In truth, the archaic notion of planetary catastrophe belongs to the global substructure of astral mythology. According to Taoist teachings the world falls into chaos when planets change their courses.¹⁶ The Iranian *Bundahish*, in its description of cosmic disorder, reports that the “planets ran against the sky and created confusion.” In the Iranian accounts, it was only after the *fravashi*’s apocalyptic battle with the *daivas* that the celestial order stabilized so that “the celestial bodies now move on their regular courses.”¹⁷ Echoes of the idea appear also in the Chinese *Bamboo Books* and the Soochow Astronomical Chart, both of which associate catastrophe with planets going “out of their courses.”¹⁸ In Hindu texts, the movements of planets, in a prior age of the gods, led to the “universe” dissolving in flame.¹⁹

To establish our case, therefore, we must reach beyond the mythic archetypes of attacking dragons, cosmic thunderbolts, and Doomsday upheaval to probe the substratum of cultural recollections about planets. As we intend to show, certain associations of the planets, though highly unusual, are remarkably consistent from one culture to another. In particular, the global image of planets as agents of catastrophe *must* have an intelligible cause or explanation in human experience.

Thunderbolts Launched by Planets

With the birth of ancient astronomy, the stargazers named the owners of the divine thunderbolt. They identified them as planets, when planets were claimed to have ruled the world. The archaic astronomical tradition is stated in no uncertain terms by classical writers, reporting ideas that predated them by many centuries. “Most men,” wrote the Roman historian Pliny, “are not acquainted with a truth known to the founders of the science from their arduous study of the heavens... Thunderbolts are the fires of the three upper planets, particularly those of Jupiter.” This mysterious truth, Pliny said—

is the origin of the myth that thunderbolts are the javelins hurled by Jupiter. Consequently heavenly fire is spit forth by the planet as crackling charcoal flies from a burning log, bringing prophecies with it.

Was the Warrior-Hero a Planet?

In his groundbreaking work, *Worlds in Collision*, Immanuel Velikovsky identified the planet Mars as the source of a pervasive ancient image—that of the great warrior bearing a radiant sword in battle. Two of the most vivid examples are the Greek Ares and the Assyro-Babylonian Nergal, both identified as Mars in the astronomical traditions.

Assurbanipal, king of Assyria, invoked the planet-god as “Nergal, the perfect warrior, the most powerful one among the gods, the pre-eminent hero, the mighty lord, king of battle.” Called the “firebrand” and “fire-star,” the “most violent among the gods,” Nergal was “the unpredictable planet,” according to Babylonian sources, the bringer of disaster, the star of evil and of *rebellion*. (We have already noted that the masculine chaos monster of world mythology is really the rebellious or terrible aspect of the warrior. See sidebar, page 50.)

Nergal’s Greek counterpart Ares, the Latin Mars, reveals the same image. He was venerated as the model warrior but hated for his fury and violence, and for the pestilence that followed him. In Homer, the words of Zeus define the warrior’s dark aspect. “Most hateful to me art thou of all the gods that hold Olympus, for ever is strife dear to thee and wars and fightings.”

Ares was both foolish and lawless. In his rampage, he was “dread as a dark whirlwind” in the heavens. His body was stained with blood, and his bellows were “as loud as nine thousand warriors.”

That the great hero of epic literature echoes the myth of the warrior-*god* can be seen in the description of Achilles—“as it were Ares him-



Babylonian Nergal, the planet Mars

self, plumed lord of battle,” the bronze of his spear gleaming “like flashing fire” (lightning). The link with the planet Mars is, in fact, explicit in the instance of the most famous of all warriors, the Greek Heracles (Latin Hercules). Greek poets remembered the fiery translation of Heracles to heaven, where astronomers identified him as *the planet Mars*.

The warrior identity of Mars is, in fact, a global theme, combined with images of fiery arrows, swords or spears, the most common mythic forms of the cosmic thunderbolt. For the Persians, Mars was god of fire and the “warrior of the sky.” Hindu astronomy knew Mars as *Skanda*, the “attacker.” And Chinese stargazers claimed that Mars exemplified the spirit of the warrior.

The Aborigines of Victoria, Australia, insist that the hero Quarnamero, the “eagle,” who brought fire to the people, is now the planet Mars. He was “warlike, and much given to fighting.” The Bunurong of Victoria remember the cultural hero as Toordt. Upon his fiery death, he became the planet Mars. Another aboriginal tradition remembered the mythic warrior as Waijungari who, amidst a fiery conflagration, climbed his own spear to the sky, becoming the planet Mars.

The North American Pawnee identified Mars as a legendary “great warrior.” The Toba Indians of Argentina said that it was Mars who assisted warriors in battle, imbuing them with the fighting spirit. So too, the Inca of Peru claimed that Mars, as the god Aucayoc, took care of all matters relating to war.

This warrior identity of Mars remains one of the great anomalies of ancient astronomy.



Greek warrior-god Ares



Roman Mars

And this is accompanied by a very great disturbance of the air ... because it is disturbed by the birth-pangs so to speak of the planet in travail.²⁰

Pliny also reports the claim by Etruscan wise men that there are nine gods who send thunderbolts, one of these being Jupiter, who “hurls three varieties.”

Only two of these deities have been retained by the Romans, who attribute thunderbolts in the daytime to Jupiter and those in the night to Summanus... Those who pursue these enquiries with more subtlety think that these bolts come from the planet Saturn, just as the inflammatory ones come from Mars, as, for instance, when Bolsena, the richest town in Tuscany, was entirely burnt up by a thunderbolt.²¹

Similarly, Pliny's contemporary, the naturalist Seneca, distinguishes the “lesser bolts” of the local storm from the vastly more powerful bolts of the planet Jupiter. And he reports the general tradition linking the planets Saturn and Mars to the occurrence of lightning. If Saturn, “has Mars in conjunction,” he writes, “there are lightning bolts.”²²

Elsewhere, however, Seneca expresses his own cynicism when claims about planets and “conjunctions” of planets contradicted the observed behavior of the planets in his time. He cites the assertions of earlier philosophers that, when planets come into conjunction, or simply approach each other, “the space between the two planets lights up and is set aflame by both planets and produces a train of fire.”²³ A stream of fire erupting between two planets is indeed an extraordinary idea, but as Seneca noted, none of his contemporaries observed such a phenomenon. And thus, through an understandable skepticism based on direct observation of stable planetary motions in Greek and Roman times, Seneca has earned a degree of respect from orthodox science today.

Nevertheless, this prejudice in favor of later observation cannot be reconciled with the earlier human memory. The first astronomical records of five stable planets do not appear until the second half of the first millennium B.C. Prior to that time, the dominant powers of the sky are not “planets;” they are simply “gods.” So the question cannot be avoided: when the first “planet” lists appeared, were the associations with the earlier gods arbitrary, or were they based on an authentic linkage between god and planet that the modern age has failed to recognize?



Roman god Jupiter

Lightning-Sword of the Planet Mars

In his investigation of the planet Mars, Immanuel Velikovsky claimed that the planet's irregular movement and close approach to other planets caused its atmosphere to be distended "so that it appeared like a sword" in the heavens. "A planet that collided with other planets in the sky and rushed against the earth as if with a fire-sword became the god of battle," he wrote.

Velikovsky compiled his work prior to major discoveries of plasma behavior in space, and before systematic laboratory investigation of plasma discharge phenomena. He did not call the "distended atmosphere" of Mars a plasma discharge, and he did not realize that the sword of the far-famed warrior was, in fact, the cosmic thunderbolt of the mythic traditions. But his identification of the warrior's "sword" with the *appearance of the planet Mars* was a breakthrough of extraordinary insight, one that has now been tested and confirmed through decades of independent research.

Velikovsky also noticed the relationship of the sword of Mars to a comet-like apparition, which we now recognize to be the *same thing* as the cosmic thunderbolt. He wrote: "In old astrological texts, as in the book of *Prophecies of Daniel*, comets that took the shape of a sword were originally related to the planet Mars."

Often before and later, too, celestial prodigies assumed the shape of swords. Thus, in the days of David a comet appeared in the form of a human being 'between the earth and heaven, having a drawn sword in his hand stretched out over Jerusalem.' (I Chronicles 21:16).

Through cross-cultural comparison, we discover that the sword of the mythic warrior cannot be separated from other versions of his weapon: spear, arrow, club, mace, hammer, spade, harpoon. All such weapons reveal similar qualities as the *essence* of the god, and all fulfill identical roles in the myths.

The mythical images imply that the planet Mars, in its plasma discharge, was virtually indistinguishable from the fiery "weapon" of the warrior. (As we noted in our summary of thunderbolt motifs, the warrior often appears as a *personification* of the lightning weapon.) Therefore it is not surprising that the sword, spear, arrow, mace, or other weapon of the great Mars figures in antiquity were seen as the *identity* of the god. The cuneiform ideogram for the god Nergal (Mars) means "sword." Both the Greek Ares and the Latin Mars were not only symbolized by swords, but also venerated *as* swords. The Scythian cult of Ares, according to Herodotus venerated an iron scimitar as *the image of the god himself*. It is also known that the oldest Latin image of Mars was a spear, kept in the Regia and addressed as Mars himself, for it was claimed that the shaking of the spear—a great prodigy—was due to the entry of the god into the weapon. According to Ammianus Marcellinus, the Alani fixed a naked sword in the ground and "worshipped it as Mars."

As observed by the comparative mythologist Georges Dumézil, "it is generally assumed that in more ancient times Mars did not have a statue, and the lance stood alone as the representative of Mars."



The Greeks celebrated the warrior Apollo as the active will or voice of the universal sovereign Zeus. Apollo was both the servant and the celestial weapon of Zeus, employed against the chaos powers in periods of crisis. He was *chrysáor*—meaning "of the Golden Sword" (áor), an acknowledged hieroglyph for the cosmic thunderbolt. (See page 45.)

Though we find no consistent identity for Apollo amongst the "planets" of later astronomy, abundant clues are available. According to W. H. Roscher, whose authority on classical myth has never been surpassed, the Greek cult of Apollo was *identical* to that of the Roman cult of Mars. (See Roscher, *Apollo und Mars*)



ABOVE: the astrological sign for Mars retained the connection to the warrior's famous weapon.

The Thunderbolt and the Comet

The evolution and transformation of mythic symbolism over time provides a host of clues about the original patterns of human memory. We have already noted that the “thunderbolts” of the gods were cosmic in nature, taking forms never presented by regional lightning. The regional phenomena can only hint at the qualities of the archetype (electricity, light, fire, violence, noise). Lightning familiar to us today is but a reminder, a symbol of the divine thunderbolt that altered the history of the world.

One of the most common errors in historical investigation is the tendency to confuse the symbol with the archetype, and the result is invariably a fruitless inquiry. Symbols alone do not explain themselves. Taken in isolation, only their absurdity will be evident, quenching the fire of discovery. Symbols were not things in themselves; they were signposts pointing backward to *something else*. All sacred symbols shared a common function, speaking for the forms and events that distinguished the age of gods and wonders from all of subsequent history. When the distinction between archetype and symbol is honored, the results are both clear and stunning. In each case we find that not one symbol alone but a wide range of symbols point back to the *same celestial form*. Of this principle, dozens of examples will be given in these monographs.

The cosmic “thunderbolt” is not a momentary flash of lightning followed by a burst of thunder. Every recurring feature of the mythic tradition is an enigma. Each requires the researcher to see beyond familiar explanations. Each stands in defined relationship to complementary symbols that reflect the same improbable events.

Consider, for example, the “absurd” fact that, mythically and symbolically the divine thunderbolt cannot be separated from the doomsday comet. The fire anciently claimed to erupt from or



Aztec painting of a comet, seen as a celestial announcement of devastating catastrophe.



Nineteenth century vision of a world-destroying comet.

between planets in close approach was not just a cosmic “thunderbolt.” It was also called a comet.

In nature as we experience it today, a thunderbolt and a comet have virtually nothing in common. And yet the archaic tradition does not allow us to distinguish the one from the other. In fact, when Seneca referred to the “train of fire” erupting between planets in conjunction (citation above), he was speaking of archaic astronomical traditions about the *comet*. The traditions coincide precisely with those of the thunderbolt. The fact that both the thunderbolt and the comet appear as the sword of a great warrior is an additional pointer to the original unity of the traditions.

The archaic traditions say that a stream of fire was seen to erupt between planets in close approach. In terms of the evolution of mythic ideas, the “fire” erupting between planets in conjunction could be called “the mother of all thunderbolts,” but also the “mother of all comets”: that is, it inspired the entire mythic content of two distinct natural symbols. Hence, there is only one reason, not two reasons, why ancient ideas about lightning and about comets defy observation in our time. The ideas arose from *extraordinary* natural events that are not occurring now. Many indications of this unity are given by the Pre-Socratic theories of the Greek philosophers.

The more general notion is encapsulated in the statement of Democritus that comets are a coalescence of two or more stars so that their “rays” unite.²⁴ Authorities agree that the term “stars” in the pre-Socratic discussion of comets means planets, since proper stars were not believed to be moving with respect to each other. Aristotle

Comet Cheseaux of 1744, with beautifully displayed, collimated jets. Drawing published by Amédée Guillemin, *The Heavens*, in 1868. The head of the comet, of course, is beneath the horizon.



and Diogenes Laertius recorded the theories of Democritus and Anaxagoras in these terms:

Democritus, however, has defended his view vigorously, maintaining that stars have been seen to appear at the dissolution of some comets.²⁵

Anaxagoras and Democritus say that comets are a conjunction of planets, when they appear to touch each other because of their nearness.²⁶

Anaxagoras is said to have held “comets to be a conjunction of planets which emit flames.”²⁷ Diogenes of Apollonia, too, believed that comets are “chains of stars.”²⁸

A similar report is given by Leucippus: comets are due to the near approach to each other of two planets.²⁹

There is, in fact, a remarkable consistency to the archaic concept, which appears to trace to the foundations of ancient astronomy.

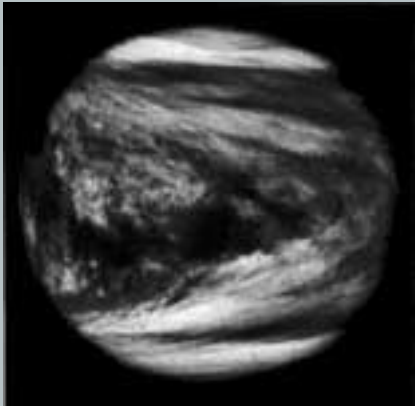
Seneca, in his review of archaic ideas about comets, reports that “Apollonius says that the Chaldaeans place comets in the category of planets and have determined their orbits.”³⁰ Seneca summarizes the planetary tradition with these words (which include the brief citation above):

Some of the ancient scholars favour this explanation: when one of the planets has come into conjunction with another the light of both blends into one and presents the appearance of an elongated star. This happens not only when planet touches planet, but even when they only come close. For the space between the two planets lights up and is set aflame by both planets and produces a train of fire.³¹

Could such traditions withstand the progressive movement of Greek philosophy toward skepticism? The earlier assertions of Chaldean and Babylonian astronomy directly contradicted planetary observation in Greek and Roman times. The classical naturalists’ reliance on contemporary observation is well illustrated by Seneca’s treatment of comets, when he notes the assertion of Ephorus (400-330 B.C.) “Ephorus said that a comet once observed by all mankind split up into two planets, a fact which no one except him reports.”³² That a “comet” became two planets is indeed an absurd claim by all modern standards. But once we have reconstructed the tradition, it will be clear that this was far from an isolated claim. It belongs, in fact, to the bedrock of cross-cultural memory.

Despite the “refutations” by the respected naturalists of classical times, the planetary nature of comets was continually asserted throughout the Middle Ages, in the works of such figures as Albertus Magnus, Gerard de Silteo, Roger Bacon, and Aegidius of Less-

The Myth of the “Great Comet” Venus



Today the planet Venus moves on a highly circular orbit around the Sun. Nothing in naked eye observations of the planet would seem to support its ancient identity as an unpredictable power, at once beautiful and terrifying. Ancient accounts depict Venus' long-flowing “hair” as the glory of the gods. But in the planet's frightful *cometary* aspect, it became a symbol of heaven-altering catastrophe.

In recent years, a number of scientists and science writers have examined the ancient fears of comets, concluding that these fears originated in a cometary catastrophe early in human history. Among the most persuasive sources are two books by astronomers Victor Clube and William Napier, *The Cosmic Winter* and *The Cosmic Serpent*. Though the theories are of great interest, they miss a point of profound significance for comparative study of the comet theme. In a global tradition, now fully and convincingly documented, the “Great Comet” of ancient fears was a *planet*. That planet, as Immanuel Velikovsky observed more than 50 years ago, was Venus.

In *Worlds in Collision*, Velikovsky noted many tales of disaster in which the agent of destruction possessed comet-like attributes. Native cultures, however, identified this agent as the planet Venus. Velikovsky observed, for example, that in Mexican records, Venus was the “smoking star,” the very phrase employed for a “comet.” (Velikovsky did not know that the same equation occurs in Maya texts.) In both the Americas and the Near East, he found a recurring association of Venus with long flowing “hair” or a “beard,” two of the most common hieroglyphs for the comet in the ancient world. The same planet, among the Babylonians and other cultures, was called the great “flame,” or “torch of heaven,” a widespread hieroglyph for a comet among ancient peoples.

Another popular symbol for the “comet” was the serpent or dragon, a form linked to Venus in cultural traditions around the world.

According to Velikovsky, the history of the comet Venus inspired some of the most powerful themes of ancient myth and ritual. At the heart of

the story, he argued, is a collective memory of global upheaval—earthshaking battles in the sky, decimation of ancient cultures, and an extended period of darkness.

Since Velikovsky's work, independent investigation has confirmed his conclusion through many additional lines of evidence. In ancient times Venus was the *prototypical comet*, providing the original content of worldwide comet fears.

The ancient idea appears to have affected all of the major cultures. Thus Robert Schilling, a leading authority on the Roman Venus (right), wondered by what “conspiracy” the image of a comet had attached itself to the planet Venus: in Latin traditions, the 8-pointed “star of Venus” also signified a comet. The Peruvian Chaska or Venus, was “the long-haired star,” the universal phrase for the comet. Similar titles of Venus occur elsewhere in both the Old World and the New. The Greek *Aphrodite Comaetho*, the long-haired or fiery haired Venus, preserves the same association in the astronomer's lexicon—“the *comet* Venus.” Altaic traditions declared that Venus “once had a tail.” In his famous debate with Galileo, Horatio Grassi recalled that the ignorant masses had long “considered Venus as a comet.”

A seemingly preposterous claim about the most conspicuous planet, when discovered around the world, can no longer be called preposterous. It then becomes a key to discovery.



ines.³⁵ Bacon (1214-1292), a father of the scientific method, argued that conjunctions and aspects of Jupiter, Saturn, and Mars were important factors in generating comets, a claim asserted also by Abu Ma'shar.³⁶

The reader may wonder whether this view of comets was limited to Europe and the Near East. An answer comes from the Chinese astronomers of the T'ang dynasty, who said that comets were temporary emanations of the *planets*, the comet's color being indicative of the planet's origin.³⁷ The unity of thunderbolt and comet traditions can also be followed through other symbolic expressions of the archetype. Even the mythic "broom" of the gods has the two concepts standing side by side. The Chinese called the comet "the broom." But the complementary Japanese tradition identifies the broom as the *thunderbolt* of the gods.³⁸

Though Aristotle, Seneca and other naturalists contributed much to the rise of scientific methodology, we must also consider what may have been lost if the more archaic ideas about thunderbolts, comets, and planets, so easily dismissed, actually reflected the sky of an earlier time, a time all too easily forgotten in the absence of the original celestial referents. But if the classical authors had too little information to hear the ancient witnesses correctly, the independent researcher today has a great advantage. An extensive library of source material, tracing to the beginnings of civilization in Egypt and Mesopotamia, is sufficient to answer the questions posed here.

Planetary Catastrophe

More than fifty years ago, Immanuel Velikovsky claimed that the planet Venus, in the form of a comet, devastated the ancient world. Velikovsky had noticed that identical images and stories were attached to comets and to Venus—not just in one land, but in virtually all of the major cultures. The comet was a hair-star, a beard-star, a torch or flame star, and a cosmic serpent or dragon. But these very words and images were also attached to Venus from China to the Americas, from Egypt to Mesopotamia. All told, the evidence is too specific and too consistent to be ignored. (See sidebar, page 76.)

In recent years, independent researchers have carefully investigated Velikovsky's work, and this new study has sparked a radical reassessment of his work by those who were most impressed with it. Though Velikovsky was certainly incorrect on many details, his insights on several foundational principles were profound. In particular we stand with Velikovsky on one of his most revolutionary



Aztec illustration of a comet emerging from the stars as a celestial serpent in 1519.

From Love Goddess to Chaos Monster

The comet-like attributes of Venus will bring us face to face with a mythical figure of vast influence on ancient imagination—the mother goddess. It is indeed an extraordinary fact that of the five visible planets, Venus is the only one that ancient cultures everywhere celebrated as the mother of gods and heroes. A clearly defined pattern of this sort cries out for an explanation, and an explanation *is* possible when we allow the ancient witnesses to speak for themselves.



What does the often-noted “Terrible Aspect” of the mother goddess signify? The goddess of love and life, when she grows angry, threatens to destroy the world. In Botticelli’s famous painting of Venus (above), we see nothing of this aspect. Ancient chroniclers, it seems, progressively separated the goddess’ life-giving and monstrous personalities into *different* mythical figures, reducing the appearance of moral ambiguity. When we trace these figures back to their earliest prototypes, however, there can be no doubt that the two stand side by side as one goddess.

In her terrible aspect, the goddess *wears the dress of the comet*, including the fiery countenance of a celestial serpent or dragon. The Sumerians revered Venus as the goddess Inanna, the source of life and the glory of heaven. But in her “tempestuous radiance” she provoked only fear. The hymns depict Inanna in the form of a great dragon “raining the fanned fire down upon the nation.”

The Babylonians knew the same planet as Ish-tar, “who is clothed with fire and bears aloft a crown of awful splendor.” She too became a dragon, bearing the “blazing fire which rains upon the hostile land.”

Alter egos of the terrible goddess occur amongst all of the great cultures. The Canaanite Anat, the Greek Medusa (right), the Hindu Durga and Kali, along with numerous other early figures of the goddess, enable the investigator to piece together a coherent story, based simply and directly on the remarkable point of agreement between the different cultures.



The terrible goddess shrieked across the sky with flaming or wildly disheveled hair (a global symbol of the comet). She took the form of a celestial torch or flame hurled against the world (another global symbol of the comet). Or she became a howling serpent or dragon (global symbol of the comet *par excellence*). In this role, the goddess emerged as the hag or witch. In both Mesopotamia and Arabia, Venus was thus “the witch star,” and even the “broom” of the witch is an acknowledged comet symbol.

The story of the terrible goddess finds innumerable archaic references in ancient Egypt, long before the rise of “planets” with their stable orbits. The Egyptian Uraeus-serpent (right) captures all of the nuances of the female serpent or dragon, but without the later planetary associations. In the hieroglyphic language the Uraeus meant nothing else than the mother goddess.



A popular Egyptian figure of the Uraeus was the goddess Sekhmet. In a catastrophe that nearly destroyed the world, Sekhmet had taken the form of the fire-spitting serpent. Her countenance was thus likened to a star “scattering its flame in fire... a flame of fire in her tempest.” “The fear of me is in their hearts, and the awe of me is in their hearts,” the goddess proclaimed. In fact, Sekhmet’s biography answers in detail to the biographies of the Near Eastern *Venus goddesses*, whose later planetary identity is beyond question.

claims: The planets have not always moved on the stable courses we observe today.

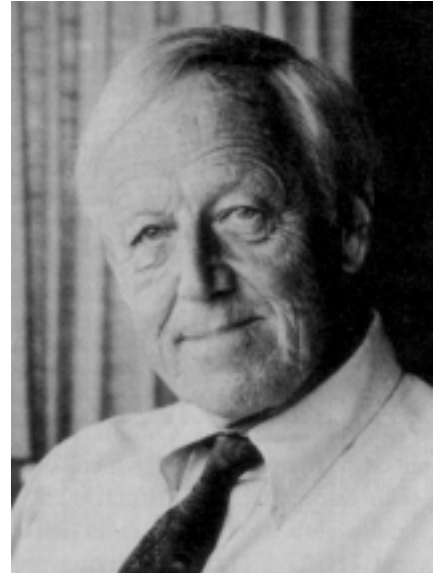
Fifty years ago astronomers considered it outrageous for anyone to suggest that a planet could generate a "comet" tail. Escape velocity from planet-sized masses would not allow gases or other material to be released into an external tail. But space probes discovered not only that planets had magnetospheres but also that the magnetospheres were swept back into the solar wind as magnetotails, structures that resembled comets' tails. Venus, without a magnetic field, still sported an "ion tail" reaching almost to Earth, a structure almost identical to a comet's tail.

Proponents of the electric universe offer an entirely different explanation: a planet-sized body will sport a comet tail if it moves on an elliptical orbit through the Sun's electric field. It will discharge electrically. The size of the body is not an inhibitor at all. In fact, only bodies small enough to rapidly adjust to regions of different charge will not become comets when moving on highly elliptical orbits. The larger the body the more likely it is to have a "tail." We now observe "comet-tails" on a stellar scale in deep space.³⁹ Hence the basis of the original argument against Velikovsky's "comet Venus" are now refuted by direct observation.

Electrical models of solar system genesis suggest an evolutionary history of the planets bearing little resemblance to textbook descriptions. If stars are formed by electrical discharge and remain the focus of discharge, we can no longer simply project current planetary motions backward into primordial times. We cannot assume a closed and isolated system. Changes in the galactic currents powering the system can alter both stellar behavior and planetary behavior suddenly and catastrophically.

How stable was the solar system in the past? In the pioneering work of Hannes Alfvén and his successors, orbital instability is a virtual certainty in the long-term evolution of an electrical model. In the birth of stellar and planetary systems, the electric force will typically dominate. But as the system dissipates electrical energy, it will reach a transitional phase at which a shift toward gravitational supremacy will occur, with potentially violent consequences. A chaotic system will then move toward stable electrical and gravitational equilibrium. Once planets achieve predictable orbits, no computer simulation based on later motions of the planets can provide even a clue as to the earlier system or its disruption.

Many questions concerning the stability of planetary motions in the past can only be resolved through observational evidence, supplemented by ancient testimony wherever that testimony is globally consistent. Observationally, the first place to look will be the solid



Hannes Alfvén, Nobel Laureate and father of plasma cosmology.

bodies in the solar system, many of them retaining pristine geologic records of past events. Under the conditions hypothesized by electrical models, planet-wide discharges would have left a multitude of electrical scars, and we must ask if planets and moons were formerly immersed in electrical discharge, perhaps at energy levels capable of removing or depositing surface material *miles deep* in a short time.

To ask the question is to confront one of the great surprises of the space age—the ravaged surfaces of solid planets and moons. But from the new vantage point, the picture requires more radical explanations than anything conventionally proposed. A great abundance of evidence makes clear that our earth was not immune from the ravages of planetary instability and its electrical effects.

A Meeting of Planets

How might earthbound witnesses have experienced such events if they occurred in ancient times, long before the rise of science? To give perspective to the hypothesis offered here, we relate below a sequence of possible events in an electrical encounter between the Earth and another planet. In this description we envision the planet Mars as the visitor, although similar events would occur at the approach of bodies with a wide range in sizes.

This scenario is deliberately oversimplified. To avoid confusion, where particular tenets of our hypothesis would require advanced clarification, we have simply excluded them from this narrative. For example, our reconstruction involves an assembly of several planets moving in close congregation, but this scenario describes only two. Issues arising from the larger reconstruction will be treated in later monographs.

Based on experimental and historical evidence, we assume that Earth is the more negatively charged body in the electrical exchange. In its closest approach we envision Earth's planetary visitor towering over the landscape, perhaps occupying 10-20 degrees of arc in the sky—making it 20 to 40 times the visual size of the Moon.



Auroras occur when ionized particles from the Sun interact with the Earth's upper atmosphere. Spectacular auroral displays would occur in the early phases of an exchange between charged planets.

A Doomsday Scenario

Our story takes place in geologically recent times, when our ancestors lived beneath a peaceful sky in a pastoral epoch prior to the rise of the great civilizations. These ancient peoples had not yet thought of building monuments or of constructing great cities. They had not yet instituted kingships and priesthoods. They had not yet devised calendars, seasonal rites, or the first astronomies. These events occurred before humanity's turn to ritual sacrifice and before

the rise of a warrior class. There were no cosmic myths, and no formal writing systems were yet in use.

As our story begins Earth and Mars move toward a close encounter. The first observable interactions occur when Mars is farther from the Earth than the Moon today. An electrical “conversation” between the two bodies produces noticeable atmospheric effects on Earth. Induced electric currents disturb the upper atmosphere, generating a remote hum, or a rhythmic purring or chatter of the sky, perhaps a distant, unearthly rumble or chant.

In this “dark current” phase, an invisible electric “breeze”—analogous to the solar wind—flows between the two bodies. Though we see no visible connection between the two planets, we do see growing auroral activity. The night skies are eerily lit. Brightly colored sheets and filaments dance across the heavens, extending to lower latitudes than ever observed with present-day auroras. Lightning storms grow in number and ferocity and move to higher latitudes, where lightning is normally a rarity. Across much of the Earth strange and stormy weather erupts, as clouds gather precipitously and race across the sky.

Without understanding the cause, people react to the extremes in rising and falling barometric pressures. Ionization of the air induces mental oppression, adding to a sense of foreboding. Animals grow more alert and excitable.

As the electrical stresses increase, the dark current transitions to the “glow discharge” phase and becomes visible. Mars begins to eject material into its plasma sheath, generating an enveloping glow distorted in an earthward direction. Electric filaments extend from the planet’s glowing envelope toward the Earth, appearing as fine luminous hair or a beard of fire stretching down from the giant sphere in the sky. The increasing electrical stress produces discharge effects on Earth’s surface as well. At first, St. Elmo’s fire streams from the highest mountain peaks; but soon all mountains are ablaze with luminescence in the night sky.



ABOVE: Planetary nebula NGC 2392, also called the Eskimo Nebula, about 5000 light-years from Earth in the constellation Gemini. A planet might produce a similar ring of comet-like streamers as electrical stresses on the body rise to a proportionate level.



LEFT: As a more positively charged planetary intruder approaches the Earth, it responds by producing an electrical discharge “beard” stretching toward our planet.

“Scarface” —Image of the Warrior-Hero



FAR LEFT: The planet Mars with its great chasm, Valles Marineris.

NEAR LEFT: The Aztec Xipe, the “flayed god,” displaying his deeply scarred face.

One of the most remarkable geological features in the solar system is the gigantic Valles Marineris on Mars. On Earth this chasm would run from San Francisco to New York and swallow hundreds of Grand Canyons.

In the early 1970's, engineer Ralph Juergens had proposed that electrical arcs between celestial bodies created many geologic features of the Moon and Mars, removing large portions of the excavated material into space. Of such hypothesized events, no feature on Mars provides a better example than Valles Marineris. The image above, one of the early photos returned by the first Mariner probe of Mars, shows the chasm dominating the visible hemisphere.

Many cultures recall a mythical warrior or giant struck down by a “lightning” weapon (sword, spear, etc.) and scarred by the deep gash or wound left on his forehead, cheek, or thigh. In view of the cross-cultural links of the warrior archetype to the planet Mars, the possible relationship of the “Scarface” theme to the creation of the Valles Marineris is well worth investigating. “Scarface” was the name of a legendary Blackfoot Indian warrior, also called “Star Boy.” A close counterpart was the Pawnee warrior Morning Star—who was explicitly identified as the planet Mars (not Venus as some might have supposed). On the other side of the world, Greek mythology described various heroes and rogues (one and the same archetype) struck down by the lightning-weapon. When Ares, the planet Mars,

was wounded in battle, he roared with the shout of a thousand warriors, rushing to Zeus to display the deep gash. So too, the hero Heracles, also identified with Mars, was remembered for the deep wound on his “hip-joint.” The monster Typhon, vanquished by Zeus, was the “lightning scarred” god, as was the giant Enceladus. Hindu myths speak of the deep scar on the head of the warrior Indra, god of the cosmic thunderbolt, and a thunderbolt was said to have scarred the monstrous giant Ravena.

Did a hemispheric scar on Mars, left by an interplanetary lightning bolt, provoke the “Scarface” theme? If so, the event occurred *within human memory*, and that would mean *within the past several thousand years*.



ABOVE: A Themis image of Valles Marineris shows many telltale signs of electric discharge. The removal of immense volumes of Martian surface remains one of the great mysteries of Mars.

The acceleration of electrons in the Earth's atmosphere begins to generate catastrophic winds, and soon regional tornadoes ravage the landscape.

All these phenomena are a result of electrical charge redistribution on Earth, before any interplanetary arcs pass between the two spheres. To persons standing in the open air, from the plains of Asia to the prairies of North America, the atmosphere feels parched. Winds grow intense and hot and the land seems ready to burst into flame. Around the globe, amid the growing noise of electrical activity, lightning strikes continuously, even from cloudless skies.

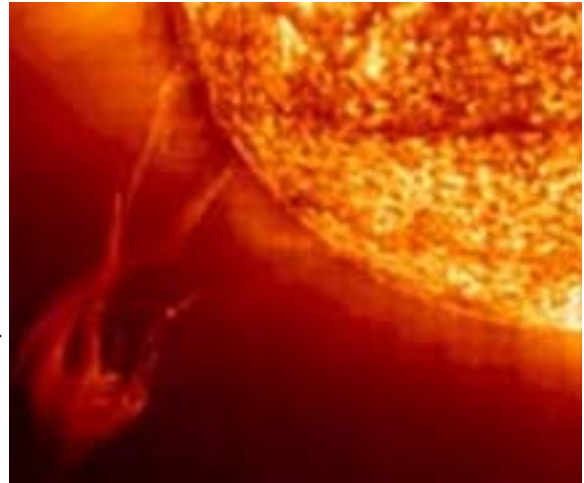
Abruptly, the intense regional winds coalesce into a hemispheric hurricane, punctuated by electrical outbursts. Fires erupt spontaneously, many to be quenched by sudden deluges of rain.

Electron streamers from Earth reach Mars and form an incandescent torus or donut-like plasma band around the planet, storing electromagnetic energy. When the torus becomes unstable, powerful arcs descend from it to the Martian surface near the equator and begin to raise the stupendous "blisters" of Olympus Mons and the other mighty "volcanoes" on the Tharsis ridge.

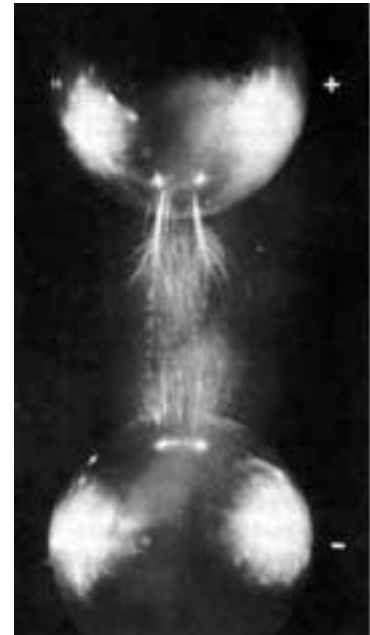
The arcs have bridged the vacuum gap between the two planets, and by so doing they "throw the switch" that unleashes the massive return stroke of a cosmic thunderbolt. The interplanetary arc takes the form of entwined "ropes" erupting from the Martian south pole and extending toward the Earth's north pole, the twin current filaments whirling about a common axis in the classic form of the caduceus. At the focal points of the electrical connection, electrons are stripped from Earth's surface. Then positively charged particles along with surface debris, explode from elevated regions of Earth, to follow the electrons away from the planet.

Soon the axes of the two planets are locked electrically into polar alignment and Earth's North Polar region is engulfed in the flares of electrical arcing between the two bodies. Increasingly powerful electrical outbursts hurl streams of charged material from Earth's atmosphere and surface into space.

On elevated plateaus of Earth, cosmic-scale lightning bolts race across and under the surface, excavating deep trenches up to many miles in length, then depositing the removed material over large areas to either side. Along the trenches, and at other elevated regions, rotating arcs—electrical "whirlwinds"—light the terrestrial landscape, descending from the sky to scoop out great circular pits or craters. Across the plains and forests and deserts of the Northern



A coronal mass ejection (CME) on the Sun heaves twisted filaments of atmospheric material into space. Electrical discharges of this sort would be likely if a positively charged planet approached a more negatively charged body.



An impression of the electrical effect of planets in close approach may be gleaned from this photograph of the onset of a discharge between two spheres. In this analogy, the lower sphere represents the Earth, the upper one the encroaching planet.

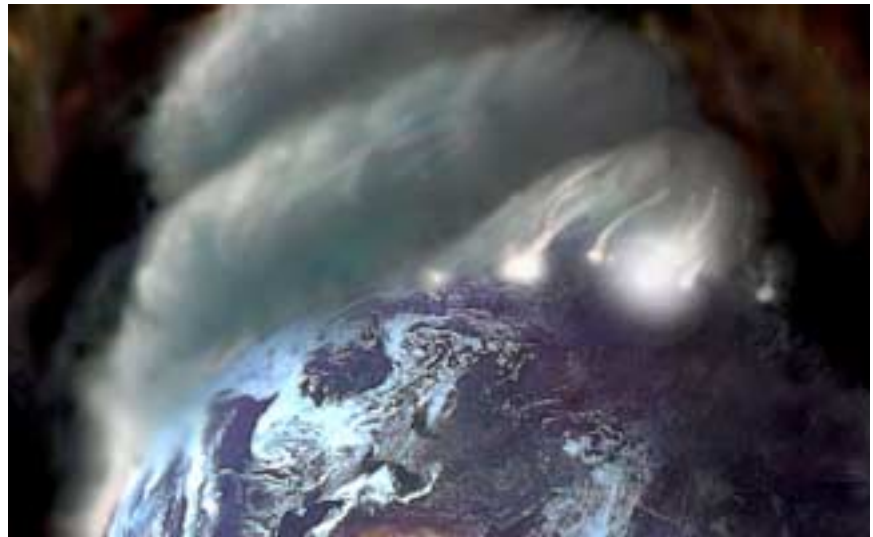
Hemisphere, the debris that isn't pulled into space falls back to the surface.

These electrical vortices are the extensions of a hemispheric, electrically driven "wind," rotating around the North Polar axis of Earth. At the outskirts of this electrical hurricane, discharges ignite fields and forests beneath rotating columns of fire. An Arctic vortex engulfs the polar landscape. Water and surface material surge from Earth toward the approaching planet. Where the exchange is most intense, electrical discharge scours away layers of Arctic rock, soil, and sediment. The Arctic Ocean becomes a whirlpool beneath a rotating column of atmosphere and debris reaching into space. Land and ocean merge into a maelstrom around the polar axis, sweeping up vegetation and creatures of sea and land and dropping them in crushed and jumbled heaps in a ring around the outskirts of the rotating storm.

Tidal waves overrun the continents and sweep material southward. Trees, animals, rocks, and mud deluge the northern regions of Europe, Asia and North America, settling on plains and on the sides of mountain ranges.

To earthbound witnesses that survive, the sky is a sea of flame rotating about a tornado-like column, rent by continuous corkscrew discharges and reaching upward from earth toward the planetary intruder. Seen from the lower latitudes, the column is a glowing pillar, surrounded by serpentine rivers of fire and smoke. This is the return stroke of the cosmic thunderbolt, with spiraling, dragon-like appendages.

As the electron flow leaves the Earth, an electrically powered "tornado" rises from the Earth's polar region toward the visitor.



Material removed from the surfaces of both planets produces an interplanetary field of rock, gas, dust, and ice. Seen from Earth, a

sky-darkening cloud of debris encircles Mars and stretches toward the Earth, illuminated by comet-like streamers and explosive bursts of lightning. Writhing, spiraling, phantom-like formations appear in bursts of electrical discharge, as the debris hurtles through regions of different potential.

Dust falls, accompanied by sand, then by gravel and rock, and finally by boulders, dropping amid the clamor of electrical screeches, howls, and whistles. A continuous roll of thunder reverberates around the Earth. There is no escaping the sights and sounds of devastation—the doomsday conflagration of wind, water, and fire.

A Question of Cosmic History

The events described in the above scenario pose questions and concerns broader than any specialized inquiry. If such events occurred, where might we look for evidence? Certainly, the evidence would not be in short supply! But what changes in current perception would be required for us to see evidence *as* evidence?

Within the world's educated populations, most beliefs about what is possible come directly from the teachings of science. But often the greatest obstacle to discovery is the inertia of prior belief. Examples abound, from centuries of denying that the Earth moves around the sun to mathematical proofs that heavier-than-air flight is impossible. Transcending this obstacle requires a wider field of view, for every age suffers from its own limited sense of possibility. Science at its best *expands* this sense of the possible.

Albert Einstein used the metaphor of climbing a mountain and gaining ever-wider vistas. From the higher vantage point you can see the lower, enabling you to understand how its limited view once seemed correct. From the higher viewpoint the old limitations become apparent, earlier explanations lose their validity, and the picture of the world changes.

Investigation across the disciplinary boundaries demands a continual reexamination of theoretical starting points. We must be mindful of all assumptions, so that critical turns in the evolution of theoretical frameworks can be taken into account in *all fields affected by them*.

Witnesses to Catastrophe

The chroniclers of old were not physicists, but they recorded human experiences that will prove vital to scientific investigation. While we shall give little or no weight to isolated testimony, it would be unreasonable to ignore the *agreement* between diverse



Even the violent storms of today sometimes exhibit the characteristics of electrical interactions. Here we see stacked toroid shapes, each embedded in the one above.

The Martian Source of Meteorites



A widely repeated ancient claim is that lightning storms produce falling rocks or “thunderstones.” (See theme #7 in our list of thunderbolt motifs, page 41.) “The thunderstone falls down from the sky in thunderstorms or, more accurately, whenever the lightning strikes,” states Christopher Blinkenberg, the leading authority on the superstition. By what reasoning did this improbable but worldwide association of lightning and falling stone occur? Certainly nothing experienced in modern times could have provoked the theme.

Yet, within the framework of our reconstruction, the idea is *predictable*. Both the original myths and the derivative superstitions can be traced to an epoch of planetary upheaval, when electrical arcs flew between planets in close congregation. Electric discharge excavated great quantities of material from planetary surfaces, generating clouds of meteoric or cometary debris—the mythic armies of chaos. Some portion of the material would inevitably fall on earth.

Thus a shower of stones was said to have occurred in the attack of Typhon. And in the “clash of the Titans,” a popular Greek theme, the gods launched both thunderbolts *and* boulders, nearly destroying heaven and earth. In fact, the theme was exceedingly widespread in the ancient world. The chaos armies of the Hindu warrior Indra, called the Maruts, simultaneously flash “lightning” and hurl stone. In Tibetan traditions the thunderbolt takes the form of the *dorje*, called “the king of stones.”

ABOVE: A Viking lander photograph of the Martian surface shows a landscape littered with sharp-edged rocky debris. In the hypothesis offered here, the vast majority of the debris originated from Mars itself, in massive episodes of electrical discharging.

Considering the archetypal link of the warrior-god to the planet Mars, it is intriguing to find that meteorites from Mars are now identified on Earth. In a number of instances (more than a dozen), chemists have determined this from the signature left in the rocks by the Martian atmosphere. But if electrical discharge removed Martian surface material *miles deep*, then we can be certain that thousands of times more rocks from Mars do *not* possess the signature of Mars’ atmosphere. They originated well beneath the planet’s surface.

In recent decades no one has devoted more attention to tracing ancient images of the planet Mars than Ev Cochrane (author *Martian Metamorphoses*.) Cochrane notes that the Babylonians, the most advanced astronomers in the ancient world, describe *meteorites falling from Mars*. For example, a text says “If a fireball[meteor] (coming from) Mars is seen...” Mars was given the name Nergal, of whom it was said, “Great giants, raging demons, with awesome numbers, run at his right and at his left.” “You hurl the towering stone You hurl the stone in fury...,” one hymn declares. Cochrane concludes that, in episodes of planetary catastrophe, “Mars was seen to hurl great bolides towards Earth, the capture of which was presumably made easy by the near passage of the red planet.”

cultures, particularly when that agreement involves specific but highly unusual details that defy simple and direct observation in our own time. In fact, the accord revealed by comparative analysis is far greater than general studies of the archaic cultures have ever acknowledged.

Around the world, ancient sky watchers drew pictures of things that do not appear in our sky today. Yet the pictures reveal global similarities. Storytellers recalled events of celestial splendor and terror. In ritual reenactments from culture to culture, ancient nations re-lived the celestial dramas, telling how a prior world order fell into chaos. And beneath the pandemic surface confusion, we discover identical patterns and meanings in pictures, words, and commemorative practices.



The “tree of life,” depicted on an Assyrian cylinder seal impression (ninth or eighth century B.C.), shows the tree between two mythic “griffins” and two “caprids.” The cosmic tree is among the most universal and compelling mythical themes, but few modern scholars have wondered if the heaven-reaching form may have once been *seen* in the sky. The similarities of the ancient design elements to the unique forms of high-energy plasma discharge is now a subject of scientific scrutiny by Anthony Peratt and his colleagues.

In these pages we dispute the modern appraisal of world mythology. Common “explanations” of the great myths cannot account for the layer of integrity beneath the wildly contradictory surface elaborations. In fact, the consensus of the different cultures constitutes an unrecognized substructure of human memory in ancient times. Additionally, the earliest astronomical records provide a library of evidence, illuminating the substructure in many surprising ways. Meticulous observers of the sky preserved vital links between their mythic gods and the planets of a recently organized solar system. These links will be particularly important because the great majority of tribes and nations around the world did not preserve sufficient astronomical knowledge to identify their gods, goddesses, heroes, and chaos monsters with the celestial bodies that inspired the myths.

Planets brought world upheaval, a catastrophic fall of rock, fire and flood. This is the message extracted from systematic cross-cultural investigation. But the interpretations of scholarly researchers



The lotus and papyrus columns of the ancient Egyptian temple of Karnak direct our attention to countless myths of the world pillar, frequently remembered as a brightly glowing plant or tree of life whose stem or trunk was the world axis.



Among the Norse tribes, the Valkyries became a popular symbol of chaos overtaking the world. When catastrophe arrives, the Valkyries ride across the sky with their hair streaming in the wind.

today are conditioned by modern beliefs. Scholars assume that the ancient storytellers simply didn't understand the forces of nature as we do today. And they are correct. But modern scholars are unaware of, or ignore, two hidden assumptions that are no longer tenable. They presume that the forces of nature were the same in ancient times as today, and they suppose that no fundamental *new* discoveries about the universe are likely, or even possible. So as unexpected vistas open before them, they begin to rationalize, grasping for explanatory straws. If chroniclers from every culture tell of a fiery dragon in the heavens, perhaps they were simply sharing with each other various exaggerations of local adventures. Or perhaps it is "only natural" that they would imagine a great mountain of the gods, a column of fire and light, as a metaphor for the invisible axis of the world. Or maybe there is a deeply psychological quirk involved, a common but irrational part of the species, causing people everywhere to give the same underlying structure to their fanciful tales.

Such responses cannot begin to account for the agreement within human testimony, when that testimony is examined objectively and comprehensively. Cultures the world over, using *different* words and *different* mythical images, invoke the *same* extraordinary forms in the sky and the *same* experiences of devastating upheaval: These universal themes will not be resolved by any fragmentary approach. What did the celestial dragon or chaos monster signify? Why was the monster so commonly linked to a celestial whirlpool, whirlwind, tornado, or "storm wind"? What did the dragon's flaming countenance or fire-breathing aspect mean? Why was the female form of the monster so commonly identified as the "terrible aspect" of a mother goddess? And who was the ancestral warrior, the celestial hero who met the monster in combat?

The above sketch of a planetary encounter is the first glimpse of a hypothesis—a proposed new way of comprehending events *remembered* in ancient times. If the Earth was formerly joined in a devastating electrical encounter of planets, what might a pre-literate people have seen in this encounter? How might they have recorded the events?

- In the conflagration of fire, wind, and stone, would they imagine great wars of the gods?
- In the heaven-spanning electrical discharge formations would they see the "thunderbolts" of divine powers in the sky?
- In the filamentary outflow of discharge, would they see the wildly disheveled hair of gods or goddesses?

- In the spiraling and undulating formations, would they see serpents or dragons in combat?
- In the electrified debris-clouds, would they see the celestial “armies” of chaos and darkness?

Archetype and Symbol

It is essential that we avoid a common misunderstanding about the nature of world mythology. In popular imagination “myth” simply means fiction, something to be contrasted with “reality,” and that is all there is to it. Though the popular use of the term is inappropriate, we do not desire to glorify mythology as a source of higher teachings or hidden wisdom. On the face of it, world mythology is a barbaric madhouse, riddled with contradictions and absurdities.

But in the end, the underlying consensus—the recurring themes or *archetypes*—will rescue us from the contradictions of myth, enabling us to discover a substratum of astonishing integrity. The distinguished analytical psychologist Carl Jung first used the term *archetype* in connection with the origins of myth and symbol, suggesting universal patterns too often ignored in prior studies of myth. An archetype is an irreducible first form. It cannot be reduced to a more elementary statement. In connection with world mythology, it means the original idea or structure, whether it is the root idea behind the “goddess” image, the model of a “good king” or “hero,” or the ideal form of a sacred temple or city.

To recognize the archetypes in the ancient world is to open up a new and crucial field of investigation, since many hundreds of global patterns persisted for thousands of years. It is vital that the reader keep in mind, however, that by “archetype” we do not mean the unconscious structures of thought to which Jung referred, but an *original pattern of conscious human experience*, to which numerous unconscious ideas and tendencies may indeed trace.

A considerable debt is also owed to the distinguished student of comparative religion, the late Mircea Eliade of the University of Chicago, author of numerous books on the subject and editor in chief of the *Encyclopedia of Religion*. Perhaps Eliade has done more than any other scholar to show that world mythology rests upon a coherent substructure. It is not the mere collection of disconnected fragments traditionally assumed within the western world.

Surely the late Joseph Campbell did the most to awaken popular interest in myth. Following a comparative approach, Campbell brought to light a large number of global themes—the “hero with a thousand faces,” the “angry goddess,” the “world mountain,”



Carl Jung, a pioneer of depth psychology, discovered many universal patterns in ancient myths and symbols. These “archetypes,” he said, can be seen even in the earliest civilizations, and they speak for mysterious structures of the subconscious still with us today.

The Conjunction of Goddess and Hero

“Mars and Venus, known as Parnassus,” painting by Andrea Mantegna, 1431-1507. On the summit of the mythic mountain of the gods, the archetypal warrior consorts with the mother goddess.

In the alchemical text, *Gemma gemmarum*, the goddess Venus describes herself in relation to the warrior Mars:

Transparent, green, and fair to view,
I am commixt of every hue,
yet in me's a red spirit hid,
no name I know by which he's bid,
and he did from my husband come,
the noble Mars, full quarrelsome

In the Sumerian temple of Inanna, a great celebration occurred when the legendary king Dumuzi engaged in sacred congress with the goddess. Playing the role of Inanna, a revered princess consorted with the king of Sumer, the living symbol of the hero Dumuzi. In this way, the celebrants symbolically renewed their world, just as had occurred in the age of gods and wonders.

A mirror of this marriage was that of Ishtar and Tammuz in Babylonian rites. But other Mesopotamian cities conducted their own variations on the theme. In Lagash it was the warrior Ningirsu who united with the goddess Baba, alter ego of Inanna. Other gods, including Enki, Ninurta, and Ningizzida, played similar roles in their respective cities. By his symbolic reenactment of the primeval “marriage,” the king on earth certified his role as regent or successor of the ancestral warrior in heaven. In doing so, he assured the fertility and abundance of the land.

The “sacred marriage” was common to kingship rites throughout the ancient Near East, with countless parallels and elaborations amongst the world’s ancient cultures. In many instances it became an integral component of New Years’ festivals—collective reenactments of catastrophe and celestial chaos, followed by the restoration of order in heaven and on earth. For an understanding of these events it is essential that we follow the dominant planetary associations of the goddess and the hero in astronomical traditions. Though we can only introduce the subject here, it



will be a primary theme in monographs to come, and the clues are well worth pursuing.

A notable Greek example is the “marriage” of Aphrodite and Ares (Venus and Mars), a subject of the 8th chapter of Homer’s *Odyssey*.

Due to the many tribal memories integrated into the chronicles of heroes, the “marriages” sometimes reach comic dimensions. Heracles (Latin Hercules) “marries” Megara, the daughter of Creon, king of Thebes, and Deianeira, daughter of Oeneus, king of Calydon, but consorts with uncountable numbers of other “princesses,” each with her own localized story. That Heracles was a Greek name for Mars is not a small clue!

But how strongly did the astronomical tradition influence Greek poetry? Opinions will differ, but Lucian’s words in the second century AD resonate well with the global theme. “It is the conjunction of Venus and Mars that creates the poetry of Homer.”

A Basque tradition depicts the goddess Mari riding in a celestial cart or on a “broomstick” in a ball of fire (a pointer to the medieval “witch”). The myths say that she “was the planet Venus ... Her son-lover was Sugaar, the planet Mars.”

In North America, the Pawnee knew Mars as a legendary warrior, and when Mars and Venus approached conjunction, they celebrated the warrior’s ancient “marriage to the daughter of a great chief”—a perfect replica of the Old World marriage of goddess (princess) and warrior-hero.

renewal through sacrifice, and dozens of other motifs.

It is also clear that the pioneers of comparative study could not account for the content of myth in terms of natural events. And they stopped short of asking the most important question of all: if the natural referents of the myths are now missing, is it possible that they *were* present in a former time? Campbell, for example, recognized the worldwide doomsday theme—the idea of a prior age collapsing violently. But he did not relate the memory to anything that may have actually occurred in our world to inspire the memory.

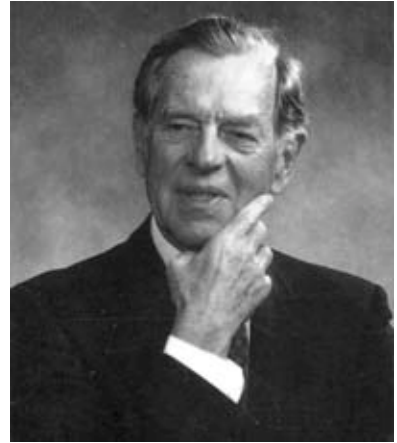
Event and Interpretation

The first step toward understanding the myth-making epoch is to distinguish between the *unusual* and the *imaginative*. The events that inspired the archetypes of world mythology are unusual, not part of our familiar world today at all. But the ancient interpretations are imaginative: humans projected wide-ranging personalities and mythic qualities onto objects and formations in space. In its skepticism about the patterns of human memory, the modern world forgot the distinction between natural event and human interpretation, then tossed out the entire body of evidence.

A systematic exploration of ancient sources will show that our ancestors lived beneath an alien sky, a world so different from all subsequent experience that the storytellers, in describing the prodigious events, drew upon a vast complex of analogies to make sense of them. Great spectacles in the sky produced an explosion of human imagination, a myth-making epoch that finds no counterpart in later times.

When the gods went to war, the heavens shook. Lightning sped between the celestial combatants as flaming weapons, with the fate of the gods themselves hanging in the balance. For anyone seeking to comprehend the ancient images, there can be no greater mistake than to rationalize away the cosmic scale of the described events. This was a time of human wonder and overwhelming fear, the measure of which cannot be gauged by anything presently witnessed in the heavens.

But is human testimony reliable? Or did the myth-makers simply defy all natural experience, including direct and unassailable observation, in order to conjure things never seen? The mythic “thunderbolt” will provide us with an exemplary test of the ancient witnesses’ power of observation. Certain extraordinary facts can now be stated concerning the archetypes, and these facts challenge all prior explanations or theories of myth—



Joseph Campbell

Fact #1: No archetype finds its natural referent in the world of common experience. All widespread themes of myth point to events that do not occur in our time.

Fact #2: All archetypes are inseparably connected to each other. No isolated archetype can be found. It is this stunning fact that validates the underlying integrity of the substratum.

Fact #3: All archetypes trace to the beginnings of recorded human history. After the flowering of ancient civilizations, it does not appear that any new archetypes arose.

We further claim that heaven was once alive with electricity as planets moved through a rich plasma environment. Ambient electrical activity gave rise to unearthly sights and sounds and earth-disturbing events. In the wake of these events, cultures around the world strove to reckon with the forces unleashed, to interpret the meaning of cosmic catastrophe, and to *remember*.

The urge of ancient peoples to record and to repeat their stories in words reflected the same fundamental impulse we see in all other forms of reenactment and alignment in ancient ritual, art, and architecture. Recitation of the story momentarily transported both the storyteller and the listener backwards to the mythical epoch, which was experienced as more compelling, more “true” than anything that came later. And that is why, amongst all early civilizations, as noted by Mircea Eliade and others, the world-changing events to which the myths refer provided the models for all collective activity of the traditional cultures.⁴⁰

It needs to be understood as well that the globally recurring themes appear to be as old as human writing. All of the common signs and symbols we shall review in these monographs appear to precede the full flowering of civilization. This rarely acknowledged fact, which could be easily disproved if incorrect, is of great significance. If our early ancestors were habituated to *inventing* experience, we should expect an endless stream of new mythical content over the millennia.

This absence of invention throughout almost all of human history forces us to ask how the original “creativity” of myth arose. If the myths are purely “imaginative fiction,” with no objective, originary event, why did later generations lose the ability to generate such fiction? But if, on the other hand, the myths arose as the human response to *extraordinary* events, then we must ask, what *were* the events? In answering this question, we cannot afford to exclude any domain of ancient testimony.



A scene from the film “Wickerman,” based on Celtic legends and rites, personifies the ancient idea of world devastation through the burning of a colossal “man.” In the most archaic forms of the general tradition, the figure dying, dismembered, or incinerated in the conflagration represents the original unity of “heaven.”

Ritual Celebrations

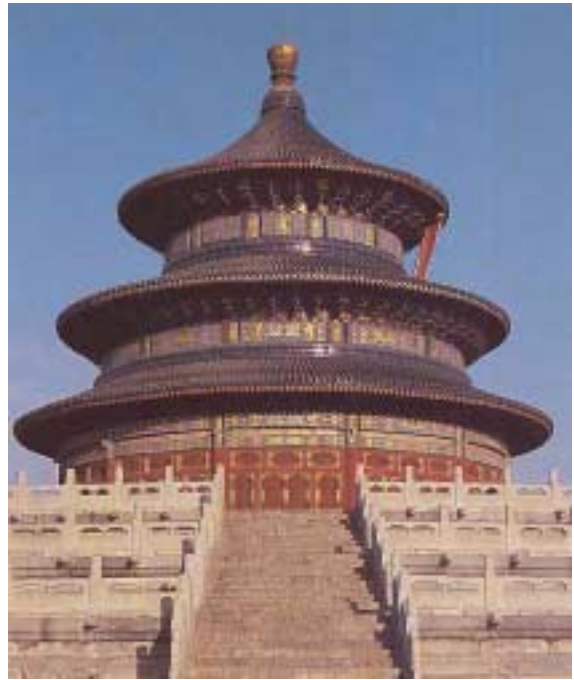
Enter the ancient world and all familiar signposts disappear. But there is a key in the relentless glance backward, occurring at every level of activity in the early civilizations, from monument building to an outpouring of hymns and prayers to the gods. We see it in ancient foundation ceremonies of temples and cities, in rites of kingship and sacrifices to the gods, and in the violent wars of conquest, by which tribal chiefs forged new nations, kingdoms, and empires. A review of such activity, with particular attention to the ritual contexts, will show a distinctive *commemorative* function. Indeed, we would not be going too far to suggest that civilization itself was a bursting forth of new and creative forms of *remembering*—all harking back to some aspect of a primeval conflict between order and chaos.

With unprecedented effort, a sense of urgency, and often remarkable skill, ancient stargazers raised towering, heaven-oriented monuments—pyramids and obelisks, ziggurats and great stone circles, monstrous creatures guarding city gates, and everywhere a panoply of gods and goddesses and celestial heroes whose explicit forms mock every attempt of the specialists to understand them.

The first mystery here is one of motivation. What drove early races to mobilize these endeavors, to drag huge stones over great distances, and to invest such collective energy in construction activity? Before the Egyptians, Sumerians, Aztecs, or Maya ever raised a sacred edifice, they would look back to primordial times. The foundation ceremonies reenacted noteworthy junctures in the lives of the *gods*. And invariably, at critical turns in the stories, chaos monsters reared their heads, threatening to ruin all of creation.

Nothing was deemed more essential to life than reverential respect for the mythical *models* in a remote epoch. Every king received his sanction from the model of a *good* king, illustrated by the lives of gods. Every sacred mountain reflected the light and power of the *cosmic* mountain, on which the gods themselves assembled. Every temple or city was built as a replica of the temple or city of *heaven*.

Of this truth, Eliade wrote continuously throughout his life. All of the models for human institutions and prescribed behavior, he said, “are believed to have been ‘revealed’ at the beginning of time”—and that means in the primeval age of the gods.⁴¹



Chinese Temple of Heaven, a replica of the radiant habitation originally created by gods in the sky.



The Buddhist Naga serpent Padoha, ruler of dark realms ever since he attempted to destroy the world.

In the particulars of his conscious behavior, the “primitive,” the archaic man, acknowledges no act which has not been previously posited and lived by someone else, some other being who was not a man. What he does has been done before. His life is the ceaseless repetition of gestures initiated by others.⁴²

Thus, “rituals and significant profane gestures,” according to Eliade, “deliberately repeat such acts posited *ab origine* by gods, heroes, or ancestors.”⁴³ We can only add that, on examination, the legendary heroes or ancestors of epic literature turn out to be the mythic gods themselves, simply presented in more human form, a common pattern in the evolution of myth over time.

Though the gods were powerful, they were not invincible. Nor were they always kind or merciful. Even as the priest-astronomers invoked the splendor of the gods, they strove through magical and often innovative means to reckon with the gods’ caprice. The ancient sphinxes and winged bulls and gargantuan towers signify a reservoir of meaning to be preserved at all cost. Together they reflect both a celebration of the age of the gods and a collective defense against chaos—that ever-present threat to which, in the remembered “*End of the World*,” even the greatest gods succumbed.

Competing impulses drove the birth of civilization. One impulse was nostalgia, a yearning for something remembered as the ideal—a *primordial condition*—subsequently lost. The second impulse was terror—the pervasive, ever-present fear that devastating events in the past will happen again. It seems that at all levels of collective activity, every civilization in the ancient world expressed the same contrasting motives.

But why do nostalgia and terror stand in such a paradoxical relationship? Clearly this is no accident. At work is the memory of an epoch without counterpart in later cultural history, an epoch of exquisite beauty, when visible “gods” ruled the world. And it was this very epoch that came crashing down in catastrophe. From one land to another the myths and ritual reenactments thus proclaim that the gods ruled for a time, then went to war, bringing universal darkness and cosmic tumult.

How was it, then, that sacred practices and ritual reenactments gave meaning, or a sense of potential defense? Clearly, the human intent was to establish a rapport with the gods, and this included a presumed ability to share magically in the observed achievements of the gods. As a rule, every symbolic object or rite possessed the ability to reproduce, on a human scale, a magical feat of divine predecessors. What the gods achieved on the celestial plane could be achieved on earth through imitation. As above, so below; as before, so again. Every monument and every ritual practice will thus hold

The Roots of Sacrifice and “Holy” War



Greek Kronos or Saturn devouring his children, as depicted by Francisco de Goya y Lucientes (1746-1828). Kronos, a counterpart of the Egyptian Atum-Ra and Sumerian An (primeval Unity of heaven), ruled for a time, then fell from his dominating position in the sky. But what did the astronomers mean when they identified this power with the planet Saturn? The theme will loom as a centerpiece of our story.

RIGHT: At the top of an Aztec temple's steps, a priest removes the heart of a sacrificial victim and holds it up, still beating, to be witnessed by the gods. The evidence makes clear that the sacrificial victims in these rites represented the divine heroes and demons of the mythic past.

“As each child issued from the holy womb
And lay upon its mother's knees, each one
Was seized by mighty Kronos, and gulped down.”
Hesiod, *Theogony*

In the Greek myths of Kronos and the lost Golden Age, the original ruler of the sky swallowed his own children. Then, in the cosmic wars that followed, the heavens nearly collapsed under the rush of gods against gods.

It seems that in the ancient world celestial beauty and divine caprice stood side by side, feeding the great contradictions of human perception—nostalgia, reverence, anxiety, and terror.

Is it possible that the entire spectrum of ancient experience can now be brought into the light of day? On every habitable continent our early ancestors strove to imitate the gods, to repeat the events of the “First Time” or the “Great Time.” Even in the darkest and most violent aspects of the early civilizations—in the wars of conquest and the sacrifices of human victims—the warrior-kings and priests repeated mythical episodes in the lives of divine predecessors.

For reasons scholars rarely comprehend, the poets say that the gods loved the smell of sacrifice and incited men to war. On earth, war became “holy” if it found sanction in the prior feats of the gods themselves. And warrior hordes learned to celebrate the cosmic battles of the gods, imitating the frenzy of the celestial conflagration and identifying their own neighbors with the fiends of chaos, the sky-darkening clouds that threatened the world in primeval times. By this identification, their flashing weapons came to represent nothing else than the cosmic thunderbolt.





A vignette from the Egyptian *Papyrus of Ani*, shows the deceased, on reaching the after-world, repeating the feats of the gods by slaying the serpent-enemy of cosmic order.

evidential value in our reconstruction. Each is a symbolic imitation pointing backward to the defining events of the myth-making epoch.

Additionally, we find a remarkable consistency in the underlying meaning of the recurring symbols. The pyramid and sacred hill will always speak for the “world mountain” on which the gods dwelt in the beginning. The “sacred marriage” of kings will always reflect the archetypal liaison of the mother goddess and the warrior-hero. And the commotion, mock battles, and frenzied crowds of early New Year’s festivals will always reenact the celestial upheaval of the apocalypse, when gods and chaos powers battled in the heavens. This consistency in meaning is worldwide, and hundreds of examples will be given in these monographs.

Conclusion

In these pages, we have posed a question that can only be answered through separate but mutually interdependent levels of investigation. Can the archetypes of world mythology be understood with the help of new tools in the sciences? The investigation has required us to cross-reference many fields of inquiry that have no history of interdisciplinary cooperation on the scale *required* by the question asked.

We began with the story of the Andromeda, the dragon, and the warrior Perseus, who defeated the dragon to win the princess as bride. In the comparative approach, such stories as this come alive. The themes are meaningful and easily recognized. The princess, the dragon, and the hero belong to the core of archetypal mythology. But answers to the mysteries raised can only come through a new respect for the ancient experience, with an eagerness to follow evidence wherever it may lead.

The principles of our presentation to this point can be summarized as follows.



1. All documented cultural traditions assert that an original epoch of gods and wonders ended in celestial chaos. Chronicles of catastrophe within the antique cultures thus provide critical evidence as to the natural occurrences involved.

2. Plasma science is re-writing the textbook on galactic, stellar, and planetary evolution. This new science, emphasizing plasma and electricity in space, also illuminates the ancient dramas in surprising ways.

3. A few thousand years ago ancient artists carved millions of enigmatic images on stone. Comparative study of these images confirms that they depict heaven-spanning electrical discharge configurations, a conclusion now supported by the distinguished plasma scientist Anthony Peratt.

4. All ancient cultures affirm that the remembered catastrophes involved earth-threatening battles of “gods” and monsters. Most common is the story of the fiery serpent or dragon attacking the world.

5. Numerous accounts say that a great warrior vanquished the dragon. On investigation, the warrior’s invincible weapon turns out to be a cosmic thunderbolt. Though often obscured in later times, comparative analysis confirms that this original identity was universal.

6. The mythic “thunderbolts of the gods” have virtually no similarity to regional lightning. They do, however, take the very forms of plasma discharge configurations in the laboratory.

7. In the early astronomies, the most revered gods appear as towering forms in the sky. They are identified as *planets*, though their behavior bears no similarity to the behavior of planets today.

In addition to these building blocks of a reconstruction, we have connected certain planets to the archetypal “personalities” of myth. In particular, we have named the warrior hero in relation to the planet Mars, and the mother goddess in relation to Venus. We have also suggested that the male and female forms of the chaos monsters are intimately linked to the “terrible aspects” of these same planets—a subject to which we intend to devote considerable attention.

Archaic memories must be approached through cross-cultural comparison and interdisciplinary analysis. The study cannot fail to raise innumerable issues for science. These issues include, among other things, the nature of plasma phenomena, the nature of the sun and stars, the nature of comets, the competing roles of electricity

The stepped pyramid of Saqqara in Egypt, one of the oldest stone structures in the world. The steps of the pyramid signified the tiers of the world mountain, by which ancestral gods ascended to the sky.



and gravity in modern theory, and the physical scars on planets and moons.

The power of the ancient evidence lies in the unity of the substratum, the archetypes. It is this underlying integrity that gives us confidence in the reconciliation of science and historical inquiry. Certain things which theoretical science today considers out of the question were consistently remembered around the world, and at a level of detail and coherence that is inconceivable under standard assumptions about the past.

But how do we deal with the situation when human memories speak convincingly for something which orthodox science, with equal confidence, denies? A meeting of the two is essential. Truth itself is unified, while mistaken perception invariably leads to conflict and contradiction. Either we have misapplied principles of reasoning to the historical evidence, or science is misreading evidence to a profound degree.

We believe the latter is the case, and the primary error lies in a failure to see how plasma and electricity challenge the underpinnings of traditional theory in the sciences. This is why we have chosen to consider the “thunderbolts of the gods” in this first monograph. The mythic theme brings us face to face with the role of electric discharge in cosmic events.

Accordingly, we shall present our opening argument on behalf of the “Electric Universe” in the monograph to follow.