



Mensionization Complementation

The Mathematics of Hermetic Alchemy

Section 6

The Philosophical Model

Now that we have covered some of the preliminary mathematics that will be referenced in the α, β oppositional system and have some of *Men-Comp's* math tools in hand; with the assistance of the three (3) mutually exclusive philosophical discipline references, we will *correct* an age old misconception of a philosophical principle in *Hermetic Alchemy*.

An understanding of a *basic structure* of the different reference philosophies is needed before proceeding with waves and harmonics. A *Hierarchy* will be established that defines an orderly progression to follow in the evolution of their properties and principles. *Hermetic Alchemy's* philosophical 2^n mathematical structure will be shown as it is also a generic *blueprint* for the other different philosophies. The 2^n expansion is a mathematical sequence that will form an orderly *hierarchy* in the different philosophies and theology.

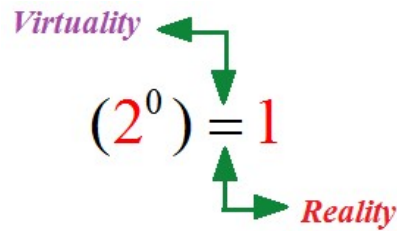
16. Hermetic Alchemy's 2^n Hierarchy

An expansion of (2^n) is shown again below, it is an exponential representation of the *doubling* of *properties* and *principles* by *dimension*. Each one (1) *integer* unit *exponent* increase of 2^n *doubles* the previous exponents' numerical values. The doubling of the previous exponent's values is equivalent to the *doubling* of *Principles* in *Hermetic Alchemy*. The following sequence is the mathematical structural order of the *Hermetic Alchemical* hierarchy.

$$(2^0) \rightarrow (2^1) \rightarrow (2^2) \rightarrow (2^3)$$

$$2^n = (2^0 = 1) \rightarrow (2^1 = 2) \rightarrow (2^2 = 4) \rightarrow (2^3 = 8) \rightarrow \dots \rightarrow \infty$$

The beginning point is the *Virtual* to *Real* transformation.



The Virtual 0-Dimensional State \mathbb{R}^0

$$f(m_0) = (\alpha + \beta)^0$$

A beginning incorporeal, “unseen,” virtual barrier when crossed becomes the ONE, the Deity, the Mension, the Prima Materia, the T'ai Chi, +...+ The Principium.

Nature was first believed by the early philosophers to consist of a virtual incorporeal world of the *unseen* and a physical world of *Reality* that could be seen and detected by our five (5) senses. A beginning level of 2^0 is representative of the boundary between the virtual incorporeal *unseen* realm and the *material* physical realm. The mathematical 2^0 is a 0-dimensional boundary between *virtuality* and dimensional *reality*.

Once the boundary is crossed, the result is a *Principium* (*beginning manifestation* ($2^0 = 1$)).

The significance of the number one (1) in ($2^0 = 1$) is *universal*. The one (1) is the essential *energy* and *position* needed for a manifestation of a beginning entity in reality that resulted from crossing of the virtual barrier and entering the *physical* world. It has universal *units* and *meanings*. Any meaning can be applied to this unit. In *Alchemy*, it is known as the “*Prima Materia*,” in the *Kabbalah* it is the sephirah “*Kether (Ein Soph)*,” in the oriental “*I Ching*, it is the *T'ai Chi*,” in *Theology* it is represented as “*Deity*,” and it could also represent *you* as an *integralized* Human Being.

$$(2^1) = 2$$

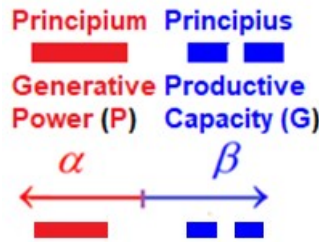
The 1-Dimensional State \mathbb{R}^1

$$f(m_1) = (\alpha + \beta)^1$$

The **Duality of Nature**. The α, β **Oppositional Duality**. The **Binary (0, 1)**. The concept of **Opposition**. It is the **value (2)** in (2^n) . The **Formation of a**

Principium and Principius

This state was the beginning observations of **oppositional** dualities (**Principium** and **Principius**) such as **day-night**, **dry-wet**, **hot-cold**, and the **magnitude** of others.



The result from this reality based observation convinced the early **Alchemical** philosophers that **Nature** was just an organized system of the interactions of **dualities**; where the dualities were **opposite** in their nature.

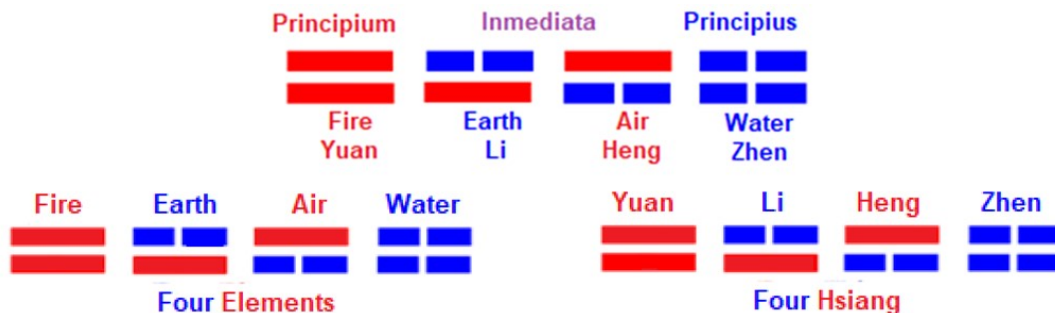
$$(2^2) = 4$$

The **2-Dimensional State** \mathbb{R}^2

$$f(m_2) = (\alpha + \beta)^2$$

The **Expansion of the Binomial Oppositional State**; the **Four Element Bigrams**; **Fire, Earth, Air, and Water**; the **Four Hsiang Bigrams**; **Yuan, Li, Heng, and Zhen**.

The **Formation of a Principium, Inmediata, and Principius, a beginning, middle, and end**



The 2-dimensional expansion is the interactions of the *Four Elements* of *Hermetic Alchemy* and the *Four Hsiang* bigrams of the *I Ching*. The *Four Elements* were believed to be a fundamental cause for the differences that occur within the *material* world and also *human nature*. *Note*: the four element's symbols (*Bigrams*) are found *only* in \mathbb{R}^2 2-dimensional systems.

The *I Ching* has a system of *five* (5) elements; however, it also has what is termed "The *Four Hsiang*" which is an *analog* of Alchemy's *Four Elements*, and is known as the "*Bigrams*" (*Yuan, Li, Heng, and Zhen* or *Old Yang, Young Yang, Young Yin and Old Yin*). The *Bigrams* were used in the *I Ching* as an *intermediate* step between the duality *Yin & Yang* symbols and the *trigram's* symbols, plus, they are also inadvertently included in interactions similar to the *Alchemist's Four Elements*.

$$(2^3) = 8$$

The 3-Dimensional State

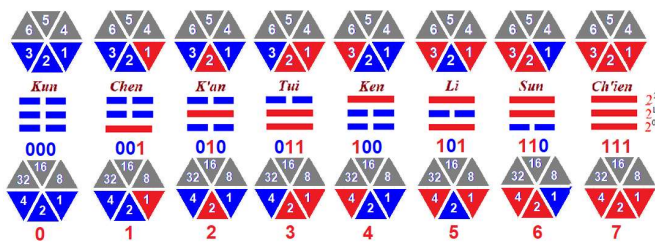
$$f(m_3) = (\alpha + \beta)^3 \mathbb{R}^3$$

A system of Trinities; the Tria Prima (Sulphur, Salt, Mercury); (Soul, Body Spirit); (x, zed, & y). The eight (8) Trigrams as Hexagons. The Law of the Triangle.

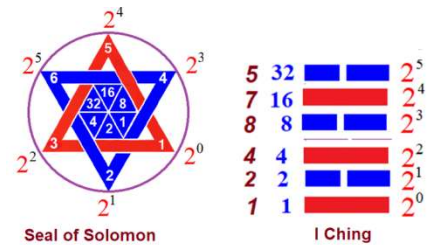
The Duality of Trigrams.

The Hexagram.

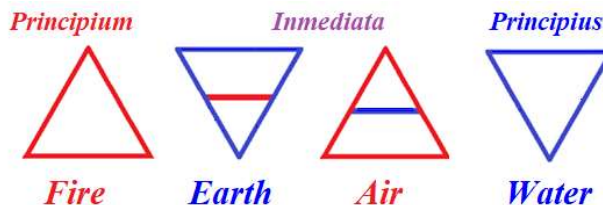
The Eight Trigrams



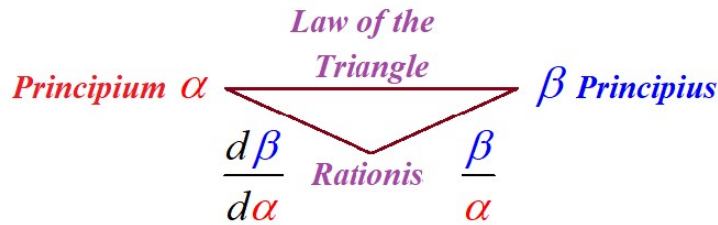
The Hexagram.



The *six*-(6) pointed star (originally termed as a *Sexanary*) had its beginning in *Alchemy* as a *single equilateral* triangle. The *Four Elements* symbols were the first *single equilateral* triangles whose (3) sides were often used to define their 3 properties of *Cardinal, Fixed & Mutable*.



The 3-dimensional state is the formation of a *Principium*, *Rationis*, and *Principius*. The *Law* of the *Triangle*, where two (2) entities interact to produce a *third* (output or *Rationis*).



The *double* equilateral triangle or *sexanary* has had a long history in *Jewish* mysticism and the *Kabbalah* where it is known as the *Star of David* or more correctly the *Shield of David*.

To understand *Hermetic Alchemy's* use of the *double* triangle (*Sexanary*) a brief explanation is given below. A more in-depth explanation can be found in Index F.

Seal of Solomon Hexagrams



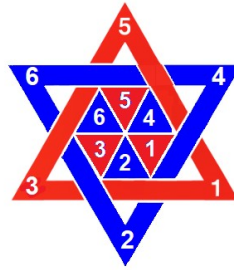
Shield of David *Seal of Solomon*

There is an important philosophical difference between the two graphic structures above. In modern times people reference the "*Shield of David*" as the "*Star of David*." *King David*, although unsupported by archaeology, supposedly used the motif on his shield in their various wars. It became known as the *Star of David* in the late 19th century when the *Zionist* movement made it their *official* seal. It eventually became the *logo* for the Flag of Israel.

The *Seal of Solomon* was anciently used as a *motif* by several different philosophies as a reference for some of their *beginning* principles. *Solomon* was noted for his early involvement in the mysteries and the occult. Notice the interlocking triangles within the *Seal of Solomon*. The interlocking of the triangles tells us they are intertwined together and interact with each other.

The triangles were first combined one above the other in an inner-locking fashion to represent the inherent bond between *oppositions* where one cannot exist without the other. i.e., *Opposites* must occur in "*pairs*". When you speak of "*good*" it automatically infers there exists an opposite "*evil*." It is another example of the use of α and β to define *oppositions*.

The following *example* graphic shows how each hexagram is presented and the inner *Hexagon* graphic's individual *red* & *blue* numbering of its *six* (6) *interior* equilateral triangles.



The *interior* equilateral *triangles* 1, 2, & 3 of the graphic are in a *clockwise* direction and *triangles* 4, 5, & 6 are in an *counter-clockwise* direction. This arrangement solves a *Binary* operation in the use of *Binary Trigrams*, where each trigram *opposite pair* sums to a *binary* value of *seven* (7), which property can be seen in the addition of the *red* and *blue's* 180° alignment within the inner *hexagon*. See *INDEX F* for more information on its *Alchemical* use.

The 3- dimensional system ($2^3 = 8$) expansion has been one of the most investigated of principles. Its fundamentals are based almost entirely within the *integer* value of its exponent *three* (3), known as a “*Trinity*.”

The *Trinity's* notable beginning came in the form of an early *theological* belief in “a *triune Deity*.” From this belief, associations of *three* expanded. *Albert Pike* explains the importance of the philosophical *trinity* and other numbers from an explication in his “*Morals* and *Dogma*.”

[*Pike, Morals and Dogma; Philosophical Trinities*]

The ONE designates harmony, order, or the *Good Principle* (the One and Only *Deity*), expressed in Latin *Solus*, whence the words *Sol*, *Soleil*, symbol of the *Deity* or *G-d*, The interpretation of the Hermetic fables shows, among every ancient people, in their principal gods, first, 1, the Creating *Monad*, then 3, then 3 times 3, 3 times 9, and 3 times 27. This triple progression has for its foundation the *three* ages of Nature, the *Past*, the *Present*, and the *Future*; or the *three* degrees of universal generation, *Birth*, *Life*, *Death*, *Beginning*, *middle*, *end*. The *Monad* was *Male*, because its action produces no change *within* itself, but only *out* of itself. It represented the *Creative Principle*.

Two, or the Duad, is the symbol of Antagonism; of Good and Evil, Light and Darkness. It is Cain and Abel, Eve and Lilith, Jachin and Boaz, Ormuzd and Ahriman, Osiris and Typhon. The Duad is the origin of contrasts. It is the imperfect condition into which, according to the Pythagoreans, a being falls, when he detaches himself from the Monad, or Deity. Spiritual beings, emanating from the Deity, are enveloped in the duad, and therefore receive only illusory impressions.

Three, or the Trinity, is most significantly expressed by the equilateral and the right angled triangles. There are three principal colors or rays in the rainbow, which by intermixture make seven. The three are the blue, the yellow, and the red. The Trinity of the Deity, in one mode or other, has been an article in all creeds. He creates, preserves, and destroys. He is the Generative power, the Productive Capacity, and the Result. The immaterial man, according to the Kabbalah, is composed of vitality, or life, the breath of life; of soul or mind, and spirit. Salt, Sulphur, and Mercury are the great symbols of the alchemists. To them man was body, soul, and spirit. NINE is the square of the trinity, and is represented by the triple triangle. The novary or triple ternary.



Hence the name of ninth envelope, given to matter. Every material extension, every circular line, has for its representative sign the number nine, among the Pythagoreans; who had observed the property which this number possesses, of reproducing itself incessantly and entire, in every multiplication; thus offering to the mind a very striking emblem of matter which is incessantly composed before our eyes, after having undergone a thousand decompositions. The number nine was consecrated to the Spheres and the Muses. It is the sign of every

circumference; because a circle of 360 degrees is equal to 9, that is to say, $3 + 6 + 0 = 9$. Nevertheless, the ancients regarded this number with a sort of *terror*: they considered it a *bad presage*; as the symbol of *versatility*, of *change* and the emblem of the *frailty* of *human affairs*. Wherefore they avoided all numbers where *nine* appears, and chiefly 81, the product of 9 multiplied by itself, and the addition whereof, $8 + 1$, again presents the number 9. As the figure of the number 6 was the symbol of the *terrestrial globe*, animated by a divine spirit, the figure of the number 9 symbolized the *earth*, under the influence of the *Evil Principle* thence the *terror* it inspired. Nevertheless, according to *Kabbalists*, the figure 9 symbolizes the generative *egg*, or the image of a *little globular being*, from whose *lower side* seems to flow its *spirit of life*. The *Ennead*, signifying an aggregate of 9 things or persons, is the first square of *unequal numbers*. Everyone is aware of the *singular properties* of the number 9, which, multiplied by *itself* or any other *number* whatever, gives a result whose final sum is always 9, or always divisible by 9. *Nine*, each member whereof, composed of two figures, presents a remarkable fact; for example: *multiplied* by each of the *ordinary numbers*, produces an arithmetical progression.

If the number *three* was celebrated among the ancient sages, that of *three times three* had no less celebrity; because, according to them, each of the *three elements* which constitute our bodies is *ternary*: the water containing *earth* and *fire*; the *earth* containing *igneous* and *aqueous* particles; and the *fire* being tempered by globules of *water terrestrial corpuscles* which serve to feed it. Not one of the *three elements* being entirely *separated* from the *others*, all material beings composed of these *three elements*, whereof each is *triple*, may be designated by the figurative number of *three times three*, which has become the symbol of all formations of bodies.

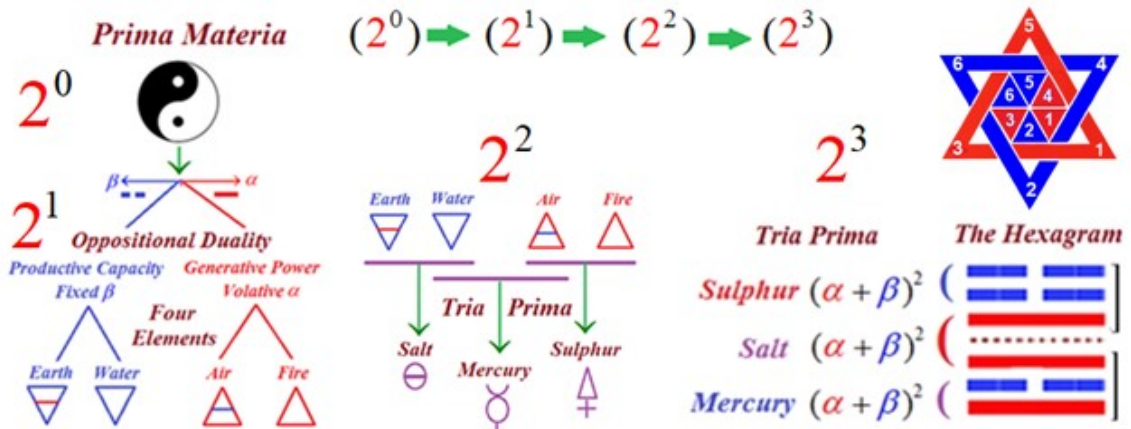
The Egyptians arranged their deities in *Triads* the *FATHER* or the *Spirit* or *Active*

Principle or Generative Power; the *MOTHER*, or *Matter*, or the *Passive Principle*, or the *Conceptive Power*; and the *SON*, *Issue* or *Product*, the *Universe*, proceeding from the two principles. These were *OSRIS*, *ISIS*, and *HORUS*. In the same way, *PLATO* gives us thought the *Father*; *Primitive Matter* the *Mother*; and *Kosmas* the *World*, the *Son*, the *Universe* animated by a *soul*.

Pike's above explication will be referenced many times. If you observe deep enough you can find a basic *trinity* in every philosophy and multiple *trinities* in theology. Our early algebraic mathematics teach us how to determine a *result* or *slope* (*Rationis*), from interactions of the variables *x* and *y*. The *Law* of the *Triangle*, where two (2) entities interact to produce a *third* (*output* or *rationis*). Putting the above mentioned 2^n principles all together in one graphic in order of precedence, we obtain the following graphic which is the *Hermetic Alchemical* hierarchy.

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The Hermetic Alchemy Hierarchy



17. A Misconception within Hermetic Alchemy.

There is a *misconception* that still remains within the *alchemical 3-dimensional* complementary properties of their elements. We will show the incorrect *tenet* and correct the misconception that has been in the texts for ages. We will begin within the *hierarchy* of the alchemists.

The essential early phrase and misconception is within the *Alchemist's* original definition of the *Quintessence* of *Matter*. "The *Four Elements* with the addition of the *Quintessence*" is a

generalized phrase and was how it was understood in the earlier texts. The *Quintessence* has had several lateral meanings over the ages; from its beginning to the early modern era it was presented as *Aether*. The concept of *Aether* also known as the *fifth* element or *quintessence* was at first thought to be the material that fills the region of the universe beyond the earth's sphere; it was thought to be the air in which the gods breathed and was prominent in early philosophy. However in the modern era it is generally assumed *not* to exist. It wasn't until 1905, when *Albert Einstein* published his Special *Theory* of *Relativity*, which did *not* include the *Aether*, physicists began to accept the hypothesis that *Aether* did not exist. The negative outcome of the *Michelson–Morley* experiment in 1887 had suggested it also; however there are still many physicists that believe it exists and could be a possible explanation of *Dark Matter*. The misconception in *Alchemy* occurs within the numerous uses and definitions of *Aether*. The holistic *concept* of *quintessence* is *true* in this case because there *is* a “*fifth*” property that involves *matter* and the *Four Elements* which does *not* fully match the general understanding of the term *quintessence*; it is the “*Tria Prima*.”

A *correct* meaning of the phrase above is “the *Four Elements* with the addition of the *Tria Prima*.” However, a more correct statement is “the *intermingling* of *three* (3) *sets* of *Four Elements* within the *Tria Prima*.” An improper use of *Quintessence* is one of the ways the Alchemists hid their actual meanings from the non-initiated.

The *Four Element's Bigrams* are found *only* in \mathbb{R}^2 2-dimensional systems; therefore; to understand the interactions of the *Tria Prima* and its connection to *matter* and the *Four Elements* we must, by the mathematics of *calculus*, *differentiate* the equation of the 3-dimensional *Hermetic* binomial opposition $f(m_3) = (\alpha + \beta)^3$ into *permutations* of 2-dimensional systems which *contain* the *Four Elements*. In order to take the *first derivative* of a composite function such as the binomial 3-dimensional function, $(\alpha + \beta)^3$, we must use the Calculus' *Chain rule* with (α) as the independent variable. We can *differentiate* the binomial with the general power rule giving an output of $n(\alpha + \beta)^{n-1}$ thus completing the “*composite*” relationship rule.

$$\begin{aligned} & \text{Chain Rule} \\ & \frac{d}{d\alpha} [(\alpha + \beta)^n] \\ & n(\alpha + \beta)^{n-1} \cdot \frac{d}{d\alpha} [\alpha + \beta] \\ & n(\alpha + \beta)^{n-1} \cdot \left[\frac{d}{d\alpha} (\alpha) + \frac{d}{d\alpha} (\beta) \right] \\ & n(\alpha + \beta)^{n-1} \cdot (1 + 0) \\ & n(\alpha + \beta)^{n-1} \end{aligned}$$

When taking the *first derivative* of the 3-dimensional function $(\alpha + \beta)^3$ we reduce its exponent to a 2-dimensional function $(\alpha + \beta)^2$ and find there are *three* (3) *permutations* of 2-dimensional

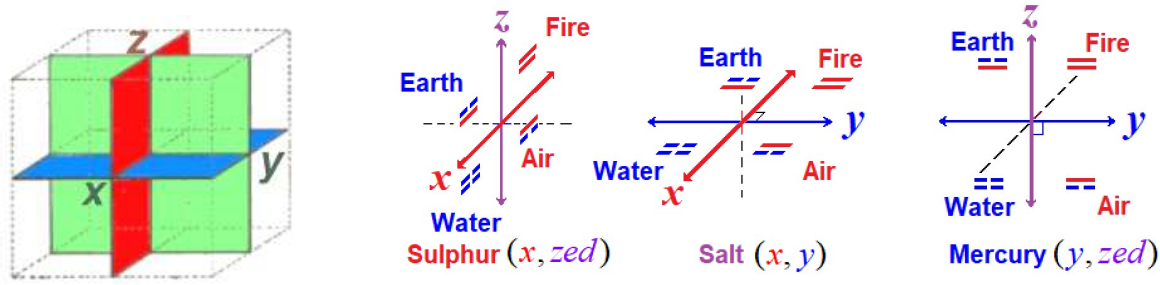
systems $3(\alpha + \beta)^2$ operating within one 3-dimensional oppositional system, the *Sulphur* ($x \times zed$), *Salt* ($x \times y$), and *Mercury* ($y \times zed$). Each of the *three Tria Prima* (*Sulphur*, *Salt*, and *Mercury*) 2-dimensional systems has a relative set of *Four Elements* as its elements. The intermingling of the *three* (3) *Four Element* 2-dimensional systems are the twelve *modal* elements within the oppositional structure of the *Tria Prima* (*Sulphur*, *Salt*, and *Mercury*) system which forms *hyper-planes* within the 3-dimensional oppositional system.

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The First Derivative of the 3-Dimensional Function

$$f'(\alpha + \beta)^3 = 1(\alpha + \beta)_{(x, zed)}^2 + 1(\alpha + \beta)_{(x, y)}^2 + 1(\alpha + \beta)_{(y, zed)}^2 = 3(\alpha + \beta)_{(x, zed, y)}^2$$

$$f'(\alpha + \beta)^3 = 3(\alpha + \beta)^2$$



In the graphic on the above left, the three *Four Element*, 2-dimensional systems' *hyper-planes* are shown as a *red*, *green*, and *blue* square-plane, where the *Four Elements* are present in each of the three (3) 2-dimensional *hyper-planes* (shown above), therefore, there are *three* sets of *Hermetic Alchemical Four Elements* in operation not just one (1). There is the *Sulphur* set ($x \times zed$), the *Salt* set ($x \times y$), and the *Mercury* set ($y \times zed$).

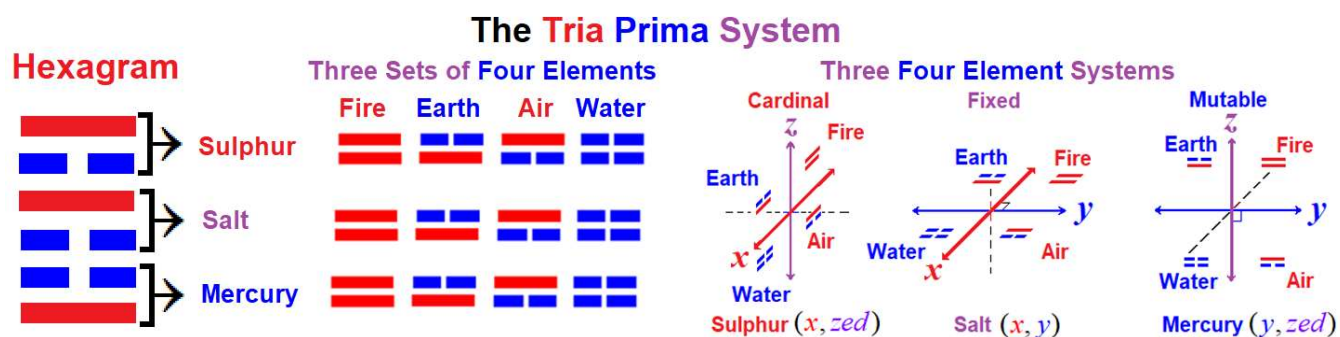
Since *Aether* is assumed *not* to exist the *Alchemist's* meaning of the *Quintessence* is the *three* (3) *Tria Prima* sets of *four* fundamental "modal" elements intermingling and functioning independently and in conjunction with each other within the 3-dimensional "*Hermetic Alchemical 2ⁿ orthogonal* oppositional system. The resulting *elemental diagram* then becomes a *six* (6) figured α, β structure containing *three* (3) *Four Element* sub-codon positions, where each sub-codons' position represents *one* of the *three* (3) "*Tria Prima*," *Sulphur*, *Salt*, and *Mercury*." The *three* (3) sub-codon positions can at any one time contain any *three* (3) of the

12 modal elements of the three (3) sets of Four Elements. It is called a Hexagram (6). It is formed from a second derivative of the 3-dimensional binomial opposition.

$$f^2(\alpha + \beta)^3 = 6(\alpha + \beta)^1$$

The 12 modal elements will be defined later on in this section; however, the hexagram is shown in the next graphic below. Note: Just as in DNA's (TCAG) & RNA's (UCAG) bases, only three (3) out of the four bases, and similarly only three (3) single elements out of the three (3) Four Element sets are used in the hexagram at any one time to define the DNA/RNA codon or define the hexagram.

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One of the fundamental tenets of Paracelsus, a 16th Century, Physician/Alchemist, was that all manifestations are composed of three (3) philosophical functions, “The Tria Prima, (The Three Primes).

”Anima, the Soul, (Sulphur)
Corpus, the Body (Salt)
Spiritus, the Transforming Spirit (Mercury)

Sulphur corresponds to a Volatile, active Principium (α Generative Power principle); also in philosophical human nature; more often, it was referenced as a Soul. Mercury corresponds to an expandable Principius, (β Productive Capacity principle), and Salt, (body), a result or Rationis; the Rationis is an algebraic slope blend of the interactions of the two opposing complementary α,β principles.

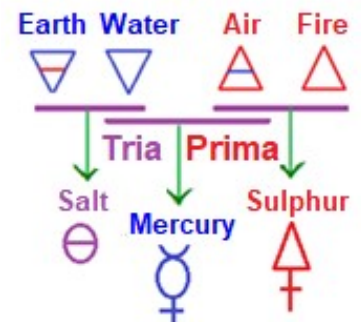
Paracelsus’ “Three Primes” belief was instrumental in the acceptance of a philosophical Sulphur to Mercury ratio (Rationis), which led to a later belief among alchemists that each

metal was formed having a specific *ratio* of the philosophical *Sulphur* to the philosophical *Mercury* and that a *metal* could be converted into any other *metal* by adjusting, or changing the philosophical *Sulphur* to *Mercury Rationis*. Therefore, many alchemists believed it was *logical* to assume lead (*or any other metal*) could be converted into the noble metals of gold or silver if a correct ratio could be found by adjusting the amounts in the *Rationis* of philosophical *Sulphur* to philosophical *Mercury*.

To the *Kabbalists* and *Alchemists*, a human consisted of a *soul*, *body*, and *spirit*; the *three* being analogs or equivalents of the *Sulphur*, *Salt*, and *Mercury* which their codons, by turn, becoming *Volatilized* or *fixed*, composed the *Azoth* or spirit of the sages; in which *Azoth* was believed to be an essential agent or *catalyst* of *transmutation* in early philosophy, it had the ability to *create life*. The essential transforming agent they called *Mercury* or "*Spiritus*," a name given by the *Kabbalists-Alchemists* to the animating spirit or *presence* hidden within all matter and manifestations that makes evolutionary reproduction and transmutation possible.

According to *Paracelsus* and the alchemists, *Sulphur*, *Salt*, and *Mercury* are the *three*-fold philosophical aspects of all phenomena, to be found in all compounds of a mineral or organic nature. It was postulated that by changing the proportions of the philosophical *Sulphur* to *Mercury* ratio in a compound; it would cause a reproduction or transmutation to occur. Also, in relation to *human nature*; to the philosophers, every phenomenon and manifestation in *Nature* was believed to possess these *three* philosophical attributes, especially the *human being*.

Sulphur (*Soul*) was believed to be a composition of the philosophical *Fire* and *Air*; *Mercury*, a mixture of the philosophical *Air* and *Water*; while *Salt* was a composition of the philosophical *Earth* and *Water*. *Sulphur* represented vital *Energy*, *Individuality* and a *Soul*; being that quality or nature of a particular manifestation which distinguishes it from others of the same *species*, especially when it's intensity is strong. It is the principle of *feeling*, *emotions*, *thought*, and *action* in humans, regarded as a distinct non physical entity, and commonly believed to be one of the two spiritual natures of humans that reside within the physical body.



Mercury, in philosophy is generally associated with *Gnostics*; *intelligence*, *mind* and *knowledge*; according to whichever philosophy you are referencing, it also has had many

lateral definitions over the ages. It was represented at one time as a spiritual immaterial essence, principle, or animating *life force*. In traditional Greek mythology, *Mercury* was the *messenger* of the Gods, and was in constant movement between the *above* and the *below*. *Above* being the abode of the Gods or the heavens, and *below* being the earth or gross matter. Within the human body, *Mercury* is the spirit, or the animating *life force*. Whereas *Sulphur* is a *Soul*, *Mercury* is the life force that moves through the soul and gives it being. It is the *carrier* that brings the *soul* down into the physical world of *Salt* or *body*. While *Sulphur* is the *fuel* for ethereal manifestations of change, *Mercury* is the animating spirit that actually shapes and transforms substances or presences in that change.

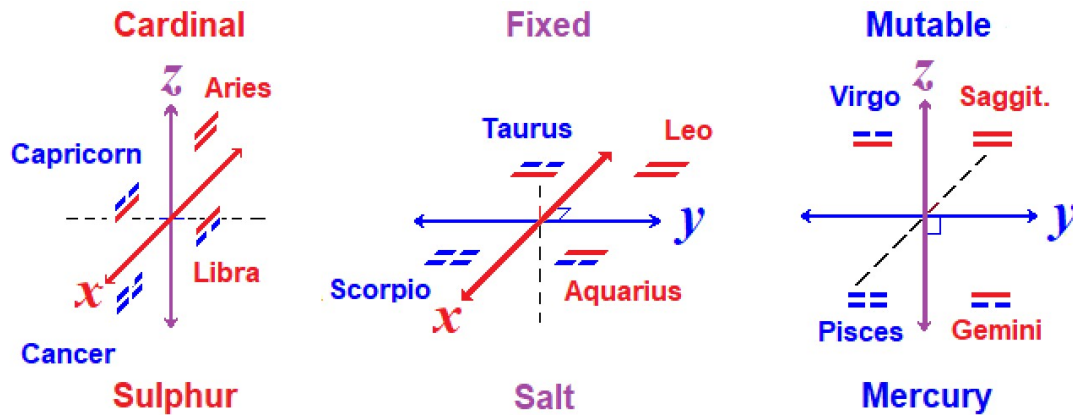
Salt is a *matter structure* that gives corporeal *reality* to interactions of the *Generative Power* and *Productive capacity*. *Salt* represents the body, as well as physical matter in general, *crystallization*, and *condensation*. *Salt* is the basic matter through which the more spiritual principles work. Each principle was thought to contain a “*Density*,” and each progressed through various levels of density, with *Salt* having the greatest density. It is a quality of the philosophical *Water* and *Earth* elements. *Salt* in humans is the physical body, and is therefore very intricate and complex. Among other entities, the human body was thought to be a *microcosm* of the universe. The human body followed “the rule of *Correspondence* - as above so below.” [There was another addition to the rule of correspondence, “As *right* so *Left*.” It was first purposed as an 8th *Hermetic* principle which involved the equilibrium of “*Ethics* and *Morality*,” however it became reserved only for initiates; just as our *left* hand mirrors our *right* hand, an initiate had to have a balance of ethics and morality.] The human body was a result of the interactions of our *soul* & *spirit* and the place in which they *resided*.

Consider the following simple analogy. An automobile engine produces work. It is a *stand-alone* system similar to the function of *Hermetic Alchemy's* 3-dimensional opposition $(\alpha + \beta)^3$. If it were possible to mathematically take the *first derivative* of this automobile engine, it would reveal *three* (3) salient 2-dimensional (*4-element*) operating systems within it, (*Four Elements* per each component of the *three Tria Prima*) that are needed to produce the work. *First*, it would need to have a physical assembly (*motor*) capable of producing the work, (the *Salt* quality or *body*); *second*, it would need to have *energy* or fuel to power the physical assembly (the *Sulphur* quality or *Soul*); and *third* it would need to have *spark* to ignite the fuel that powers the assembly (the *Mercury* quality or *Spirit*). This *trinity* of systems works

independently of each other but only when they work in conjunction with each other, with each contributing its own special *qualities* does the engine function and produce work. This simple analogy is an illustration of the philosophical operations of the “*Tria Prima*,” (*Sulphur*, *Salt*, and *Mercury*) systems of the *Hermetic Alchemical* system.

In addition to the above-discussed properties, until the early 19th century, philosophical *Astrology* (a *syncretic* discipline of *Hermetic Alchemy*) had been more widely a verbally handed-down staple and discipline of reference with the *Alchemists* for understanding *human nature*. From philosophical *Babylonian* astrology though, their philosophers had early on determined that within our 3-dimensional spatial system, the internal sub-codons of the *Sulphur*, *Salt*, and *Mercury* were each identified as interacting within *three* (3) *sets* of the four elements in which there are *three* different types of *Fire* elements, *three* types of *Earth* elements, *three* types of *Air* elements and *three* types of *Water* elements. They called these subsets “*Modes*,” in which the elements were separated into the *three* (3) *Cardinal*, *Fixed*, and *Mutable* modes. The *Babylonian* philosophers had previously associated the *three* sets of *Four Elements* with the twelve signs of the Astrological Zodiac. The *Fire* elements are *Aries*, which is of the *Cardinal*-Fire quality, *Leo* of the *Fixed*-Fire quality and *Sagittarius* of the *Mutable*-Fire quality. The *Earth* elements are *Capricorn* of the *Cardinal*-Earth quality, *Taurus* of the *Fixed*-Earth quality and *Virgo* of the *Mutable*-Earth quality. The *Air* elements are *Libra* of the *Cardinal*-Air quality, *Aquarius* of the *Fixed*-Air quality and *Gemini* of the *Mutable*-Air quality. The *Water* elements are *Cancer* with a *Cardinal*-Water quality, *Scorpio* of the *Fixed*-Water quality and *Pisces* with the *Mutable*-Water quality.

The early astrological philosophers explained the *Cardinal*, *Fixed* and *Mutable modes* in terms of *Seasonal Change*. *Cardinal* is the beginning of a new season of each year, thus it is the beginning of *new seasonal conditions* (*warm*, *Hot*, *Cool*, *Cold*), it acts as a catalyst; welcomes, enhances, and begins the new changes; *Fixed*, is the middle of the season, is stable, stubborn, resists change; its changes maintain *status quo*; it protects and furthers the changes of the original *Cardinal* quality. *Mutable*, is the *prelude* to a new season and *completes* the beginning changes from the original *Cardinal* and starts preparing for the start of a new *Cardinal* season.



18a. The Hexagram, (Structural “Engine” for the Lattice-Datum System)

Successive derivatives of the 3-dimensional Lattice Datum system return the main internal operational functioning parts of a 3-dimensional α, β oppositional system. If successive derivatives are performed on the general equation for the 3-dimensional binomial function $(\alpha + \beta)^3$ until it reaches the 1st dimensional differential binomial state $(\alpha + \beta)^1$, its coefficient or permutations will be the number of dimensional α, β lines in its lineal elemental diagram.

The second derivative of this equation shows the six individual lines or permutations of the hexagram, each line is capable of holding either an (α) or (β) binomial oppositional bit-type symbolic line.



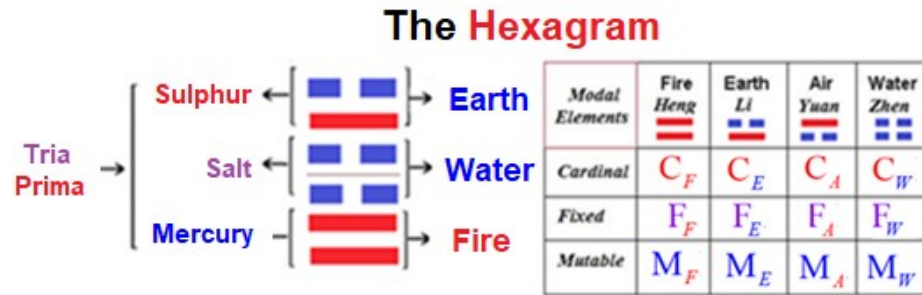
Successive derivatives of the Lattice Datum System

$f^1(\alpha + \beta)^3 = 3(\alpha + \beta)^2$ 1st derivative, (three permutations of 2-dimensional Modal Four-element, Bigram Systems for one Tria Prima, Sulphur, Salt, and Mercury.

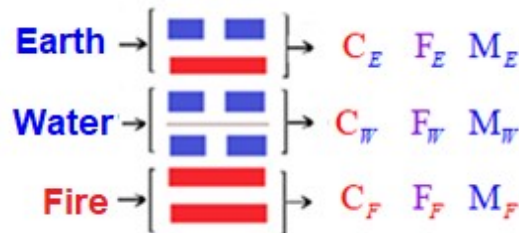
$f^2(\alpha + \beta)^3 = 6(\alpha + \beta)^1$ 2nd derivative, (the six (6) 1-dimensional permutations of α or β elemental lines of the 6-line Hexagram.)

The coefficient of the 2nd derivative is the six (6) permutations of α, β lines; *Note*: The 2nd derivative forms the hexagram; the hexagram then uses the Four Elements of the 1st derivative as inputs to form its structure, holistically forming a mathematical hierarchy. In the diagram below, the Tria Prima is separated into its three (3) individual permutations or positions,

Sulphur, *Salt* and *Mercury*. Each of the three (3) positions is an individual permutation or position that can hold any one of the 12 modal *bigram* elements.



Only *three* (3) of the twelve modal elements are used at any one time just as in DNA and RNA bases where it uses only *three* (3) of its *four* (4) bases. In the graphic above, the top position (*Sulphur*) now contains a *generic Earth* element; the middle position, (*Salt*) contains a *generic Water* element; and the bottom position (*Mercury*) contains a *generic Fire* element, in which the combination of all *three positions* form the *hexagram*. The line in the middle divides the hexagram into its two *trigrams* of *K'an* (☵) (*top*) and *Tui* (☱) (*bottom*). The graphic below shows the three *generic* positions of *Earth*, *Water*, and *Fire* having to be one of their *three* different *modal* elements.



The *generic Earth* element (*top*) has to be one of the *three* modal *Earth* elements, *Cardinal*, *Fixed*, or *Mutable* (right side), for an accurate *Four Element* type. The accuracy of using modal elements was a beginning reason the twelve (12) signs of the Astrological Zodiac were formed, it introduced a “*time*” separation into the system. Each of the remaining two (2) *generic* elements (*Water* & *Fire* shown above) also have to be one of its *three* (3) modal elements to be completely accurate. The question at this point is “How do we determine the *modality* of these *generic* elements?”

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The Modal Four Elements

As mentioned earlier, the different modes of the *three* sets of *Four Elements* are seasonal dependent. Each season, of the *four* seasons of a year, cycle through *three* (3) different modal elements. The modal elements as a whole are defined by the Alchemical definition of the “*three times three*” (3 x 3) rule in *Albert Pike’s* discussion of *Hermetic Alchemical Trinities* (think of it as a 3 by 3 rule, not especially as a *multiplication* which it actually is).

[Pike, Morals and Dogma, Trinities] The *Trinity* of the *Deity*, in one mode or other, has been an article in all creeds. He *creates, preserves, and destroys*. He is the *Generative Power, the Productive Capacity, and the Result*. The immaterial man; *Salt, Sulphur, and Mercury* are the great symbols of the alchemists. To them man was *body, soul, and spirit*. If the number *three* was celebrated among the ancient sages, that of *three times three* had no less *celebrity*; because, according to them, each of the *three* elements which constitute our bodies is *ternary*. Not one of the *three* elements being entirely separated from the others, all material beings composed of these *three* elements, whereof each is *triple*, may be designated by the figurative number of *three times three*, which has become the symbol of all formations of bodies.

To untangle the (3 x 3) rule we need to understand what Pike is telling us in the above paragraph. Note the underlined text above; Pike is confirming *three* (3) elements out of the 12 modal elements constitute our bodies (*immaterial man*). The 12 modal elements are divided into *three* (3) equal sets of *Four Elements* by the *Tria Prima*.

First, we have the *three* (3) *Tria Prima Sulphur, Salt, and Mercury*; the *three Tria Prima* make up the “*immaterial man (Soul, Body, and Spirit)*.” Each member of the *Tria Prima* has its own relative set of *Four Elements* and each of these four elements can be any *one* of the *three* (3) *Cardinal, Fixed* or *Mutable* qualities. This relationship is the 3 x 3 rule. However to understand the *modal* elements, we need to recall the functioning of *seasonal change*.

Seasonal changes occur within *harmonic* time cycles of circular motion of the four seasons. Their properties will be presented *linearly* where it is a little more understandable. The graph

below starts at each circle's *Eastern* most point, which in *Western* philosophies, represents the *Spring Equinox* of an upcoming year.

There are two (2) *Equinoxes* and two (2) *Solstices* during a yearly cycle. The *equinoxes* occur at the beginning of *Spring* and at the beginning of *Autumn*; the *solstices* occur at the beginning of *Summer* and the beginning of *Winter*. *Equinoxes* are the times of the year when day and night have equal lengths, *Solstices* are the times of the year when the Sun is at its highest or lowest position (*declination*) in the sky.

Spring			Summer			Autum			Winter		
C	F	M	C	F	M	C	F	M	C	F	M
F	E	A	W	F	E	A	W	F	E	A	W
♈	♉	♊	♋	♌	♍	♎	♏	♐	♑	♒	♓

The 360° degrees of the yearly cycle is shown above as a linear, straight, informational rectangle. Shown are *four* (4) linear rectangles showing the *seasons* of the year, the *Cardinal*, *Fixed* and *Mutable* times of the Year (C F M), the separation of the three sets *Four Elements* of the alchemists that occur within a year and the *Zodiac* signs. In a yearly cycle there are four (4) sets of *Cardinal*, *Fixed* and *Mutable* (C F M) *modes* and three sets of Alchemical *Four Elements* (F E A W). We will also need the dates of these *Equinoxes* and *Solstices*, plus the dates of the *middle* and *ending* parts of each *season*.

Spring Equinox (Mar. 21 – Apr. 19)

Mid-Spring (Apr. 20 – May 20)

End-of Spring (May 21 – June 20)

Summer Solstice (Jun. 21 – Jul. 22)

Mid-Summer (Jul. 23 – Aug. 22)

End-Summer (Aug. 23 – Sept. 22)

Fall Equinox (Sept. 23 – Oct. 22)

Mid-Fall (October 23 – November 21)

End-Fall (Nov. 22 – Dec. 21)

Winter Solstice (Dec. 22 – Jan. 19)

Mid-Winter (Jan. 20 – Feb. 18)

End-Winter (Feb. 19 – Mar. 20)

The above dates are the approximate dates an *astrological sign* changes from one to another. *Aries* is the beginning of the *Spring Equinox*, *Taurus* is the middle of spring, and *Gemini* is the ending month of spring. Similarly *Cancer* is the *Summer Solstice*, *Leo* is the middle of summer and *Virgo* is the ending month of summer. The *Autumn Equinox* is *Libra*, *Scorpio* is the middle of autumn and *Sagittarius* is the ending month of autumn. Finally, *Capricorn* is the *Winter Solstice*, *Aquarius* is the middle of winter and *Pisces* is the ending month of winter. Having these dates we can accurately calculate the *modality* of any of the *Fire*, *Earth*, *Air* and *Water*,

twelve (12) *modal* elements. In the *rectangular* chart above, the *blue* rectangle is the four (4) sets of *Cardinal*, *Fixed*, and *Mutable* modes and the two *red* rectangles are the three (3) sets of *Four Elements* and *12 Zodiac* signs, all of which occur in a yearly cycle all *corresponding* to one another.

The season's rectangle notes the *three* (3) months (another *trinity*) in a season and shows the first month of Spring (*Aries*) is a *Cardinal-Fire* (C_F). The Second or middle month of Spring is *Taurus* (an *Earth* element), and by the same *convention* as above, we note the sign *Taurus* is a modal *Fixed* Earth (F_E) element. For the final month of spring, the sign *Gemini*, through the same process as above is found to be a *Mutable* modal *Air* element (A_M). Complete this same process for each of the three (3) remaining months for the *summer*, *autumn*, and *winter* seasons and we will have a complete set of the twelve (12) *Modal* Elements needed in *Hermetic Alchemy* and *Astrology*.

Before modern times the "*Astrological Sun Sign*" data changed with the *Precession* of the *Equinox* (a cyclic wobbling in the orientation of Earth's axis of rotation within a period of *25,772* years), however, being related to *time*, and the seasons of each year; *plus*, the seasons being a constant cyclic *repetition* or *frequency*, the standardized system used in *Astrology* in modern times was adopted. The outer zodiac constellations are now used for position reference only.

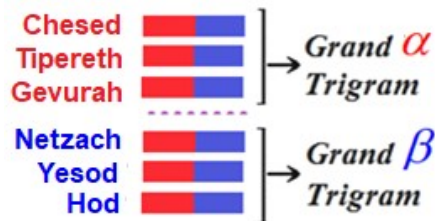
Normally, in generalized situations, we just use the *generic Fire*, *Earth*, *Air*, and *Water* natures to produce a *generic* type *hexagram*; however, if we need more in-depth information (as its use in *Astrology* and *Alchemy*) we do the *modal* calculations. The *Cardinal*, *Fixed*, and *Mutable* designations are inclusive for each different independent element in which an *Earth* element has *Earth* element *qualities* and the *modal Earth quality* only alters one quality of the manifold *qualities* that determine the nature of an *Earth* Element.

To summarize this section and follow up on the *hexagram* in general, the combination of the *three* (3) bigram *Four-Element* sub-codons taken at once gives two "*Sub-Master Codons*" (an *upper* and *lower trigram*), shown right, which form the *3-dimensional Lattice Datum's* compositional data structure, the hexagram *Engine*. There are *64* (2^6) possible hexagram master codons that can be formed from the six (6) lines of the *hexagram*, however, once the formation of the *hexagram*



codon is completed from three (3) elements of the 12 modal elements, the generic interactions of the hexagram is viewed differently. The three Tria Prima positions Sulphur, Salt, and Mercury (three (3) 2-dimensional Four Element bigrams) are now transformed into a duality of two 1st order trigram elements as an additional 3-dimensional set of operators. From the hexagram shown above, the three Tria Prima positions become the two trigrams, “Kun (☷)” & “Tui (☵)” for I-Ching Hexagram number "45", “Gathering Together” or Alchemical Grand Elements as noted below from Albert Pike.

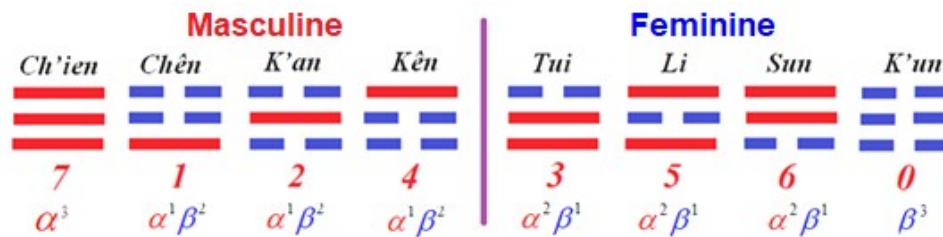
[Pike, “Morals & Dogma” page 783]- From the mixture of the four elements and of their four qualities, result the Three Principles, Mercury, Sulphur, and Salt. These are the Philosophical, not the Vulgar. The philosophical Mercury is a Water and a Spirit, which dissolves and sublimates the Sun; the philosophical Sulphur, a Fire and a Soul, which mollifies and colors it; the philosophical Salt, an Earth and a Body, which coagulates and fixes it; and the whole is done in the bosom of Air. From these three principles result the Four Elements duplicated, or the Grand Elements.



The Grand α and Grand β alchemical trigram duality is similar in respect to the x & y of the 2-dimensional four modal elements except the Grand Elements contain masculine or feminine trigrams in the two positions of the divided hexagram along with masculine or feminine trigram volatile (α) and fixed (β) bold and broken lines of the x, zed, & y, however, the Grand α is still an external form masculine Generative Power and the Grand β is still representative of an internal form feminine Productive Capacity as in an \mathbb{R}^2 2-dimensional bigram system, but existing in a higher, more complex level.

The hexagram, along with being defined by the three-bigram sub-codon positions of the Tria Prima, Sulphur, Salt, and Mercury, can now additionally be defined philosophically in terms of

the *I Ching's* 3-dimensional 1st order *trigram* (☱) elements. However, whereas the *Four Element* bigrams contain an *x* and *y* position one above the other; the Grand Elements contain two 1st order *trigram* (*x*, *zed*, & *y*) positions, one above the other. The *Grand Elements* suggest the existence of a Grand Active (α) *yang* and a Grand Inactive (β) *yin trigram*. In the *I Ching* this is indeed the case when we consider the traditional arrangement of the *eight trigrams* into the familial *masculine* and *feminine*. The *King Wen* or *later* arrangement assigns the trigrams *Ch'ien*, *Chên*, *K'an*, and *Ken* as *yang* or *masculine* and *Tui*, *Li*, *Sun*, and *K'un* as *yin* or *feminine*, which is seen from the gender relationship shown below along with their math identifiers and their *Western* culture binary numbering.



(For a listing of each *trigram's* *concept*, *properties*, *familial* relationship, and other qualities see *INDEX A* in the Reference Section).

The King Wen Sequence Section 6-A

