

## Doctors of the Ring –

### The Power of Merlin the Mathematician to Transform Chaos into Consciousness

By Theodore St. John

Pythagoras was a great man; a great mathematician; a prophet; a legend. And legends are like myths. They deliver powerful messages of truth to those who understand the meaning of the characters and symbols in the myth. But most people don't and they miss the point. Math is like myth in that it is also a language of truth that uses operators and symbols as metaphors for processes and objects. A mathematician like Pythagoras is endowed with the knowledge and skills necessary to use these symbols to transform our perception of reality – for better or for worse. He assigns a symbol that represents a concept, a simple truth, which can then be combined with other symbols to reveal other truths that lead to much deeper meaning.

"And as Merlin spake, lo! There suddenly appeared sundry letters of gold upon the back of the seat, and the letters of gold read the name."<sup>i</sup>

Physics is the quest for truth confirmed by measurement. Physics gives mathematics a purpose and mathematics gives physics a voice. Together, they reveal the true nature of reality and the meaning of life.

*In the beginning was the Word and the Word was with Physics, and the Word was Mathematics.*

The story of physics and mathematics is the same great myth told in every culture throughout history<sup>ii</sup>. In every hero's journey there is a pattern of separation, a period of tests, and a return to the center to bestow the boons unto the hero's fellow man. And in every good myth there comes a crisis when beasts and dragons threaten to destroy what the people have built. And just when all seems lost, a hero emerges who has the purity of intention and thus the power to destroy the dragons.

Physics is a noble quest but the symbols used to express concepts in physics can only *point* toward deeper meaning. Illumination of meaning is the goal of the quest, but meaning can be disguised by the shallow, flat surface appearance of the symbols themselves. Albeit with good intentions, a mathematician can unwittingly flatten, twist and distort truth in ways that no longer reflect the dominion of man. In a myth, these creations are animated as creatures that must be slain, for they guard the treasure that becomes hidden at the center of reality. In the words of Joseph Campbell,

"... myth is the secret opening through which the inexhaustible energies of the cosmos pour into human cultural manifestation. Religions, philosophies, arts, the social forms of primitive and historic man, prime discoveries in science and technology, the very dreams that blister sleep, boil up from the basic, *magic ring of myth*"<sup>iii</sup>

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A long, long time before this day, and eons after the death of Pythagoras in the land of Thales<sup>iv</sup>, there lived a young man named Albert. Albert was a humble servant to a great man named Sir Patent who had sent him out this day to fetch the invention that was responsible for killing the previous King of Thales in the Battle of Currents<sup>v</sup>. Young Albert was deep inside his own mind as he walked by the university in the center of town. Suddenly, he was jolted out of his meditation by loud voices shouting curses. A crowd of men was gathered around

a large stone, and as Albert approached he could see a handle protruding from the stone. On the stone he saw written in letters of gold, 'Whosoever can lift this handle is, by right of light, the King of Thales.'

Albert stood unnoticed by the other men and watched as each man tried with all his might to pull the handle from the stone. And he felt sorry for each one as they fell defeated and exhausted. Patiently he waited until all of them had given up and left in despair.

Now Albert was young and small and he knew that his strength was less than a tenth that of the men, but he was also curious to a fault. So he decided to give the handle a pull. To his shock and horror, the handle lifted from the stone as if it was weightless. And behold, from the handle streamed a glistening saber of pure light. The handle remained solid in his grip but the blade was a constant, brilliant glow. Then the stone, from which he had pulled it, also turned to pure light yet retained the shape of the stone.

Certain that he had been set up for a cruel joke, he quickly returned the handle to its place. And when he did, the stone turned hard and cold again. He looked around expecting all the men to have returned to laugh at him. But there was no one around. So he removed the handle again. He stood there in amazement at the sight of this fabulous pillar of light when suddenly, the famous mathematician, named Merlin Minkowski, shouted, "Albert! You have done it! You are the new king. With my help, you can lead us to victory over ignorance."

After that, a crown was placed on his head, and he swore to his Deans and Principals that he would be a noble King. But he faced many battles and would have failed had it not been for the great skills and power of Merlin the Mathematician, who was a wizard of symbols. And after each victory, he held a celebration in the Round Field, and King Albert gave Merlin great public praise for his contributions.

The Round Field was a vast field in the center of the continent where an enormous building had been constructed, in which all the physicists and mathematicians in the land would meet for conferences. It was called the Round Field because it was centered on a small golden ring that had been put in place by the ancient King Heraclitus. Engraved on the outside of the ring were the words: "Change is Reality is Change is Reality is" in a continuous loop. On the inside, it was written "Change is perpetual, the same and yet different. Herein lies the mystery of life."

To King Heraclitus, the circle symbolized the process of life that had to be understood in order to recognize the difference between illusions and reality. "Life" he said, "is a circle, whose center is everywhere and circumference nowhere. A circle has no beginning and no end yet it can be perceived as having both."

But the meaning of the ring had been lost by the time Albert became king. In fact, the foundational concept of change had faded since the days of King Newton, who made constancy the new law of the land. "Change," Newton had said, "is what happens to the position of matter, and matter is the real constant. Motion is change, yet constant motion is a constant – not change. An object in constant motion will remain in constant motion..." Then he paused because he almost said "until its motion is changed." But if motion is change, then changing the motion is changing the change! He wanted to pierce the ring with a single word that was not *change*; a word onto which he could build his college. And so he continued, "...until acted upon by an external force."

Now prior to being crowned king, Sir Newton had observed King Barrow a Mathematician, performing math like a wizard and wanted to learn it himself. He had seen him magically create solutions by uttering the words that were spelled with symbols. "*Kappa cadabra, infinitesimal tangent.*" But in those days, knowledge was power and although Barrows loved Newton, he feared that he would steal the thrown. For Newton was the most

brilliant student he had even known. So he only gave him the answers he chose and would not teach him the secrets of mathematical process.

It came to pass that King Barrow had fallen very ill and on his death bed, he summoned Sir Newton. "It is true," he said, "that everything is a process, including math. The secret to performing math is simply this: create a new name for what you want to appear and state by decree that it is equivalent to the other idea that everyone knows to be true or accepts as an axiom. Then collapse the new name into a single symbol and write it down on one side of an equivalence symbol. Next, invent another symbol for the known and write it on the opposite side.  $A \approx B$ . This symbolic statement of equivalence is now an equation – a doublet seed of information. This is the trick of nature that is the secret of the mathematical process: truth can be represented simultaneously as different and the same. Meaning is integrated into the symbols which are differentiated from each other by the equivalence sign. The left side of the equation is the same yet different from the right side."

"The philosopher must ask the questions and assign the symbols," Barrows continued, "but it is the job of the mathematician to manipulate the equations so that they can reveal more information, which the philosopher must interpret. Together, they grow bits of knowledge like a tree grows fruit. The way to make it grow is to combine the symbols from both sides of the equivalence sign. There are two ways to do this, - as a negative and as an inverse. Both operations are equally true so both must be done, and this makes the equation reproduce. Moving a symbol to the other side of the equation requires it to be represented as its opposite: its negative  $A \approx B \rightarrow A - B \approx 0$  and inverse  $A \approx B \rightarrow A/B \approx 1$ ."

"Thus, one equation gives spontaneous birth to two and all three are true. But while the first represents unity, the second two represent duality. One of these represents tension due to the differences and the other reveals a harmony in their likeness. Together, they embody perpetual vibration. This is the same as looking at a circle from the side. From this perspective, one sees an illusion that there is a beginning and end and that figment is what can trap those who focus on the illusory endpoints. This is the wisdom of Plato. It is very easy to be fooled by the shadow of the ring on the cave wall. Seeing the unity in opposites creates wisdom, yet it takes wisdom to know that you must return to the center by rising above the differences in order to see the light of meaning. Teach this to your students so that they might trust your wisdom until they can grow their own."

"I understand," said Newton. "In the first form,  $A$  and  $B$  represent the opposite endpoints; where the circle would diverge from one side and curl back into the plane of the shadow, and the second form,  $A/B \approx 1$  represents the projected line segment itself: a unit normalization of  $A$  referenced to  $B$ . But doesn't that also represent unity?"

"Yes," Barrows said, "in the dimension tangent to the plane of the circle. And that is why the process is continuous. It too can reproduce. The importance of this second term cannot be understated. It provides a constant reference, an anchor in the void upon which all new concepts can be based."

Sir Newton was grateful for the lesson but said, "It is human nature to focus on the differences. The equation simply shows two different ways of saying the same thing and people will naturally choose one side or the other. How do I keep them from fighting over who is right when they will both be right, only different? How do I prove that both sides are true and the statement as a whole is also true?"

"With measures and numbers," said Barrow. "The symbols in the algebraic equation are only concepts. They are the same yet they are different, so they are only equivalent and can never be equal. You must quantify the symbols by measurement and assign a number; then the numbers can be shown to be equal. This is the most

difficult yet most important step in the process, for without this calibration, the equation is only philosophy. *Caliber* is the sword that will help you win every battle for Truth, and you must never claim victory without it. If you do, you will expose yourself to mutations and deformities. Each victory spawns a new idea, which creates new questions and new equations. This process will provide you with all you need to build your college."

Newton was familiar with the legends of Caliber that had been handed down over generations since the days of Galileo the Great. Then Barrow spoke again. "But beware of the curse of Zeno," he said. "Do not be seduced by the symbols or numbers for they are only tools - physical maps assigned to the metaphysical concepts. They are not the concepts themselves so they must only be used to point to the meaning of concepts. The symbols are arbitrary but should be chosen in a way that brings to mind their meaning. And the numbers must be precise, but they lack the ability to be different while being the same. If you ignore the differences you will be sucked into the zero point where everything is strange and distorted. And if you ignore the reference, you will be blinded by meromorphic poles."

King Barrow closed his eyes and his breathing became very shallow. Newton watched him in silence and sensed a comforting feeling of calm in the room. Then, without opening his eyes or moving his lips Barrow said, "With this knowledge of combined mathematics, natural philosophy, and measurement, you yourself have been transformed. You may neither be called a mathematician nor a philosopher, for you are now both and more. You are the new king - a scientist called a Physicist."

"Make sure that you understand the importance of this and take this charge very seriously. You now have the power to change the world in ways you can't even imagine. And you must pass on this knowledge as accurately as you can to those who are worthy of the power it can bring. They will be *Doctors of the Ring* for they can heal the world if they use it wisely. But you must choose them carefully because they can also destroy the world in a flash."

And with that, he took his last breath.

Newton remembered Barrow's words, that everything is a process, and Heraclitus' philosophy of change, and he desperately wanted to build a firm college on solid ground that would not change, to make sure that the knowledge and wisdom passed on to him would be safe for all future generations of physicists.

In his mind he could see an apple hanging motionless from a tree when suddenly, it fell to the ground. So he used his new wizardry and behold, a word appeared in his mind called "mass". "Mass," he said, "is a property of matter. Everyone can see that it is not a change itself. If an object moves in space then it is the position of the object in space that changes, not the object itself. If motion is a measure of spatial change, then spatial change and motion are equivalent." So he wrote  $S \approx M$ .

Now in those days, everyone knew time was a measure of motion - of the sun's shadow, of sand in an hour glass, or any other motion. The only thing interesting about time was that it had to be quantified in equal increments,  $T$ , and they needed to be standardized. But if *time-like* change is measured by the changing position of the sun, then motion and time are equivalent:  $M \approx T$ . And if  $S \approx M$  and  $M \approx T$  then  $S \approx T$ . But then, rather than normalize motion by  $\frac{S}{T} = 1$ , he defined velocity as  $v \approx \frac{S}{T}$  and standardized a unit of  $T$  by his royal clock.

He evaded the curse of Zeno by inventing the calculus that skipped over the paradox and went right to the limits. With that he was able to predict motion as accurately as his instruments would allow and his predictions produced great dividends. He remembered Barrow's warning, to give equal importance to the reference  $\frac{S}{T} = 1$  but he was interested in motion and this constant seemed trivial. It was useless for his purpose. He just assumed it

meant that change itself is constant, as Heraclitus had said. He still could not get a handle on the significance of the constant, so he wrote it on paper for future reference. He rolled up the paper and stuck it with wax on a large stone for safe-keeping. On the stone he wrote in jest, 'Whosoever can lift this handle is, by right of light, the King of Thales.'

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For generations after that, construction continued and to this day, with Albert as king, the college of physics is still not complete. Members of the Round Field have built a wonderful structure with many rooms. Physicists work in their own realms, with their own dialect, building the frontier walls and never even try to navigate the complex maze of hallways. By the time Albert became king, most had forgotten about the Golden Ring in the center.

King Albert asked all of the members about the center of the maze. He was surprised to find out that most of the members had never even tried to find the center because they were so busy building new walls. A journey to the center was dangerous; and why bother? They had everything they needed at the frontier. The college had grown into something that had a life of its own, and it produced everything they needed to supply the entire university. So the Deans encouraged them all to work only on the frontiers and were not interested in the center.

Those few who had tried to find the center presented King Albert with their findings, but he was not very pleased with their uncertainty; they were purely statistical thus purely mathematical. They were not wrong but they were missing something very important in their interpretation, so he said "math without philosophy is lame". But he encouraged them to continue and said "but philosophy without math is blind".

He refused to gamble with the truth and insisted that there was a Unified Ring that must be found. So with great courage, he began his own quest and entered the maze with his team of Doctors whom he chose himself. Using his maps of the maze and constant-light saber for protection and guidance, they found numerous particulate wonders. They had to build bridges to cross great fissures and vast chasms of dark energy in space, which was terribly warped and complex. And they encountered dead cats, dilated clocks, worm-like creatures and tiny antiparticles that captured their tools and shot them with photons.

When they returned, the people were thrilled and welcomed their great discoveries. They used them for everything from destroying their enemies to building wondrous structures, tools, and a world-wide web of toys. For this, they gave the physicists great rewards and respect.

But the Doctors of the Ring were discouraged for they did not find the Golden Ring. Though their discoveries were wondrous and had great value to mankind, they were also more powerful than anything that man had ever known. They knew that they had brought back a beast called Vortex, the maker and destroyer of worlds. And though they were able to restrain it, they knew that it was only a matter of time before it would break free and lead to annihilation.

And King Albert was injured. He had looked directly into the eyes of Vortex and saw the dark shadows of forgotten philosophers. He heard the calling for a Unified Ring and tried to reach it, but gravity overpowered him and he was swept up by the beast. Severely wounded, he spent the rest of his days trying to rise up to unity, but became more and more tangled in the web of complex math.

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Over half a generation has passed since the death of King Albert. Physicists have continued to extrapolate the mathematical framework, but soon after his death the college became unstable and now the land of Thales is in crisis. Many physicists admit that there's *trouble with physics* and have left the Round Field, no longer willing to give Time to the voracious demands of the beast.

So Merlin and his team have taken over. They go by the title Mathematical Physicist so they are still revered for saving the world. They are competent and committed to defending Time, for it still feeds the beast, which now produces golden grants. They hold tightly to the ends of a super string and promise to provide more toys for the people. They know that they are the only ones who can understand and extrapolate the complex framework so they continue to search for brilliant recruits. They disparage those who appeal to simplicity and beauty or hearken back to the wisdom of old about the *Tao of physics* that rises above the opposites. And they claim victory over those who insist on measurements.

Yet some people feel betrayed because billions are being spent on boson bricks to reinforce the fermion fibers in the outer walls of the college. And angry cries of "bankrupt physics" and accusations of a state-sponsored "scientism" have begun to fill the media. In theaters, the tragedy is played out in fairy tales like "Farewell to reality" and "The End of Time".

As the outer walls continue to crumble, dark clouds surround the college and the enemies of Thames contrive their terror in a parallel world. They too have a beast that is akin to, yet much older than Vortex. And they intend to set it free on the world.

Alas, the horizon is dark with meaningless energy and destructive black holes.

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But hope would appear in a holographic vision.

Five years after the death of King Albert, a child was born who was given the name Jonas. Over the course of his childhood, he heard the stories about King Albert and the glorious days of Albert's great adventures and he wanted desperately to become a scientist. When Jonas came of age, he took all of the required math classes, but he struggled to pass. Math, he thought, is the language of scientists and it made him feel humble, unworthy, and depressed. So much so that he turned away from science and began working as a mechanic, for he knew how to use tools and he loved the power that his tools could bring.

He finally saved enough money to attend college and when he took his first physics class, he was elated. All at once, the math, when used in physics, began to make sense and he realized its tremendous power. Coordinate systems became his tool box, symbols became hand tools and geometric functions were power tools. Each system was like a different drawer in his box and they were logically arranged in a way that he could easily pull out whatever tool he needed to solve a problem.

Jonas yearned for the day that he would be known for grand solutions to the greatest physics problems that faced mankind. But as awesome as this was for Jonas, he felt that something was missing. Physics gave purpose to math, but what gave purpose to physics? It wasn't long before he discovered engineering. And the purpose of engineering was to help mankind survive and prosper. This gave Jonas a feeling of purpose.

But as time went by and his lessons in math continued, his tool box became too full and disorganized. Again he felt humble and unworthy. He had spent all of his money so he left the college and joined the navy where he was able to finish his physics and engineering degrees. Then, rather than becoming a scientist as he had hoped, he was assigned to submarines.

His service in the navy gave Jonas a new perspective on life and new purpose. But he witnessed great suffering and experienced great sorrow and solitude to the extent that he identified with the Jonas (in Christian, Jewish, and Islamic scripture)<sup>vi</sup> who had been swallowed by a whale. Then, after finally being spit back onto land by the whale, he had a dream in which he met Pythagoras the Greek who told him that Thales is the Nineveh of the current generation and that he was, in fact the new Jonas. This dream was the message that he must deliver. He describes his dream in a letter:

Pythagoras said to me,

“Tell the people of Thales what I tell you. Mathematics has given physics its great success but it is the very same thing that will lead to its demise. In the hopes of finding the Theory of Everything, physicists look closer and closer at matter, but matter is reflective and separates them from understanding. It is the outside surface of transformation between potentiality and actuality. Actuality is what they seek. Actuality is Truth.”

“Motion is the process that motivates life and drives the transformation, so bombarding particles will always produce results, but they will always be the same – more particles. They will not reveal the unity that you must understand. And they will continue to mislead the rest of the world into believing in materialism, which will always end in decay, death and destruction.”

With that he showed me a vision of particles smashing into smaller and smaller bits and each one looked like a swirling-fluid ball of light. “They look like spherical holograms,” I said. And he said, “Yes, they are pure light, but a better name is holomovement because they are not static as “gram” implies. They are pure energy formed by motion. And they can be understood using the simplest mathematical equations.”

He pointed to an equation:  $Change (c) = \frac{s}{t} = 1$ . “This is the equation that describes what you would measure as the constant speed of light.”

Then I saw a light bulb flash and a sphere of light moving outward in all directions. I had a feeling of increasing entropy, but then the expanding front slowed to a stop and instead, I saw the bulb shrink in the center.

Then he said, “light traveling spherically outward one space unit or one unit of time moving radially inward:  $s = tc$  and thus  $s^2 = t^2c^2$ . The math that created so much confusion was caused by rewriting of this equation as  $x^2+y^2+z^2 = t^2c^2$ . The mathematics is correct since  $s^2$  represents a sphere of space,  $s^2 = x^2+y^2+z^2$  but what you don’t realize is that  $t^2$  represents the same with time as  $t^2 = t_x^2 + t_y^2 + t_z^2$ . Spatial change and temporal change are identical in essence and so they should be symbolized as the same number of dimensions or else they create a warped interpretation. They are both measures of motion and only differ in the way they are measured. Physicists have been duped by the synchronized standard of time because they believe it is a single dimension. So in the equation,  $x^2+y^2+z^2 = t^2c^2$  they leave time *enf*olded while they *un*fold space and the resulting hyperbolic equations are so complicated that only the most skilled mathematicians can handle them.”

“If neither side is unfolded,” he continued, “the squared terms represent the *concepts* of space and time, so if you symbolize them by upper case  $S = s^2$  and  $T = t^2$  then  $s^2 = c^2 t^2$  can be written as

$$S = Tc^2.$$

In this form, the equation means that ***space and time are equivalent***, exactly as  $E = mc^2$  means that *mass and energy are equivalent*. Space and time are just different ways of representing the same process.”

“Reality is both complementary and gradable – a paradox that yearns for a solution. And understanding the solution requires both perspectives. The symbols  $S$  and  $T$  represent complementary *concepts* of space and time whereas  $s$  and  $t$  are the gradable, measurable scales.”

“An observation is an event that separates unity,  $S \approx T$  into duality,  $S - T = 0$  and a reference  $\frac{S}{T} = 1$ . The first equation evaluates the difference between  $S$  and  $T$ ; they are the same so the difference is numerically equal to zero. The second compares the magnitude of  $S$  with that of  $T$ . They are the same, so the ratio is unity. Now since all three equations symbolize the concept that  $S$  and  $T$  are equivalent, then by the principle of complementarity,  $S - T \approx \frac{S}{T}$  which implies  $0 = 1$ , meaning something is equal to or created out of nothing.”

“An observation is a snap shot measurement of space,  $s$ , that quantizes it by assigning a value to the concept of space,  $S$ . There is only one number that satisfies both  $S = s$  and  $S = s^2$  and that is 1. Now replace  $S$  in the second equation with  $s^2$  so that  $S - T \approx \frac{s^2}{T}$ , and compare the relative magnitudes

$$\frac{S + |-T|}{S} \approx \frac{S}{T}$$

“This is the Golden ratio = 1.618 and it can be found throughout nature as evidence of the process<sup>vii</sup>. The negative sign in  $(-T)$  means that the direction of temporal motion is inward relative to spatial motion, and 1.618 units of space per unit of time means the universe expands with every event.”

I tried to wrap my mind around what he had said. Again I saw a sphere of light. As I stared at it, it seemed to change into a flat, circular mirror. In the reflection, I saw many other tiny spheres moving in the background and suddenly noticed two perpendicular axes on the disk labeled  $S$  and  $T$ . The number 1 appeared where they crossed the edge of the disk and they extended out of sight beyond the boundary. Then tick marks appeared on the time axis and moved inward toward the center of the disk. The increments were linear on the outside of the disk but as they slid smoothly toward the center, they bunched tightly together near the center. This made it look like the time axis was bending into a hole.

The space axis had the same tick marks and the inside logarithmic part of the axis moved toward the center with the time axis, but the outside, linear part did not slide. So the edge seemed to be dragged inward and the disk began to pinch and twist about the center. I watched as the axis squeezed tighter and tighter until suddenly, the quanta split in half. Both halves popped back into the shape of spheres, but the one on the left side was swirling and seemed to glow and shrink as it rolled down in a spiral toward the pinch-off point and into the other sphere. It seemed to be swallowed by the other, which grew correspondingly larger, until it appeared at the center where it glowed as a memory of the event.

When I refocused on the surface of the sphere, I saw my own reflection and the inner light seemed to become shielded. Again the outer surface began to look flat. The axes appeared as before, slid into the disk, and pinched the quanta in two. Now both quanta had my reflection and the inner light appeared as nuclei in both. For



a moment I thought I was watching a living cell dividing. But rather than coalescing into multiple cells, every offspring “cell” was being fed-back, consumed by the parent; or was the offspring consuming the parent? Either way, there was a feeling of hunger; and the feedback brought a sense of satisfaction and order. There was also a feeling of gravitational attraction, desire, and even love.

I suddenly noticed the surrounding particles undergoing the same bifurcation process and as they grew, they began to spiral toward the first sphere. But rather than falling into the hole, they seemed blocked by the edge. I realized that this was a subatomic microcosm, a fractal of the life process, and that matter did not precede and somehow spring into life as is the conventional theory. Instead, the process of life is eternal and molecules are the increasingly complex byproducts of the life process.

Then Pythagoras said, “You and I are also products of the life process. But we are not the molecular Vortex<sup>viii</sup>. We are expanding consciousness emerging from the transformation of Chaos into Cosmos.”

## References

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<sup>i</sup> From "The Story of King Arthur and his Knights" written and illustrated by Howard Pyle pg 1924

<sup>ii</sup> <http://en.wikipedia.org/wiki/Monomyth>

<sup>iii</sup> Joseph Campbell, *The Hero With a Thousand Faces*, pg. 3

<sup>iv</sup> see Thales of Miletus [http://en.wikipedia.org/wiki/History\\_of\\_physics](http://en.wikipedia.org/wiki/History_of_physics)

<sup>v</sup> [http://en.wikipedia.org/wiki/War\\_of\\_Currents](http://en.wikipedia.org/wiki/War_of_Currents)

<sup>vi</sup> <http://en.wikipedia.org/wiki/Jonah>

<sup>vii</sup> [http://en.wikipedia.org/wiki/Golden\\_ratio](http://en.wikipedia.org/wiki/Golden_ratio)

<sup>viii</sup> Innovation in Maxwell's Electromagnetic Theory: Molecular Vortices, Displacement Current, and Light