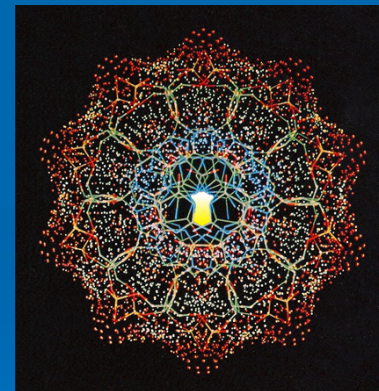
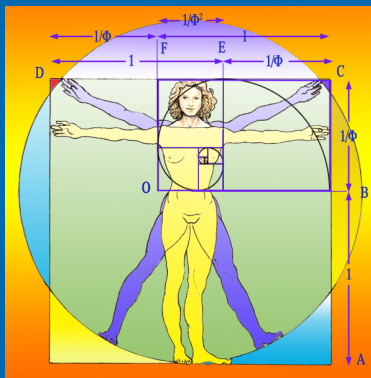
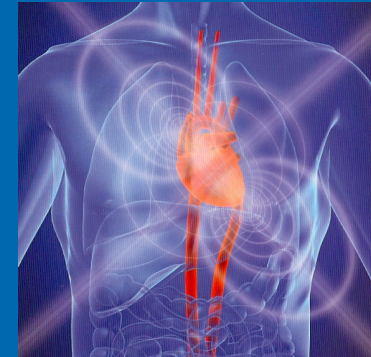
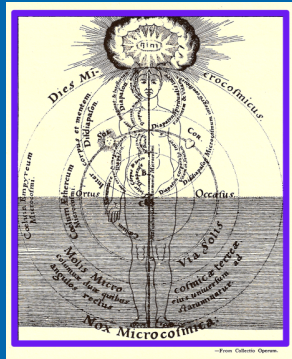


# SG204.Ia PHI in the Human Body, Biology & DNA

Online Module SG 204  
(Interm IV)



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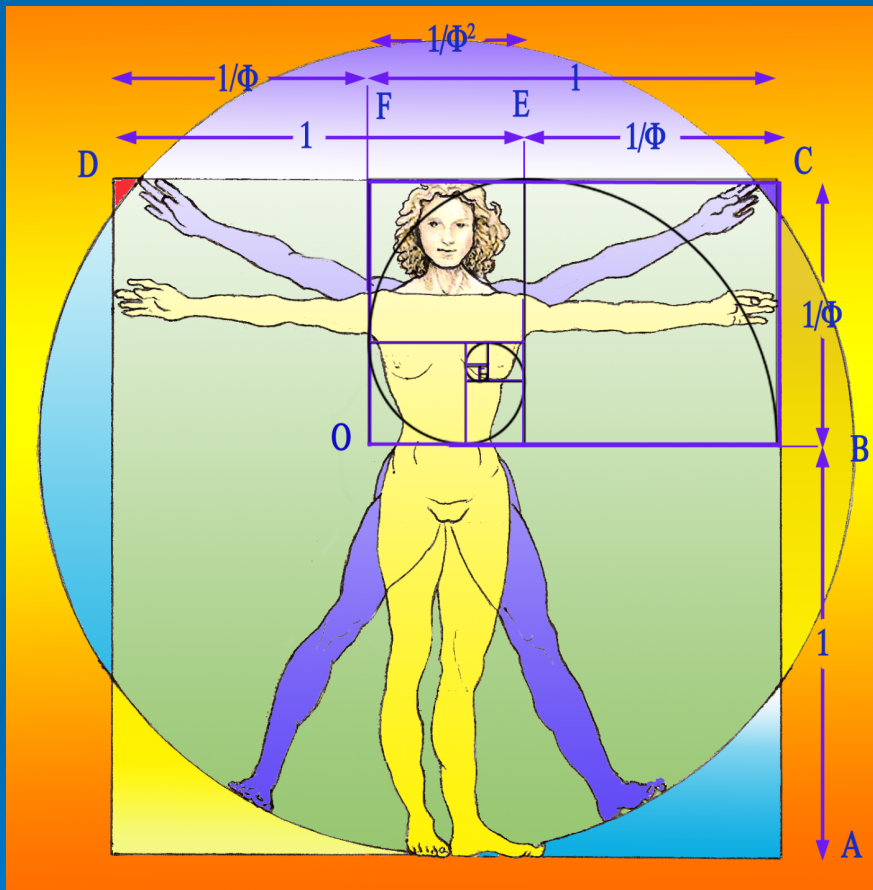
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## SG204.Ic PHI in the Human Body, Biology & DNA



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# SG204.Id PHI in the Human Body, Biology & DNA - Intro 1

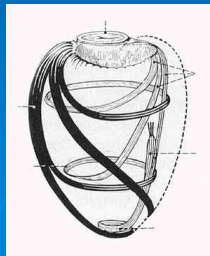
In chapter 1, we are starting with a brief historical review of the many traditions pointing to a "canon" of sacred proportions in the human body. To ancient sacred cultures, the human body is but a "mini cosmos" pointing to the larger cosmos. Way before the terms "holography" (1947) and "fractal" (1975) were coined, many traditional cultures had an intuitive understanding of the harmonic relationship between people and the universe, encapsulated in the Hermetic saying "as above, so below". Indeed a fractal-like, quasi-holographic self-similarity between the human body and the body of the universe was assumed: this was the concept of the "*anthropocosm*".

In chapter 2, PHI Proportions of the Human Body, we will get down to the business of actually measuring this human body and realizing that it is an exquisite template of golden proportions. Even though individual measurements vary, as pointed out by anthropometric surveys, the average harmonic graphs of adult bodies point to the PHI standard of a Human Canon.

Chapter 3 will describe the New Biology of Field Resonance which is going much larger & deeper than the now obsolete bio-chemistry of separate life components and machine-like biological processes. The New Biology is an extension of the New Paradigm in science that we started to describe in SG203. The New Paradigm is about the fractal, non-local inter-connectivity of all aspects of the universe and consciousness. Consciousness is the key element carefully left out in the old science. And the PHI optimization of the universal fractality and coherence is the re-discovery of the ancient wisdom called Sacred Geometry. The New Biology is also the foundation of the New Medicine ("Energy Medicine") and the Healing Arts [◆SG307], as it is based on the field resonance of energetic systems harmonically nested within each other. On our way to be acquainted with "Quantum Biology", we will meet bio photons, the universe of the cell and some extraordinary cellular components such as microtubules.

DNA will be our focus in Chapter 4, PHI Resonance in the DNA. We are introducing here the research of French scientist Jean-Claude Perez. Well established in Europe since a dozen years, yet completely unknown in the US, this is a revolutionary breakthrough that uncover the astounding presence of Fibonacci & Lucas series resonance within the nucleotides. Lately, using the official data of the Human Genome project, J. C. Perez has accumulated statistical evidences of specific number ratios and patterns that support his earlier discovery of a "PHI pulse" within the DNA. We will conclude this chapter with some remarks about the uncanny similarity between the DNA structure and the ancient Chinese Book of Changes, the I Ching, as well as a glimpse of the advanced Russian research on "Wave Genetics".

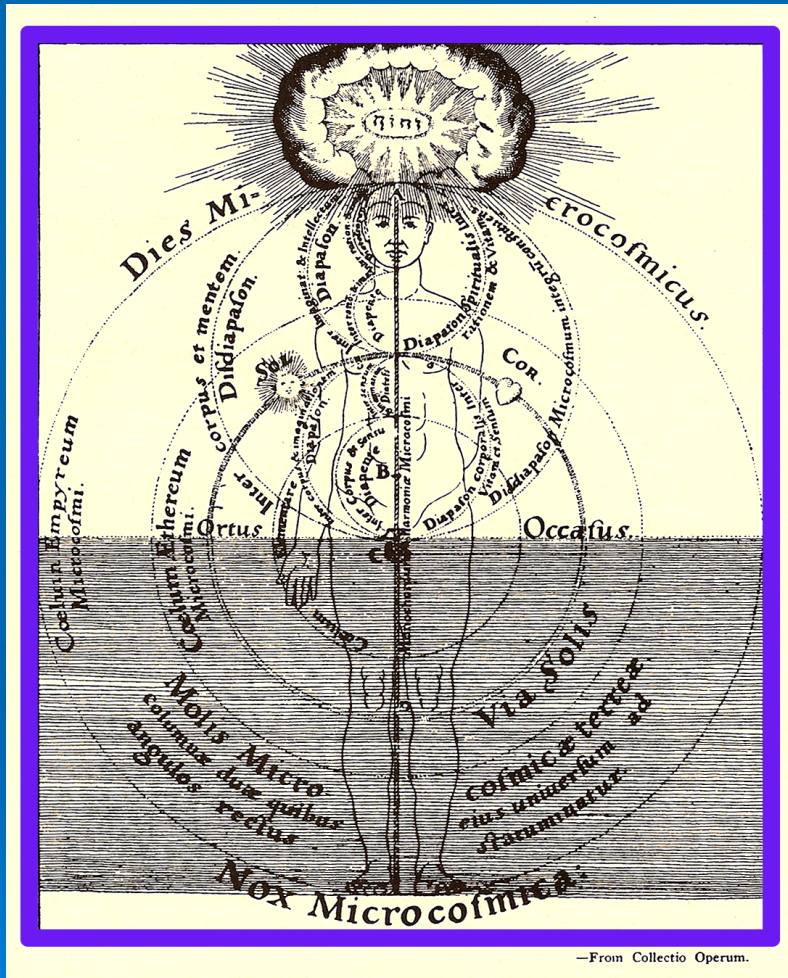
The final chapter, PHI Harmonics in Heart & Brain, brings up some new data about the functioning of the heart, the new heart's rate variability research, and the orchestration of harmonic coherence between heart, brain and the many other other systems & integral components of the "Human Hologram".



← The "heart's vortex": a spiral arrangement of muscular fibers at the apex of the heart.



## SG204. Chapter 1 Traditions of the Human Canon



—From Collectio Operum.

This chapter is first reviewing the traditional view of the human body as a *micro-cosm*, in harmonic proportion with the universe or *macro-cosm*.

We will then briefly visit the historical periods when the Phi-based Canon of the Human Body was understood and applied by artists & architects.

After the Renaissance, the traditional understanding rapidly disappeared. Only now, do we see it resurfacing.

← The human body, as Heavenly Man, shown in resonance with the musical chords of the universal monochord. This diagram points to the *harmonic structure* common to man and the cosmos.

(Robert Fludd. *Utriusque Cosmi*. 1619.)

## SG204.1.1 Note on Cosmic Anatomy

In 1932, Manly P. Hall (1901-1990), a leading scholar in occult mysticism & founder of the Philosophical Research Society in Los Angeles, published *Man, the Grand Symbol of the Mysteries*, in which he gathered the "noble heritage of wisdom" pertaining to the "human body as a witness to a hidden majesty". M.P. Hall adds: "Those who have envisioned the true splendor of wisdom have closed their books forever." We are touching here upon Inner Sacred Geometry, accessible by the mystical experience of higher senses and subtler organs of perception capable of breaking through the human 3D conditioning of individual separation.

*"The student of occult anatomy can then understand  
how there can be a heart in the world and a world in the heart;  
how the planets are in the vital organs and the vital organs in the planets;  
how each is in all and all in each;  
how atoms make stars and stars make atoms;  
how there are macrocosms and microcosms;  
how man, blinded by the single sun of heaven,  
supports a hundred million suns within himself."*

The New Paradigm science is pointing to & expressing these worlds within by describing the universe as nested systems of self-similarity instantly communicating and interacting through the Quantum Plenum Field. In later chapters, we will explore the concepts of the New Biology and the fractal harmonics orchestrating the human body-mind-spirit system in a dance of super-coherence with the entire universe. "There are striking parallels between human and cellular society", states Bruce Lipton in his "Biology of Belief" (2005).

However, this is not enough: inner experience must ground these concepts in the inter-dimensional unity of our consciousness, individual, collective and ultimate. While some parts of the Global Being called humanity are collecting proofs for the mind, other parts are co-creating and weaving experiential bridges & pathways to directly navigate the inner worlds.

*"Flung through the wide vistas of space, suns, moons, and stars are but the separate bones of a great skeleton: the framework of the Universal Man.  
Our little lives are moved by the thrill of that infinite life which courses and throbs through the arteries and veins of space. We live isolated in the midst of an incomprehensible whole, on the one hand infinite greatness and on the other, infinite smallness, but on all sides, within and without, infinite wisdom". (M. P. Hall)*

A key to this ancient and re-emerging wisdom is the Golden Fractality of the Cosmos.



↑ The Macrocosm and the Microcosm. Title page of Robert Fludd's "Utriusque Cosmi". 1617.



## SG204.1.2 The Anthropocosm

Ancient traditional wisdom regarded the human form as a summary of the whole universal order and a textbook for understanding all creation. *"Anatomy and physiology were cultivated as divine sciences and studied not for themselves alone but as aspects of sacred learning..."* (M. P. Hall).

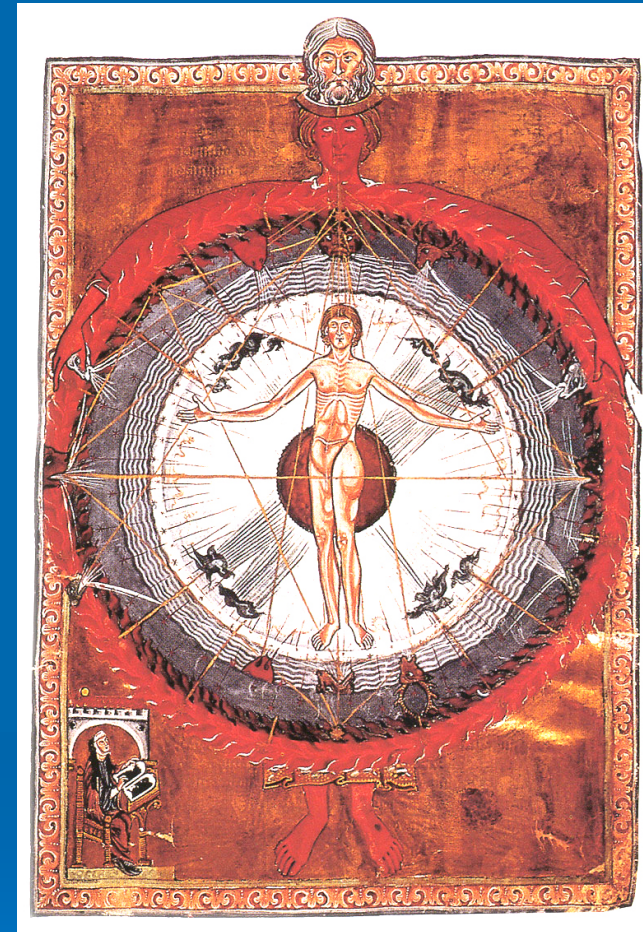
In developing their concept of the relationship between the superior and inferior orders of existence, ancient wisdom depicted the universe as the Macrocosm (The Vast Countenance) in the shape of a Heavenly/Cosmic Man and the microcosm (The Lesser Countenance) as the Earthly Human.

Traditionally, human beings as "small worlds" are a recapitulation, a miniature of all things. As Humans, we are microcosms with reference to the universe, but we also are macrocosms with reference to our 60 trillions cells, each one of them, in turn, a macrocosm for their contained molecules... The proper science, art & philosophy is our own self-study as human beings. This was summarized by the traditional motto: "Know Thyself!".

In the perspective of the Pythagorean wisdom, Sacred Geometry and whole systems theory, "wholes" are not composed of fragmented parts (fractions) but of gnomonic, fractal parts that are proportioned and self-similar to the wholes. *"This system of thought justified the ancients in correlating man to the world, for to them all forms were concatenations of similars."* (M. P. Hall). It is then not surprising that philosophers & naturalists of old sought so enthusiastically to discover the inner workings of the human body, measuring and classifying its parts & proportions in order to acquire knowledge of the whole universe. In the East, the yogic sages were exploring even further: they reached into the grids of subtle energy woven through the body-mind-spirit of their human "universe", mapping out many invisible harmonic correspondences, and creating vibrational technologies & healing systems to directly navigate the macro-micro inter-connectedness.

The alchemists affirmed that all the metals are contained within each single metal, the mystics proclaimed that the whole universe was reflected within the human being. *"Oh man, look at man! For man has in himself heavens and earth"*, exclaimed Hildegard of Bingen in one of her enlightenment experiences.

*"If the same signature be in all things, then it follows that one simple set of laws is applicable to the whole diversity of manifestation. Furthermore, any impulse conveyed to the Macrocosm (or Greater Part) is communicated ultimately (non-locally & instantly) to all the microcosms depending from that macrocosm. Conversely, any change in the whole is also reflected in all its aspects."* (M. P. Hall)



Illumination of the "Universal Human".  
Hildegard of Bingen's  
*Liber Divinorum Opera Simplicis*. 1165.

Gift yourself with a moment of contemplation of this cosmological mandala, a medieval expression of a Grand Experience of Unification & Inter-connectedness.



# SG204.1.3. The Vedic/Indian Tradition

In many creation myths, the universe is represented like the body of a gigantic being. Cosmogonic giant beings had their bodies dismembered or divided in order to birth the universe we know: Tiamat-Apsu in Babylonia, the giant Ymir in Nordic mythology, the giant Pangu in China, Atum in Egypt...

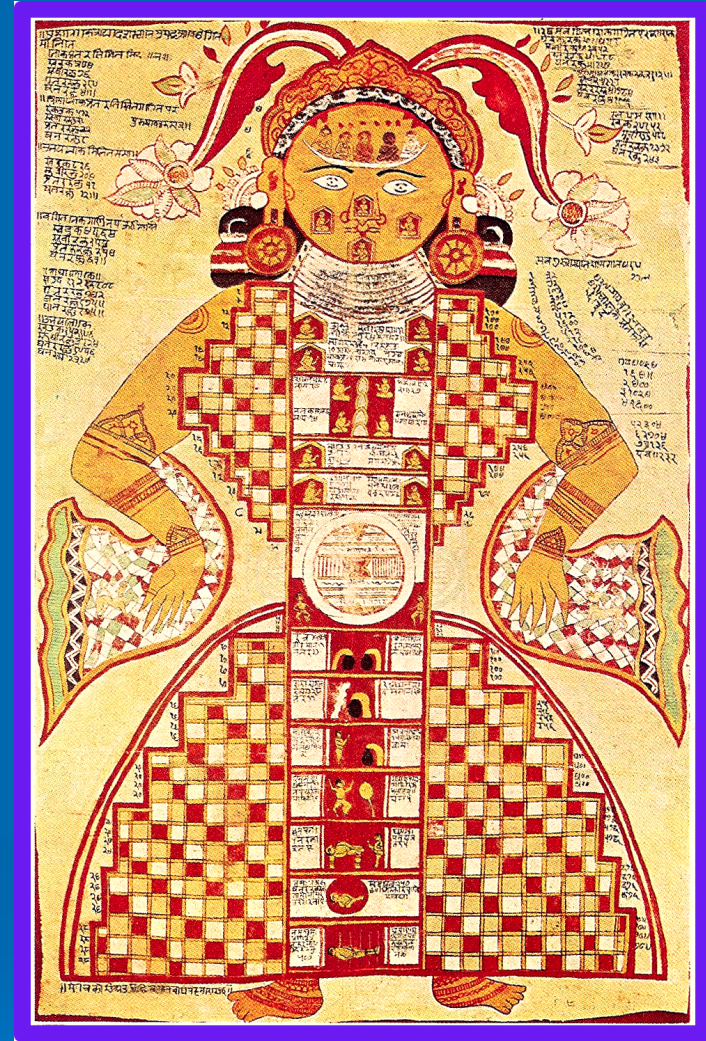
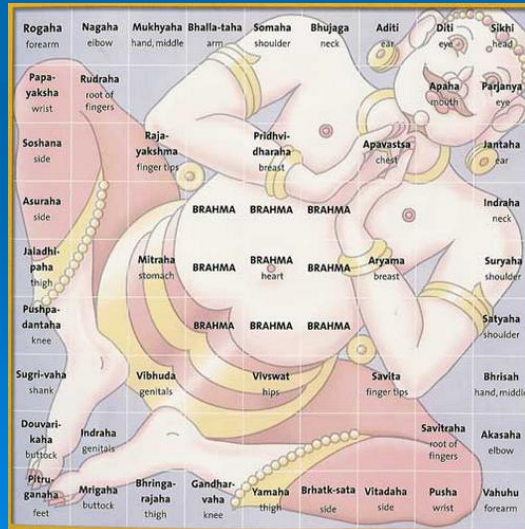
In India, Prajapati (Sanskrit "prajan" = to procreate, and "pati" = Lord) is the original progenitor. He is in fact the male aspect of Brahma. When he is proceeding to create the universe, he calls it to emerge out of a golden egg: "Bhur! Bhuva! Svahah!" (Earth, Sky, Intermediary Space). These three creative mantra-calls constitute the essence of Prajapati's body: svahah is his head; bhuva his bellybutton; and buhr his feet. His eye is the Sun. This is the essence of the Gayatri mantra.

The cosmic elemental energies created by Prajapati are the "gods" and Prajapati will sacrifice itself in order to nurture the gods. For that purpose Prajapati creates a self-reflection in the form of Purusha, the Cosmic Man of the Rig Veda and his creative shakti Prakriti. Purusha-Prakriti is the giant being that the gods sacrifice and dismember in order to manifest all the aspects of the manifested cosmos, all the way to the 27 lunar constellations (the nakshatras of Vedic astrology).

We could say that PURUSHA is the male principle of the cosmos (archetypal number 3), and PRAKRITI is the female principle (archetypal number 2). And man and woman are the microcosm of this Cosmic Person, thus reflecting l'Atman (soul) of the supreme creator Brahma. Because it is the blueprint of the universe, the body of Purusha is also the traditional plan (Purusha-mandala) for temple building and for the Indian form of geomancy called Vastu. ◆SG207



↑ The auspicious locations in a building, according to the Purusha-Mandala. The goal is to establish harmony between the human micro-cosm and the universal macro-cosm.



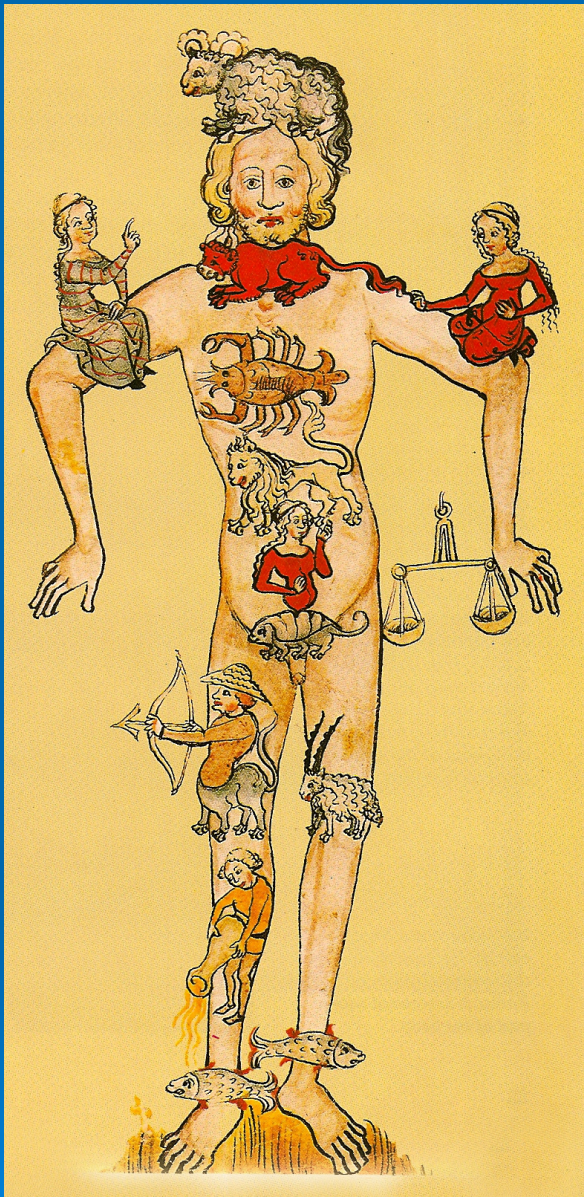
↑ Purusha-kara, the Cosmic Man containing the universe. He is displaying the 7 ascending planes (lokas) and the 7 descending planes (talas) of consciousness experience. The earth plane is the central circle. Manuscript, Gujarat, 18th c. (Nick Douglas. Tantra Yoga. 1971)

← The Purusha-mandala used by Vastu practitioners.



## SG204.1.4 The Zodiacal Human

"Zodiacal Man" is a constant theme in medieval European manuscripts, art and sculpture. The signs are associated with corresponding principles & organs in the human body to show man & woman as the micro-cosmic image of the heavens. Thus the human being is a mirror reflecting the celestial realms.



↑ Zodiacal Adam in intimate contact with the 12 constellations.

German manuscript, 14th c. Munich.

(From: Warren Kenton. *Astrology*. Thames & Hudson, 1974)



↑ French medieval engraving showing the relationship of the organs to the planets.

This was called the theory of "Sympathetic Correspondences"



↑ This well-known page from "Les Très Riches Heures du Duc de Berry" shows the 12 zodiacal constellations and their resonant location in the human body. (15th c.)



The knowledge of a universal canon of human proportions has cycled in and out of public awareness throughout the history of western cultures. Firmly established in Egypt, it was picked up and applied by the classical Greeks, advocated by the Roman Architect Marcus Vitruvius Pollio (1st c. BC.) [◆SG102 "Vitruvius"], and then disappeared until the Renaissance rediscovered classical antiquity.

- Leon Battista Alberti (1404 - 1472), the architect of the great dome in Florence, wrote a treatise on sculpture dealing with human proportions. He stated:

*"Beauty is the harmony and concord of all parts,  
achieved in such a manner  
that nothing could be added or taken away or altered except for the worse."*

- Leonardo da Vinci (1452 - 1519), along with many other Renaissance masters, was a herald of the human canon of proportions and its key, the Golden ratio: he magnificently illustrated the *"De Divina Proportione"* of his teacher Luca Pacioli (1445 - 1515). Leonardo pointed to good proportions in these words:

*"... every part is disposed to unite with the whole,  
so that it may thereby escape from its incompleteness."*

- Albrecht Dürer (1471 - 1528) visited Italy twice to learn from the Renaissance masters. He wrote a *"Treatise on Human Proportions"* as well as a work on applied geometry to pursue the question: how may the artist works as nature works? He found the answer in the "art of measurement" saying:

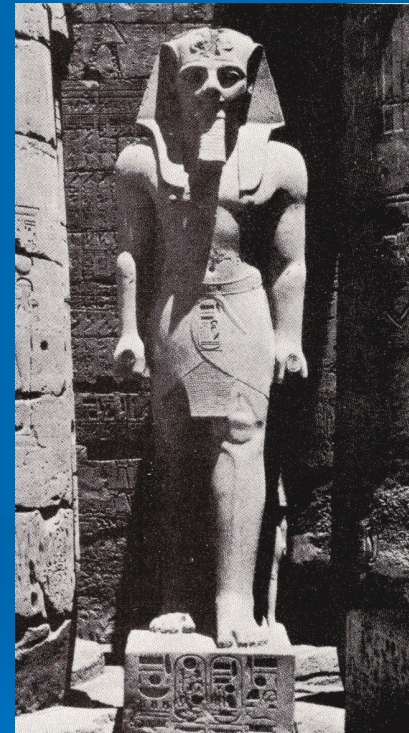
*"True proportion maketh a good figure both in painting and in all the arts."*

- Daniele Barbaro (1514-1570), the man for whom Palladio built the harmonically-conceived Villa Maser, wrote in his Commentary to Vitruvius:

*"Symmetry is the beauty of order as 'eurythmia' is the beauty of disposition.  
It is not enough to order the measurements singly one after the other,  
but it is necessary that those measurements be related to each other...  
there must be some proportion between them."*

The Renaissance resurrected the cultural perception that the canonic proportions of the human body were in resonance with the proportions of a perfect temple, the roots harmonies of music and even the dance of the planetary spheres. This was the last flourishing of a unified cosmology perceiving the universe as a hologram of Beauty and Harmony, where the microcosm and the macrocosm, Man-Woman and the universe, are mutually singing and dancing each other in a celebration of Oneness.

## SG204.1.5.1 Brief History of the Human Canon (1)



The colossus of Ramesses II at the entrance of the Luxor temple. Carved from a single block of granite, this statue reveals a rigorous canon of proportions. The location of the navel is at the Phi point.



## SG204.1.5.2 Brief History of the Human Canon (2)

With the coming of the era of "enlightenment" and the takeover of "rationalism", the concept of a "canon" was held as somewhat obsolete or even oppressive. The rise of the new scientific approach to knowledge and perception challenged the traditional belief in an all-pervading harmonic order of the universe. It was a gradual move from the focus on a cosmological synthesis (the "whole") to a new focus on atomization (the "parts"). This in turn led to a re-evaluation in the field of aesthetics and the use & applications of a universal canon. Eventually, the multiple viewpoint that set in with Romanticism attempted to prove that there is no such thing as a universal set of proportions for the human body.

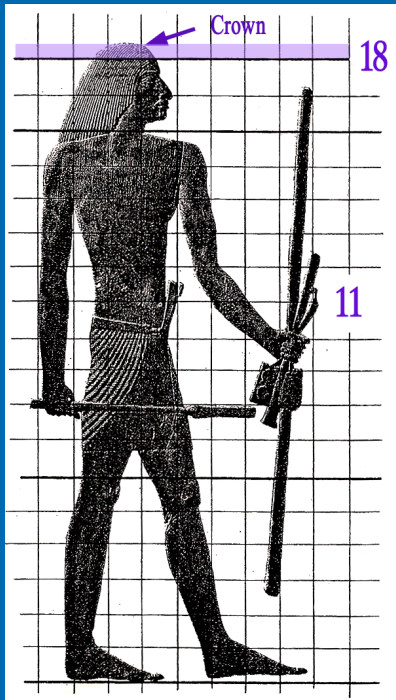
By the 20th century, when the field of anthropometry was created in order to compute individual variations, the conception of harmonic ratios in the human body and the Renaissance ideas about universal proportions were completely reversed. The relativity of Beauty, Harmony and aesthetic judgment was emphasized and the knowledge of proportions was regarded as an outmoded amusement.

Historian Rudolf Wittkower, in his *"Architectural Principles in the Age of Humanism"* (1971) gives the following quotes:

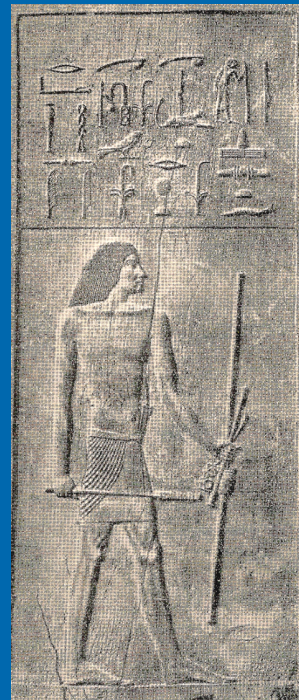
- Painter William Hogarth (1697-1764) was the spokesman of the new tendencies when he rejected any commonality between mathematics and beauty. He considered it a *"strange notion"* that there should be any correspondence between visual beauty and musical harmonies.
- Philosopher David Hume (1711-1776) turned objective aesthetics into subjective sensibility and held that *"beauty and deformity, more than sweet and bitter, are not qualities in objects, but belong entirely to the sentiment"*. Hume's famous quote is: *"Beauty is in the eye of the beholder"*.
- Politician Edmund Burke (1729-1797) in his *"Enquiry into the Origin of Our Ideas of the Sublime and Beautiful"*, stated that beauty does not have *"anything to do with calculation and geometry"*. Proportion is solely *"the measure of a relative quantity... and is indifferent to the mind"*. Moreover, *"no two things can have less resemblance or analogy than a man, a house or a temple"*.  
R. Wittkower comments: *"Burke's analysis shows that his generation had lost the faculty of understanding even the most general principles of the classical conception. He does not see that the Beauty of the classical theory has its roots in the idea of an all-pervading harmony, which was regarded as an absolute and mathematical truth, and he is therefore unable to grasp that, for instance, ratios of parts of a body remote from each other may be compared."*
- Richard P. Knight declared (1805) that proportion *"depends entirely upon the association of ideas, and not at all upon either abstract reason or organic sensation."* Proportion was now reduced to mental jumble.
- By the end of the 19th century, social and art critic John Ruskin (1819-1900) was asserting in *The Seven Lamps of Architecture* (1849): *"Proportions are infinite as possible airs in music, and it must be left to the inspiration of the artist to invent beautiful proportions"*.

It is interesting, from the perspective of the historical cycles of cognition & awareness, to observe the progressive disappearance of the paradigms of universality being replaced by paradigms of multiplicity. Humanity was left to its own devices and was no longer in tune with the universe... until our current era where we are seeing the progressive opening of new windows into an "ancient-future" paradigm that perceives again basic "cosmic fractals" and proportions as harmonizing the continuum matter-energy-consciousness. Humanity may again have a co-creative role in the cosmos and play again with the scale-invariant harmonic resonance of matter, biology, culture and consciousness.

## SG204.1.6.1 Egyptian Tradition - Canon (1)



↑ Egyptian art used a main canon of human proportions based on a grid of 9 (or  $9 \times 2 = 18$ ). The navel, marking the Phi point, is at 11. The top part of the head (crown) was excluded as being the supra-physical interface with higher dimensions. (Hezirá. Circa 2750 B.C.)



Ancient Egyptian art was not an avenue for individual "artistic freedom". It was highly codified because it was carrying universal knowledge. The Egyptians believed in an overall cosmic order: everything that had significance originated in the life of the cosmos. The job of the Pharaoh was to maintain harmony in this scheme of things and the function of art, architecture & music was to help people to achieve contact with the larger cosmic "whole": they were "sacred". Geometry & proportion were the means used to achieve balance & harmony with the cosmic order. The Egyptian grid is the canvas upon which the cosmic functions & measures can be crystallized or "incarnated".

Man is the measure or projected map of the universe.

### Egyptian art used two canons:

In his masterpiece *The Temple of Man*, Schwaller de Lubicz gives the following explanations:

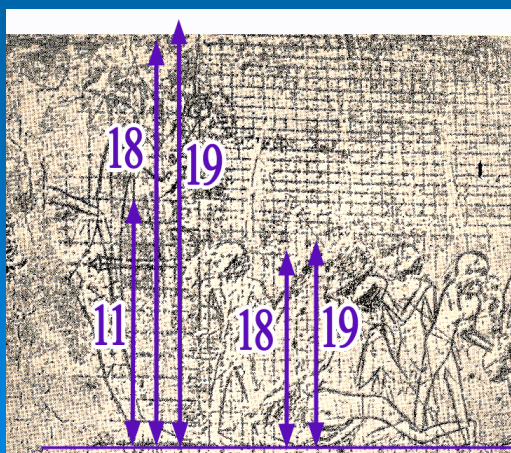
- Until the XXVIth dynasty, the main, *classical canon* was the grid of  $18 \times 18$  squares + 1. Line 18 is the height which, when divided by Phi, gives the location of the navel. The number 18 is a simple multiple of 6, the number of palms in the regular Egyptian cubit of 24 digits. The portion of the height above line 18 represents the metaphysical part of the human figure, the part that is beyond life & death as the "crown" connecting the physical body to the higher realms. For regular humans, the height of this crown is always variable, but in the case of the *Royal Canon* (which represents the Pharaoh as perfected or Cosmic Human), the crown fills in the whole space between 18 & 19 and the top of the head always touches line 19. The number 19 has high significance in Sacred Geometry and astronomy.

- After the XXVIth dynasty and until the end of the Greco-Roman domination, the grid used was  $21 \times 21 + 1$ . The number 21 is  $7 \times 3$  and 7 corresponds to the Royal cubit of 7 palms of 4 digits.

- In their application, these two grids are linked to the two lineages of the PHI additive series that generate the square root of 5: they imply and complete each other:

$$18 / 11 = 1.636 \text{ and } 11 / 7 = 1.571$$

$$21 / 13 = 1.615 \text{ and } 13 / 8 = 1.625 \text{ (Fibonacci Series).}$$

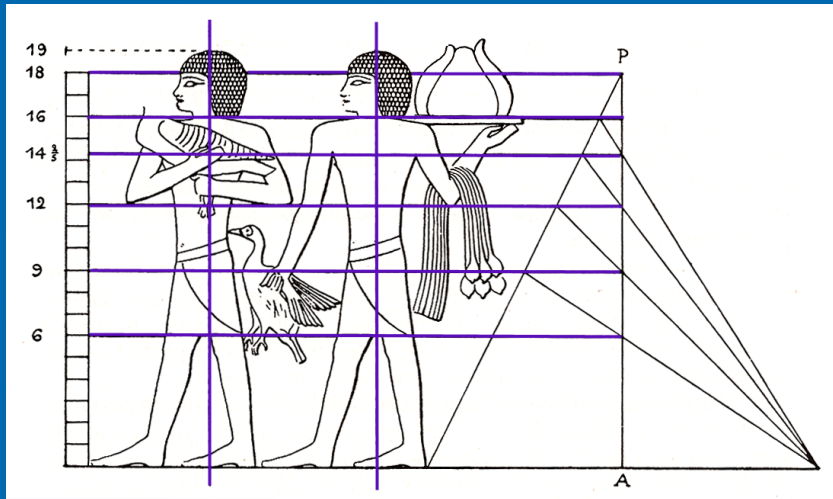


← Example of an incompleated wall (necropolis of Thebes) showing two scales of 18/19 grids.

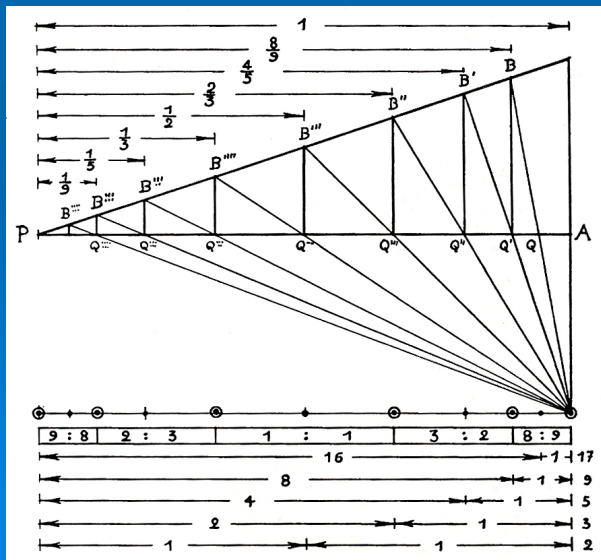
From: Else Christie Kielland. *Geometry in Egyptian Art*. 1955.



## SG204.1.6.2 Egyptian Tradition - Canon (2)



↑ This tablet from the Old Kingdom (Tomb of Per-neb) has the six horizontal grid lines drawn upon its back: they are overlaid here (in blue) on the front design for easy comparison.

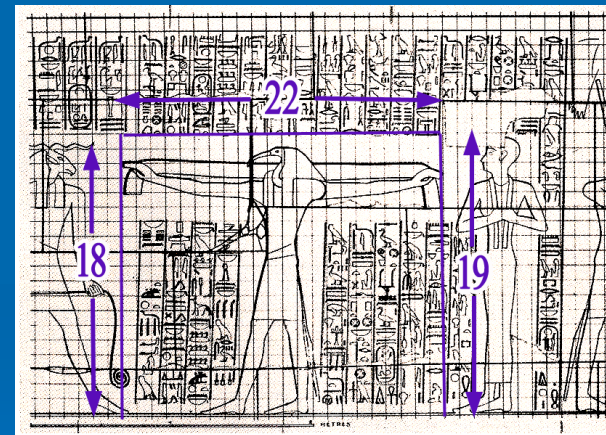


↑ The harmonic grid of music intervals corresponding to the above 6 horizontal canvas lines.

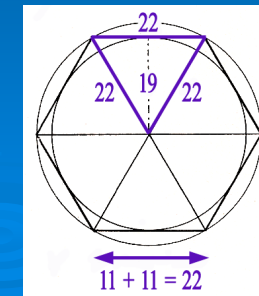
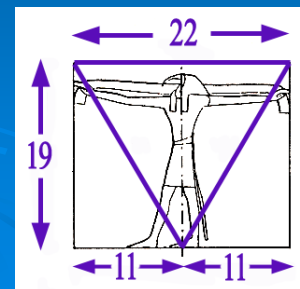
The tomb of Per-neb in Saqqara, high ranking dignitary of the Vth dynasty, is one of the most ancient figurations of gridlines by Egyptian artists. It has two vertical lines (the axis of stability of the figures) and six horizontal lines corresponding to precise proportions.

This grid is based upon harmonic considerations:  
(as per Schwaller de Lubicz' analysis)

- Line 18 corresponds to the height of this classical (human) canon. Line 19 is not traced because the "crown" portion of the figure is "beyond" measure.
  - The two top lines (18 and 16) establish the ratio  $8 : 9 =$  base tone of the scale.
  - The other four lines divide the height 18 in twos and threes: octave ( $1 : 2$ ), fifth ( $2 : 3$ ) and tone ( $8 : 9$ ). The musical fourth corresponds to  $12 : 16$  or  $3 : 4$ .
- The line going through  $12 + \frac{2}{5}$  corresponds to the ratio  $4 : 5$  (major third).



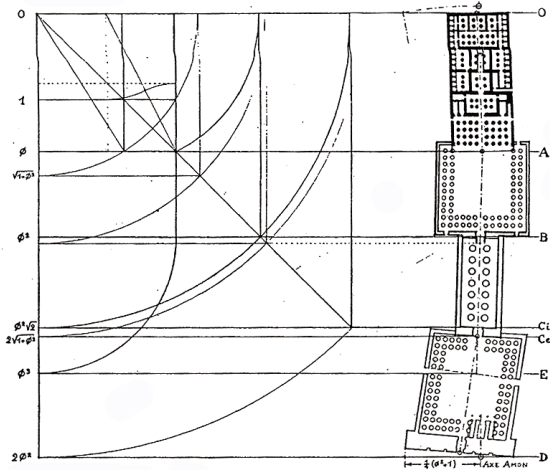
← At the temple of Karnak, the "hunting scene with a net" shows Thoth, the master of numbers & measures, demonstrating the two canons: the classical/human archetype of 18/19 and the royal archetype of 22.



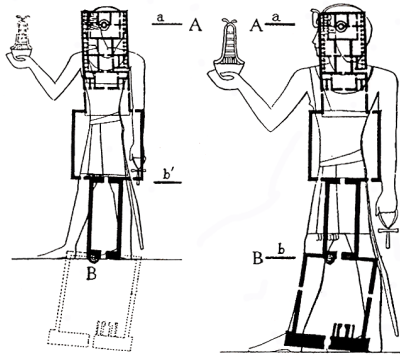
← The geometries involved: 19 and 22 represent the radii of the two circles (inscribed & circumscribed) of the hexagon.



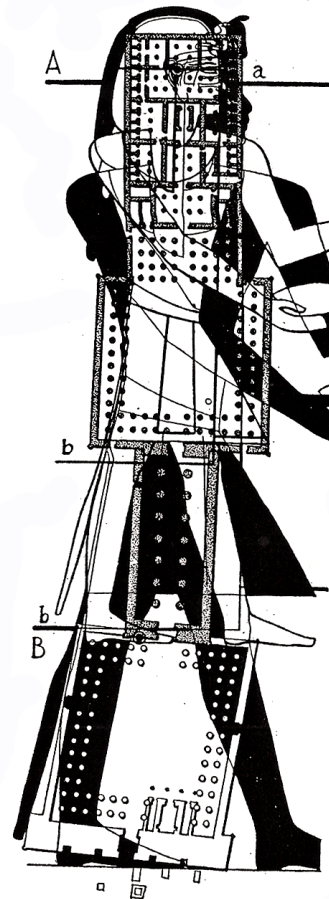
## LUXOR: Body & Temple



Growth of the Temple plotted on a PHI harmonic scale  
(R. A. Schwaller de Lubicz)

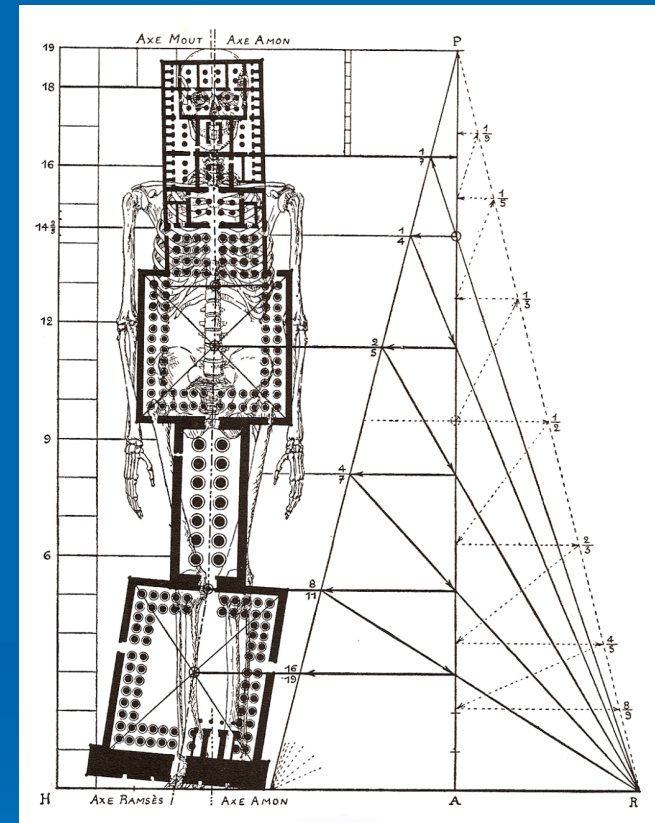


↑ The Egyptian Pharaoh was the incarnation of the Anthropocosmic principle whose cosmic body was expressed in the Temple.  
(Drawings from R. A. Schwaller de Lubicz.)



"The Temple of Luxor is a planned, wholly conscious, embodiment of the laws of creation."  
(John A. West)

## SG204.1.7.1 Egyptian Tradition - The Temple in Man (1)



↑ Projection of two music harmonic scales upon the plan of the Luxor Temple and the human skeleton. The harmonic systems determine practically all of the the major architectural features.

Credit: R. A. Schwaller de Lubicz.  
*The Temple of Man.* 1955

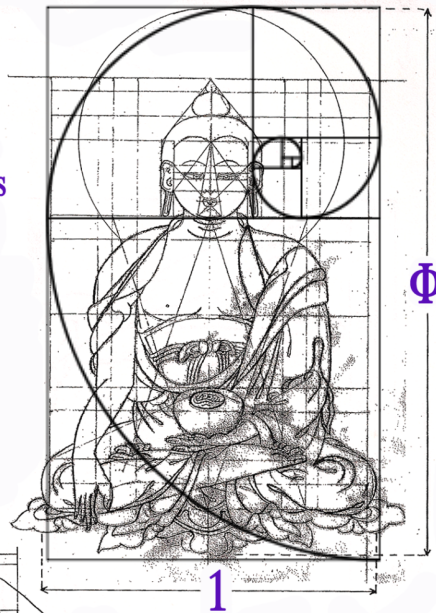
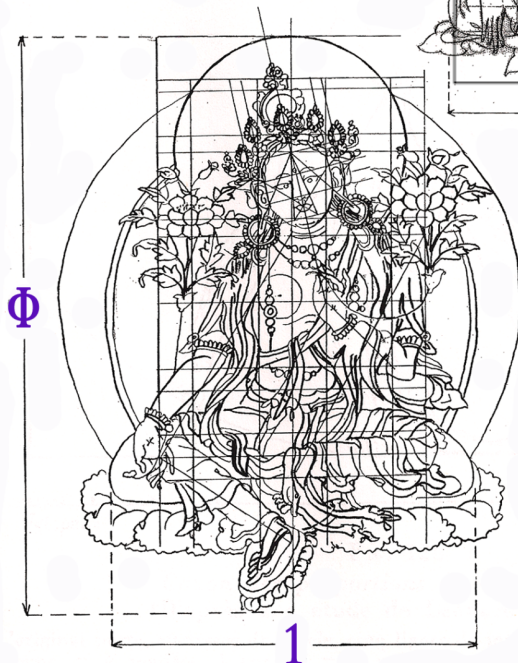


## SG204.1.8 Buddhist Tradition

### Buddhist Canon

Tracings of Buddhist art figures according to canon of Tibetan Tangka paintings.

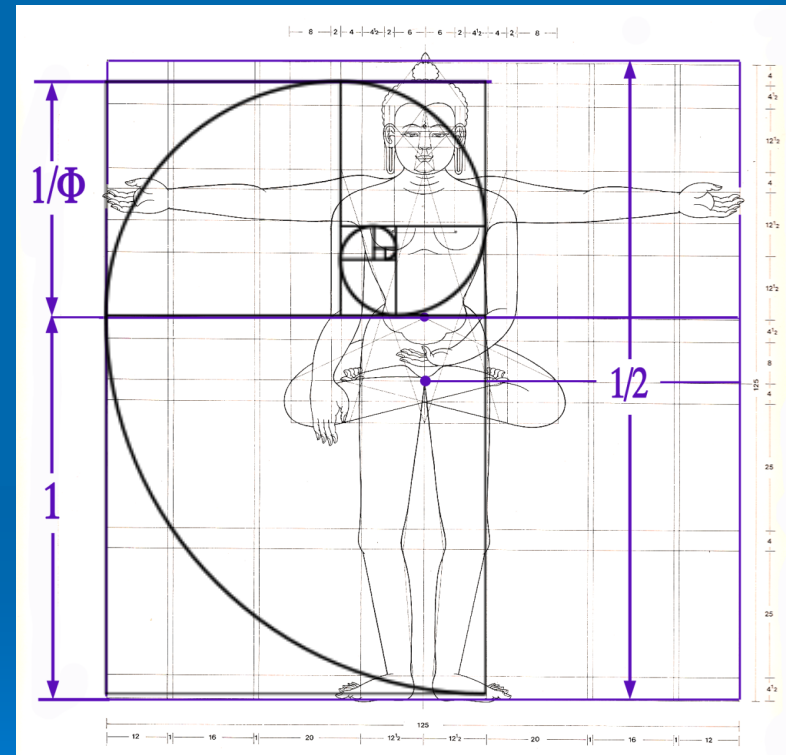
(Workshop by Terry Temple Phoenix, 2003)



↑ Note the Golden Rectangle proportions between the height (including the halo) and the width.

"The composition of a *tangka*, as with the majority of Buddhist art, is highly geometric. Arms, legs, eyes, nostrils, ears, and various ritual implements are all laid out on a systematic grid of angles and intersecting lines." (Wikipedia).

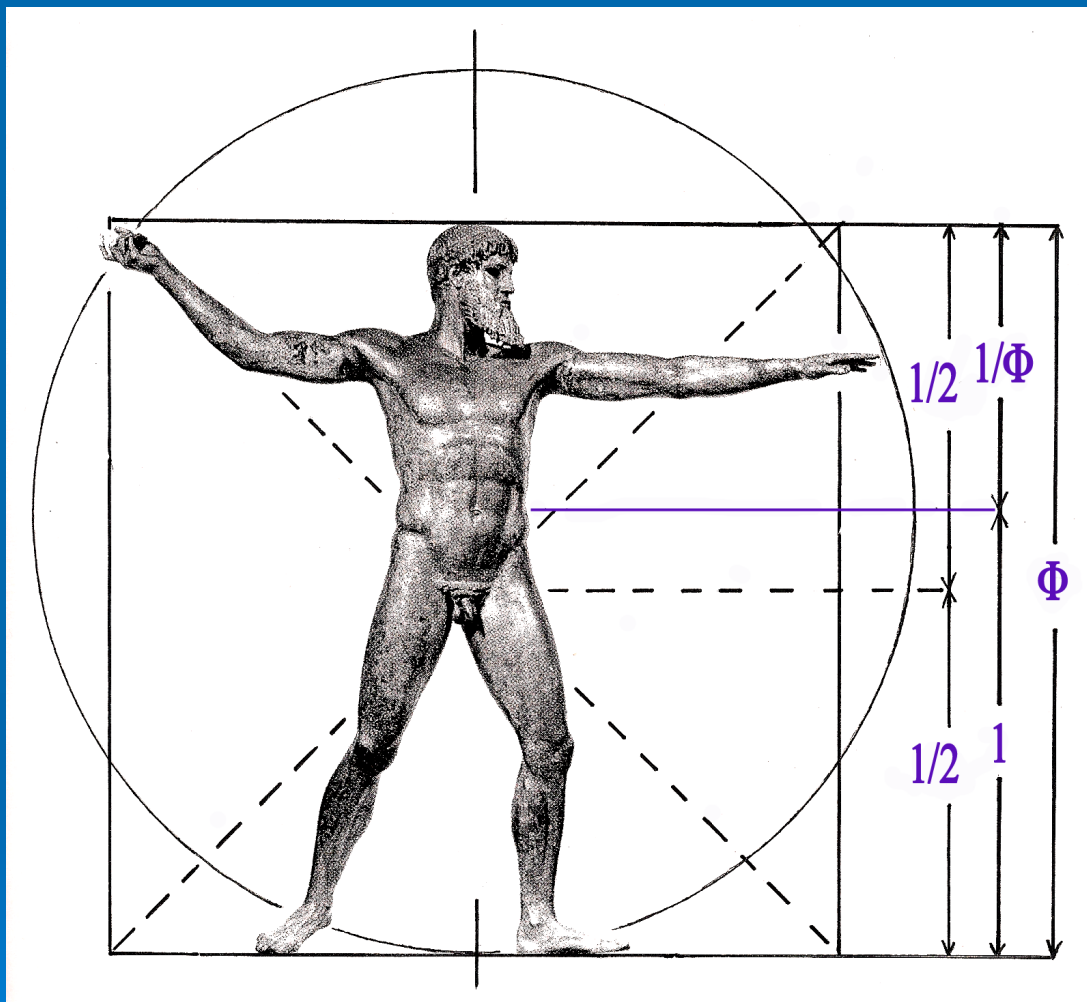
The units of measurement are merely used to indicate the proportional relationships WITHIN each sacred image, be that image 100 feet tall or the size of a grain of rice. The classical canon consists of 6 main classes of proportions, five for deities and one for humans.



↑ Proportional grid showing the relationship of the standing and seated Buddha. The height of the figure equals the arm span (125 *sor*) and the sex point measures half of the figure (by including the *ushnisha* or top knot). Note the Phi ratio at the navel (feet to top of head). Also note the Golden Rectangle match. (Credit: drawing after D. & J. Jackson. *Tibetan Tangka Painting*. 1984)



## SG204.1.9.1 Classical Greece (1)

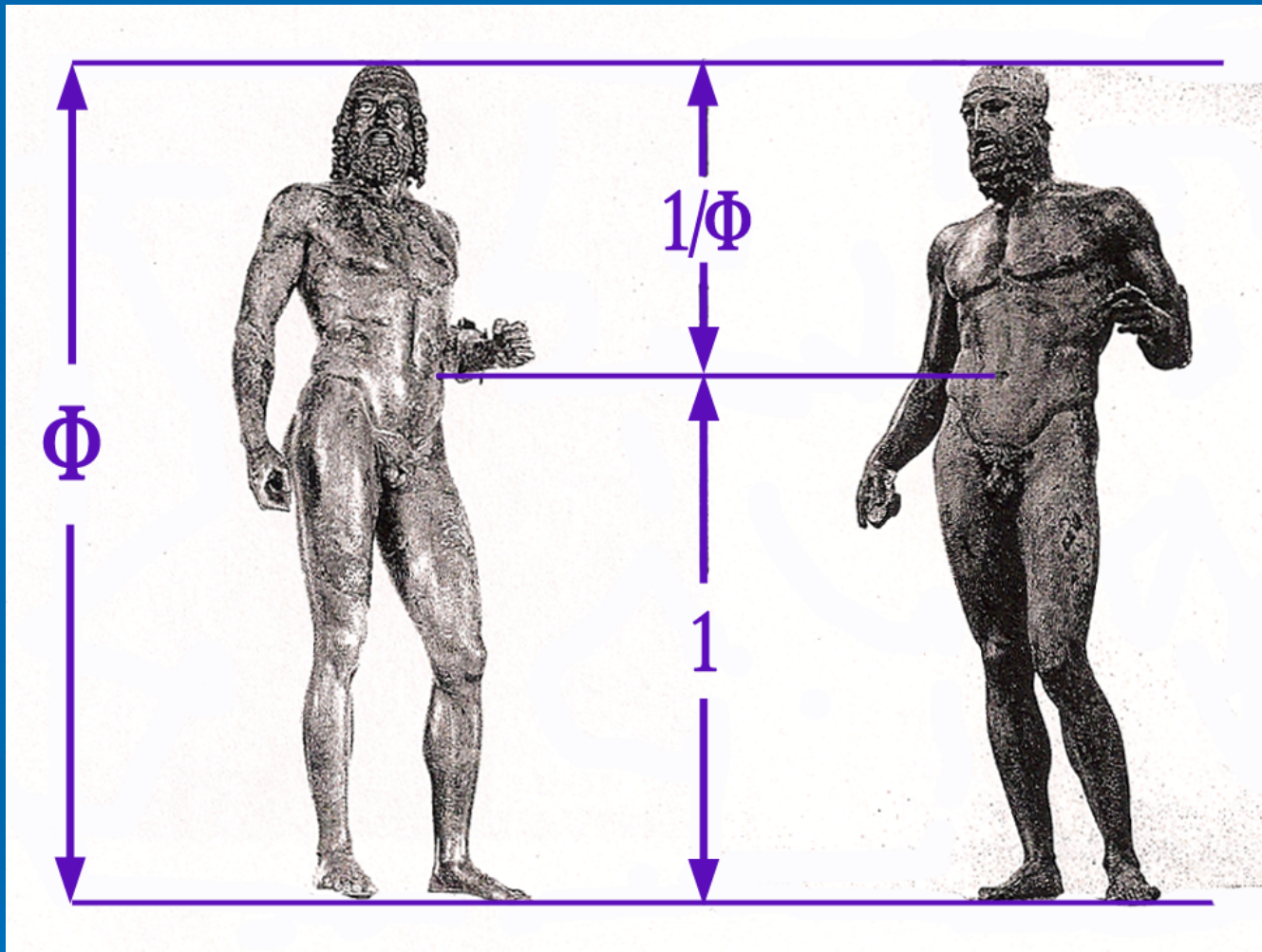


This magnificent example of the Greek ideal of the human body approximates the "Vitruvian/ Da Vinci Canon": a circle, centered on the navel, touches the hands & feet (here, the arms are longer than in the Da Vinci man) while a square, based on the body's height, is the enclosing frame.

- When adjusting for a full standing position:
- The sex point divides the body into two halves.
  - The navel point marks the Golden Section.

↑ Statue of Zeus, found in the sea off Cape Artemision, Euboea (on the Aegean Sea).  
C. 460 BCE. Bronze. Height: 82 inches.

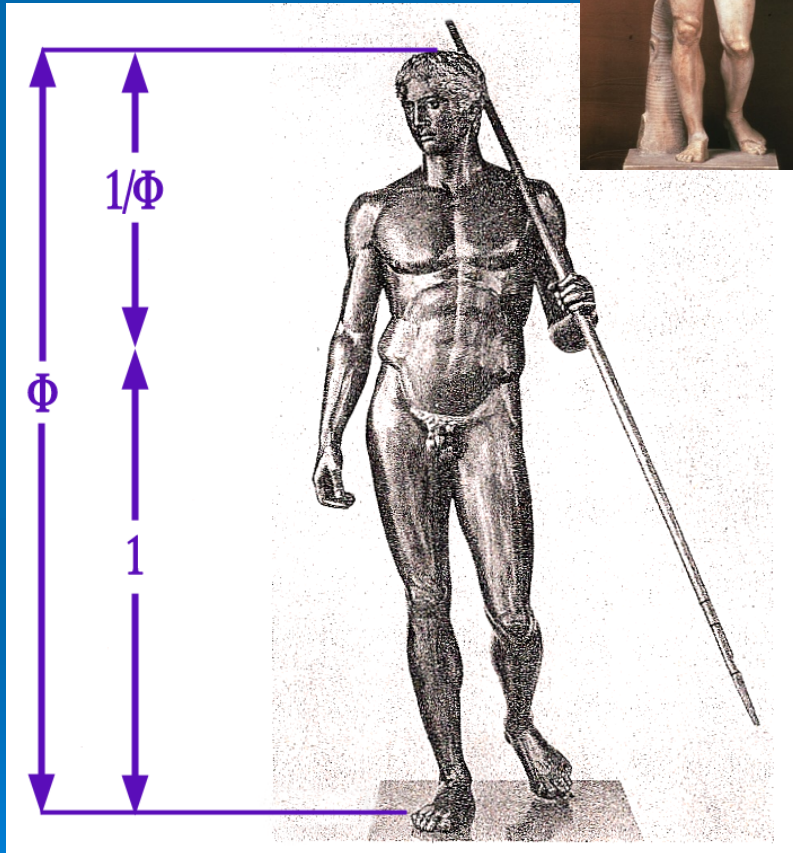
SG204.1.9.2  
Classical  
Greece (2)



↑ Two "warriors", discovered in 1972 in the sandy bottom of the Ionian Sea, near Riace, Calabria (the toe of the Italian "boot"). C. 460-450 BCE. Height: c. 80 inches each.



## SG204.1.9.3 Classical Greece (3)



↑ The "Doryphoros" (spear bearer) by Polykleitos.  
C. 450-440 BCE.  
Bronze reconstruction. Munich.

"Polykleitos (5th c. BCE), along with Phidias, created the Classical Greek style. Although none of his original works survive, literary sources identifying Roman marble copies of his work allow reconstructions to be made. An essential element of his and the Classical Greek style is the use of a relaxed pose with the shifted balance of weight known today as *contrapposto* yielding a naturalness that was a source of his fame.

Polykleitos consciously created a new approach to sculpture. He wrote a treatise (the *Kanon* - now lost) and designed a male nude (also known as *Kanon*) exemplifying his aesthetic theories of the mathematical bases of artistic perfection. (In Greek, *Kanon* means measuring rod or standard.) Galen, the prominent Greek physician (2nd c. BC), wrote: "*The Kanon got its name because it had a precise commensurability (symmetria) of all the parts to one another*".

Though the *Kanon* may be represented by his Doryphoros, the bronze has not survived, but references to it in other ancient books imply that its main principle was expressed by the Greek words *symmetria*, the Hippocratic principle of *isonomia* ("equilibrium"), and *rhythmos*. Philo of Alexandria (20 BCE - 50 CE), a Hellenistic Jewish philosopher, reported of Polykleitos: "*Perfection, he said, comes about little by little (para mikron) through many numbers*". By this Polykleitos meant that a statue should be composed of clearly definable parts, all related to one another through a system of ideal mathematical proportions and balance, no doubt expressed in terms of the ratios established by Pythagoras for the perfect intervals of the musical scale: 1:2 (octave), 2:3 (harmonic fifth), and 3:4 (harmonic fourth).

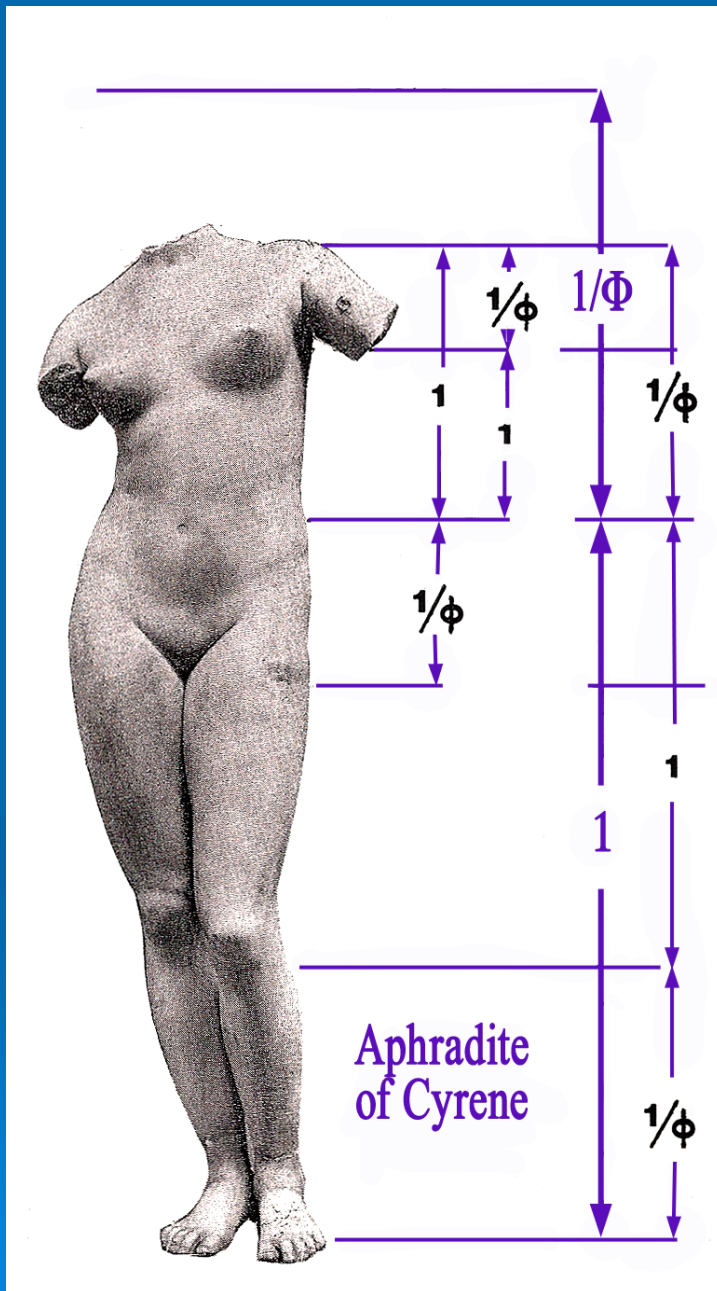
The refined detail of Polykleitos' models for casting executed in clay is revealed in a famous remark repeated in Plutarch's *Moralia*, that "*the work is hardest when the clay is under the fingernail*".

(Wikipedia)

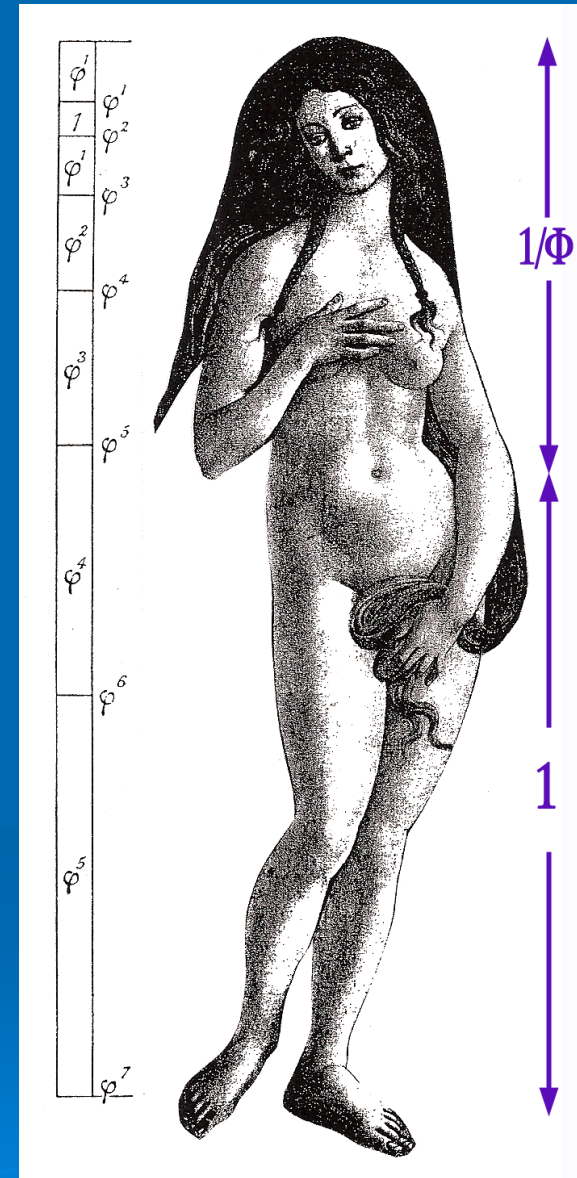
"The Greek systems of human proportion, like that of Polykleitos, derive from their love of mathematical relationships".  
(F. Hartt. Art, A History of Painting, Sculpture, Architecture. 1985)

## SG204.1.9.4 Classical Greece (4)

The Classical Greek understanding of Human Proportions guided the art of antiquity and then re-appeared in the Italian Renaissance with the re-discovery of Greek classical texts.



← Early 1st century BCE.  
Marble.



↑ *The Birth of Venus*. 1486.  
Sandro Botticelli (1445-1510)



## SG204.1.10.1 Vitruvius (1)

Marcus Vitruvius Pollio, a contemporary of Cicero (1st century BCE), is the author of the oldest and most influential work on architecture: *De Architectura Libri Decem*. In this book, Vitruvius recorded the Golden Canon of human proportions known to earlier civilizations, like Classical Greece. This Canon came to be known as the “*Vitruvian Canon*”, later to be illustrated by Da Vinci & Dürer.

Vitruvius’ fame soared with the *princeps* edition of 1486 and the invention of printing. According to the Encyclopedia Britannica, he was “*the chief authority studied by architects, and in every point his precepts were accepted as final. Bramante, Michelangelo, Palladio, Vignola, and earlier architects were careful students of Vitruvius.*”

*De Architectura* describes extensively all the basics of architecture and put them in relationship with the proportions of the human body, the musical intervals and irrational numbers, according to the traditional conception of the correspondence between the macrocosm and the microcosm.

"Vitruvius is famous for asserting in his book *De architectura* that a structure must exhibit the three qualities of *firmitas, utilitas, venustas* that is, it must be solid, useful, beautiful.

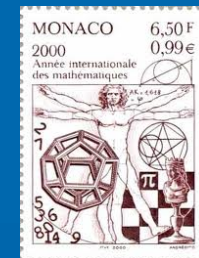
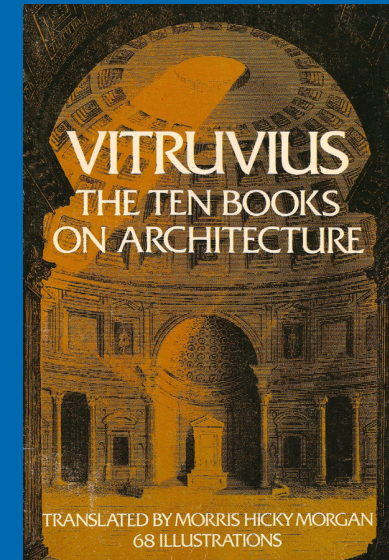
According to Vitruvius, architecture is an imitation of nature. As birds and bees built their nests, so humans constructed housing from natural materials, that gave them shelter against the elements. When perfecting this art of building, the Ancient Greek invented the architectural orders: Doric, Ionic and Corinthian. It gave them a sense of proportion, culminating in understanding the proportions of the greatest work of art: the human body. This led Vitruvius in defining his Vitruvian Man, as drawn later by Leonardo da Vinci: the human body inscribed in the circle and the square (the fundamental geometric patterns of the cosmic order)."

(Wikipedia)

**Vitruvius on Symmetry:** *"The design of a temple depends on symmetry, the principles of which must be most carefully observed by the architect. They are due to proportion, in Greek analogia. Proportion is a correspondence among the measures of the members of an entire work, and of the whole to a certain part selected as standard. From this results the principles of symmetry. Without symmetry and proportion there can be no principles in the design of any temple; that is, if there is no precise relation between its members, as is the case of those of a well shaped man".*

*"Since nature has designed the human body so that its members are duly proportioned to the frame as a whole, it appears that the ancients had good reason for their rule, that in a perfect building the different members must be in exact symmetrical relations to the whole general scheme".*

(Ten Books on Architecture. Dover, 1960. Book III, Chap.1)

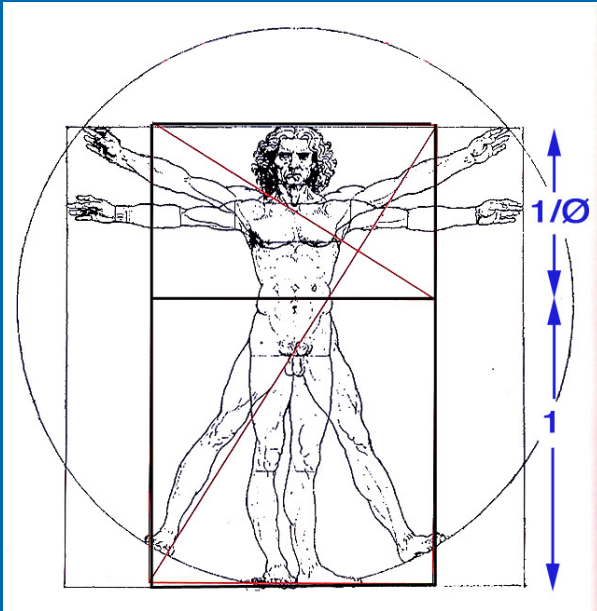


## SG204.1.10.2 Vitruvius (2)

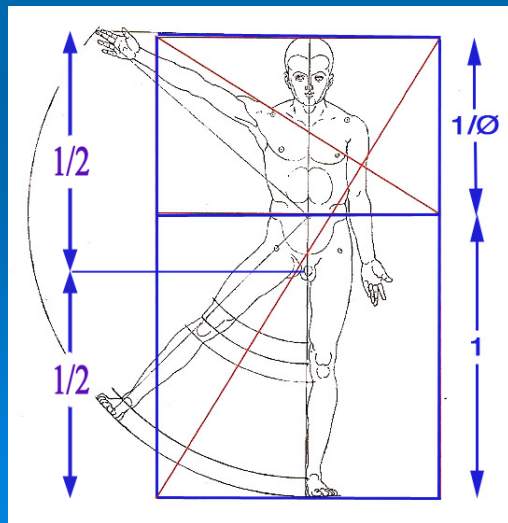
Vitruvius on the Human Body. "... In the human body the central point is naturally the navel. For if a man be placed flat on his back, with his hands and feet extended, and a pair of compasses centered at his navel, the fingers and toes of his two hands and feet will touch the circumference of a circle therefrom.

And just as the human body yields a circular outline, so too a square figure may be found from it. For if we measure the distance from the soles of the feet to the top of the head, and then apply that measure to the outstretched arms, the breadth will be found to be the same as the height, as in the case of plane surfaces which are perfectly square."

(Ten Books on Architecture. Dover, 1960. Book III, Chap.1)



↑ 'Human Figure in a Circle, Illustrating Proportions'  
Leonardo Da Vinci, 1485-1490



← Albrecht Dürer's canon of proportions.

"Nature has designed the human body so that its members are duly proportioned to the frame as a whole..."  
Vitruvius

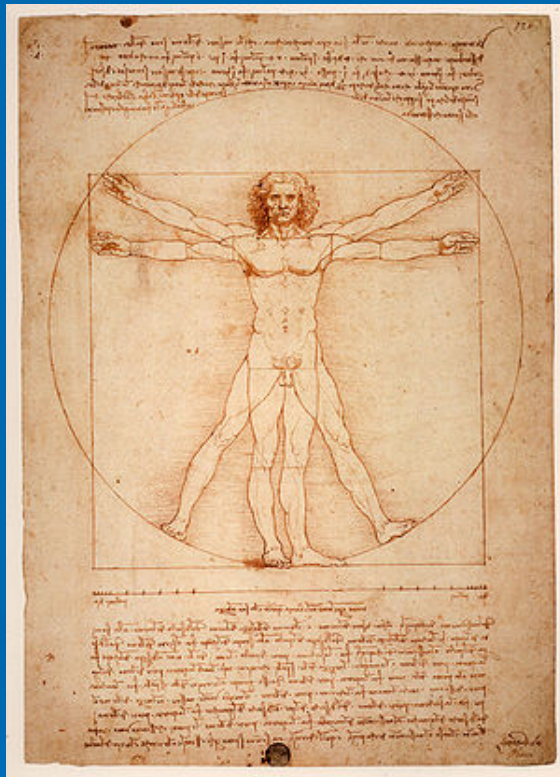
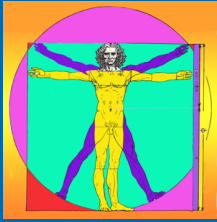
In the *Vitruvian Canon*, the human form is divided in half at the sex center, and by the Golden Ratio at the navel.

This proportioning system was used in Classical Greece and was found again in the Renaissance by artists such as Da Vinci & Dürer, under the tutelage of Luca Pacioli, the author of '*De Divina Proportione*' (1509).

Both Da Vinci's and Dürer's drawings clearly apply the canon of proportions described by Vitruvius.



## SG204.1.11.1 Vitruvian Canon - Da Vinci Man (1)



Under the drawing is the "Ruler" defining the code of measurement:  
a man's height = 4 cubits  
1 cubit = 6 palms  
1 palm = 4 digits

The Vitruvian Man is a world-renowned drawing created by Leonardo da Vinci around the year 1487. It has actually become a global icon of "harmony" and "sacred geometry".

The drawing is accompanied by notes based on the work of the famed architect, Vitruvius. With pen and ink on paper, Da Vinci depicts a male figure in two superimposed positions with his arms and legs apart and simultaneously inscribed in a circle and square. The drawing and text are sometimes called the Canon of Proportions or, less often, Proportions of Man. It is stored in the Gallerie dell'Accademia in Venice, Italy, and, like most works on paper, is displayed only occasionally. The drawing is based on the correlations of ideal human proportions with geometry described by the ancient Roman architect Vitruvius in Book III of his treatise *De Architectura*. Vitruvius described the human figure as being the principal source of proportion among the Classical orders of architecture. Other artists had attempted to depict this concept, with less success. Leonardo's drawing is traditionally named in honor of the architect.

This image exemplifies the blend of art and science during the Renaissance period and provides the perfect example of Leonardo's keen interest in proportion. In addition, this picture represents a cornerstone of Leonardo's attempts to relate man to nature. Encyclopedia Britannica online states, "*Leonardo envisaged the great picture chart of the human body he had produced through his anatomical drawings and Vitruvian Man as a cosmografia del minor mondo (cosmography of the microcosm). He believed the workings of the human body to be an analogy for the workings of the universe.*"

Leonardo's drawing combines a careful reading of the ancient text with his own observations of actual human bodies. In drawing the circle and square he correctly observes that the square cannot have the same center as the circle (the navel) but is somewhat lower in the anatomy. This adjustment is the innovative part of Leonardo's drawing and what distinguishes it from earlier illustrations. He also departs from Vitruvius by drawing the arms raised to a position in which the fingertips are level with the top of the head, rather than Vitruvius's much lower angle, in which the arms form lines passing through the navel. The drawing itself is often used as an implied symbol of the essential symmetry of the human body, and by extension, of the universe as a whole. It may be noticed by examining the drawing that the combination of arm and leg positions actually creates sixteen different poses. The pose with the arms straight out and the feet together is seen to be inscribed in the superimposed square. On the other hand, the "spread-eagle" pose is seen to be inscribed in the superimposed circle.

There is a deep connection  
between the organic & geometric foundation of Beauty.

## SG204.1.11.2 Vitruvian Canon - Da Vinci Man (2)

According to Leonardo's preview in the accompanying text, written in mirror writing, it was made as a study of the proportions of the (male) human body as described in Vitruvius. The units of measurement outlined below the drawing are:

- a PALM = width of four fingers
- a FOOT = width of four palms (12 inches)
- a CUBIT = width of six palms
- a PACE = four cubits

Leonardo is clearly illustrating Vitruvius' *De architectura* 3.1.2-3 which reads:

*"For the human body is so designed by nature that the face, from the chin to the top of the forehead and the lowest roots of the hair, is a tenth part of the whole height; the open hand from the wrist to the tip of the middle finger is just the same; the head from the chin to the crown is an eighth, and with the neck and shoulder from the top of the breast to the lowest roots of the hair is a sixth; from the middle of the breast to the summit of the crown is a fourth. If we take the height of the face itself, the distance from the bottom of the chin to the under side of the nostrils is one third of it; the nose from the under side of the nostrils to a line between the eyebrows is the same; from there to the lowest roots of the hair is also a third, comprising the forehead. The length of the foot is one sixth of the height of the body; of the forearm, one fourth; and the breadth of the breast is also one fourth. The other members, too, have their own symmetrical proportions, and it was by employing them that the famous painters and sculptors of antiquity attained to great and endless renown. Similarly, in the members of a temple there ought to be the greatest harmony in the symmetrical relations of the different parts to the general magnitude of the whole. Then again, in the human body the central point is naturally the navel. For if a man be placed flat on his back, with his hands and feet extended, and a pair of compasses centred at his navel, the fingers and toes of his two hands and feet will touch the circumference of a circle described therefrom. And just as the human body yields a circular outline, so too a square figure may be found from it. For if we measure the distance from the soles of the feet to the top of the head, and then apply that measure to the outstretched arms, the breadth will be found to be the same as the height, as in the case of plane surfaces which are perfectly square."*

- a man's height is four cubits (and thus 24 palms)
- the length of a man's outspread arms (arm span) is equal to his height
- the distance from the hairline to the bottom of the chin is one-tenth of a man's height
- the distance from the top of the head to the bottom of the chin is one-eighth of a man's height
- the distance from the bottom of the neck to the hairline is one-sixth of a man's height
- the maximum width of the shoulders is a quarter of a man's height
- the distance from the middle of the chest to the top of the head is a quarter of a man's height
- the distance from the elbow to the tip of the hand is a quarter of a man's height
- the distance from the elbow to the armpit is one-eighth of a man's height
- the length of the hand is one-tenth of a man's height
- the distance from the bottom of the chin to the nose is one-third of the length of the head
- the distance from the hairline to the eyebrows is one-third of the length of the face
- the length of the ear is one-third of the length of the face
- the length of a man's foot is one-sixth of his height

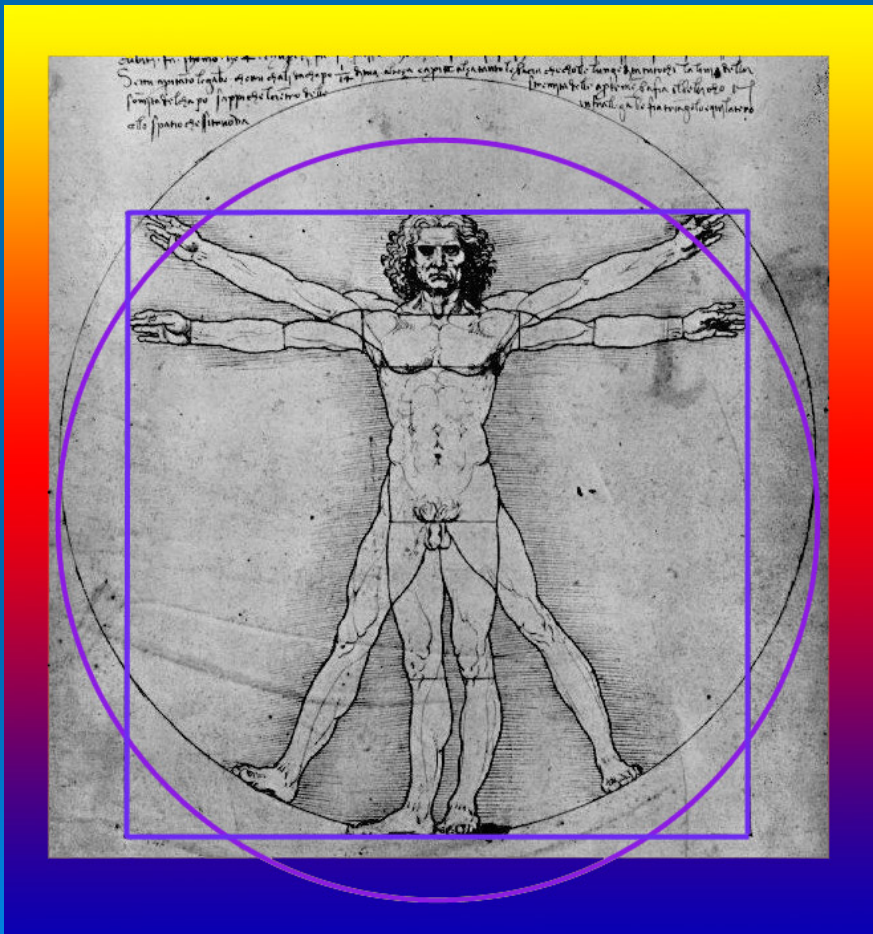


# SG204.1.11.3 Vitruvian Canon - Da Vinci Man (3)

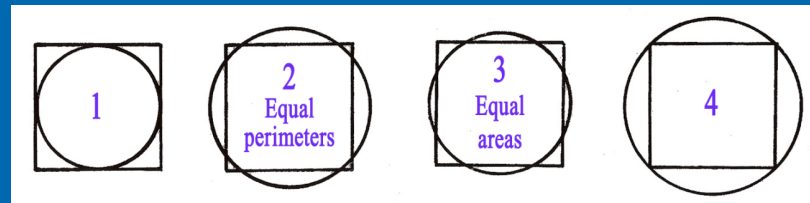
## Squaring the Circle



Besides the canonic human body proportions, Leonardo Da Vinci's drawing is replete with hidden geometric symbolism. One of the most classical is the Squaring of the Circle, representing the unification of the Circle of Spirit and the Square of matter [◆SG101.5.6.2]. While, in 1882, Lindemann proved that there is no exact mathematical solution (Pi being an irrational number that cannot be "measured" whereas the sides of a square are real numbers that can be measured), there are geometrical approximations that can convey visually this "geometric wisdom". Classical Sacred Geometry constructions for Squaring the Circle will be given in ◆SG302.



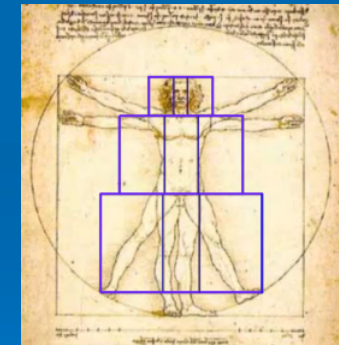
← If we lower the Da Vinci Man circle to fit symmetrically with the square, we have an approximation of Squaring the Circle.



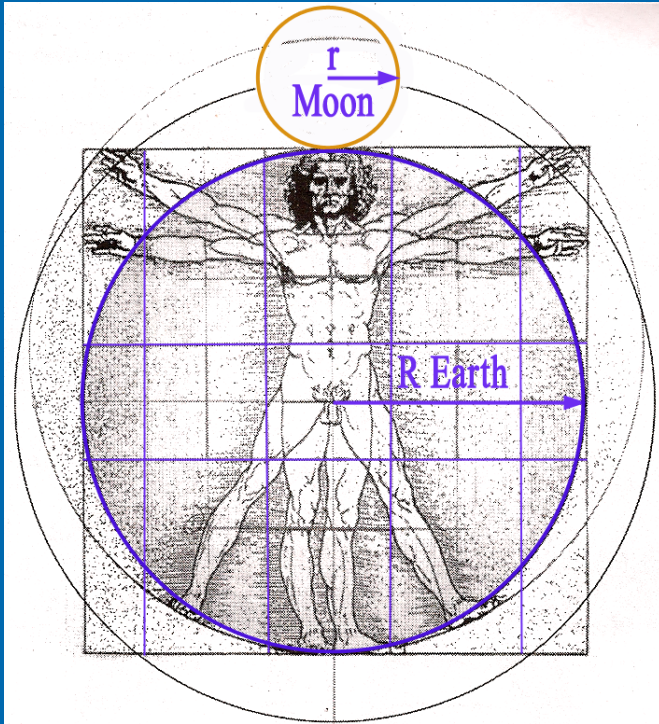
↑ The Star-Tetrahedron and the Da Vinci Man.

Drunvalo Melchizedek.

(The Ancient Secret of the Flower of Life. 1990.)



↑ 3 Golden Rectangles in the Da Vinci Man.



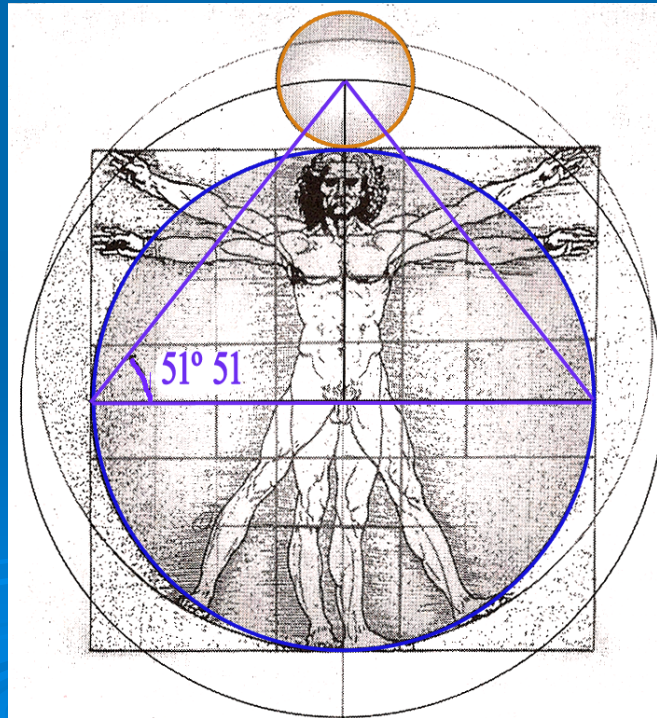
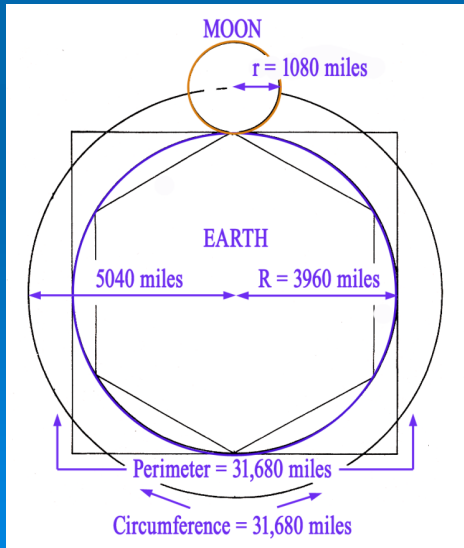
## SG204.1.11.4 Vitruvian Canon - Da Vinci Man (4)

There are other proportions showing up in the "Da Vinci Man": the earth and moon, and even the proportions of the Great Pyramid.

← The red and blue circles have the same proportions as the Moon and the Earth. The red circle is centered on a circle of circumference equal to the perimeter of the square enclosing the blue circle (geometric Squaring of Circle).



↑ The Italian one Euro (€) coin, based on Leonardo Da Vinci sketch of the Vitruvian Man.

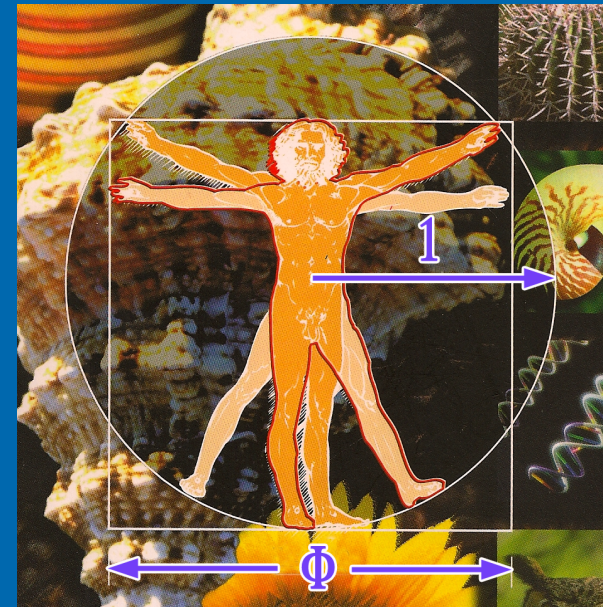
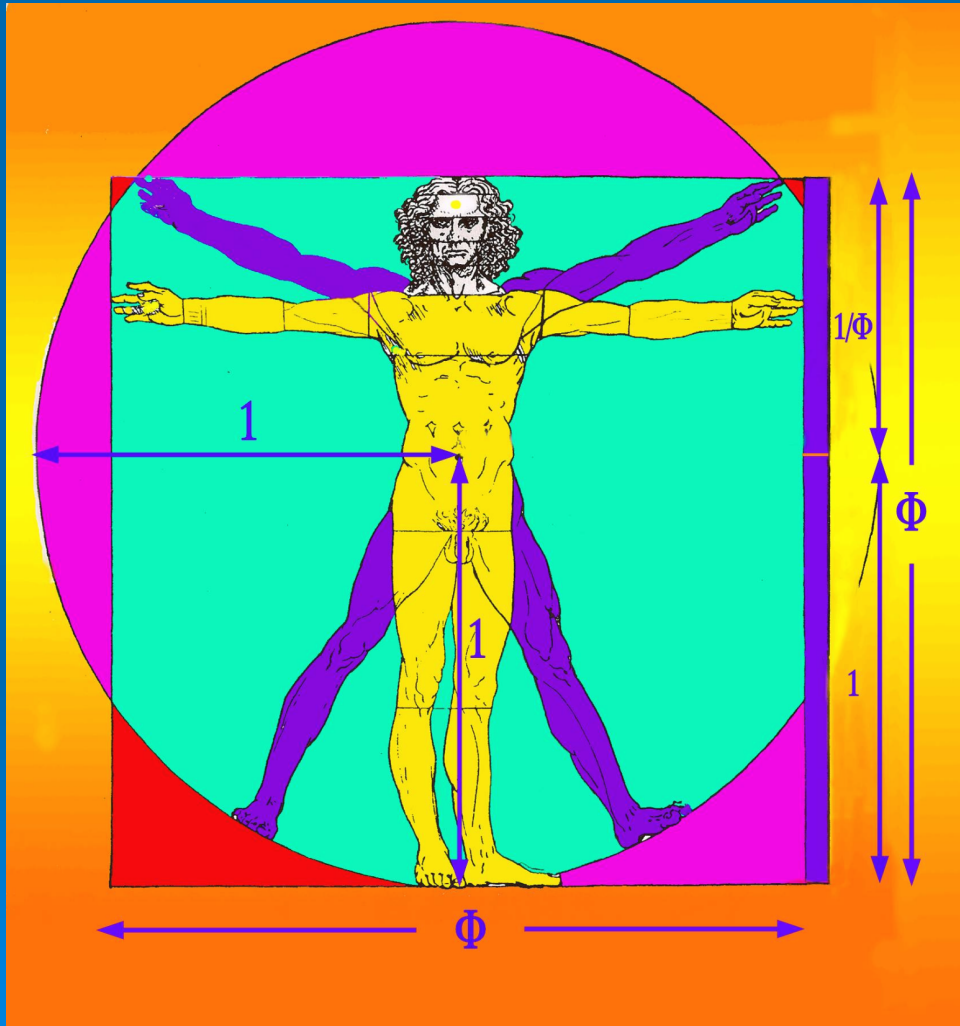


← If we draw the diameter of the "Earth" (circle inscribed in the Da Vinci square), and connect lines to the center of the "Moon", we obtain the proportions of the Great Pyramid.



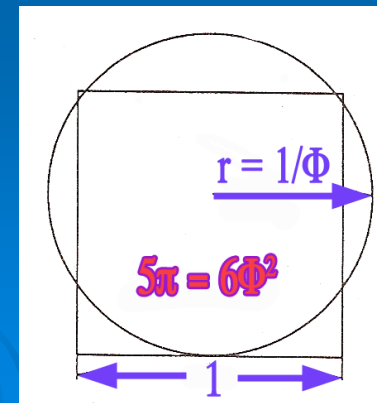
## SG204.1.11.5 Vitruvian Canon - Da Vinci Man (5)

Finally, here is an amazing proportion found by Jean-Claude Perez, the discoverer of the DNA Supra-Code: in the Da Vinci drawing, the side of the square and the radius of the circle are in a Golden proportion!



This proportion between the circle and the square is the traditional ratio between Pi ( $\pi$ ) and Phi ( $\Phi$ ), also called the "Osiris Ratio":

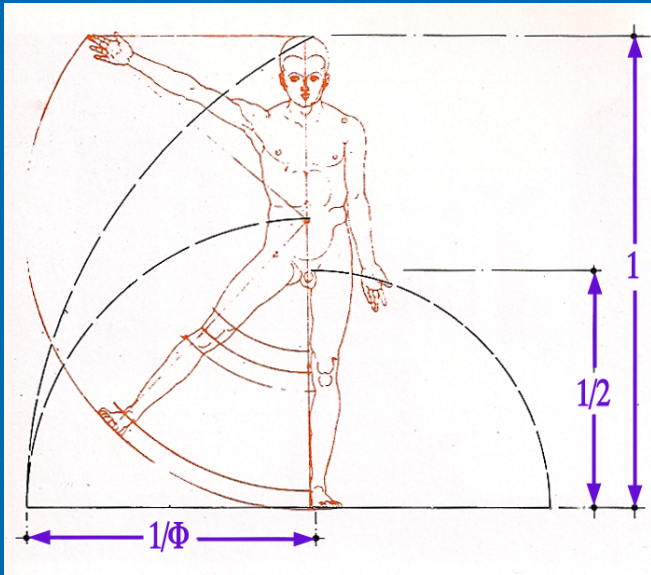
$$\pi / \Phi^2 = 6 / 5$$



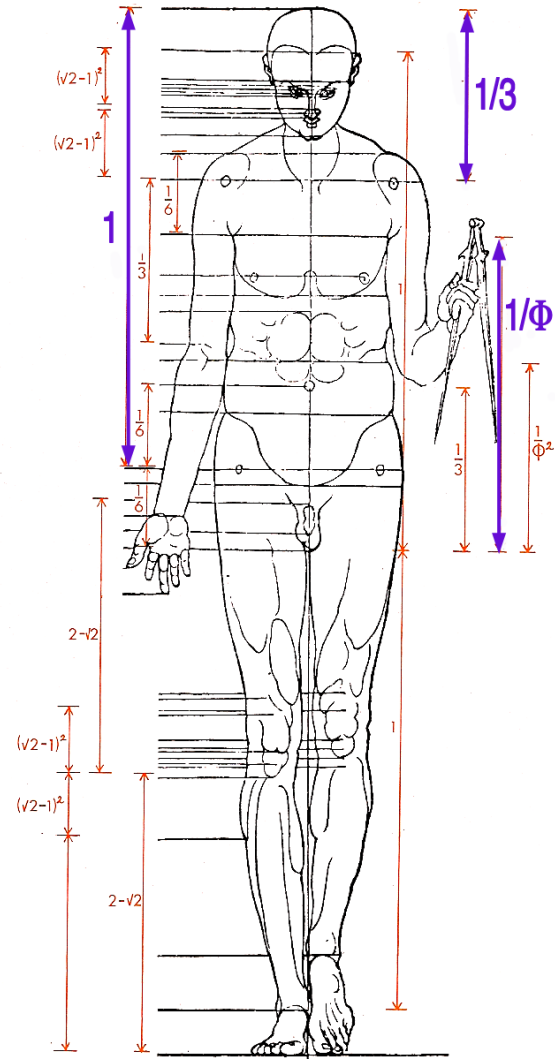
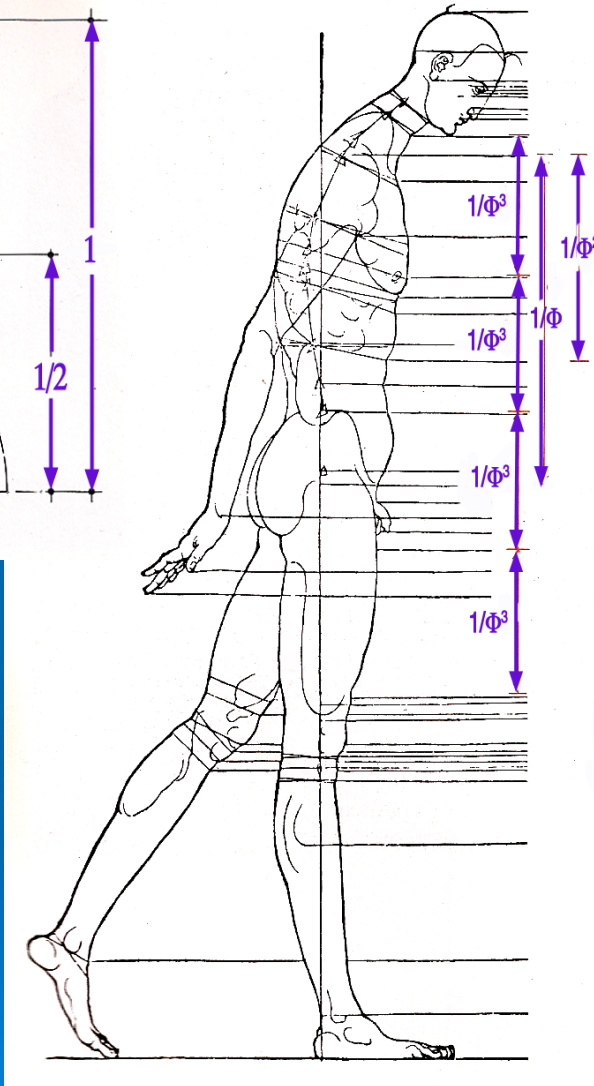
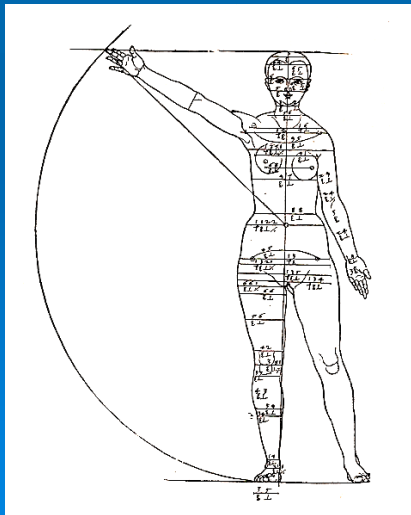
Area of circle:  
 $\pi r^2 = (.618)^2 \times \pi$   
 $= 1.1998$   
 Area of square:  
 $1 \times 1 = 1$

Ratio of areas  
 circle / square:  
 $1.2 / 1$  or  $6/5$

# SG204.1.12.1 Vitruvian Canon - Albrecht Dürer (1)



↑ In this figure, Dürer divides the body according to the traditional Human Canon: the sex marks  $1/2$  and the navel the Phi ratio.



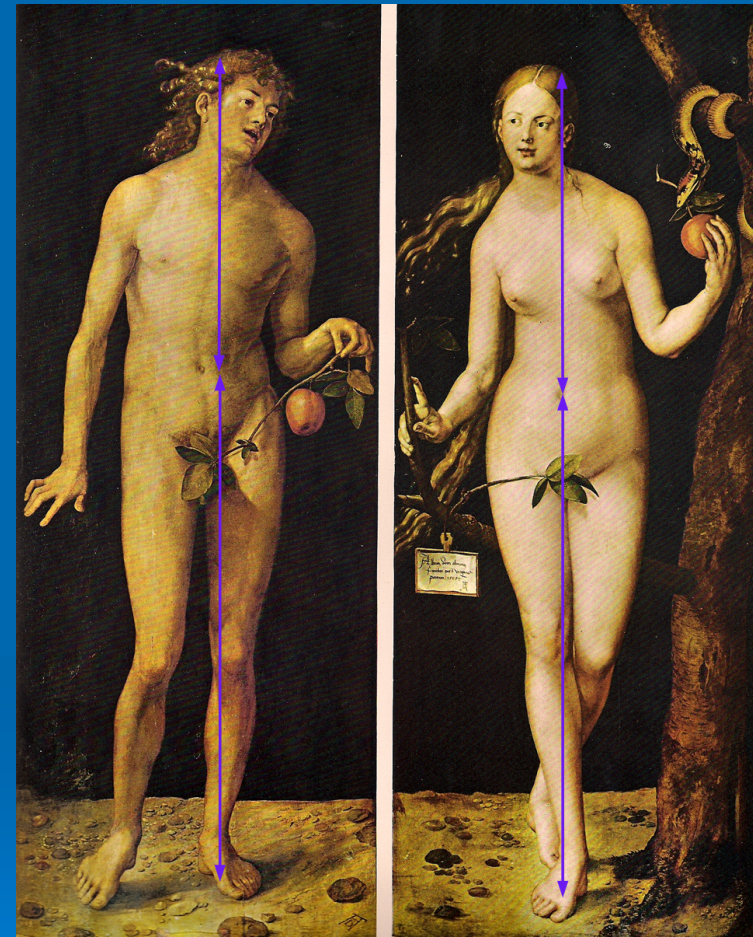
↑ Dürer's human canon is composed of proportions derived from the three unique divisions of unity into the Arithmetic, Harmonic and Geometric Means.  
(Designs from Robert Lawlor. Sacred geometry, 1982.)



## SG204.1.12.2 Vitruvian Canon - Albrecht Dürer (2)



↑ "The Fall of Man" by Albrecht Dürer. 1504.  
This engraving shows the ideal human proportions  
based on the navel as the Phi ratio of the body.



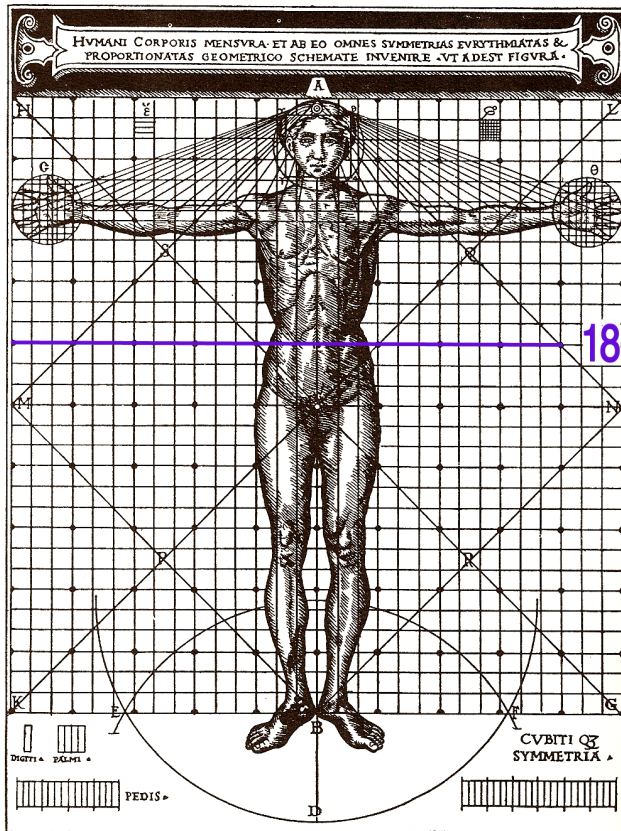
"Adam and Eve". 1507.



## SG204.1.13.1 Renaissance (1) Cesariano

Cesare Cesariano is chiefly remembered as the first translator of Vitruvius' treatise *De Architectura* into a modern language (Italian), with his added commentary. It was published in 1521, with copious woodcut illustrations and was later superseded by Daniele Barbaro's edition (1556) with illustrations by famous Renaissance architect Andrea Palladio (1508 - 1580).

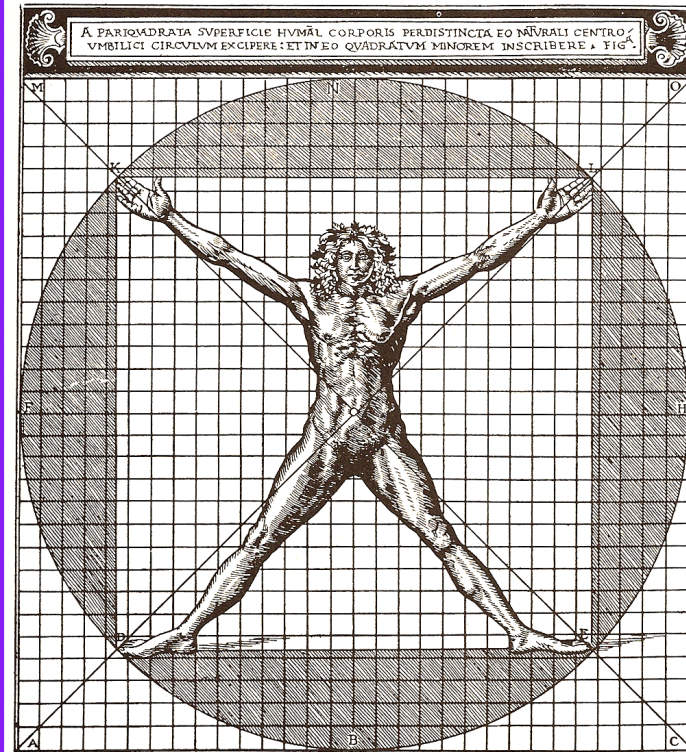
Left and below are two grid illustrations in Cesariano's edition of Vitruvius.



↑ The creative aspect of the Cosmic Body showing measurements (in digit, palms, feet and cubits) as geometric proportions for symmetry, eurhythmy and architecture. This diagram is a universal Canon (note the triangular "Alpha" pyramid on the crown, symbol of Origin, and the 3 circles representing the 3 higher Kabbalah sephiroth).

The body is drawn upon a grid of 900 squares (or 10 magic squares of 9) and the diagram is divided into 12 larger sections (4 squares + 8 triangles); this is the traditional design of a horoscope, a symbolic figure of the heavens, showing the 12 constellations as members of the Cosmic Man. Here, the body touches ten of the regions and the two untouched are connected by arcs. Note that these arcs are in fact a Vesica Piscis, or "Geometric Womb of Creation".

Following this basic grid, the navel is on line 18, thus dividing the height into an approximate Phi ratio.



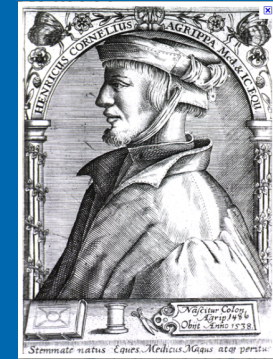
↑ The "Lesser Man" or Human Micro-Cosm is drawn upon the same grid as the Cosmic Man: it is a fractal image of the "Greater Man" and partakes of the same canonical measures (30 x 30) and proportions. The navel is the center of the circle touched by the two arms and the two legs and also the center of the inscribed square of 21 x 21.



## SG204.1.13.2 Renaissance (2) Agrippa

Cornelius Agrippa (1486 - 1535) was a theologian and occultist whose *Three Books concerning Occult Philosophy* (published in 1531 & 1533) were an encyclopedia of occult & magic traditions & thought. The *Three Books* were a highlight of the Occult Renaissance & they greatly influenced thinkers like Giordano Bruno and John Dee.

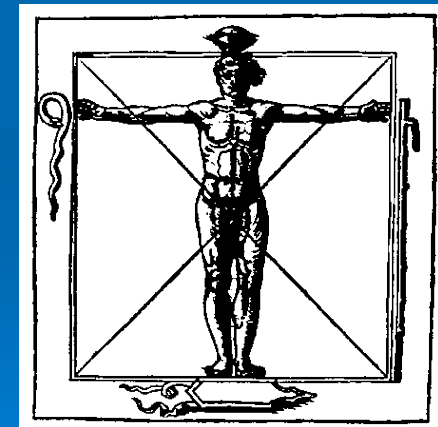
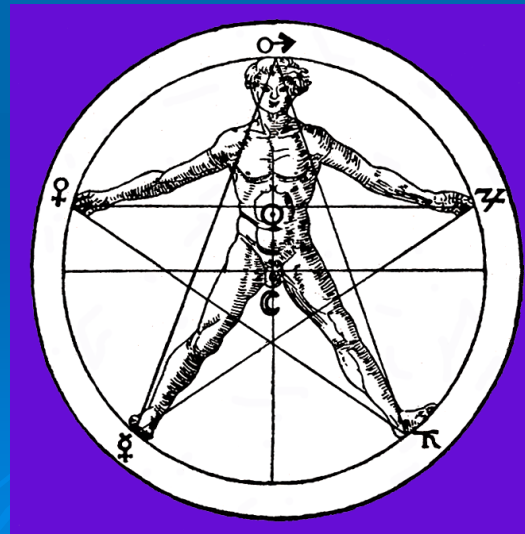
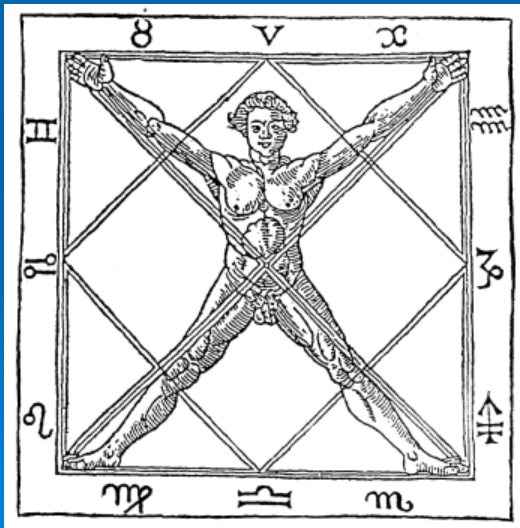
Agrippa emphasized: "All things which are similar and therefore connected, are drawn to each other's power." This is the traditional wisdom known as the *law of resonance*; it certainly prefigures our current understanding of the non-local inter-connectivity mediated by the Zero Point Quantum Field of information-energy.



### Book II, Chap. xxvii. Of the proportion, measure, and Harmony of mans body.

"Seeing man is the most beautifull and perfectest work of God, and his Image, and also the lesser world; therefore he by a more perfect composition, and sweet Harmony, and more sublime dignity doth contain and maintain in himself all numbers, measures, weights, motions, Elements, and all other things which are of his composition; and in him as it were in the supreme workmanship, all things obtain a certain high condition, beyond the ordinary consonancy which they have in other compounds. From hence all the Ancients in time past did number by their fingers, and showed all numbers by them; and they seem to prove that from the very joynts of mans body all numbers measures, proportions, and Harmonies were invented; Hence according to this measure of the body, they framed, and contrived their temples, palaces, houses..."

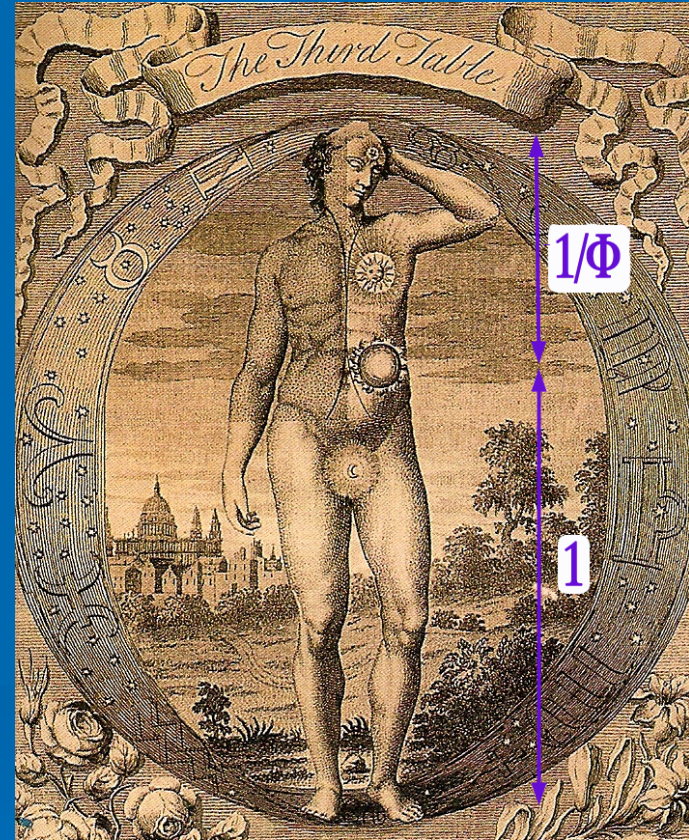
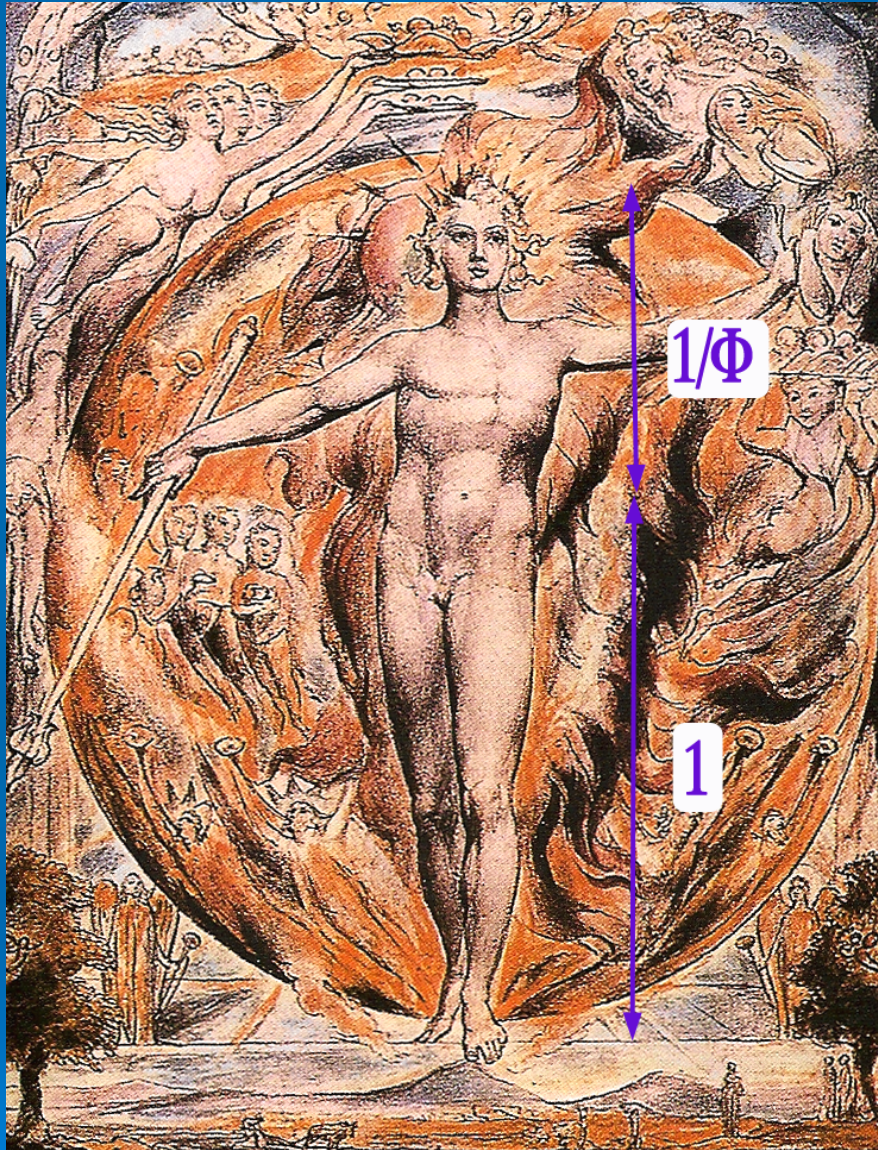
In like manner the measures of all the members are proportionate, and consonant both to the parts of the world, and measures of the Archetype, and so agreeing, that there is no member in man which hath not correspondance with some sign, Star, intelligence, divine name, sometimes in God himself the Archetype. But the whole measure of the body may be turned, and proceeding from roundness, is known to tend to it again."



←←↑ Diagrams from *Three Books* showing the rough Vitruvian Canon.



## SG204.1.14 Modern Times - Mystical Art



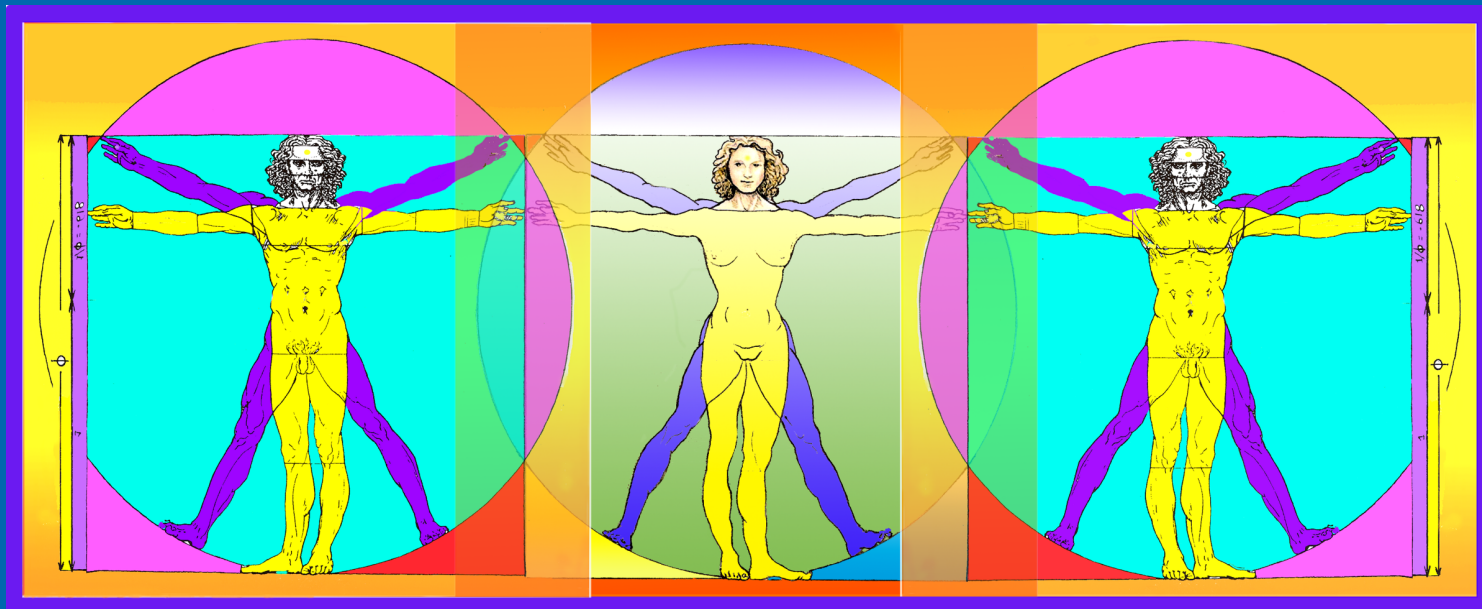
↑ 1764 illustration by D.A. Freher  
for Jacob Böhme's *Of Predestination* (1623)

← "The Sun at the Oriental Doorway". William Blake. 1815.

*"All of this is human: the rivers, the mountains, the cities and the villages. And if you enter into them, you walk the skies and the lands as well as you find within yourself heaven and earth and everything that you perceive."*  
(William Blake, *Jerusalem*.)



## SG204. Chapter 2. PHI Measurements in the Human Body

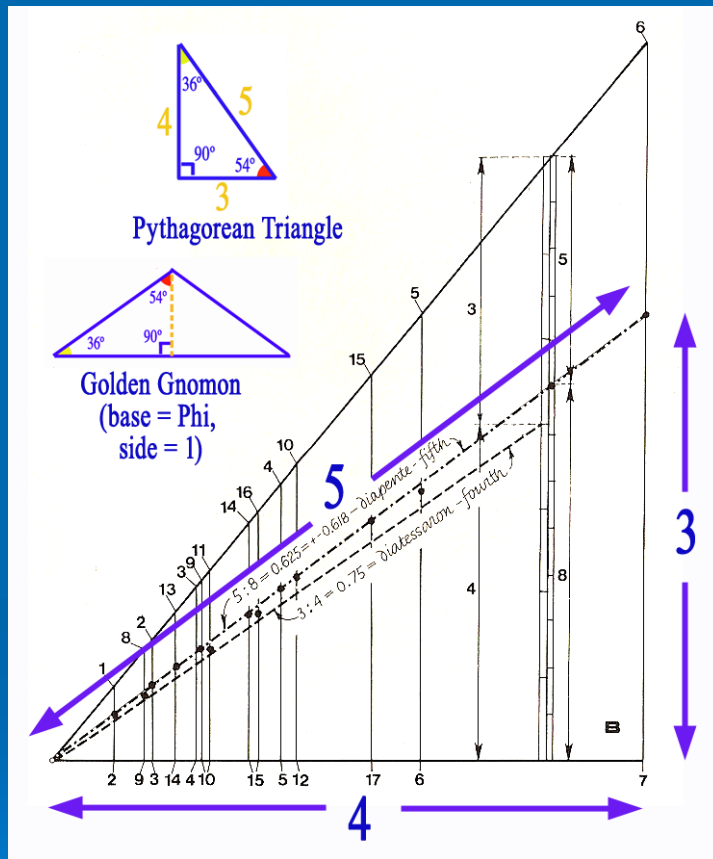


In this chapter, we will review the main occurrences of Phi ratios in the human body. They are based on the traditional ("Vitruvian") canon of harmonic proportions and therefore represent a universal average of the variations between individual bodies. Our new friend, the *Da Vinci Woman* (here above at center), will model the various proportions.

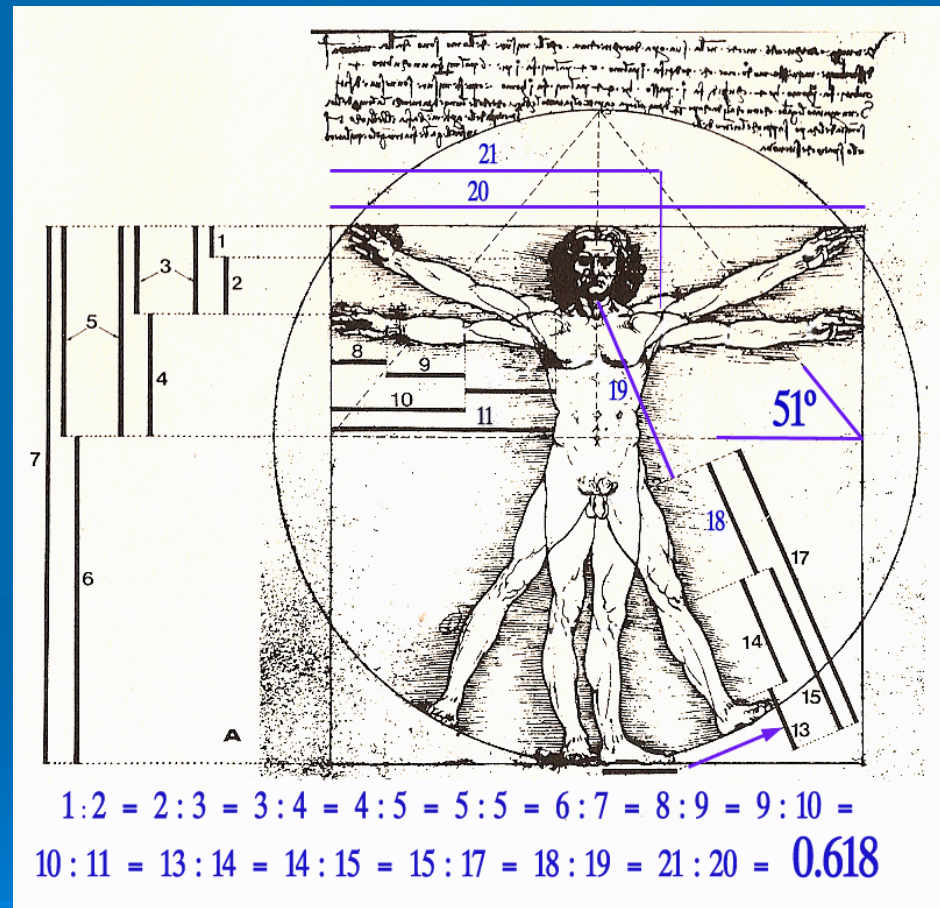
We will then consider ways to analyze large numbers of variations in human measurements. This is the quantitative field of study called *anthropometry*. The question naturally rises: is the Phi harmonic canon validated across large human population? The answer is: yes!

## SG204.2.1 PHI Ratios in the Da Vinci Man

We are here following the lead of György Doczi in *"The Power of Limits"* (1981), a wonderful pioneering study of proportional harmonies in Nature, Art & Architecture. Doczi correlates space proportional measurements with musical harmonies. The bar and triangular diagrams below show how adjacent parts of the body share proportions which fall within the range of the Golden Ratio Phi and therefore the musical chord of the "fifth" (2/3).



↑ Plotting the measurement ratios on a triangular diagram yields the line of the musical fifth or "diapente".  
Note the direct relationship between the Golden ratio, the musical fifth and the Pythagorean triangle 3-4-5.  
(Remember how two Pythagorean triangles side to side form a Golden Gnomon Penta-Module. [◆SG106])

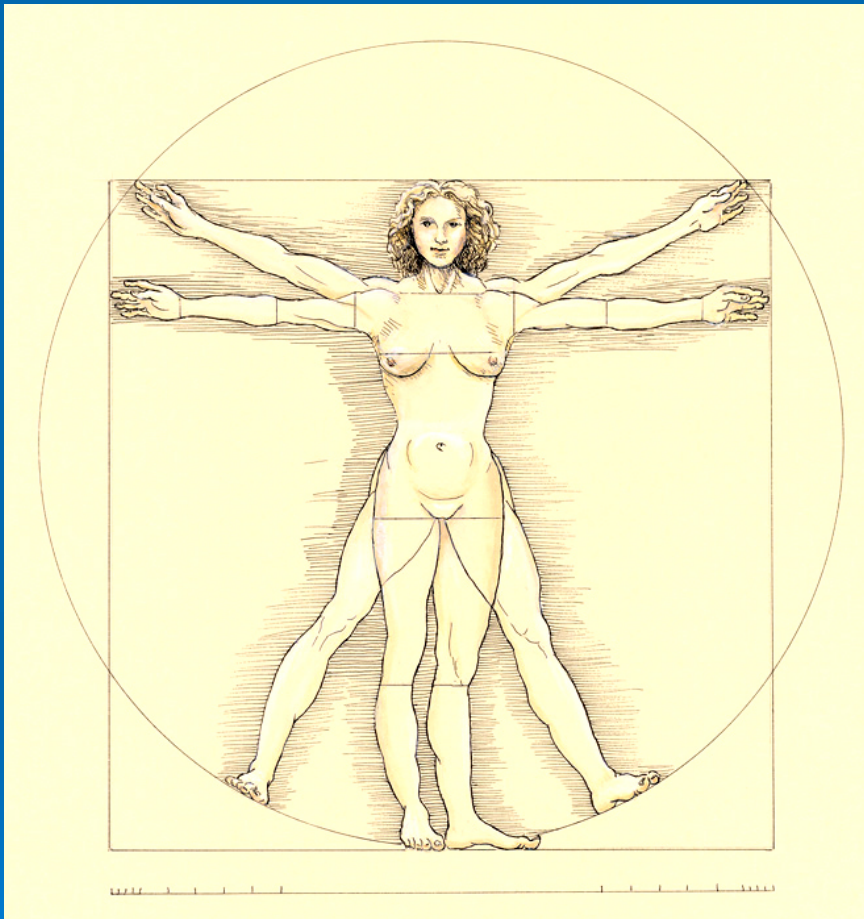


↑ Some of the PHI ratios in the Da Vinci Man template.  
Note that Doczi has inserted the Great Pyramid's cross-section triangle with slope angle 51° 51'.

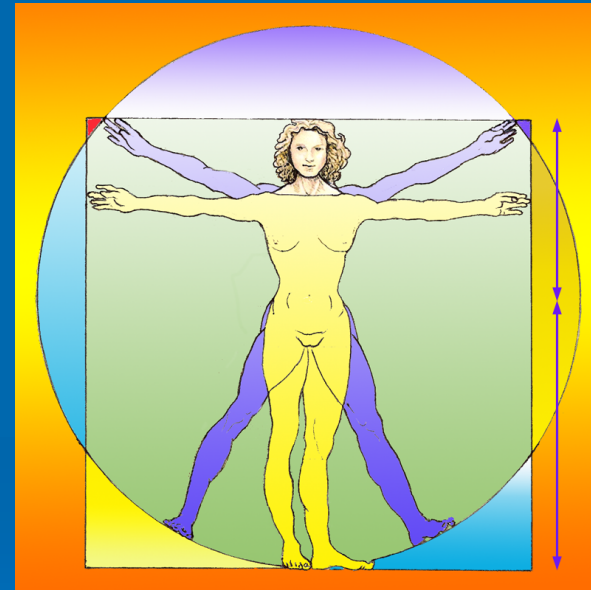


## SG204.2.2 Meet Da Vinci Woman (1)

The Da Vinci "Vitruvian Man" has found his partner.  
It was time that the global icon of balance & harmony be represented by a feminine figure.

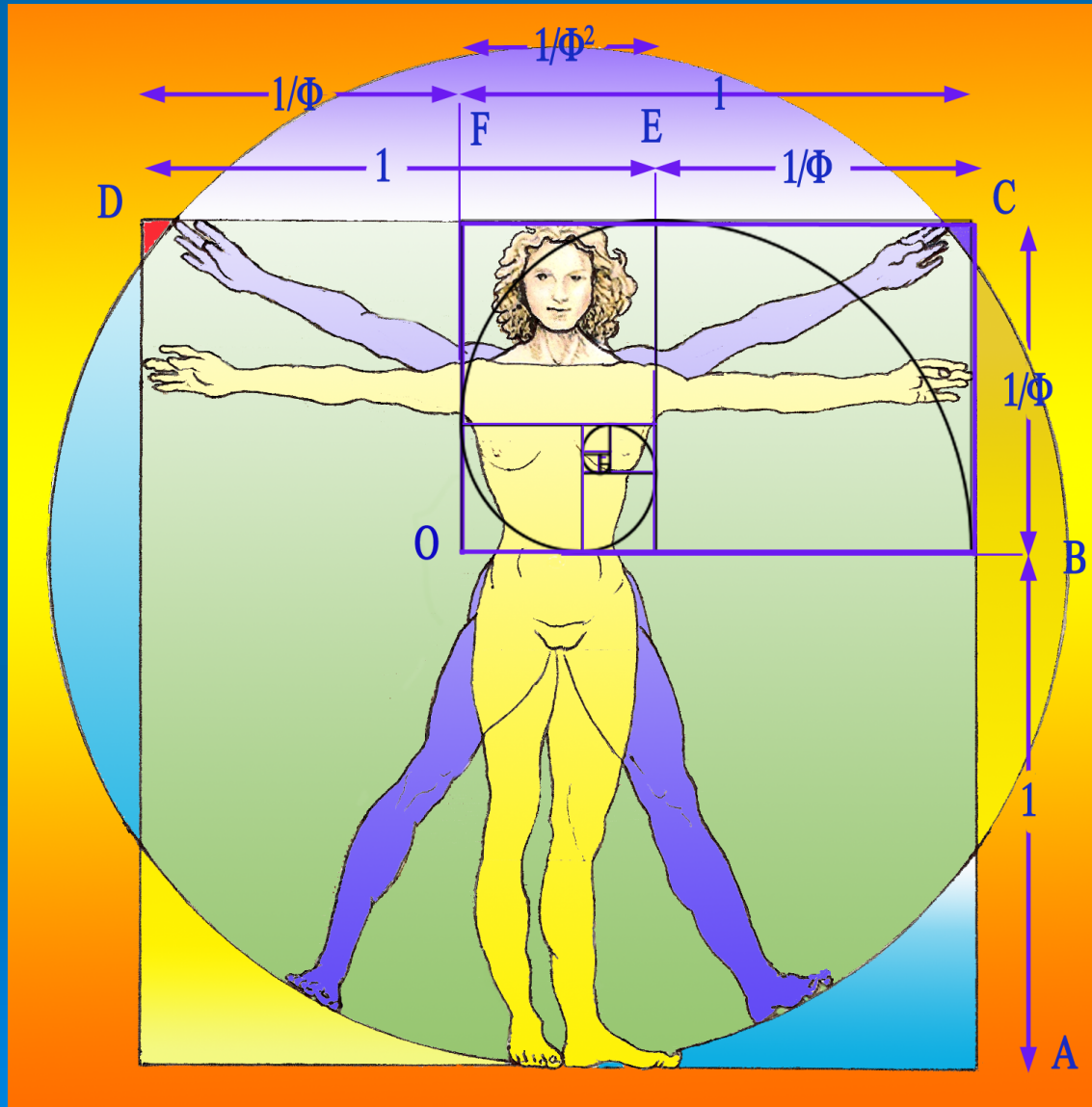


Susan Dorothea White. *Sex Change for Vitruvian Man*, 2005.  
Drafting pen, black ink and gouache, 24.5 x 21 cm  
(published in *Draw Like Da Vinci*, 2006)  
[www.susandwhite.com.au](http://www.susandwhite.com.au)



This New *Gioconda* will be our guide to demonstrate  
some of the main PHI proportions in the human body.

## SG204.2.3.1 Whole Body - Height & Width (1)



*When someone asks you:  
"What is the Golden ratio?", the easiest  
answer is to point to your feet,  
your navel and the top of your head and  
say: "See, the navel divides my body  
into the Golden ratio!"*

### Canonic (averaged) proportions of a human whole body:

- Height = width of outstretched arms  
 $AC = DC$
- Navel divides body into PHI ratio  
"Large" (sole of feet to navel)  
divided by "small" (navel to top head) = Phi  
 $AB/BC = 1/(1/\Phi) = \Phi = 1.618$   
"Large" plus "small" = Phi  
 $AB + BC = AC = \Phi = 1.618$
- Arm length (outstretched) is in Phi ratio at  
the shoulders (left & right)  
 $DE = \text{tip of right fingers to left shoulder} = 1$   
 $EC = \text{left shoulder to tip of left fingers} = .618$

Note that the square around the head  
has sides of  $1/\Phi^2$

... and see  
how the Golden Rectangle OFCB  
is home to the Golden Spiral  
zeroing on the HEART!!!





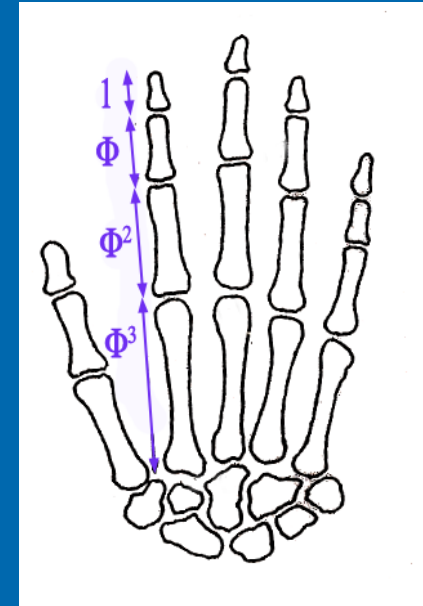
## SG204.2.4.1 Body - Arms and Hands (1)



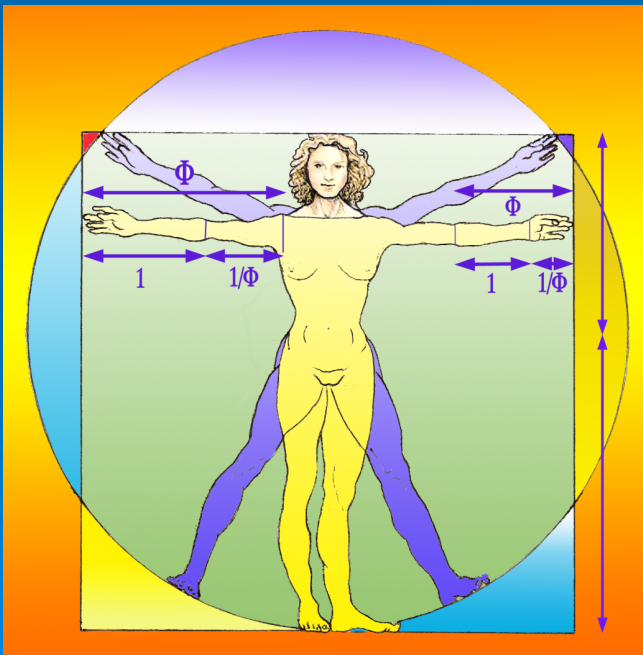
← Fibonacci progression on the 3rd finger, checked on an x-ray image (in cm).

Next to pointing to your navel, you can hold up your hand to your audience and point to your index finger: each segment of your index finger, from the tip to the base of the wrist, is larger than the preceding by Phi, the Golden proportion, which can be visually expressed by the sequence of Fibonacci numbers: 2 - 3 - 5 - 8. On this scale, your index fingernail is 1 unit in length.

You can also check your hand's proportions by using the powers of Phi (image on the right).

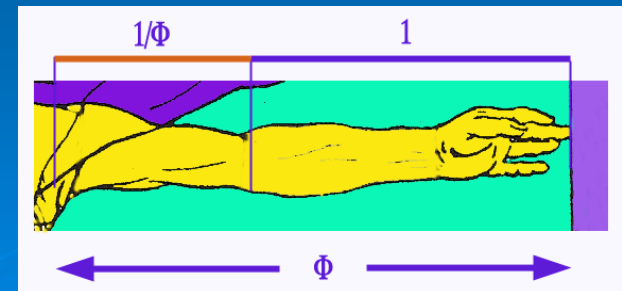
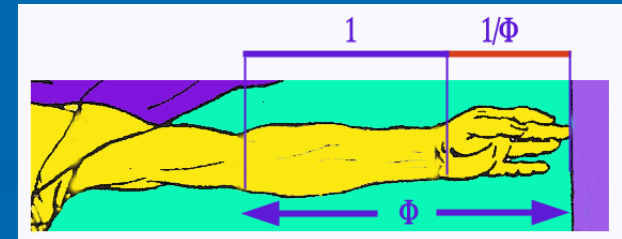


Golden ratio progression → on the bones of a human hand.



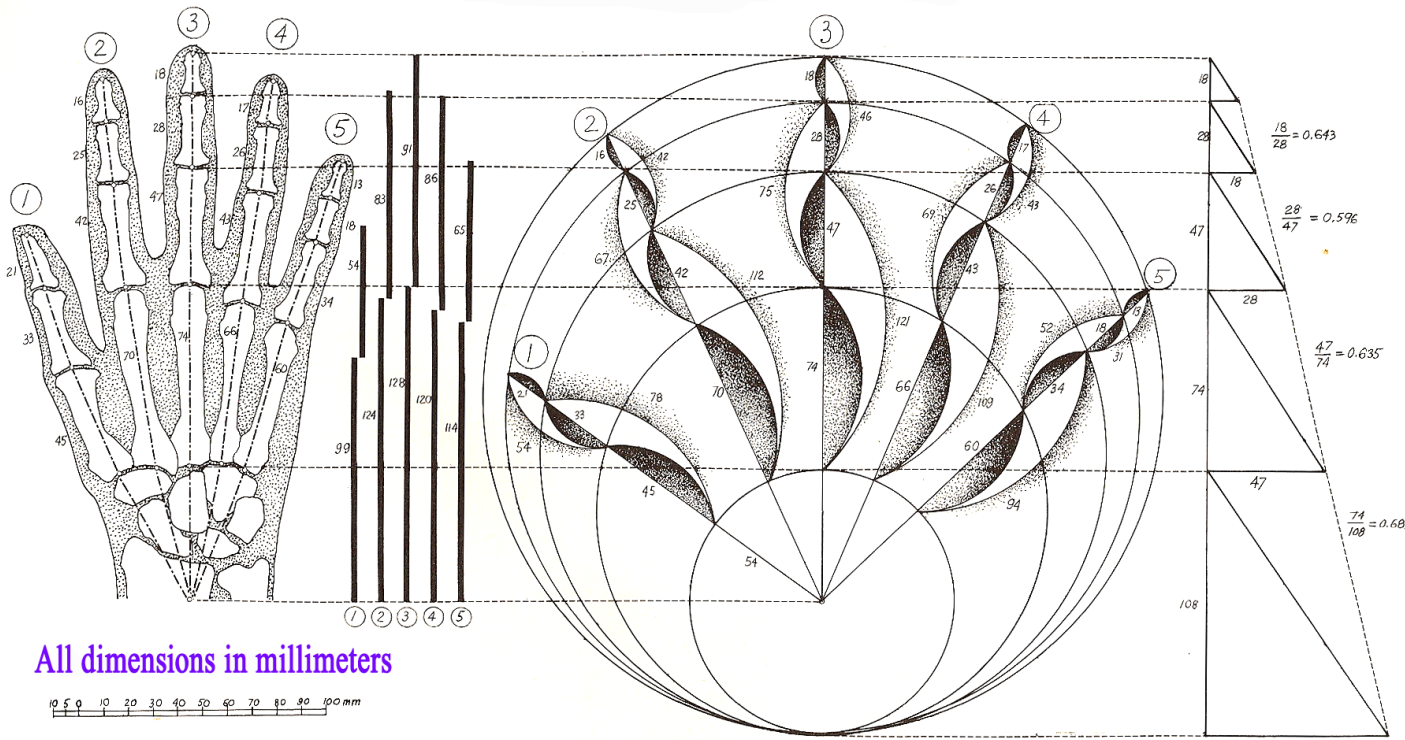
Next, let's explore the harmonic → proportions in your arm. Work with a partner. Have your partner measure the length from your elbow to the tip of your hand. Here is another Golden proportion: the ratio of your forearm to your hand is PHI.

Now, have your partner measure → the length of your arm from the shoulder to the end of the middle finger. Then get the measurement from the elbow to the end of the middle finger. Divide the larger number by the smaller number. What do you get?

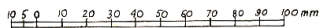




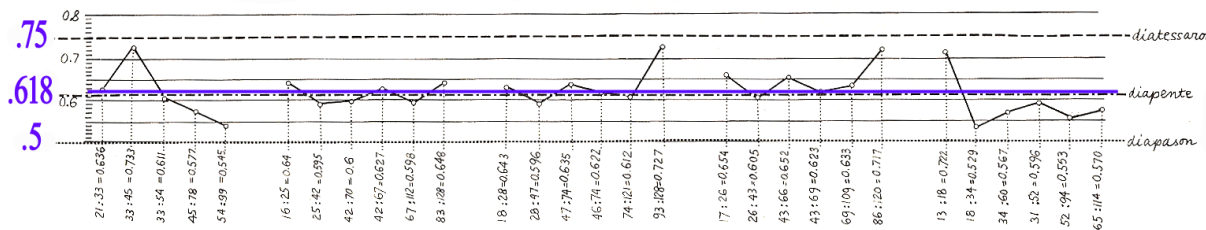
# SG204. 2.4.2 Body - Arms and Hands (2)



All dimensions in millimeters

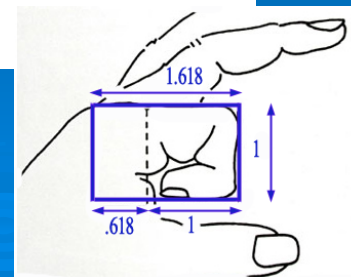
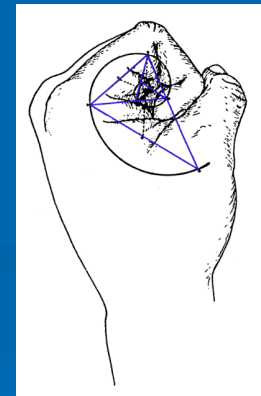


① Thumb      ② Index      ③ Middle      ④ Ring      ⑤ Small



Approximations  
of  
musical  
root  
harmonies

3:4  
2:3  
2:1

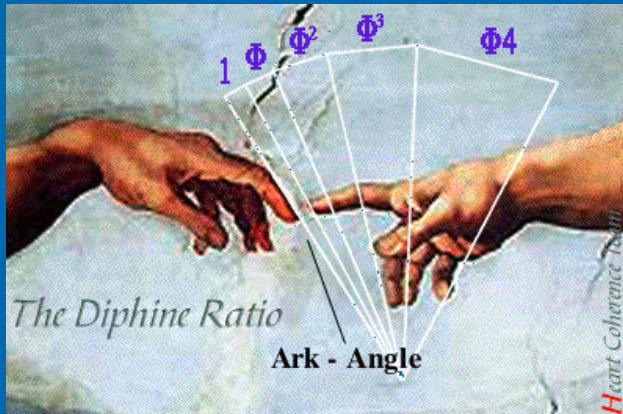


(Diagram  
by  
György  
Doczi)

In *The Power of Limits*, György Doczi writes about the human hand:

*"The hand is a microcosm mirroring the macrocosm of the body.  
It grows out of the wrist as the spine grows out of the sacrum,  
and as wings grow out of the butterfly,  
or as leaves and flowers grow out of their stems"*

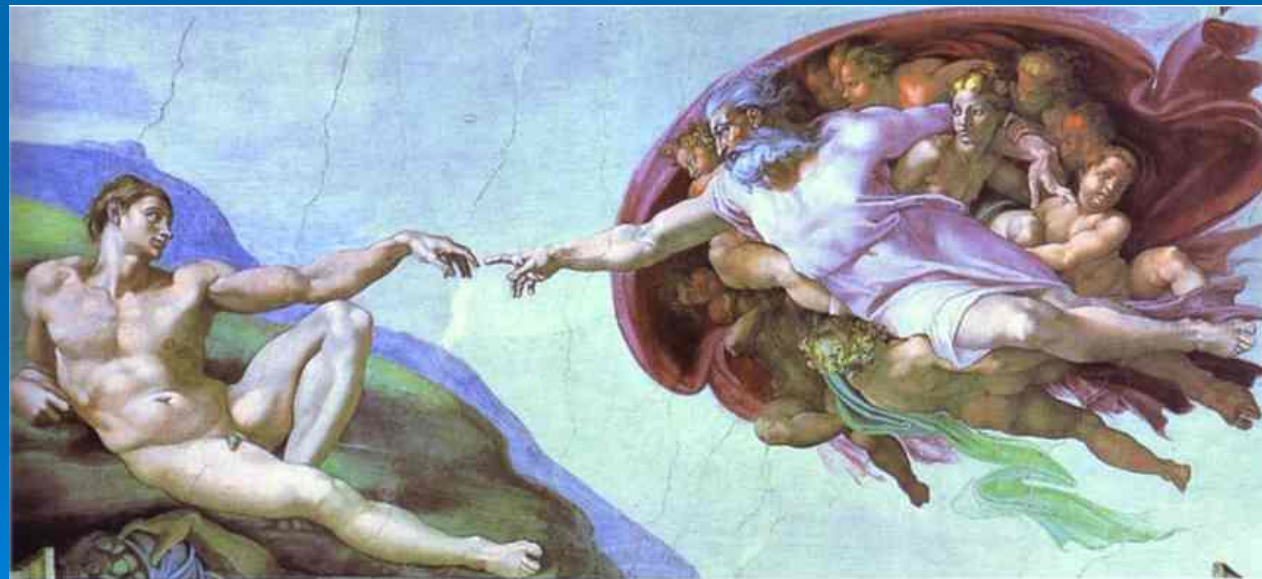
## SG204.2.4.3 Body - Arms and Hands (3)



The beautiful scene of the Creation of Adam shows the archetypal "Divine Hand" transmitting life force or sparking the material body of Adam with a higher frequency.

It is interesting to note that this higher dimensional transmission is bridging over through the diminishing Phi progression of the hand as a sacred instrument of power.

↑ Dan Winter's slide  
(Heart Coherence Team)  
[//goldenmean.info](http://goldenmean.info)

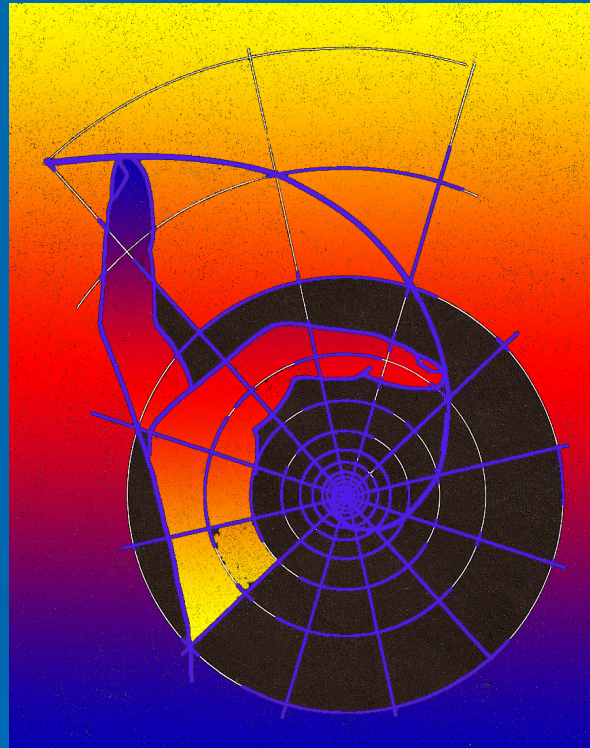
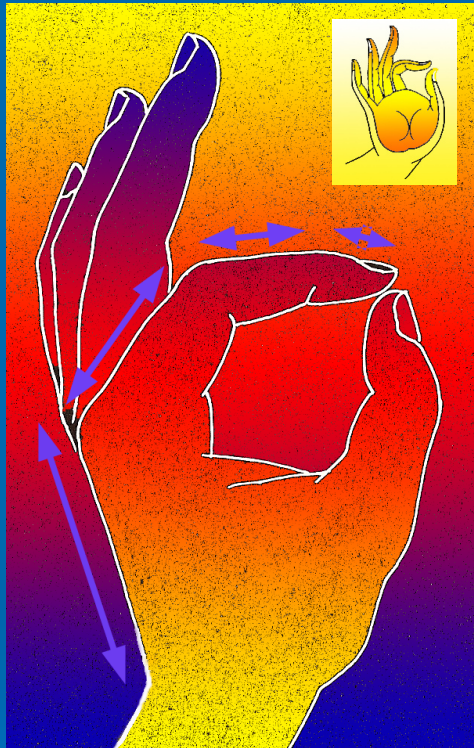


↑ "The Creation of Adam" (1511) by Michelangelo Buonarroti (1475 - 1564)



## SG204.2.4.4 Body - Arms and Hands (4)

In *The Power of Limits*, György Doczi shares his insight about the proportional blossoming dance of the fingers, as they unfold from the position of the sacred "Teaching Mudra" (*Vitarka* - with the index finger touching the thumb)... The *Vitarka Mudra* points to a transmission with no words, as the circle formed by the thumb and index finger creates a constant flow of energy/information. Opening the hand creates the *Abhaya Mudra*, the mudra of Blessing and Fearlessness - radiating energy from the heart through the hand chakra and into the world.

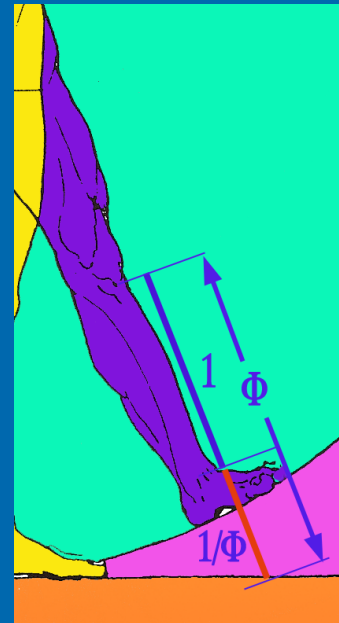
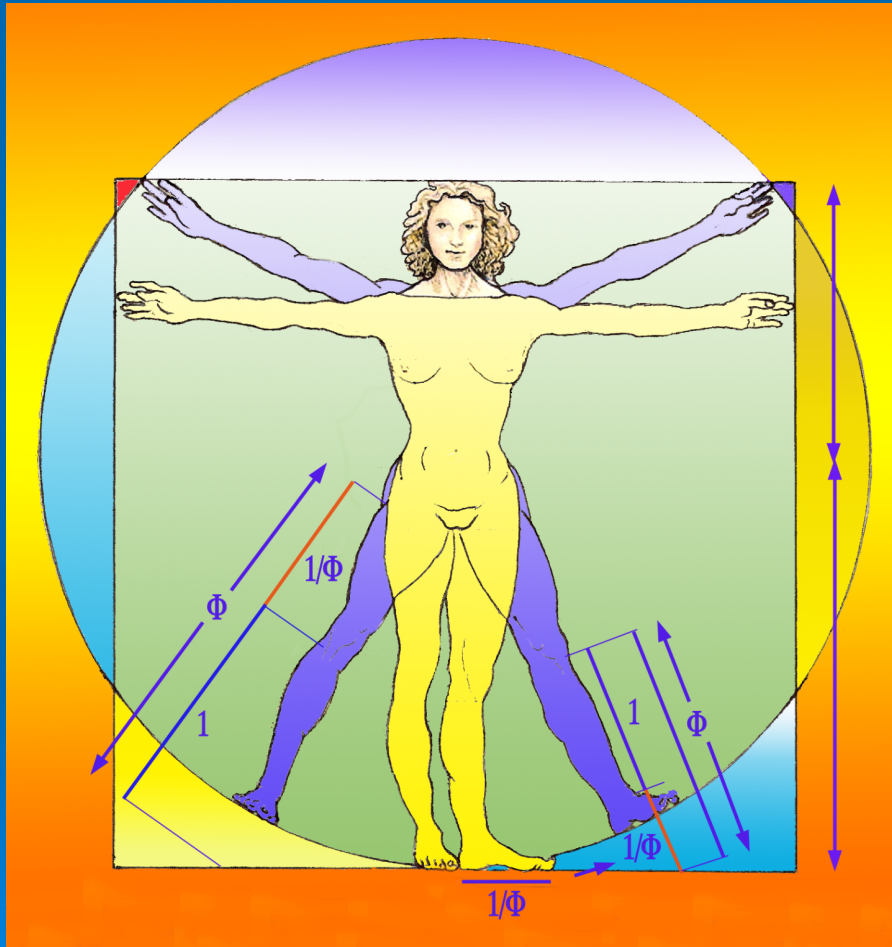


*"As it unfolds, the index finger moves along the same kind of logarithmic spiral that unfolds in the myriad forms of nature. The combined movements of all five fingers create a picture of a 1000-petaled lotus, symbol of final attainment and wholeness. But this hand is not only the hand of the Buddha: it is the hand of every human being."*

(György Doczi)

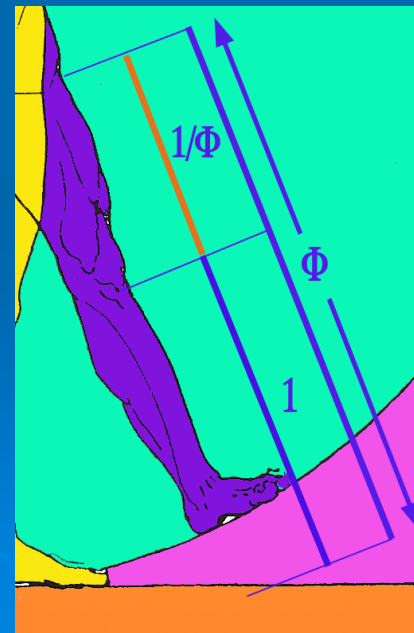
# SG204.2.5.1 Body - Legs and Feet

The are two main Phi proportions in the legs  
(counting the extended foot)



Note:  
In order to see the main proportions in the leg, we need to extend the foot in a line with the lower leg, just like the hand is the prolongation of the forearm.

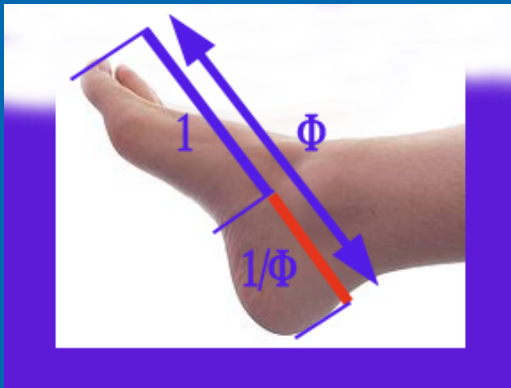
← From the tip of the (extended) foot to the ankle ( $1/\Phi$ ) and from the ankle to the knee joint (1).



← From the hip joint to the knee joint ( $1/\Phi$ ) and from the knee joint to the tip of the (extended) foot (1).



## SG204.2.5.2 Body - The Foot (1) Ratios



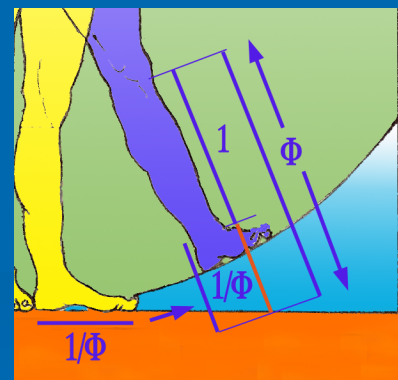
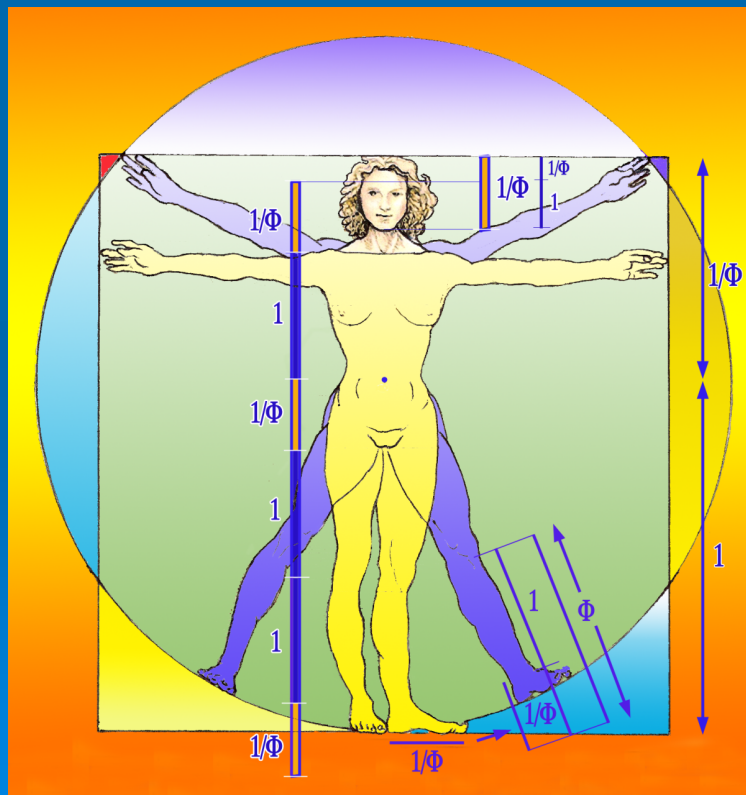
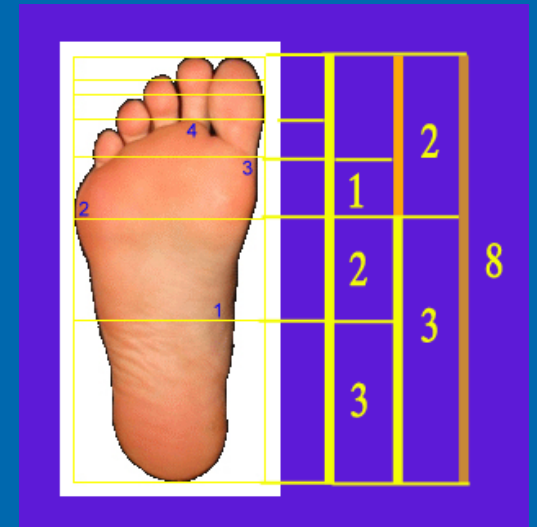
↑ The middle of the natural arch of the foot marks a Phi proportion.

The human foot is a marvel of support, balance, flexibility and resiliency. 1/4 (26 bones) of the bones in the human body are in the feet. It is traditionally said that the length of the foot is about 15% of the total height: length foot x 6.66 = height.

The foot has several proportions based on phi lines →

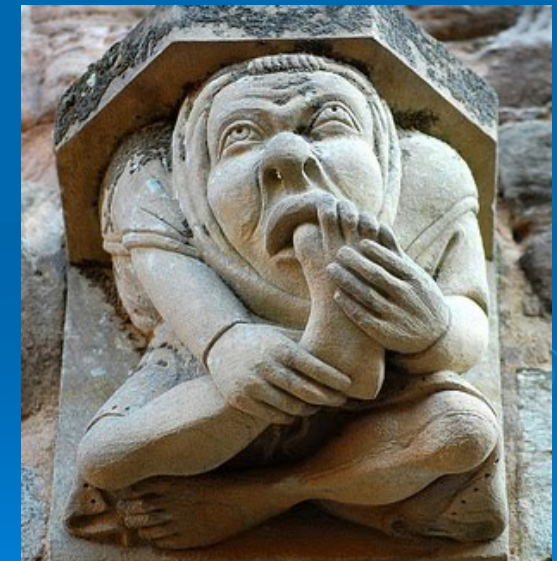
- 1) The middle of the arch of the foot
- 2) The widest part of the foot
- 3) The base of the toe line and big toe
- 4) The top of the toe line and base of the "index" toe.

(after [www.goldennumber.net](http://www.goldennumber.net))



↑ The distance from the knee to the ankle is in PHI ratio with the length of the foot.

↑ The length of the foot corresponds to the height of the head.



↑ Medieval sculpture. Unknown origin.

## SG204.2.5.3 Body - The Foot (2) Dynamics

The dynamics of the foot walking

← By recording the changes in pressure on each part of the foot, it is possible to recreate the dynamics of walking. This is called *pedobarigraphy*.

In a healthy body with a healthy foot →, the colors indicate an increasing pressure (from white to purple to green) that moves from the heel to the big toe.

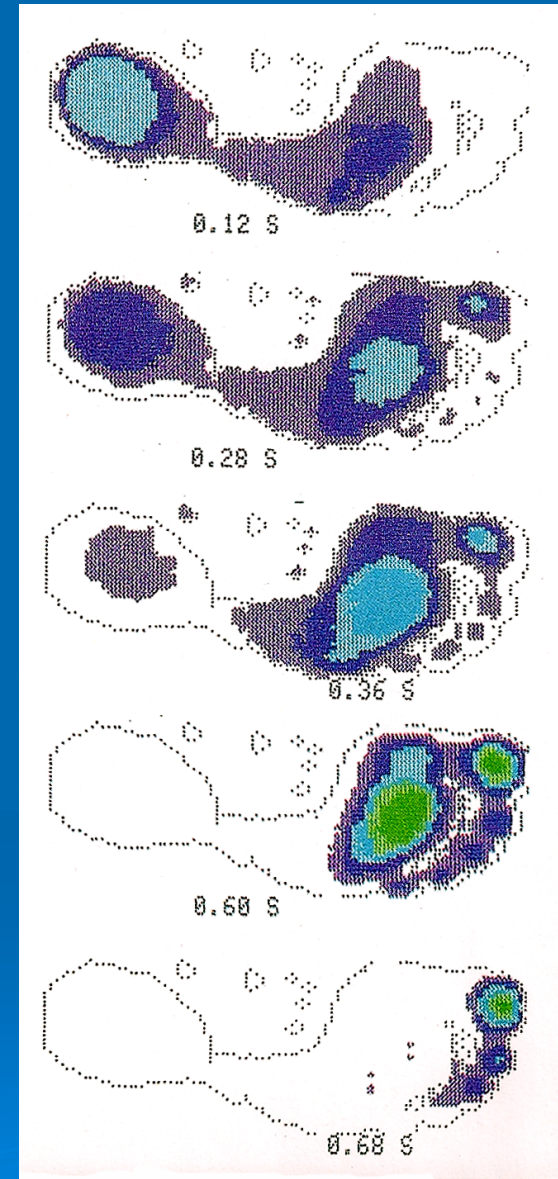
As we walk, we are harmoniously balancing on a Phi-ratioed arch.



Image: [www.stpatrick-lakeforest.org](http://www.stpatrick-lakeforest.org)



↑ The spiral soles of a Cambodian Buddha.



(Human Anatomy. TAJ Books. 2006)



## SG204.2.5.4 Body - The Foot (3) Buddha's Foot

Buddhist historiography reports that, prior to his death, the Buddha left an imprint of his foot on a stone near Kusinara (present Kushinagar, India), as a reminder of his presence on earth. A rich symbolism is attached to this "relic" [◆SG303].

Some of these footprints often place the Dharma Wheel (one of the 32 marks of a Buddha) at the centre of the sole and show the toes as having equal length, thus using the foot as a billboard or rectangular canvas for displaying Buddhist teachings.

Other representations of the Buddha's footprints are closer to the physiology of a real human foot and show harmonic proportions.

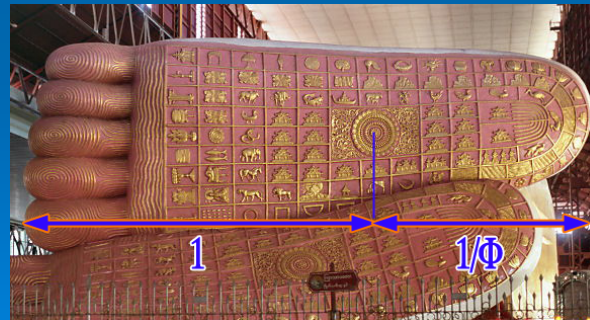
We give in this page some examples pointing to an intentional or intuitive placement of the Golden proportion on the foot.



↑ Buddha's footprint.  
Taxila, Pakistan.



↑ Human to Buddha proportions...  
Leshan Buddha ("Dafo"), China.  
233 ft high.



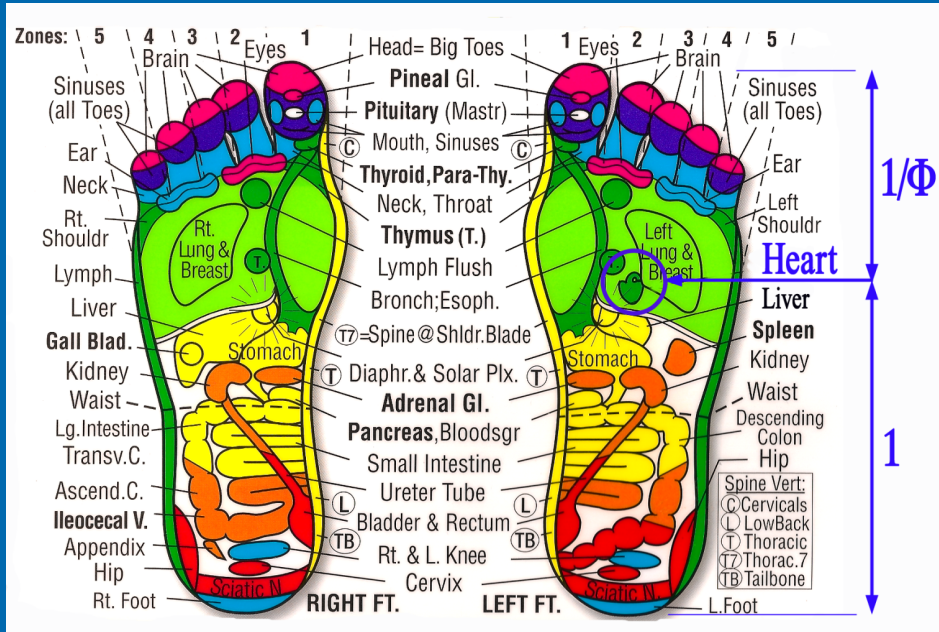
↑ Chaukhtatgyi Buddha.  
Myanmar (Burma). 70 meters long.



↑ Buddha's footprint. Phra Putabat. Bronze.

# SG204.2.5.5 Body - The Foot

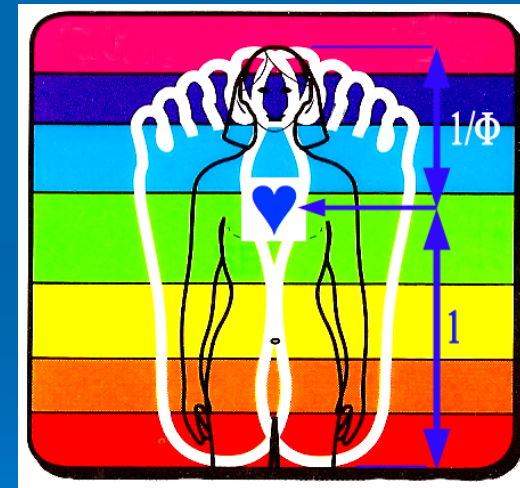
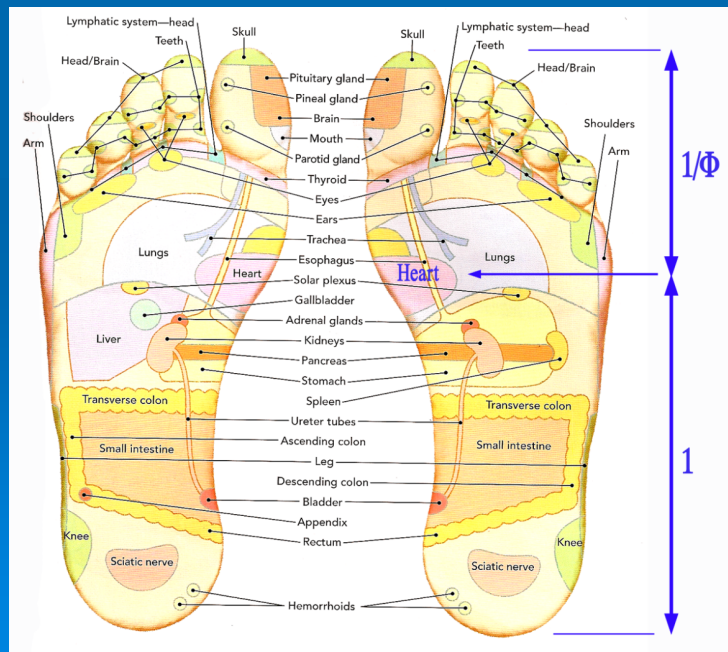
## (4) Reflexology Maps



Reflexology is a time-honored healing method coming from the early Egyptian, Chinese, East Indian & Japanese cultures. It involves the activation of body "reflex zones" in the hands, feet and ears that map out a mini-image of the entire body. Through acupressure, acupuncture or color laser therapy, these points allow the regulation of corresponding organs, glands or systems.

Reflexology is a traditional holistic understanding that has been cognizant of the fractal, holographic aspect of the human body-mind. The new biology of wave-function resonance is only catching up with ancient wisdom.

Interestingly, the Phi ratio applied to the human foot corresponds to the Heart in terms of the reflexology map.



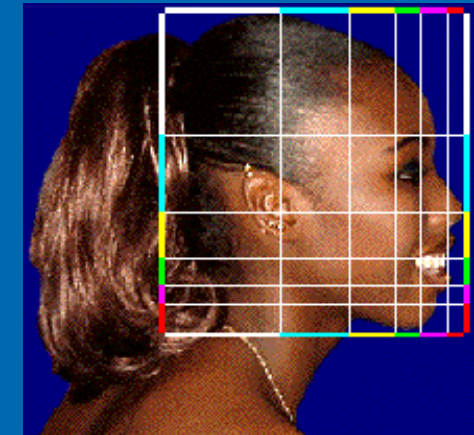
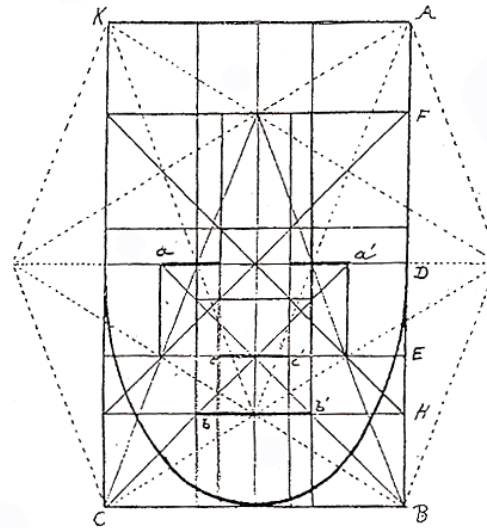
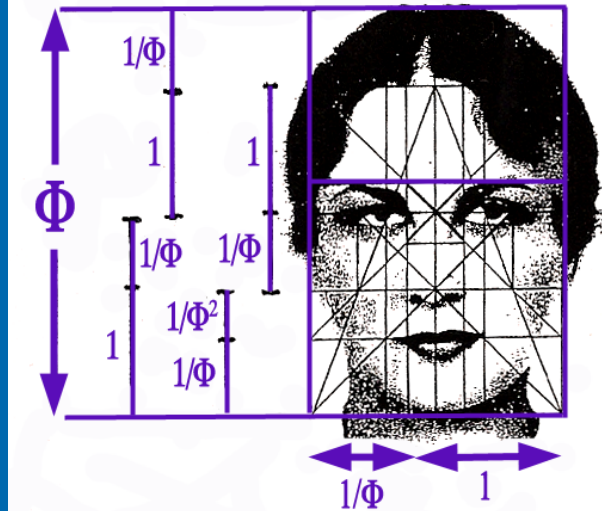
↑ The feet map out the entire body

← Two Foot Reflexology charts showing the Phi ratio at the level of the Heart. Above: Inner Light Resources. Rainbow Chart. 1997. Below: Cyndi Dale. The Subtle Body. 2009.



## SG204.2.6.1 The Human Face (1)

The human face is a rich template of Golden proportions, displaying nested ratios of Phi with multiples (powers) and submultiples (reciprocals).

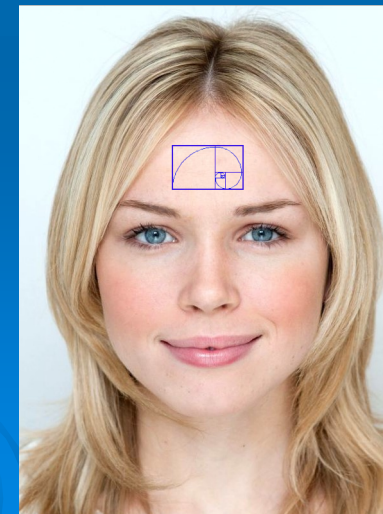
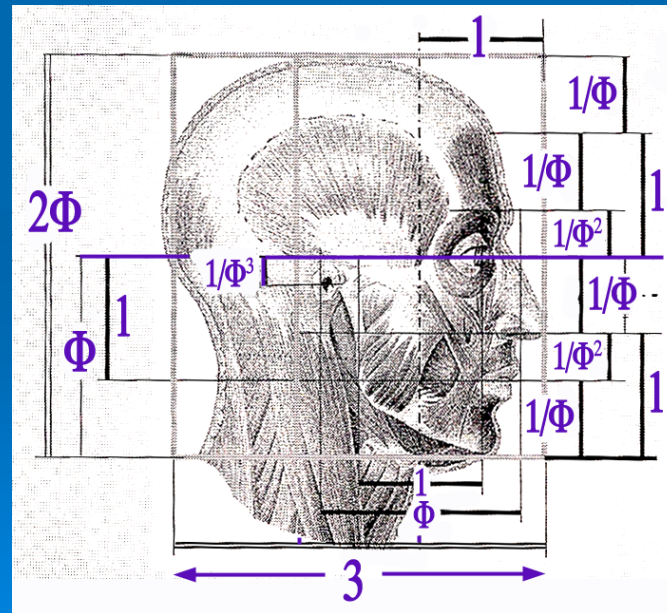


↑ Golden section analysis by Matila Ghyka. Face of Helen Wills. *Le Nombre d'Or*. 1931.

→ Fibonacci series plotted on the human face. [www.goldennumber.net](http://www.goldennumber.net)

→ Golden section analysis by Robert Chalavoux. *Nombre d'or*. 2001.

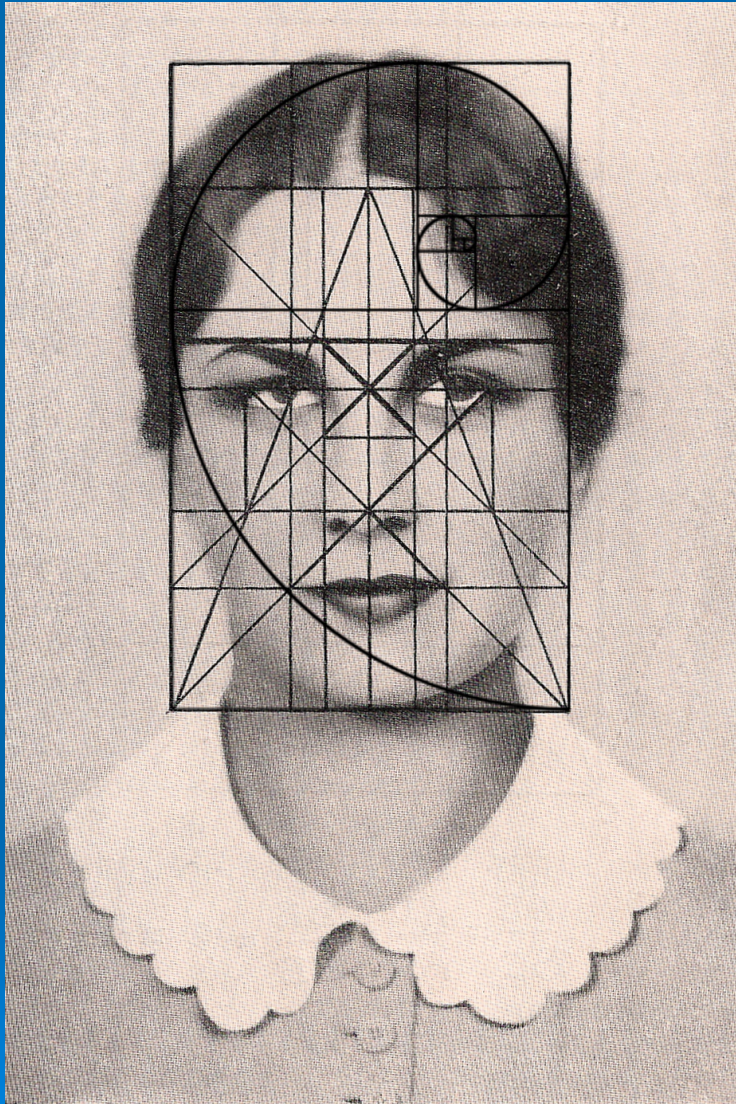
Diagram from: Dr Fau. *Anatomie*. 1830.



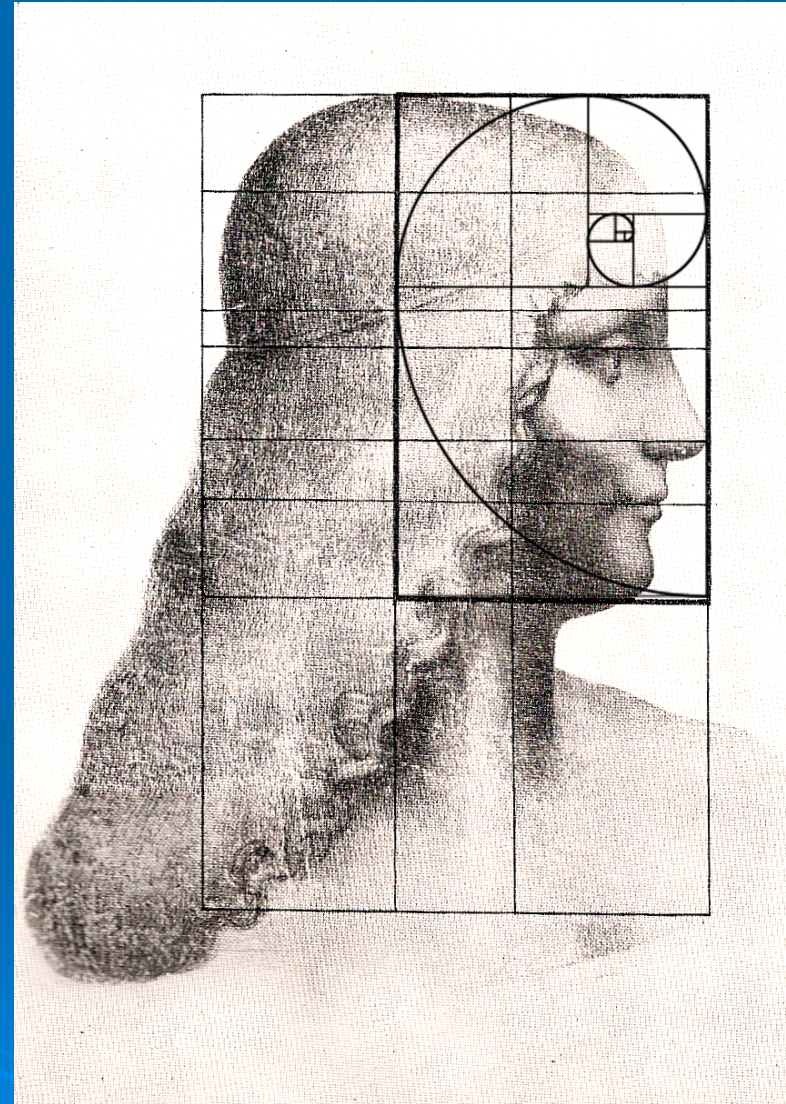
← The British contest in 2012 to find "Britain's Perfect Face" drew over 8,000 entries, and found Florence Colgate as the winner. [www.goldennumber.net](http://www.goldennumber.net)



## SG204.2.6.2 The Human Face (2)



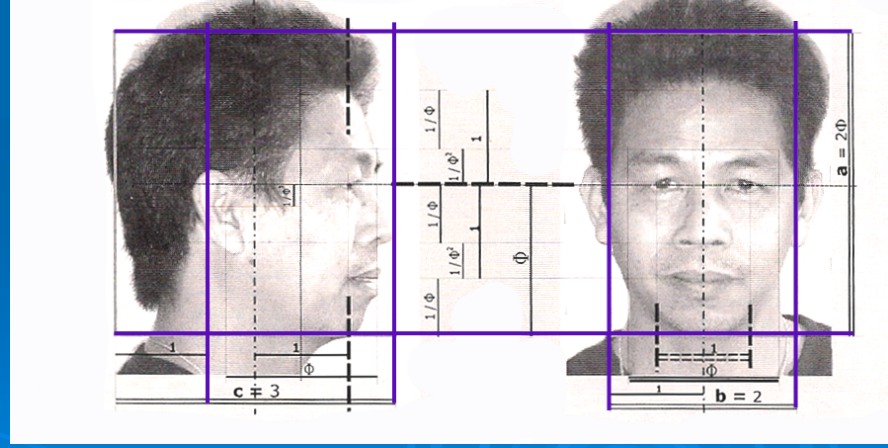
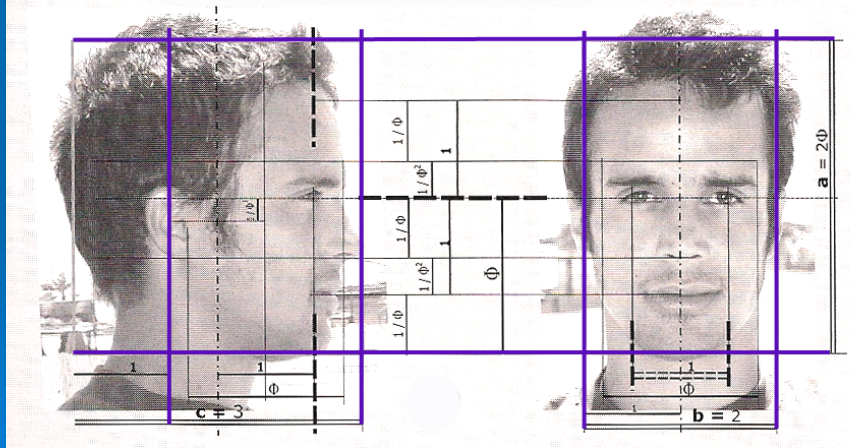
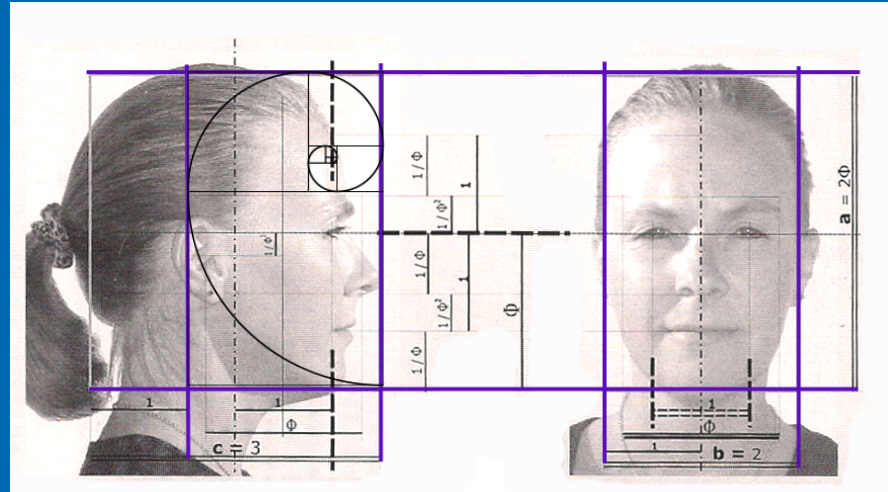
↑ The Golden Spiral fitting into the Golden rectangle of the face.



↑ Golden rectangle analysis of "Isabelle d'Este"  
by Leonardo da Vinci.



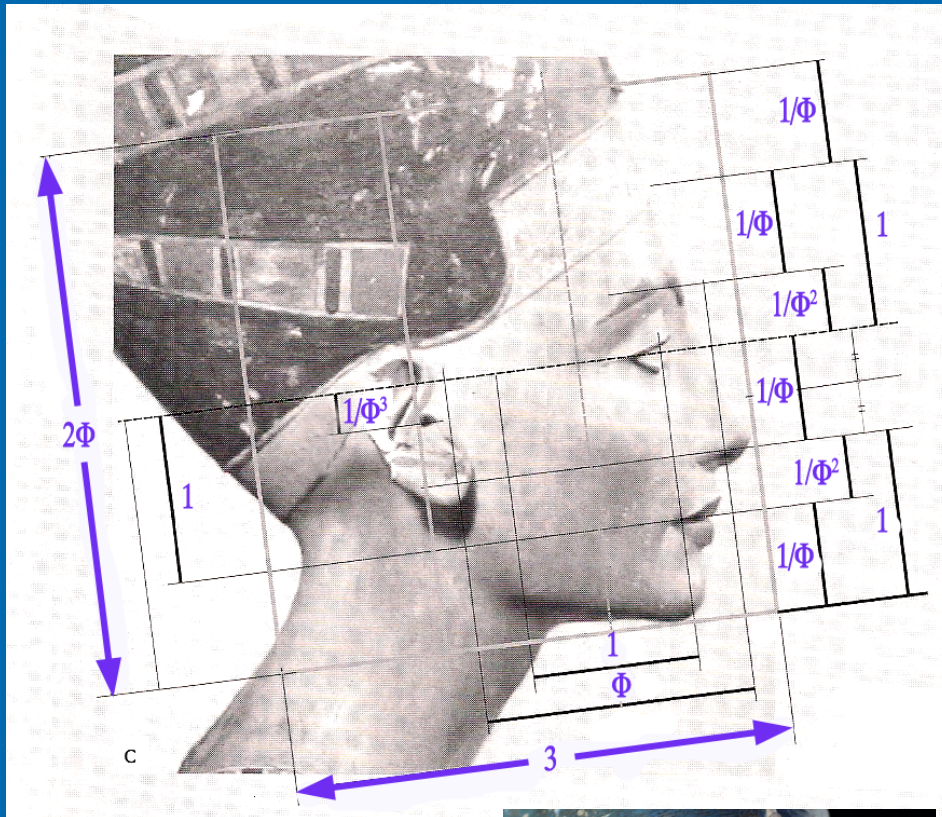
### SG204.2.6.3 The Human Face (3)



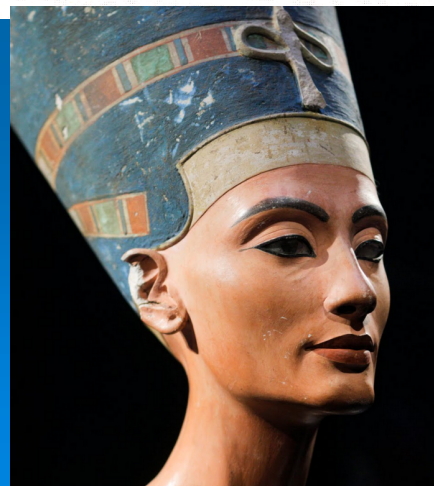
↑ Four faces analyzed by Robert Chalavoux. *Le Nombre d'or*. 2001.  
Beyond variations due to race, age or personality, the relative proportions are identical.



## SG204.2.6.4 The Human Face (4)



↑↔ 34 centuries ago,  
Nefertiti's beauty displayed  
the Golden proportions.

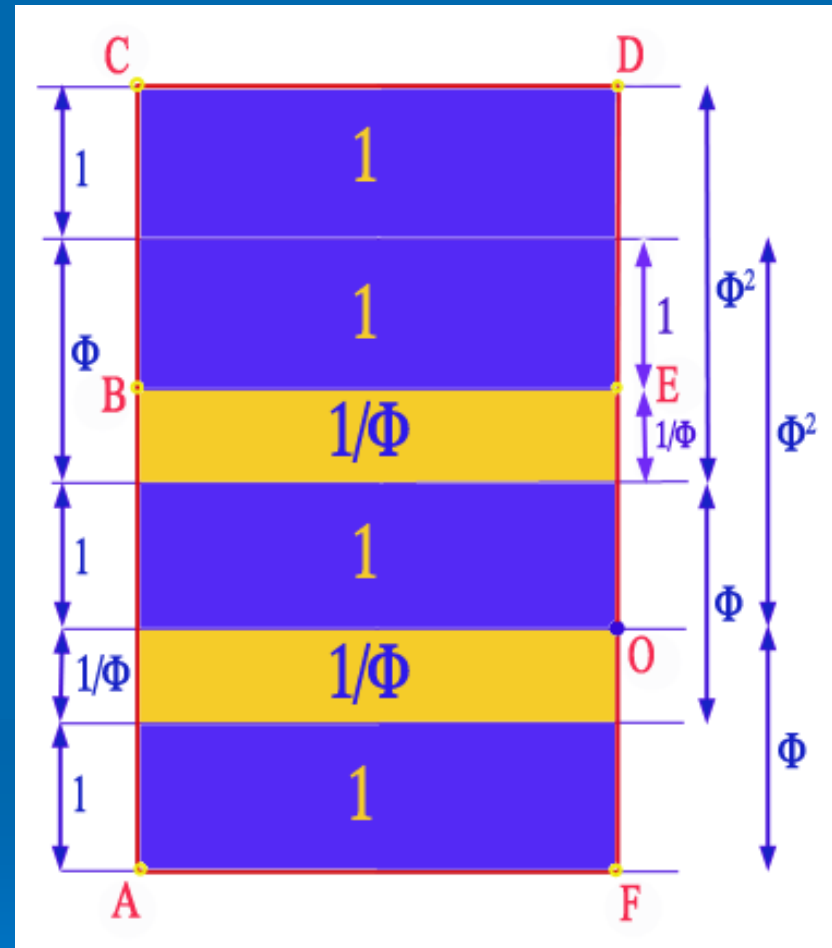
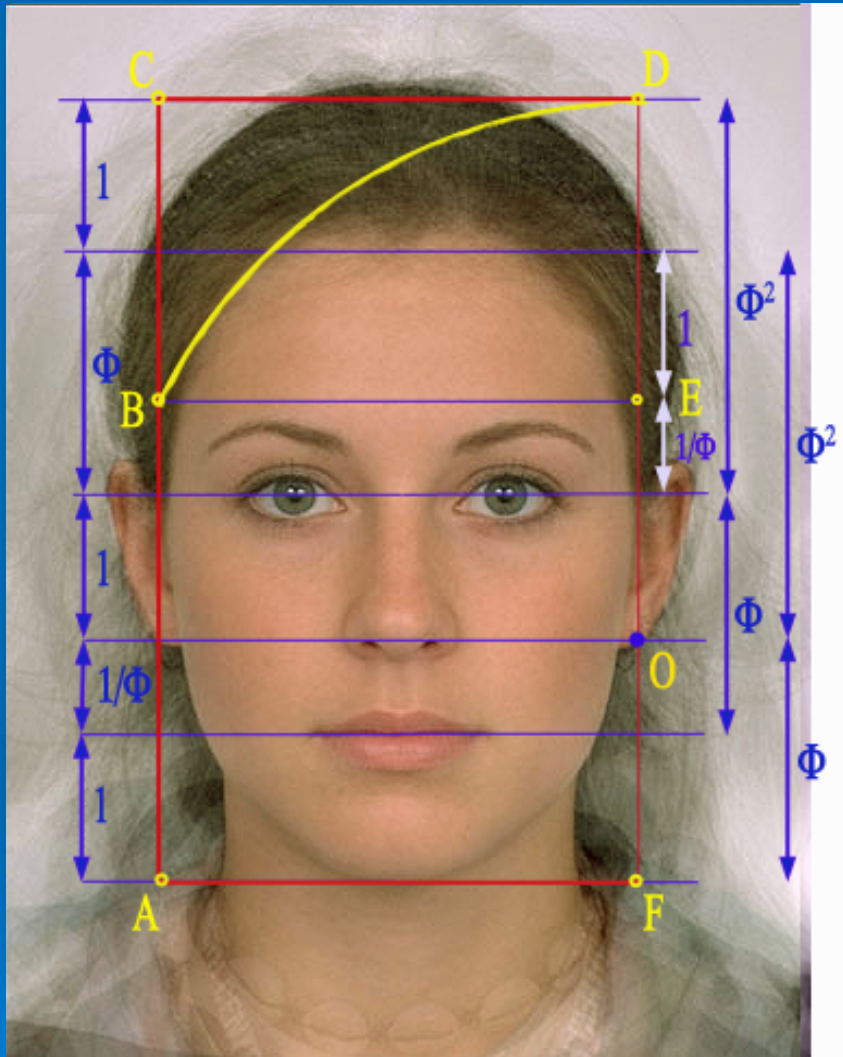


↑ Gaia Goddess with Phi features.  
Unknown web image.



# SG204.2.6.5 The Human Face (5) Summary (1)

Vertical Proportions



↑ This diagram shows the main vertical Phi proportions as color blocks. The eye line divides the face into two halves: the lower half is made of two "1" (chin to mouth line and nose line to eye line) sandwiching "1/Phi" (mouth line to nose line). The upper half is made of "1/Phi" (eye line to temple line) and two "1" (temple line to hairline and hair line to top of head).

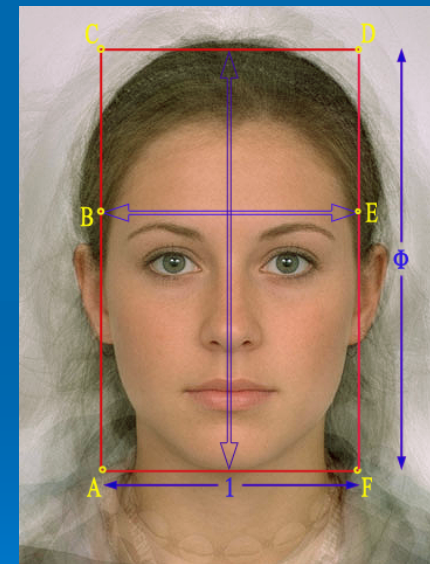
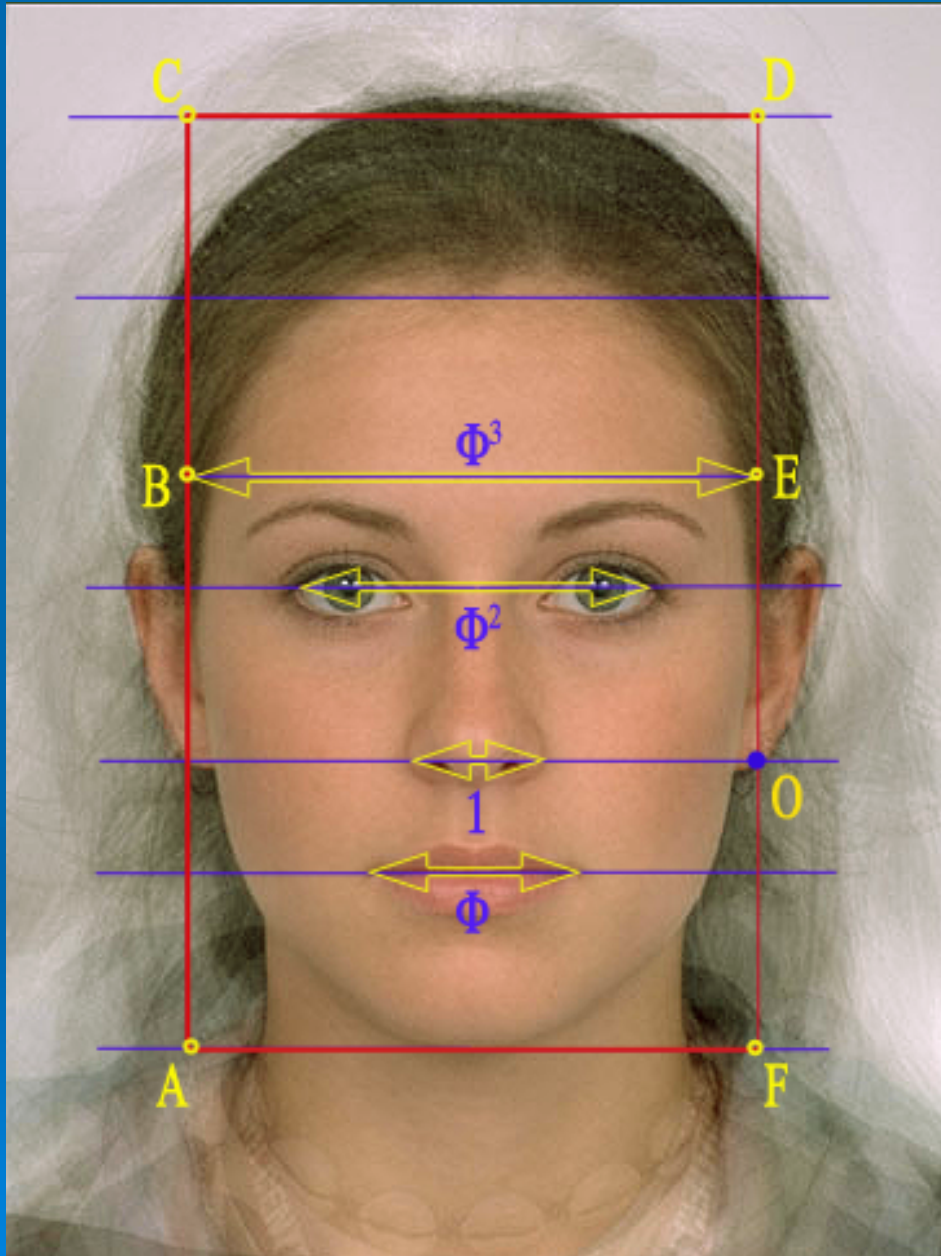
↑ Why is this face displaying such perfect Phi proportions?  
 Because it is a *composite* face (generated by [Face Research Lab](#)).  
 In a group of people, *average measurements* tend to yield ratios closer to the exact Golden Mean. Note the Golden Rectangle ACDF and the arc BD (centered on O) giving the Golden cut D from the square ABEF.

## SG204.2.6.6 The Human Face (6) Summary (2)

### Transverse Proportions

◀ When looking someone in the face, be aware of their crosswise proportions:

1. Taking the width of the nose as unit = 1
2. The width of the mouth will be = Phi
3. The width between the two corners of the eye = Phi<sup>2</sup>
4. The width between the two temples = Phi<sup>3</sup>



↑ If the distance between the two temples = 1, then the ideal height =  $\Phi = 1.618$



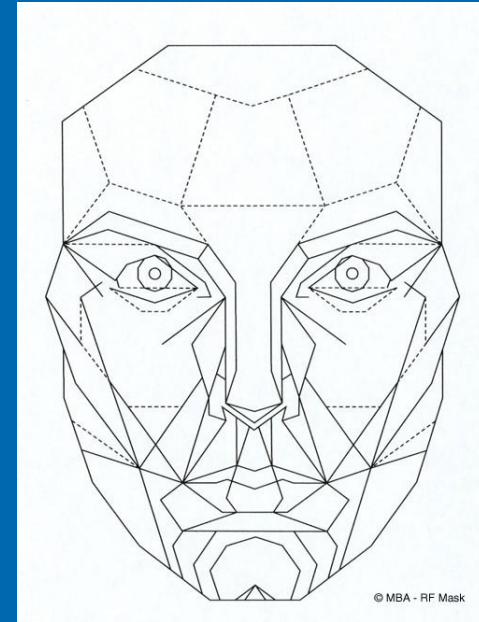
## SG204.2.7.1 Phi & Cosmetic Surgery (1)

The Phi canon of Beauty has been extensively analyzed by face surgeon Dr. Stephen R. Marquardt who gathered data about "beauty" from all over the world, in past and present cultures. His conclusions is unequivocal: the human face has an "ultimate geometric configuration".

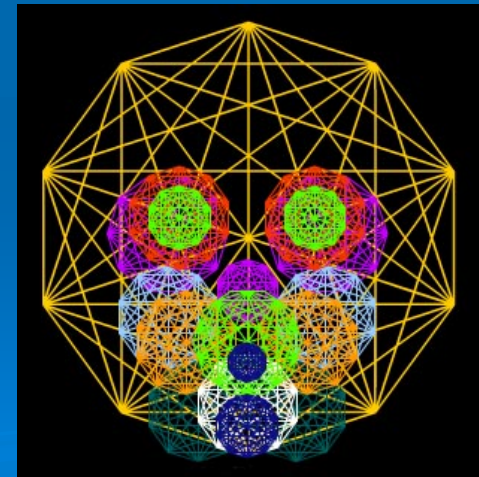
Dr. Marquardt has been using his specially developed "Beauty Mask" as a template for remodeling faces in his medical practice. The "mask" is based on the phi ratios of a double pentagon matrix (decagon) and is therefore called the "Phi Mask" or the "Golden Mask".



↑ Homepage of Marquardt Beauty Analysis.  
[www.beautyanalysis.com](http://www.beautyanalysis.com)

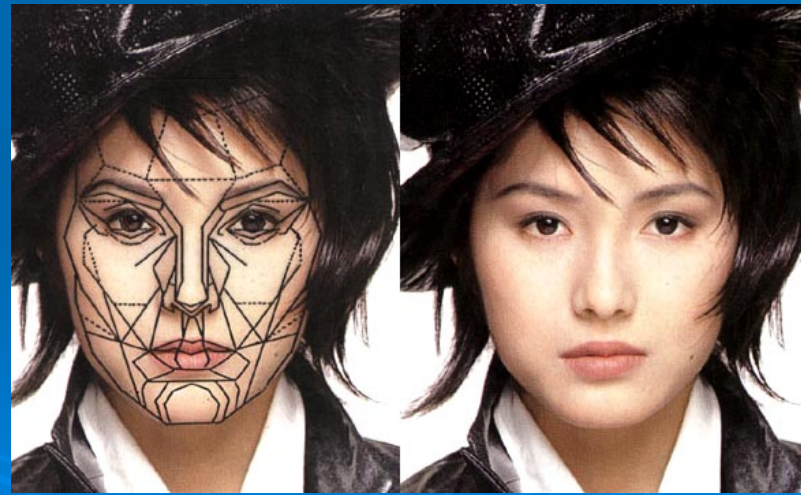
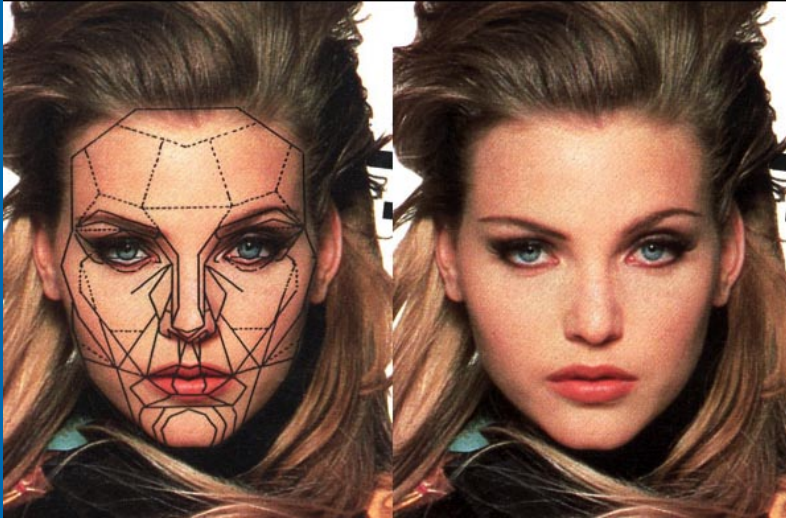


↑ The Marquardt Phi mask



↑ The Marquardt decagon matrix

## SG204.2.7.2 Phi & Cosmetic Surgery (2)



↑ Four different racial expressions sharing the same Phi harmonics. From [www.beautyanalysis.com](http://www.beautyanalysis.com)



## SG204.2.8 Phi: Universal Face Standard

Is there a universal standard of face beauty? The question was answered affirmatively by Dr. Marquardt, based on comparing data from many cultures and many times. His model of "beauty Mask" is a pentagonal, Phi-based geometric matrix.

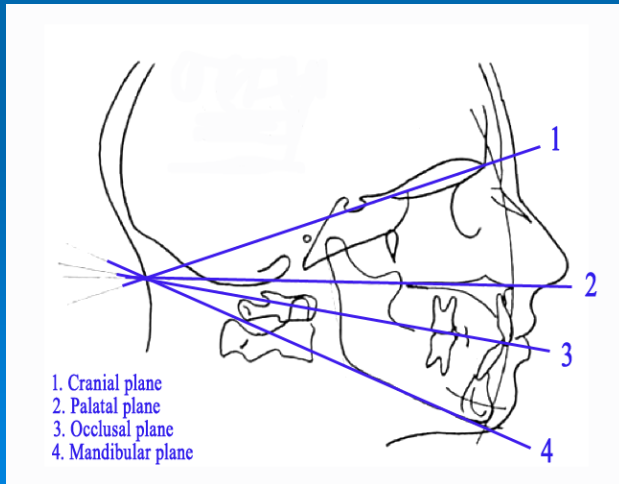
Another doctor, Dr. Yosh Jefferson, a general dentist, has made it his life's study to seek the cause and treatment of facial and dental abnormalities. Today he treats his patients based on the Divine Proportion. Dr. Jefferson's website [www.facialbeauty.org](http://www.facialbeauty.org) is sharing the successful health applications of his discoveries.

Here are some of the explanations by Dr. Jefferson as quoted from his website and the professional articles he published:

*"All beautiful faces regardless of race, age, sex, and other variables conform to the Divine Proportion. Underneath skin color and hair texture, lies facial architecture that must conform to a universal standard for facial beauty based on balance and harmony... The entire human population is genetically encoded to develop toward the Divine Proportion."*

*The concept of the Divine Proportion lends support to my contention that a universal standard for ideal skeleton position is not only possible, but necessary... because all creatures, including humans, are predisposed to develop toward ideal proportions."*

*Development toward ideal proportion maximizes efficiency & health. Faces that do not conform to the Divine proportion not only have esthetic problems, but physiological problems as well. It is becoming clear that the physical, emotional and psychological health of our patients is intimately related to the cranio-mandibular anatomy."*

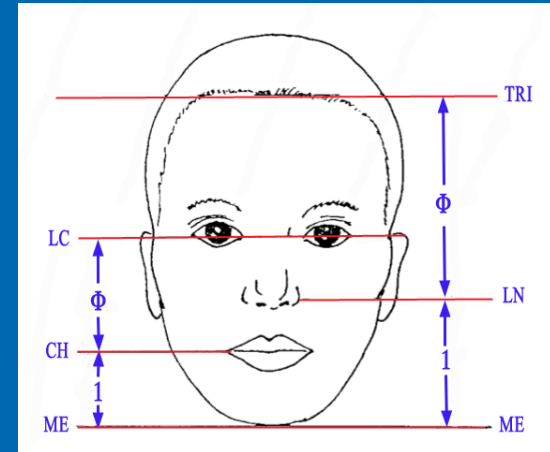


← For assessing facial-skeletal anatomy, Dr. Jefferson applies his Skeletal Archial Analysis.

The diagram on the left shows the ideal skeletal position where all four lines of reference converge to the cranial base.

According to Dr. Jefferson, "the Skeletal Archial Analysis is easy to trace & diagnose, efficient, universal, accurate and based on the Divine Proportion."

(Adapted diagrams from: Journal of Orthodontics. Vol. 7, Nb 2, June 1996.)



↑ Face proportions. (Dr. Y. Jefferson).

*"If the distance from LN (lateral side of the nose) to ME (soft tissue of chin) is 1, then the distance from LN to TRI (trichion-beginning of forehead wrinkling when one lifts the eyebrow) is 1.618."*

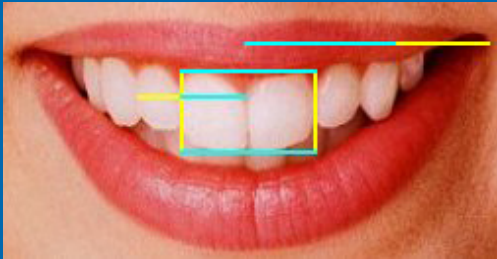
*If the distance from CH (cheilion-corner of the mouth) to ME is 1, then the distance from LC (lateral canthus of the eyes) to CH is 1.618."*

"The following biologic equation holds true for all humans regardless of race, age, sex and other variables:  
Divine Proportion = Facial Beauty = TMJ Health  
= Psychological Health = Physiological Harmony  
= Fertility = Total Health and Wellness  
= Quality of Life".

(Dr. Yosh Jefferson, DDS.)

# SG204.2.9.1 The Human Teeth & Mouth (1)

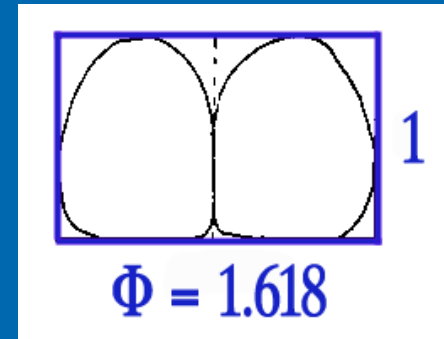
The Phi ratio appears in the proportions of the human mouth, lips, teeth and in the expression of this ubiquitous sign of human-ness: the smile...



↑ The two front incisor teeth form a Golden rectangle. The ratio of the width of the first tooth to the second tooth from the center is also Phi. In a half-smile such as above, the ratio of the width of the smile to the third tooth from the center is phi as well. [www.goldennumber.net](http://www.goldennumber.net)

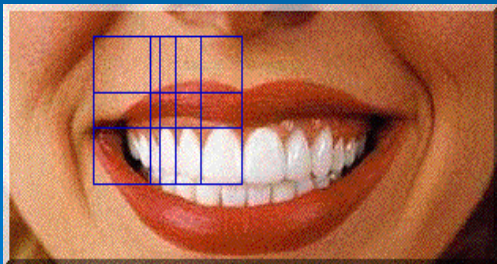


www.yourhandaid.com

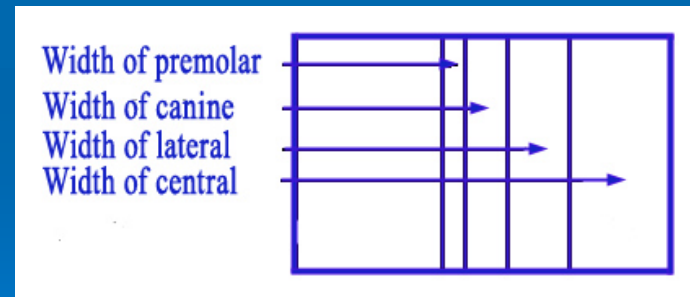


↑ The HEIGHT of the central incisor is in Golden Proportion to the WIDTH of the TWO central incisors.

The main Golden Proportion relationship in the human teeth is a simple tooth to tooth Golden relationship. The four front teeth, from central incisor to premolar are the most significant parts of the smile and they are in the Golden Proportion to each other. The width of the central incisor is in Golden Proportion to the width of the lateral incisor. Similarly, the lateral incisor is in the same Golden proportion to the canine and the canine is in the Golden Proportion to the first premolar.



↑ In a full smile, the white of the 8 front teeth is in the Golden Proportion to the width of the smile.



↑ Perspective diagram showing the Phi ratio between the four front teeth (left side of the mouth).

← Two images from Dr. Levin's website: [www.goldenmeangauge.co.uk](http://www.goldenmeangauge.co.uk)



## SG204.2.9.2 The Teeth (2) Golden Dentistry

Since the late 1970's, Dr. Eddy Levin of the U.K. has used the concept of Phi to design aesthetically pleasing cosmetic and orthodontic solutions in the field of dentistry. Dr. Levin's principles are now compulsory study in many American Dental Schools. Here is how Dr. Levin presents his story:

*"Many years ago, when I was a young dentist, starting out in my own practice, I became intrigued with finding out why, after all my hard work to make teeth look natural, the teeth still looked false. What was the secret of nature, the secret of beauty, that kept eluding me?"*

*By coincidence, I was studying the Golden Proportion at the same time as I was trying to find out what made teeth look beautiful. It was at a moment, like when Archimedes got into his bath, that I suddenly realized that the two were connected - the Golden Proportion and the beauty of teeth. I began to put this into practice and started testing my ideas on my patients. My first case was a young girl in a hospital, where I was teaching, whose front teeth were in a terrible state and needed crowning. Despite the skepticism of the other members of staff and the unenthusiastic technicians with whom I had to work and whose co-operation I depended upon, I crowned all her front teeth, using the principles of the Golden Proportion. Everybody, including the young lady herself, agreed that her teeth now looked magnificent. The technician involved went on himself to give lectures on the application of the Golden Proportion to dentistry.*

*For the past twenty-two years I have been putting this application into practice in my surgery in Harley Street where I have been gratified by my many patients' delight with my work on their mouths. During that time I have been writing, giving lectures and courses on the Golden Proportion, to dentists and lay people all over the world.*

[Note: Since the application of the Golden Proportion to dental aesthetics (first written about by Dr. Levin in 1978), there has been a proliferation of Golden Proportion medical studies undertaken in three main directions: prosthodontic, surgical and orthodontic.]

*Since my discovery of the application of the Golden Proportion to teeth, I have expanded my interest in this concept beyond teeth and out into the Universe, where every day I find new breathtaking revelations that I am eager to share, just as I shared my original discovery. There is a universal recognition of good proportion running throughout the beauty of nature, and art. We recognize good proportion in the same way as we know how to divide a line in half or erect a perpendicular. We easily agree that an object of art has good or bad proportion, or that this face looks too long, or too short and out of proportion. This magical connecting takes us on a journey of discovery into an unexpected dimension of beauty which affects our lives at every turn."*  
(From Dr. Levin's website: [www.goldenmeangauge.co.uk](http://www.goldenmeangauge.co.uk))

Dr. Levin has developed the software program [PhiDental](#) to apply the beauty, harmony and balance of nature's proportions in dental aesthetics and orthodontics. It is used to design aesthetically pleasing cosmetic and orthodontic corrections and to clearly present the issues and results to patients.

In order to test the validity of the Golden Proportion quickly and easily, Dr. Levin makes available a measuring instrument, the Golden Mean gauge →



## SG204.2.9.3 The Teeth (3) The Mandible Phi Spiral

Dr. R. M. Ricketts, another "unorthodox" dentist who believes in "harmonic beauty", has been relentlessly applying the Golden Ratio to his trade of functional orthodontics, starting with the publication in 1972 of his seminal paper "*The biologic significance of the divine proportion and Fibonacci series*" (American Journal of Orthodontics) - see abstract below. We show here a couple diagrams illustrating Dr. Ricketts' pioneering research about the Phi spiral growth of the human mandible, scientifically termed the "archial growth" or the "logarithmic / gnomonic properties" of the human mandible. Dr. Ricketts research - which he neutrally calls the "bio-progressive philosophy of orthodontic treatment" - has been validated and has changed the thinking and practice of new generations of orthodontic doctors.

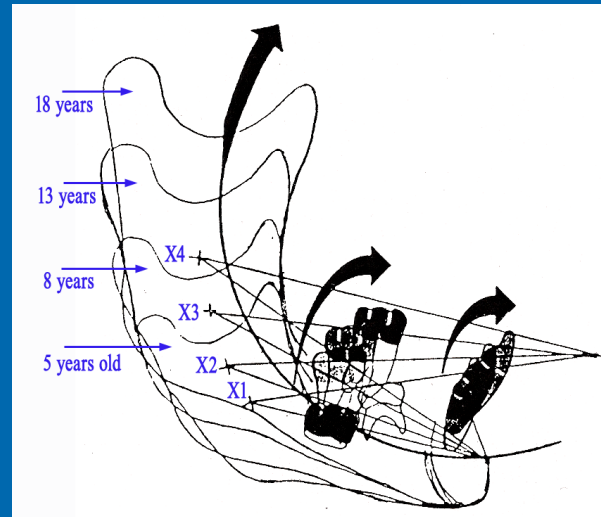
### The biologic significance of the divine proportion and Fibonacci series. Robert M. Ricketts. D.D.S.

**Abstract.** This article shows the application of basic mathematical and geometric principles to the normal morphology of structures regularly involved in orthodontics and dentistry. For appreciation of beauty, it has been suggested that the human mind functions at the limbic level in attraction to proportions in harmony with the Golden Section. This is a proportion of 1.618 and its reciprocal 0.618 in geometry. Fibonacci numbers express precisely the same ratio and are mathematically unique and mysterious.

Questions arose regarding these geometric and mathematical relationships in our living patients. Studies were conducted from measurements of models of the teeth of normal-occlusion subjects, the photographs of the faces of commercial models, and conditions found in lateral and frontal cephalometric head films. Variations of the beautiful photographic models were analyzed together with computerized composites of patients with ideal occlusions.

Several key relationships were found. The investigation yielded useful relationships for all aspects of dentistry and particularly for orthodontics and orthognathic surgery. The normal face and the occlusion of the teeth have a majestic beauty. The study strongly suggests that esthetics can indeed be made scientific rather than the need to resort to subjective perceptions as in the past.

(American Journal of Orthodontics, Volume 81, Issue 5, May 1982, 351-370)

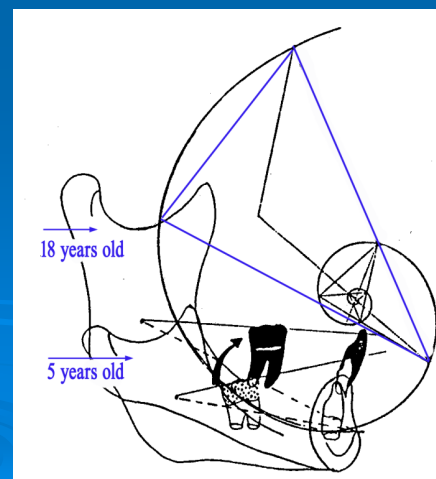


← Gnomonic growth of the human mandible as a composite in samples of patients aged 5, 8, 13, and 18.

- The occlusal plane is moving progressively upward with the X point.

- The lower incisor moves upward & forward as the alveolar remodeling proceeds.

- The lower molar moves upward and forward, making space for the 2nd and 3rd molars.



← The arc of growth fits the curve of the Phi logarithmic spiral.

(Original drawings: Dr. R. M. Ricketts.)

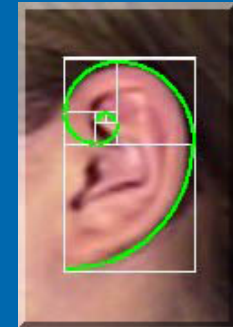


## SG204.2.10.1 The Human Ear (1)

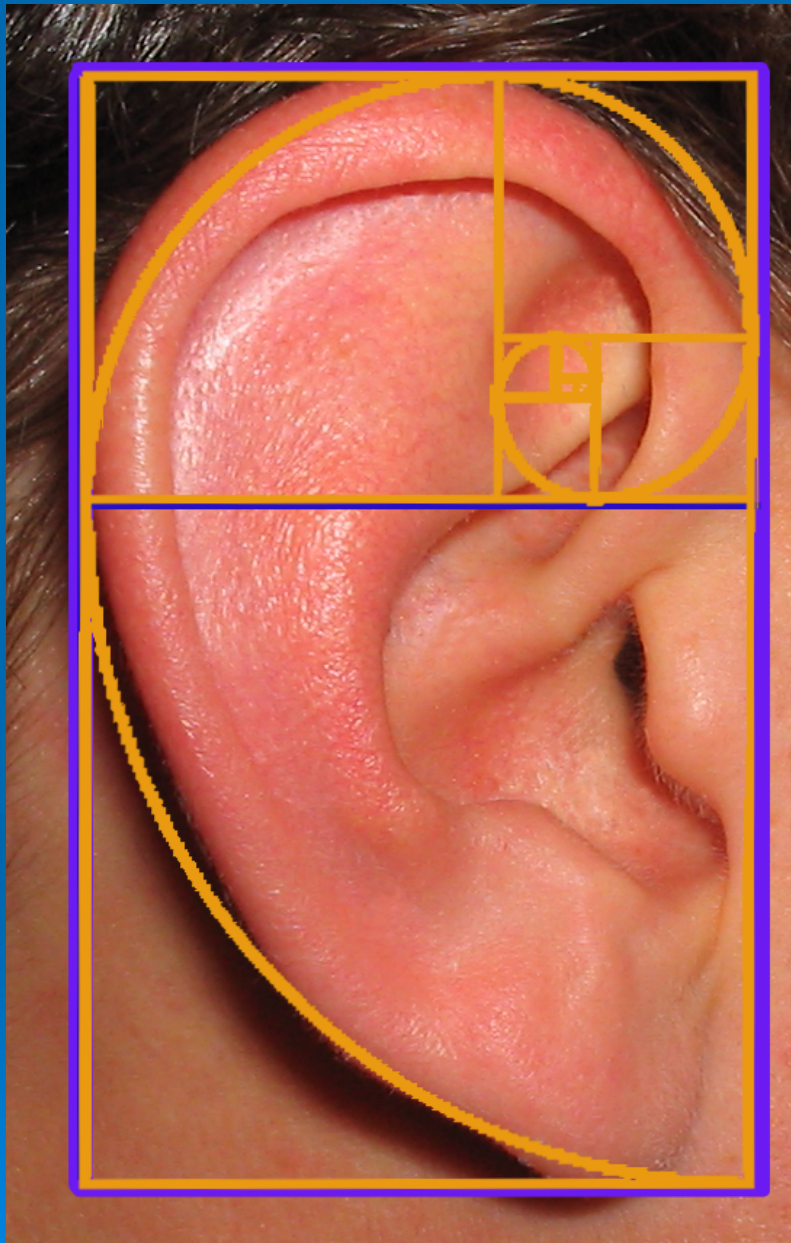
The outer ear consists of an antenna collecting the sound vibrations (*pinna* or *auricle*) and the auditory canal conducting the vibrations to the tympanum. The pinna has an ovoid form, with its larger end directed upwards.

More precisely, the shape of the average human ear fits a Golden Rectangle and espouses the logarithmic curve of the Golden Spiral inscribed in the Golden Rectangle. In fact, in anatomy, the folded rim of cartilage around the outer ear is called the "*helix*".

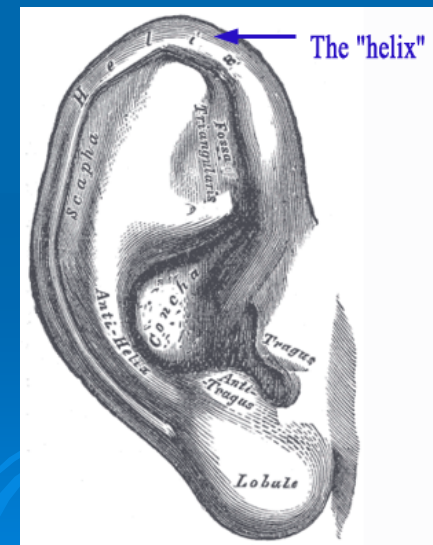
And the inner ear relies on a 3D spiral, the *cochlea*. [SG201.4]



↑ The Golden Spiral & Golden Rectangle in the human ear.  
([www.goldennumber.net](http://www.goldennumber.net))



↑ The spiral in the inner ear



(From: Gray's Anatomy)

## SG204.2.10.2 The Human Ear (2) Auriculo-therapy

As a holographic fractal of the body, the ear (just like the foot, the eye or the tongue) maps out a direct resonance with the entire body. This is called ear reflexology or *auriculotherapy*.

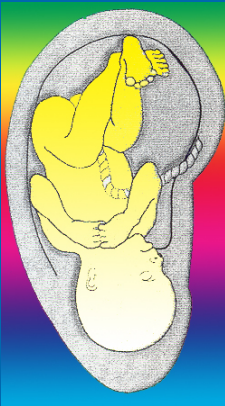
*"All the vessels congregate in the ear."*  
(Yellow Emperor's Classic of Internal Medicine - 100 BCE)

### A little history of Auriculo-medicine

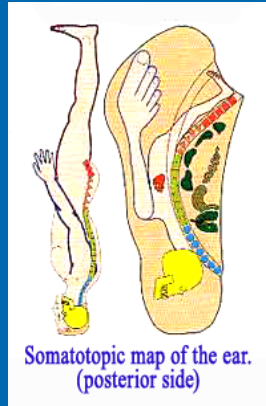
In the early 1950, Paul Nogier, a French physician noted that some patients attending his clinic had a small scar from a burn on part of their ear. On enquiring into this, he was told that a very small area of their ear had been cauterized by a folk healer for the treatment of sciatic pain - a treatment that proved very rapid and effective. This first observation put Dr Paul Nogier on the search for an explanation, a quest that led to the discovery and development of Auriculotherapy and Auriculomedicine. His first great insight was the recognition of the homunculus, the "man in the ear" - the representation and anatomical correlation of the inverted fetus in the ear. Points on the body, for example the knee, corresponded precisely with the fetal representation of the knee in the auricle. For long, the Chinese had been using ear points for acupuncture, but these had been considered empirical points for particular treatments and were not associated with a somatotopic representation of the homunculus in the ear. Dr Paul Nogier tells the story of this discovery in his book "The Man in the Ear".

In recognition of Nogier's discoveries and research on the auricle, the Chinese Government honored him by awarding him the formal title of "Father of Modern Auricular Therapy". The Chinese charts of the auricular points were published in 1958 based on Nogier's research. The first to apply this form of auricular therapy were the Barefoot Doctors, young medical trainees who, during the Cultural Revolution, were sent out to provide basic traditional medical care for the masses.

www.jaredhanson.com



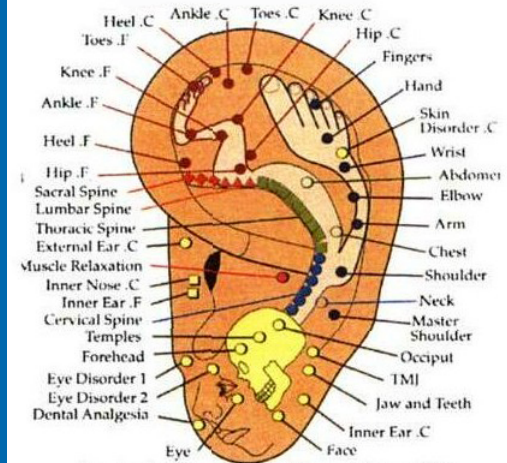
↑ The fetus in the ear



Somatopic map of the ear.  
(posterior side)

↑ Somatotopic map

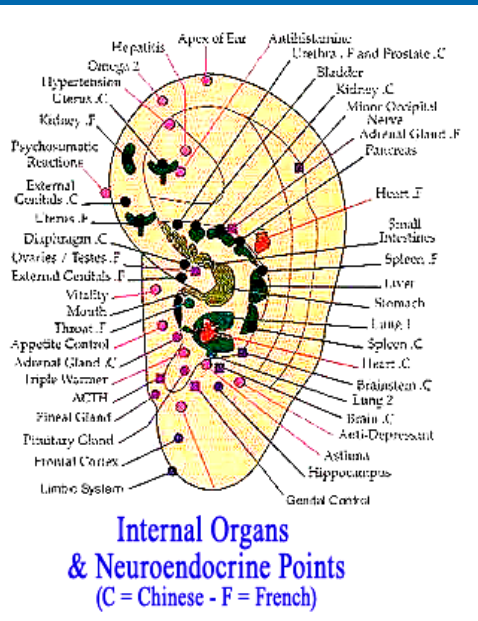
### Musculo-skeletal Points



Re-printed with permission of Terrence Oleson PhD  
Researched at UCLA School of Medicine

Using a hand-held micro-current device to gently stimulate points on the ear, Auriculotherapy stimulates reflex points that signal the brain, which, in turn, signals specific parts of the body. With ancient roots in Chinese acupuncture, the modern form of auriculotherapy was developed in the 1950s by Dr. Paul Nogier, based on his re-discovery that nerves supplying the ear have reflex actions on the rest of the body.

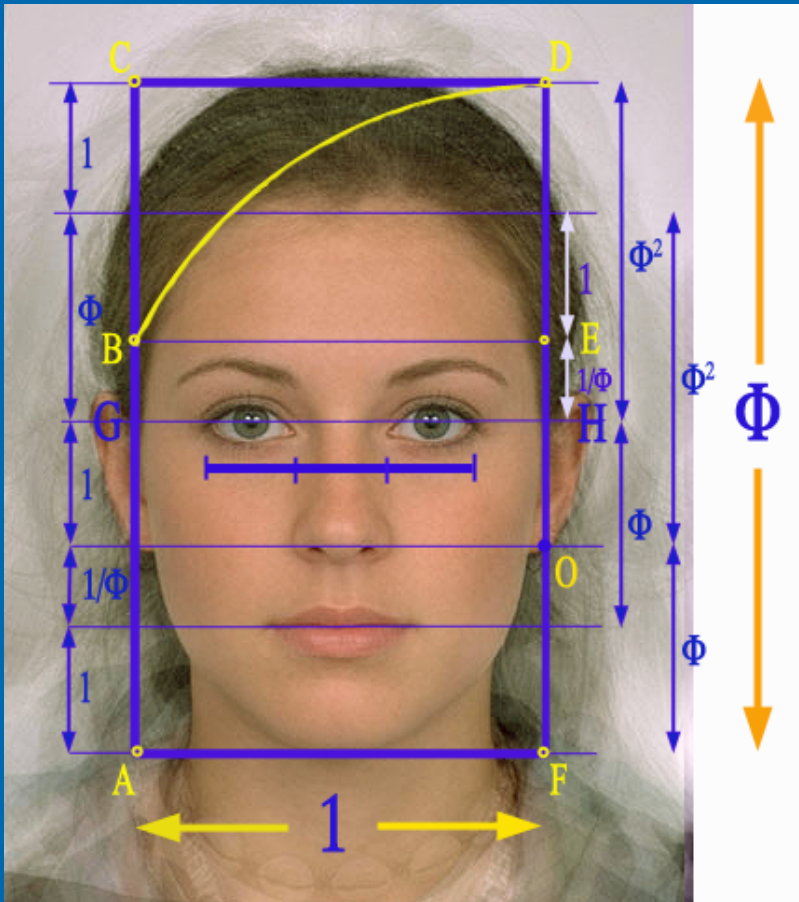
The World Health Organization lists 150 diseases that auriculotherapy cures. The Director General of the WHO stated: *"Auriculo-acupuncture is probably the most developed and best documented, scientifically, of all the micro-systems of acupuncture, and is the most practical and widely used"*.



Internal Organs  
& Neuroendocrine Points  
(C = Chinese - F = French)



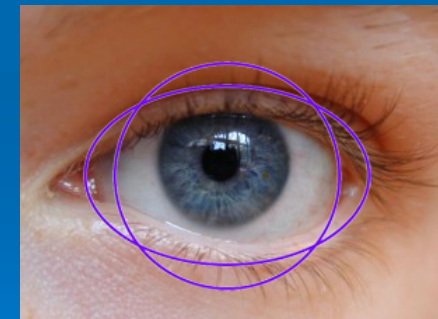
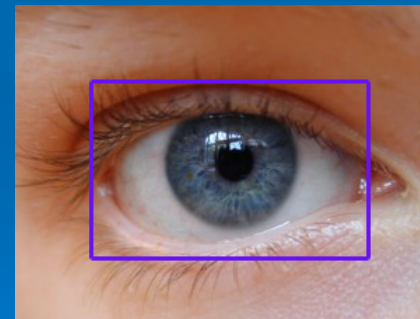
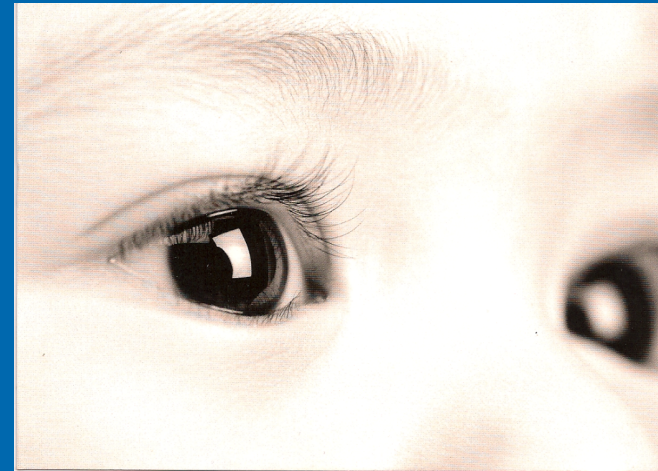
## SG204.2.11 The Human Eye



↑ The eyes are exactly at the center of the human head: the line crossing the center of the eyes divides the head in two halves. The Golden Rectangle  $ACDF$  is divided in two by the eye line  $GH$ .

In this diagram, the eye line is at  $2.618 (1 + 1 + 1/\Phi)$ .  
 The overall height of the head ( $AC$  or  $CD$ ) is twice the distance:  
 $2.618 \times 2 = 5.236$  (long side of the Golden Rectangle).  
 If the long side of the Golden Rectangle framing the head is  $\Phi$ ,  
 the base or short side of the Golden rectangle is 1.

**Note that the width of the eye  
 = the width between the eyes.**



↑ The average human eye fits the geometry of the golden rectangle and the golden ellipse.

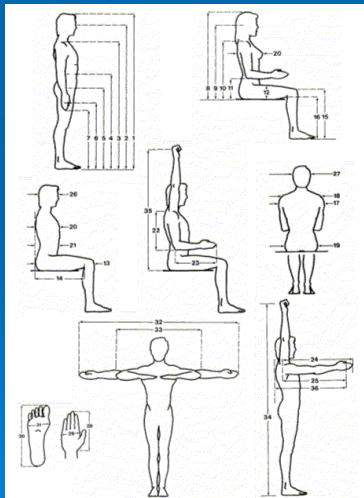
## SG204.2.12.1 Anthropometry Data (1) Introduction

In the modern age (19th & 20th centuries), the progressive disconnection from a universal understanding of the cosmos in terms of harmonic oneness led to the multiple viewpoint that settled in with Romanticism and attempted to convince us that there is no such thing as a universal set of proportions for the human body. The field of anthropometry was created in order to prove that point and describe the *multiple* individual variations.

Anthropometry (Greek "*anthropos*" = man, and "*metros*" = measure) refers to the measurement of the human individual for the purposes of understanding human physical variation. Gathering data from set points of the human skeleton, anthropometry was originally based on dubious conceptions about criminology and race anthropology. Nowadays, it is used in ergonomics, the study of the relationship between worker and environment with the goal to optimize the efficiency of a job or a product. It is a derivative of Newtonian physics seeing the universe and the human body as mechanical constructs made of specific fixed parts and has no interest about nor understanding of the whole human as an energy system and its LIVE harmonic proportional dynamics of coherence and inter-connectedness.

Critics of the concept of a "universal canon of harmonic proportions" point to the variations & differences of measurements in human beings and they like to accumulate massive amounts of data proving their point. For example, the center of mass of the human body depends on the position of the limbs, and in a standing posture is typically about 10 cm lower than the navel, near the top of the hip bones; therefore, the traditional viewpoint of classical writers (like Vitruvius) stating that the navel is the center of the body, has to be obsolete along with all the "phi ratio mysticism".

What these critics generally fail to do is take the next step: analyze & chart their data in terms of statistical *proportional averages* in order to discover the hidden symmetries, the relationships with larger *wholes*, the inner coherence series and the main harmonic fractality which Sacred Geometry focuses upon. Vitruvius was reporting about classical *average proportions* and took pains to give a precise mathematical definition of what he meant by saying that the navel is the center of the body as a *harmonic system*. Bio-harmonics is what the new scientific paradigm is now starting to look into.



↑ Chart used in current ergonomics.

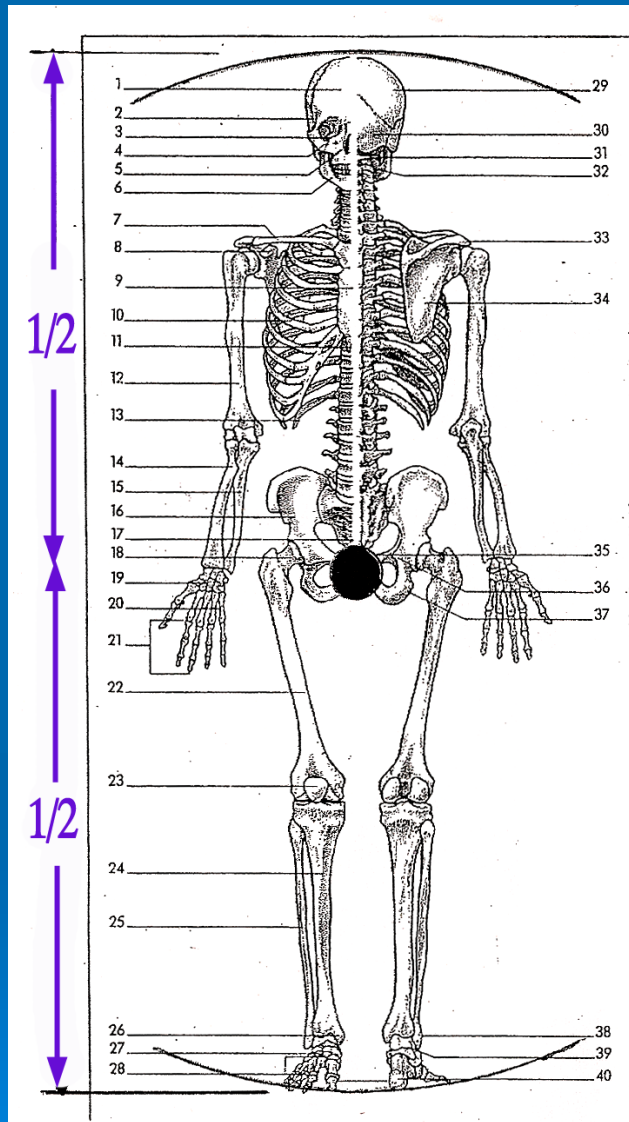
Older (left) and current (right) systems of anthropometry are seeing the human body as a sum of mechanical parts that can be charted for external identification or better efficiency.



← Late 19th century system of body identification introduced in France by Alphonse Bertillon and based on physical features and certain skeleton points.



## SG204.2.12.2 Anthropometry (2) Anatomy Larousse



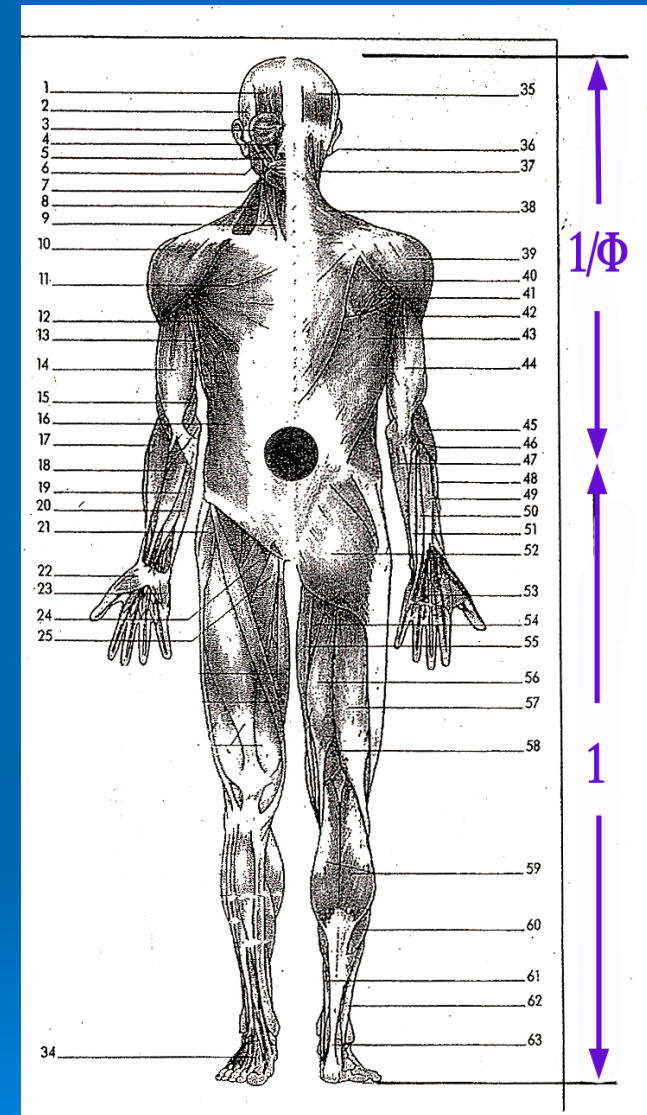
Contemporary standard reference books (dictionaries, classbooks etc...) tend to illustrate the classical proportions of the sacrum as half-body size and the navel as Phi ratio.

The two illustrations here are from the French dictionary Larousse.

→ In the adult human, the navel is located at the PHI ratio point, but at birth the navel is located at the midpoint of the body.

← The *sacrum* (Latin "*os sacer*" = sacred bone) is located at the geometrical point of balance of the body, midway between the top of the head and the sole of the feet.

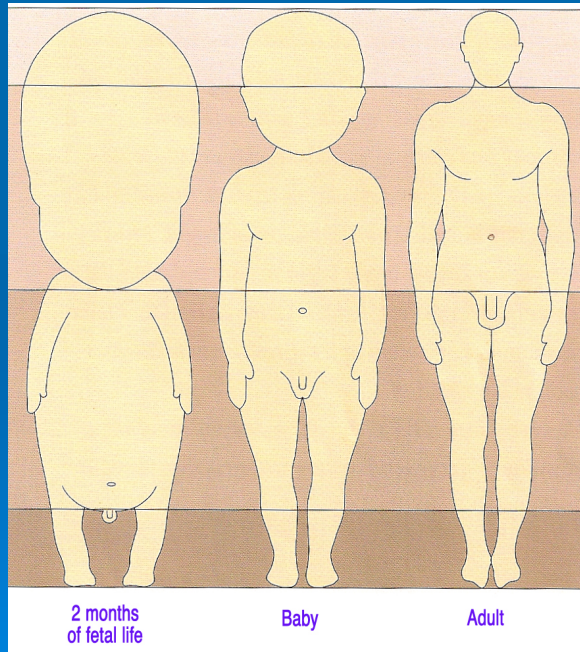
The sacrum is the center of the circle round the head and the feet.



## SG204.2.13 Proportions & Ages of Life



↑ A baby's navel is located lower in the body.



↑ Average variation of navel location

During childhood and teenage, different parts of the body grow at different rates. Interestingly, the navel goes on a wild journey before it stabilizes at the PHI point in adulthood. The rhythms followed by the navel as a marker have been called the "dance of the navel".

The first extensive studies were done by the German researcher Adolf Zeising (1810 - 1876) who measured thousands of human bodies and published his findings in 3 massive books (1854, 1855 and 1884). Credited with introducing the expression the "Golden Section" (*der Goldene Schnitt*) and enthusiastically rediscovering the Phi proportion in various domains (Greek temples, plants, music and the human body), Zeising was a meticulous researcher who measured thousands of human bodies and found the following:

- The statistical average for healthy adult bodies is PHI.
- The proportions of the male body tend to oscillate around the average ratio of  $13 / 8 = 1.625$  (height to distance from feet to navel) whereas the proportions of the female body oscillate around  $8 / 5 = 1.60$ . Thus the male body tends to be slightly above PHI and the female body slightly below PHI: when averaged, one obtains exactly PHI ( $1.625 + 1.60 = 3.225$  or twice 1.61).
- The location of the navel follow an gradual oscillating approach to the final adult position (averaged by PHI). At birth, the navel divides the body in two equal parts, i.e. is at the geometrical center of the body. Gradually the navel moves upwards, going even past PHI to finally come back down and settle at the PHI point. In a typical case (left), the PHI point is reached at age 13, then the ratio (above/below navel) goes higher on an upward oscillation that gives to the 17 years old male teenager more of a feminine figure; finally, at age 21, the navel stabilizes at the PHI point that was reached at age 13.

*Note: this oscillation follows the same pattern that was observed when we studied the Fibonacci series [◆SG104] and saw how the ratios of the first Fibonacci numbers oscillate around the PHI line. (Apparent) chaos is attracted to the harmonic order of PHI.*

Height (h) in meters	Age in years	$\frac{h}{n}$	$\frac{n}{m}$
0,485	0	2	1
	1	1,90	1,11
0,863	2 (1)	1,84	1,17
	3	1,79	1,26
	4	1,75	1,34
	5	1,70	1,42
	6	1,68	1,46
	7	1,67	1,50
	8	1,65	1,54
	9	1,64	1,56
	10	1,64	1,57
	11	1,63	1,58
	12	1,63	1,59
	13	1,625	1,60
	17	1,59	1,70
	21	1,625	1,60
1,731			

← Variation of navel location in a male child from birth to age 21. (Zeising)

h = total height  
n = distance feet to navel  
m = distance navel to top head

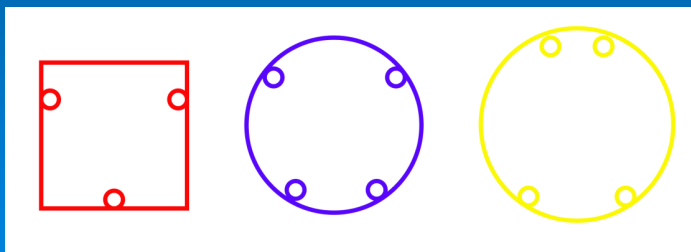
At birth, the navel's location is half way. At 13, it is at about PHI. At 17, it is higher and at 21, it is back to PHI.



## SG204.2.14 Full Body Extension

The human standing body has 3 geometric extensions:

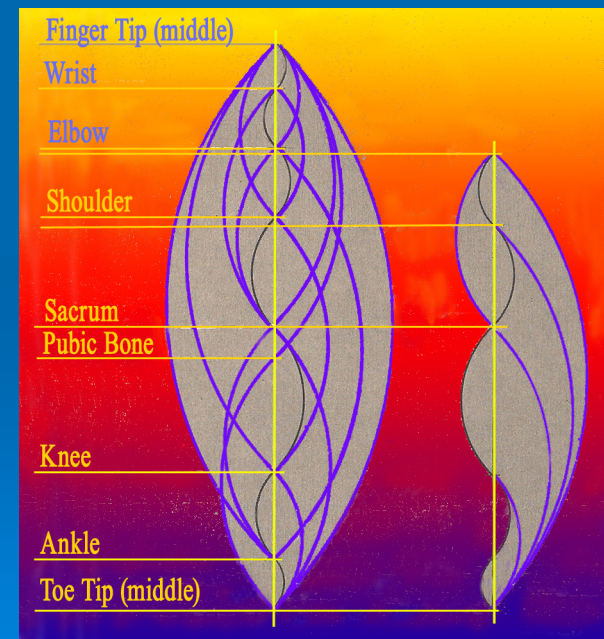
1. A square - when standing up in a "T" shape. This is the regular human position: being and moving within a square/cube.
2. A first circle - when spreading the legs and raising the arms. This is the "Da Vinci Human" position.
3. A second (extended) circle - when standing on the tip toes and moving the arms in a "V" shape above the head. This is the ballerina position or the position of extreme opening to the universe in Anjali Yoga.



Square

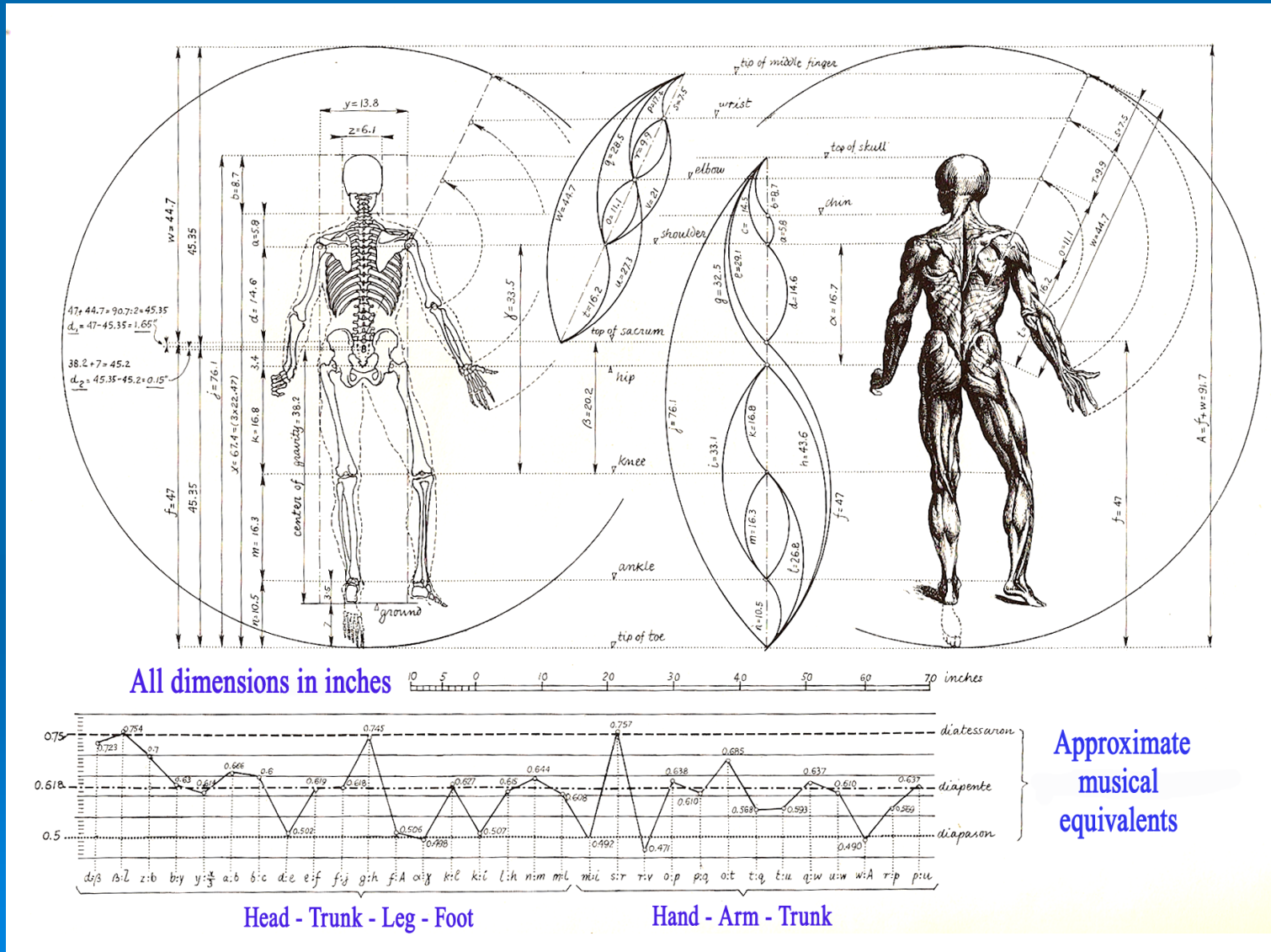
Circle

Extended Circle



# SG204.2.15.1 Harmony in Diversity (1)

The traditional concept that the root harmonies of music correspond to the canonic proportions of the human body has been illustrated by sacred geometer and architect Gyorgy Doczi, as we have already seen earlier. Here Doczi, after collecting measurements of human skeletons from various anthropometric sources, set out to integrate them in terms of musical proportions., in order to show "Harmony in Diversity". All dimensions are those of average-sized adults as reported by U.S. government sources.



(Doczi -  
The Power  
of Limits.  
p. 97)

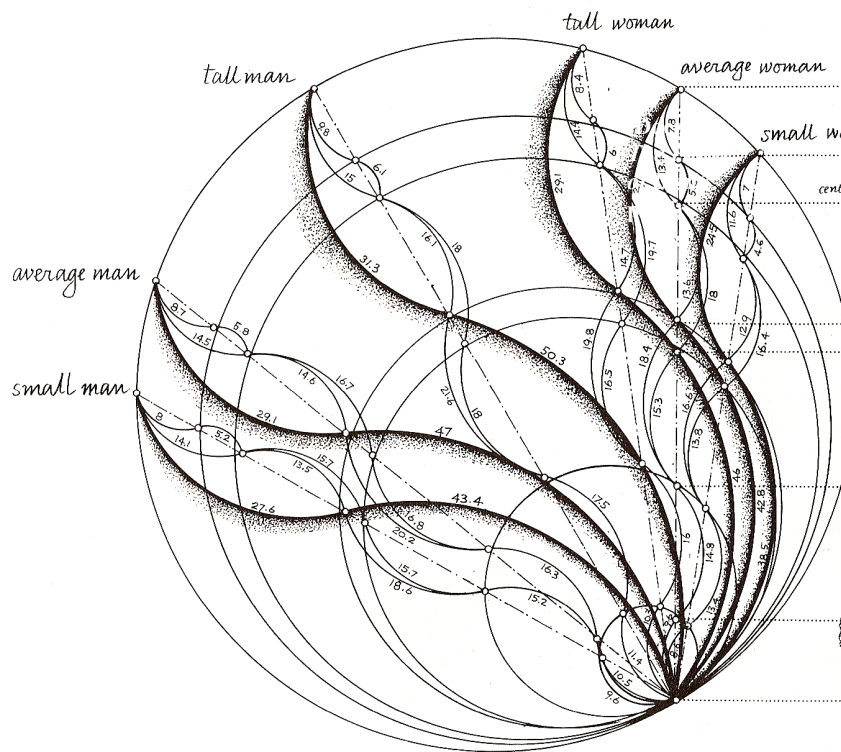


## SG204.2.15.2 Harmony in Diversity (2)

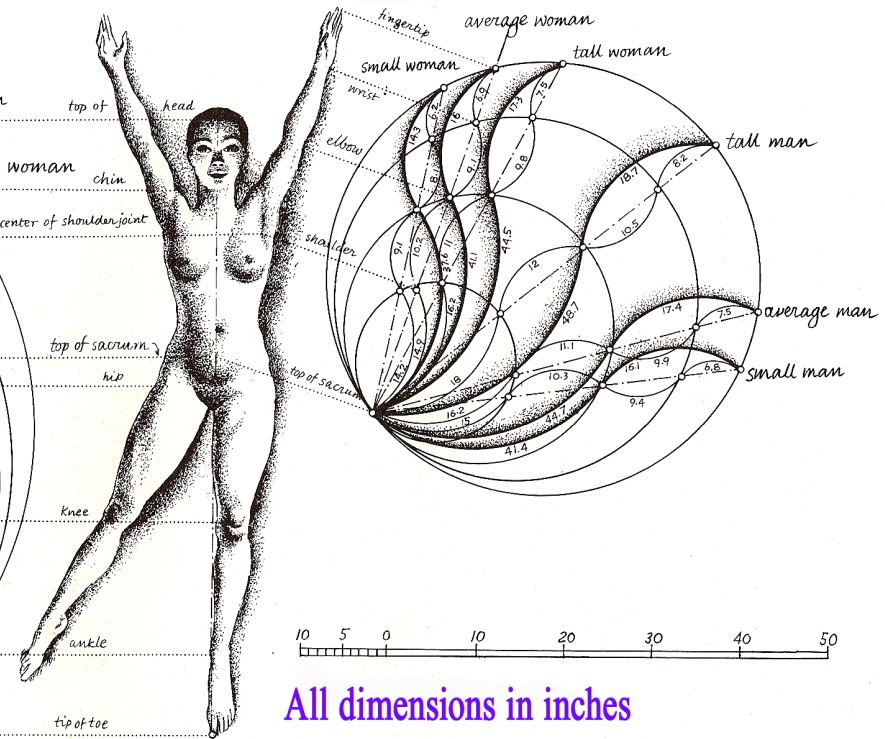
In this diagram, Doczi shows the "surprising correspondences between proportions of diversely sized bone structures of both sexes." All corresponding longitudinal dimensions of tall, average and small women and men tend to fall upon coaxial circles.

"The trend towards unity of these wave patterns is so marked that they are almost identical, appearing to be stroboscopic images of one and the same moving pattern. These rhythmic waves are reminiscent of the gracefully swinging loops of pendulum patterns or the fanlike overlapping stages of growth in the daisy's central pattern."

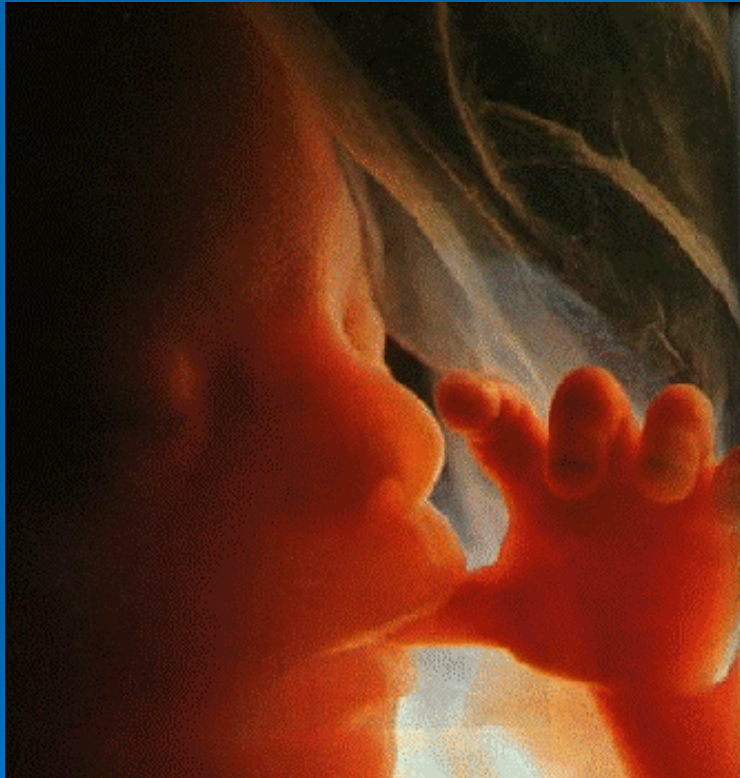
### Diagram of Full Figures



### Diagram of Arm & Hand Relationships to Trunk



## SG204. Chapter 3. The New Biology



Throughout the SG modules, we are introducing pioneers of human evolution, oftentimes ahead of their times: thinkers, philosophers, mystics, artists & architects, scientists, poets, researchers... who had insights about the Universal Harmony and set out to rediscover the principles of this wisdom and the keys to its mathematics and science.

In the next chapters, now focusing on the domain of biology, we will introduce more of these pioneers as they investigate: DNA Fibonacci resonance, epigenetics, the biology of vacuum field communication, Golden-based wave functions in the heart & brain, super-coherence, systems harmonics, Golden fractality...

Biology is in effervescence as it finally moves past the fixed electro-chemical interaction model into a wave function model of interconnectivity and in-formation between the living systems and the vacuum/ZPE super-fluid primary field.

Chapter 3 will discuss the new paradigm in biology, current R & D in bio-photons, the new biology of the cell and a variety of coherence & resonance effects pointing to the presence of an all-encompassing Harmony in and between living systems.

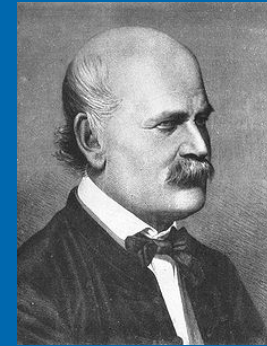
This harmonic coherence, previously unrecognized or ignored, is now showing a larger context, a more unified picture of the universe and consciousness. It is as if we uncover more & more pieces of the cosmic puzzle and find out how exquisitely they fit together.



## SG204.3.1 The "Semmelweis Reflex"

The story of Dr. Ignaz Semmelweis is typical of the fierce resistance an old paradigm can put up against new discoveries, techniques or concepts.

Dr. Semmelweis was a Hungarian physician described as the "*savior of mothers*", who discovered by 1847 that the incidence of puerperal fever could be drastically cut by the use of hand disinfection in obstetrical clinics. Puerperal fever (or *childbed fever*) was common in mid-19th century hospitals and often fatal, with mortality rates at 10%-35%. The theory of the day was that puerperal fever was a "weakness in women". In fact, mothers and babies were dying from serious infections because the doctors that delivered them didn't wash their hands or instruments after doing autopsies on mothers or babies who had just died from the same infections.



Dr. Ignaz Semmelweis

In 1847, while working in Vienna General Hospital's First Obstetrical Clinic where doctors' wards had three times the mortality of midwives' wards, Dr. Semmelweis concluded that it must be because tiny particles from cadavers were being transported by doctors into the obstetrical clinic. He ordered that all doctors leaving the morgue had to wash their hands with "chlorinated lime solution". Within a few months, the death rate dropped to about 1%. During 1848 Ignaz Semmelweis widened the scope of his washing protocol to include all instruments coming in contact with patients in labor and used mortality rate time series to document his success in virtually eliminating puerperal fever from the hospital ward. He published a book of his findings in *Etiology, Concept and Prophylaxis of Childbed Fever*.

So far, so good: isn't it obvious and aren't we doing just that? But let's get back to the mid-19th century in Vienna.

In May 1851, Semmelweis was head-physician of the obstetrical ward of Budapest's small St. Rochus Hospital. Childbed fever was rampant at the clinic. After taking over, Semmelweis virtually eliminated the disease. During 1851-1855 only 8 patients died from childbed fever out of 933 births (0.85 percent). Despite the results, Semmelweis's ideas were not accepted by the other obstetricians in Budapest. Semmelweis next instituted chlorine washings at the University of Budapest maternity clinic. Once again he obtained impressive results. Semmelweis had now achieved dramatic successes at three obstetrical facilities. Even so, his ideas continued to be ridiculed and rejected both in Vienna and in the rest of Europe.

In 1861, Semmelweis lamented the slow adoption of his ideas: "*The medical literature for the last twelve years continues to swell with reports of puerperal epidemics, and in 1854 in Vienna, the birthplace of my theory, 400 maternity patients died from childbed fever. In published medical works my teachings are either ignored or attacked. The medical faculty at Würzburg awarded a prize to a monograph written in 1859 in which my teachings were rejected*". A number of unfavorable foreign reviews of his book prompted Semmelweis to lash out against his critics in series of open letters written in 1861-1862. He bitterly attacked various prominent European obstetricians.

In July 1865, Semmelweis was lured to a Viennese insane asylum. Semmelweis surmised what was happening and tried to escape. He was severely beaten by several guards, secured in a strait jacket and confined to a darkened cell. He died after two weeks, on 13 August 1865, aged 47, from a gangrenous wound, possibly inflicted by the beating. The autopsy revealed extensive internal injuries, the cause of death *pyemia* - blood poisoning. In maternity clinics this would have been called *childbed fever*. The rules of the Hungarian Association of Physicians and Natural Scientists specified that a commemorative address be delivered in honor of each member who had died in the preceding year. For Semmelweis there was no address and his death was never even mentioned.

*Semmelweis is now recognized as a pioneer of antiseptic policies and his legacy is the so-called "Semmelweis Reflex" - a metaphor for a certain type of human behavior characterized by reflex-like rejection of new knowledge because it contradicts entrenched norms, beliefs, paradigms or privileges.*

## SG204.3.2 The New Paradigm in Biology

The story of Semmelweis is very pertinent to the contemporary science establishment. However, LIFE shows itself to be infinitely bigger than scientific & cultural paradigms. As we move into the new science paradigm applied to the areas of biology, medicine, health and eco-systems, we need to remember that this new perspective itself will be superseded as we collectively continue to expand the human consciousness.

Currently, the field of biology is witnessing a rapid merging with the discoveries of quantum physics: this is now called Biophysics, Bioenergetics or Quantum Biology. We will first give an outline of the new biology and then offer more details about specific new areas of research such as *biophotons*, the new view of the cell and latest findings re: the coherent information fields that are now found to regulate the body's processes.

**Outgrowing Molecular Biology.** The purely molecular aspect of life sciences may be only one necessary step in understanding biology and can never reach the significance of a sufficient and complete explanation. Molecules have no intelligence, despite the manifold impressive functions that have been assigned to them (e.g., isomerase, synthetase and a variety of other enzymatic or "informational" activities). There is a need for a larger, more integrative and interactive view of and between the many systems the body-mind is embedded into. There is a need for understanding the extra-molecular triggering functions that the new research about *epigenetics* (Greek *epi* = above or "that which is *above* the genetics"), biophotonics, systems biology and bio-entanglement is uncovering.

**A Biology of Feedback Loops.** It is starting to dawn on biologists that isolating the study of life from its environment is old reductionist, Newtonian-type science. The living systems have to be measured as a functional integrity of their relationship to the environment in which they are entangled. In the words of Peter Fraser in his *Decoding the Human Body-Field* (2010): "*The physics of life is the physics of loops of information that provide feedback between the organism and the environment, so that the organism can constantly adjust itself and maintain homeostasis.*" This is a new biology of interaction, integration and interconnectedness that starts to understand the scale-invariant, fractal resonance of the universe and is erasing the false "wall" between the micro-world and the macro-world as quantum processes are increasingly found to underlie biological processes.

**A Biology of Information Fields.** Evidence is accumulating in favor of the fact that life depends on fields of information, at a deeper, more fundamental level than molecular chemistry. These information networks are directed by quantum rules, not by the classical rules of mechanistic physics. Moreover, rather than information arising from quantum particles, it may well be that quantum particles derive their behavior from the information they are attuning to. Non-local (instantaneous) effects that penetrate electromagnetically sealed rooms must be mediated through some quantum information field, suggesting that, at a fundamental level, the ancient wisdom stating that We Are All Relation (connected), might become the next science.

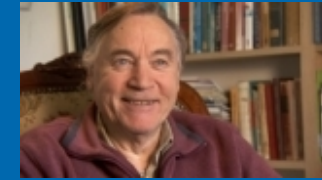
**A Biology of Resonance & Entanglement.** Scientists are now observing quantum interaction in the macro-world: cesium gas molecules can be entangled, and so do sodium ions and even atoms (very large entities by the quantum scale). Subatomic particles can be entangled and the information they carry can be teleported, as reported for the grand public by Anton Zeilinger in his *Dance of the Photons* (2010). Numerous studies have also proved the fact of "Entangled Minds".

With information and quantum entanglement, we are getting very close to intention and consciousness. Rather than arrogantly proclaiming that consciousness arises from the body, we are returning to the traditional, sacred, and more humble, view: the body-mind arises from consciousness. The quantum world observed in biology is the first encounter between science & consciousness preparing the ground for a grand wedding.



## SG204.3.3.1 Bio Photons (1) Meet Fritz-Albert Popp

*"Licht ist Leben". Fritz-Albert Popp*  
(*"Light is Life"*)



← ↑ Fritz Albert Popp

Fritz Albert Popp is a recent example of an established, credentialed scientist, who made a serendipitous discovery that revolutionized science (the *biophotons*) but triggered the "Sommelweiss reflex" (or wrath of current paradigm scientists) and was vilified, in addition to being fired from his academic career. Undaunted, Popp kept his focus and sure enough, twenty years later, the research was fully validated and is now a burgeoning new field of study & development, while once ostracized Popp morphed into an internationally respected science pioneer.

A preeminent German physicist, Fritz-Albert Popp conducted research, starting in 1976, that confirms the existence of biophotons. These particles of light, with no mass, transmit information within and between cells. His work shows that DNA in a living cell stores and releases photons creating "biophotonic emissions" that may hold the key to illness and health. Biophotonics may well be one of the major elements of a future theory of life, consciousness and holistic medical practice. The importance of the discovery has been confirmed by eminent scientists such as Herbert Froehlich and Nobel laureate Ilya Prigogine. Research based on the *Biophotonic Coherent Field* theory has already brought many new discoveries (see next pages).

In Popp's words:

*"Even enzymes or messenger molecules have to be triggered by external energy, i.e. photons which activate the diverse transition states due to the characteristic translational, rotational, vibrational, and electronic energies. These activation energies cover the whole electromagnetic spectrum, from distinct radiowaves, microwaves, infrared waves up to the visible and even ultraviolet photons. There is only one possible vehicle for conducting this concert of up to millions of reactions per second and per cell: non-thermal photons which provide the right quantum energies at the right place and at the right time... Consequently, the weak photon current from biological systems may well suffice to take the role of regulating the whole biochemistry and biology of life."*

In 1996, Popp founded the International Institute of Biophysics in Neuss, Germany [see infra [◆SG204](#)]. International projects have led to cooperation with scientists such as Walter Nagl, Ilya Prigogine and David Bohm. Popp is an Invited Member of the New York Academy of Sciences and an Invited Foreign Member of the Russian Academy of Natural Sciences (RANS). Biophotons and Biophotonics are now official disciplines in Chinese and Indian universities.

WHY are Biophotons important to Sacred Geometry? Because they have been found to be COHERENT LIGHT (like lasers). The higher the coherence, the higher the resonant harmony or interconnectedness and oneness. Biophotons exhibit the highest level of quantum order called "super-coherence" or "super-conductivity". Full biophoton resonance with the Quantum Plenum Field may be body-mind and spiritual FRACTAL SUPER-RADIANCE.

Every change in the biological or physiological state of the living system  
is reflected by a corresponding change in biophoton emission.

## SG204.3.3.2 Bio Photons (2) What are biophotons ?

*Biophotons* are ultraweak emissions of light radiated from the cells of all living things.

This phenomenon is not confined to "thermal" radiation in the infrared range. Biophoton emissions are weak electromagnetic waves in the optical range of the spectrum - in other words, they are LIGHT. A *photon* is a single particle of light. All living cells in all biological systems (plants, animals and humans) generate up to 100 photons per second, per .15 square inches (1 sq. centimeter) of surface area. The light of biophotons is too faint to be seen by the naked eye, but biophotons have been detected and verified in 1976 by F. A. Popp, using photomultiplier tubes.

After an initial decade and a half of basic research on this discovery, biophysicists of various European and Asian countries are now exploring the many pioneering applications: cancer research, non-invasive early medical diagnosis, food and water quality testing, chemical and electromagnetic contamination testing, cell communication, and various applications in biotechnology. The BIOPHOTON COHERENT FIELD theory progressively developed on the basis of these discoveries has offered the following data and perspectives:

- The biophoton light is stored in the cells of the organism and a significant part of biophoton emission originates from the DNA molecules within each cell's nucleus. These biophotons create a dynamic, *coherent* web of light which is constantly released and absorbed by the DNA and connects cell organelles, cells, tissues, and organs within the body.
- This web serves as the organism's main communication network as well as the overall regulating agency for all biological processes: chemical reactions within cells, cellular communication throughout the organism and morphogenesis processes (growth, differentiation and regeneration (including embryonic development into a predetermined form)).
- The number of photons emitted seems to be linked to an organism's position on the evolutionary scale: the more complex the organism, the fewer photons are emitted. Rudimentary plants or animals seem to emit more than humans.
- There are patterns of biophotonic emission linking them to biological rhythms (day/night, number of days/weeks/months, planetary positions etc...).
- The biophotonic light emission (and its coherence) is an expression & measurement of the healthy state of the living organism. For instance, photonic emissions from cancer patients lost their coherence and interconnectedness: they are scrambled. The rate of emission in stressed subjects tends to go up - maybe an indication of a correction mechanism to return the organism to a state of harmonic balance.
- The holographic nature of the biophoton field of the brain and the nervous system, and maybe even that of the whole organism, may also be basis of memory and other phenomena of consciousness, as postulated by neurophysiologist Karl Pribram and others. The consciousness-like coherence properties of the biophoton field are closely related to its base in the properties of the physical vacuum (Zero-Point Field or Quantum Plenum) and indicate its possible role as an interface to the non-physical realms of mind, psyche and consciousness.
- The discovery of biophoton emission also lends scientific support to some unconventional methods of healing based on concepts of homeostasis (self-regulation of the organism), such as various somatic therapies, homeopathy and acupuncture. The "*chi*" energy flowing in our bodies' meridians (which according to Traditional Chinese Medicine regulates our body functions) may be related to node lines of the organism's biophoton field. The "*prana*" of Indian Yoga may also be a similar regulating energy force that has a basis in weak, coherent electromagnetic biofields.



## SG204.3.3.3 Bio Photons (3) Coherence & Super-coherence

The discoveries about biophotons all point to QUANTUM EFFECTS in the macro world of the living systems: coherence, super-coherence, non-locality and harmonic resonance. Finding *coherent light* in the human body (a macro system) IS OVERTURNING some of the most entrenched beliefs in established physics & biology. The old paradigm view was that quantum processes give way to classical ones in the hot (thermal), wet environment of the body because heat and chaotic conditions from the environment lead to a *de-coherence* of the quantum information signals.

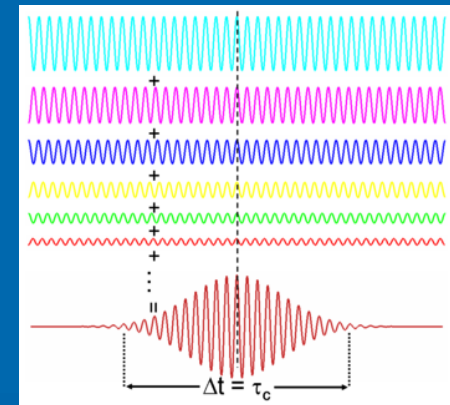
As pointed out by Lynn McTaggart: "*The high-level of quantum order witnessed by Popp and his team is usually only observed in material substances such as superfluids or superconductors studied in the laboratory in very cold conditions - just a few degrees above absolute zero - and not in the hot and messy environment of a living cell.*" At first, none believed that quantum particles in the body could behave in such a cooperative way and Popp got "*semmelweissed*". Now, the new paradigm science is seeing that the communication/information system that connects the human body to the cosmos is a complex network of resonance & hyper-resonance of highly specific frequency signatures interfering positively in a non-local way.

### About Coherence and Supercoherence

In quantum physics, QUANTUM COHERENCE means that subatomic events are able to take notice of each other, self-organize and enter in various degrees of communication & cooperation. These quantum (subatomic) waves/particles become highly interconnected by common information fields: they act like tuning forks resonating together or, in an orchestra, music instruments that are tuned to each other. Physicists call this coherence a Bose-Einstein condensate.

The laser-like coherence of the biophoton field is a significant attribute, "*making it a prime candidate for exchanging information in a highly functional, efficient and cooperative fashion, lending credence to the idea that it may be the intelligence factor behind the biological processes. An aspect of, or cousin to consciousness, though this remains speculative*" (Popp).

As students of Sacred Geometry, let us remember that biophoton emissions are sourced in the DNA which is a dodecahedron vortex based on the golden ratio PHI and replete with Fibonacci/Lucas music-like resonances [see next chapter ◆SG204.4]. PHI-BASED COHERENCE is SUPER-COHERENCE, both on a body-mind and metaphysical level, opening the way to SUPER-RADIANCE of the light body.



↑ Phase-conjugate waves add up to form coherence. (Wikipedia).

### Correlation between delayed luminescence (DL) and biophoton emissions.

Delayed luminescence (DL), which is the long-term afterglow of living systems after exposure to external light illumination, corresponds to excited states of the biophoton field. When they relax in darkness continuously into the quasi-stationary states of biophoton emission, DL follows a hyperbolic-like relaxation function rather than an exponential one, indicating a fully coherent field. In addition, all the correlations between DL or biophoton emission and biological functions such as cell growth, cell differentiation, biological rhythms, and cancer development, turned out to be consistent with the coherence hypothesis.

(Sources: data & quotes in the pages about Biophotons are from F. A. Popp's website: [www.lifescientists.de](http://www.lifescientists.de), books & articles, and books by Lynn McTaggart (*The Field, The Intention Experiment*) and Marco Bischof (*Biophotonen, das Licht in unseren Zellen.*)

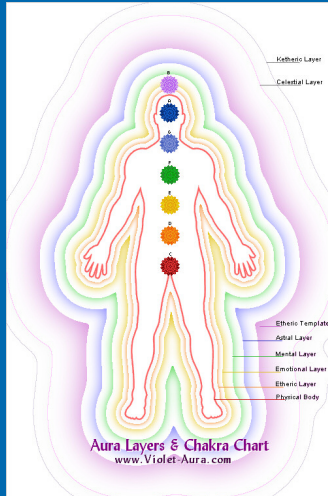
## SG204.3.3.4 Bio Photons (4) History & Landmarks

Below are some landmarks & highlights of the R & D into Bio-photons, since their discovery in 1976.

- 1972. F. A. Popp, lecturer at Marburg University, Germany, found correlations between carcinogenic and optical properties of polycyclic hydrocarbons.
- 1976. Physicist B. Ruth built, under the supervision of Popp, a most sensitive equipment for measuring light emission. Ruth & Popp showed evidence of a permanent weak light emission in the visible range (400 - 800 nm) from plant and animal cells & tissues.
- 1976. Popp introduced the term "biophotons" in order to express the biological origin as well as the quantum character of this radiation.
- 1976-1981. Popp traced the tumor problem back to a definite loss of coherence of the biophoton field. Cancer patients have fewer photon counts: it is as if their light is going "out".
- 1977-1999. Evidence of biophotons for triggering all the biochemical reactions in the living cell.
- 1979. Evidence of the proportionality of the excitation temperature of the biophotons and their frequency.
- 1981. Introduction of photocount statistics (PCS) of biophotons.
- 1981. Nagl, Popp and Ratlemeyer showed evidence of the DNA as a source of biophotons.
- 1981-1999. Evidence of the coherence of the biophoton field.
- 1981-1999. Evidence of the intra- and intercellular bio-communication by means of biophotons confirmed by Albrecht-Bühler (bacteria), Popp and Chang (dinoflagellates), Galle (daphnia), Shen (blood) and Vogel (bacteria).
- 1981-1999. Introduction of biophotonics for food quality assessment.
- 1992. Popp proposed the expansion of coherent states as the driving force of biological evolution.
- 1995-1998. Chang & Popp showed evidence that electroluminescence is the most sensitive tool for assessment of changes in the quality of fluids, including microbial infection.
- 1995-1998. Popp, Chang and Shen showed evidence for *non-substantial communication* by means of biophotons.
- 1997. Cohen & Popp showed evidence of biological rhythms of the human body indicated by biophotons, as well as indication of health & disease.
- 1998. Popp and Chang proposed phase conjugation effects as mechanism for non-substantial communication.



## SG204.3.3.5 Bio Photons (5) Historical Context

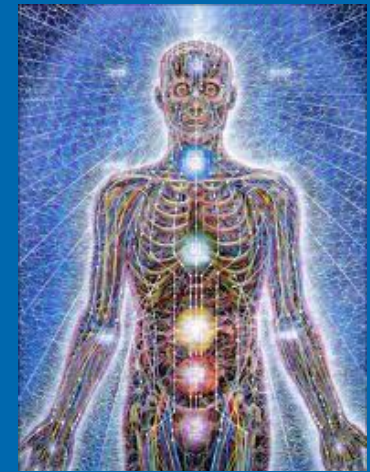


↑ Layers of the auric field as seen clairvoyantly.

- **Traditionally, in sacred healing & wisdom cultures**, the human body has been described as emanating a cascade of layered color lights variously called the "aura", "luminous cocoon", "magnetism", "personal energy field", "body of light", "etheric/astral body", "life field"... Auras resonate with different colors, sounds, and light frequencies and can be sensed physically as light pressure or seen clairvoyantly as a color spectrum that can be "read" to understand the readee's physical, emotional, mental, and spiritual states. Sacred cultures understand the aura as the interaction between a human being and the cosmic sea of universal energy.

- **1858.** Baron Von Reichenbach reported "*emanations*" from plants, animals, gems & humans which he termed "*odic force*".

- **1911.** In his book "*The Human Atmosphere*", physician Walter John Kilner explains his discovery of making the human aura visible to everyone through the use of a special screen ("*Kilner Screen*") filled with a solution of dicyanine dye.



↑ Light body by Alex Grey.

- **Around 1923.** Russian medical scientist Prof. Alexander G. Gurwitsch discovers an "ultraweak" *photon emission* from living systems (onions, yeast...), since he suggested connections between photon emission and cell division rate. He called this photon emission "*mitogenetic radiation*" in order to express its growth-stimulating capacity. His experiments indicate the wavelength in the range of around 260 nm. The mitogenetic rays were widely researched in Europe and the US.

- **1930s & 1950s.** Russian scientists measured and rediscovered an "ultraweak photon emission" from living organisms, using a specially built Geiger-Müller counter.

- **1954.** Italian nuclear physicists Cooli & Faccini discovered a "bioluminescence" of seedlings. "Biothermoluminescence" (Arnold, 1957) and "Biochemiluminescence" (Shuralev, 1965). In 1964, Vladimirov & Lvov discovered luminescence in the mitochondria.

- **1969.** Kaznachejev discovered, from 12,000 experiments, the UV aspect of what he called the "cytopathic mirror effect". The fluctuations correlated with interplanetary changes in the geomagnetic field.

- **1980s & 1990s.** Independently from each other, scientific groups in Russia (Maslov, Garjajev), Australia (Quickenden), Germany (Fritz-Albert Popp), Japan (Inaba), and Poland (Slawinski) showed evidence of ultraweak photon emission from biological systems by use of modern single-photon counting systems. Garjajev introduced his research on "Wave Genetics" [see infra].



← Alexander Gurwitsch around 1930.

Because, in Gurwitsch's time, the coherence of light was a rather unidentified field of physics and - later on - molecular biology did not need light to explain the rapidly growing discoveries of biochemistry and related fields, Gurwitsch's ingenious idea of growth regulation by photons had no chance of becoming accepted and making a breakthrough in conventional science.

## SG204.3.3.6 Bio Photons (6) Institute of Biophysics

The International Institute of BioPhysics (IIB) is a worldwide network of biologists, chemists, medical researchers, physicists and other scientists at 14 universities and governmental research institutes. The central office and focus of activities is located in Neuss, Germany. As vice president of the IIB, F. A. Popp facilitates research among the groups, focusing on coherence in biology, biophotonics and biocommunication.

The Institute facilitates the integration of different disciplines into the one common topic of understanding life and creating technologies that support the coherence of life in all forms.

### Present Topics of Research

**1. Food Quality in terms of Biophotonics.** This research is based on Schrodinger's definition of food quality: food shall work for building up and establishing the high order (negentropy) of the consumer. Biophotons, including the relaxation behavior of delayed luminescence, reflect to some extent the organizational degree of the subject under investigation. Consequently, they are indicators of food quality. Actually, it turned out that small changes in food quality lead to significant changes in biophotonic parameters. This present research and development include basic research on the germination capacity of seeds.

**2. Investigations and Development of Electrochemiluminescence.** Since the biophoton equipments are rather sensitive to single photons they can be used for measurements of electrochemiluminescence, i.e. the creation of single photons by conductive fluids after application of an electric potential. This method is sensitive enough to register a few bacteria per ml water.

**3. Biocommunication:** In a double chamber, where two samples can be investigated at the same time by two multipliers, the samples can be visually connected and disconnected by a shutter. By recording the biophoton emission alternatively in phases of visual contact and disconnection, it is possible to analyze bio-communication systematically in terms of correlation analysis. A coincidence counter between the samples can be used as a new tool of investigating the photocount statistics of the samples under investigation. It provides at the same time a sensitive tool of registering external influences on the system.

**4. Biological Rhythms:** The biophoton measurements on the whole human body over a period of many months have shown evidence that the biophoton field reflects all the biological rhythms as well as left-right-symmetry of corresponding points on the body in case of healthy people. These results require more basic investigation of biological rhythms and their connection to biophotons.

**5. Fields of current research are:** bio-electromagnetism, holistic concepts and the understanding of consciousness and evolutionary development.



↑ The offices of IIB in Neuss, Germany, forming the hub of an international mandala-network of research institutes, universities & scientists around the world - all furthering our understanding of *biophotonics*.



## SG204.3.3.7 Bio Photons (7) Bio-photonic Field R & D

### • The Biophoton CCD research of Gary Schwartz:

The equipment developed by F. A. Popp to count biophotons can only work in utter blackness. Gary Schwartz (University of Arizona) wanted to actually witness living systems glowing in the dark and was able to borrow time on a high-tech CCD camera, a state-of-the-art supercooled charge-coupled device used to photograph galaxies in deep space and able to pick up about 70% of any light, no matter how faint. This highly sensitive equipment would surely be able to pick up the faint light coming off living systems.

Sure enough, Schwartz, as reported by Lynn McTaggart in her *Intention Experiment* (2007), obtained "*a perfect image of a leaf in light, like a shadow in reverse, but in incredible detail, each with its tiniest veins delineated*". Moreover, Schwartz experimented with placing a healer's hands (on white background) upon the apparatus and obtained "*breath-takingly clear images: a stream of light flowed out of the healer's hands, almost as though it were flowing from their fingers.*" Schwartz had just proved that HEALING INTENTION CREATES WAVES OF LIGHT. In other words, focused consciousness creates coherent light.

• Two-Way biophotonic communication. Various researchers have found that LIGHT seems to be a communication system *between* things. Lynn McTaggart gives the following examples in her book *The Intention Experiment*:

- a. In experiments with *Daphnia* (a common water flea), it was discovered that female water fleas were absorbing the light emitted from each other and sending back wave interference patterns, as though they had taken the light sent to themselves and updated it with more information.
- b. Experiments with the light emissions between *dinoflagellates* (luminescent algae) showed that they were *signaling* to each other.
- c. Gary Schwartz showed that the biophoton communication carries on even if the organism is cut into pieces. Experimenting with a cut up string bean, he found so much light between the sections that it appeared as though the bean were whole again.
- d. A Dutch psychologist E. Van Wijk (as well as Gary Schwartz's team) demonstrated that healing energy and intentional thoughts were significantly interacting with the biophoton emissions of plants.

As a result of these observations, researchers in biophotonics are now looking at the complex networks of communication taking place at the boundary of biophotonics and the primary quantum field or ZPE.

• The Garjajev Group (Russia) is researching the photonic ability of DNA, in terms of electro-magnetic signaling and re-programming. They found that the DNA cause photons to spiral along its helix-shaped, i.e. the DNA has the ability to bend or weave light around itself. This ties in with the Russian R & D about "*torsion waves*", a sub-luminal field from higher dimensions quite distinguishable from electro-magnetic radiation.

The Garjajev group has demonstrated that the chromosomes function like holographic computers able to assemble themselves into a holographic lattice designed to generate and interpret highly stable spirals of standing waves of sound & light. The DNA appears to literally be a genetic "text" that can be modified by the wording of human intention and belief.

• "Biophotonen" is a German company working for development and practical applications of biophotonics. The work is based on a variety of patents. "Biophotonen" solves practical problems of food industry, environmental industry, cosmetics, agriculture and other branches. The service concerns:

- Quality of food in terms of a scale of biophoton emissions.
- Quality of water and fluids.
- Optimization of quality in environments.
- Green sustainability and control of effects and side effects of pollutants.

# SG204.3.4.1 The Universe of the Cell

## (1) Meet Bruce Lipton

Renowned cell biologist, former University of Wisconsin Medical School professor and Stanford University researcher Dr. Bruce Lipton has turned his scientific exploration to the integration of mind, body and spirit. In short, he studies how our beliefs affect our health and overall happiness.

In 1982, Dr. Bruce Lipton began exploring quantum physics to more fully explain the cell information processing systems. His breakthrough studies on the cell membrane revealed its function as essentially an organic computer interface, the cell's equivalent of a brain. A decade later, Dr. Bruce Lipton made a discovery that ran counter to everything scientists believed about the role of genes in the body. His research showed that environmental forces outside the cell control its behavior and physiology, turning genes on and off. This idea opened the door to a new and important field, the science of *epigenetics*.

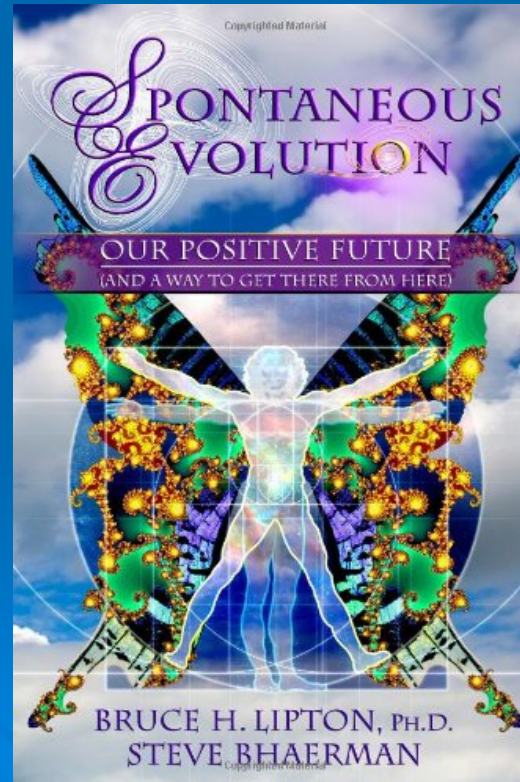
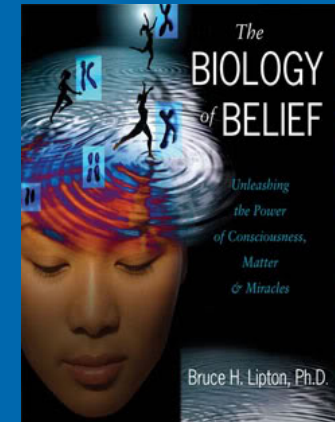
In his best-seller *The Biology of Belief* (2005), B. Lipton describes in an engaging way the parallel evolution of his scientific experimentation & understanding of cell biology and the growth of his personal life and awareness beyond the "victim syndrome". His epiphany occurred when he had data proving that the Central Dogma of molecular biology (genes control life) is a lie: genes are not "self-emergent" i.e. they cannot turn themselves on and off. Something in the environment has to trigger gene activity. For a while, *genetic determinism* (the belief that DNA & genes CONTROL our lives) mind-programmed us into powerless biochemical machines that could only be fixed by "genetic engineers". This is over. DNA (and gene manipulation) is no longer the miraculous 'secret of life' that all-mighty science can market out to "genetic victims". In Bruce's words:

*"It is a single cell's 'awareness' of its environment (both physical & energetic), not its genes, that sets in motion the mechanisms of life... I knew that if single cells are controlled by their awareness of the environment so too are we trillion-celled human beings. Just like a single cell, the character of our lives is determined not by our genes but by our responses to the environmental signals that propel life."*

By giving the energy-based environment its due, the new biology pioneered by B. Lipton and others not only propels us into the era of a science of cosmic interconnectedness but also provides a foundation for the science, the philosophy and the wisdom of traditional & contemporary complementary medicine.



↑ Bruce Lipton



←↑  
Bruce's  
two  
best-  
sellers.

Note, on the cover of *Spontaneous Evolution*, the Da Vinci Man, the Lorenz attractor, the Golden Rectangle, the Golden Spiral, fractals, and a cone of light opening from the point of the heart.



## SG204.3.4.2 The Universe of the Cell (2) The Success of Cooperation

During a short-term sabbatical at a medical school in the Caribbean, B. Lipton was exposed to the island's amazing integration of plant and animal species:

*"Once I was immersed in the Caribbean rich ecosystem, I began to appreciate biology as a living, breathing integrated system rather than a collection of individual species... In this garden-like island, all species live in a delicate, dynamic balance, not only with other life forms, but with the physical environment as well. It was life's HARMONY - not life's struggle - that sang out to me as I sat in the Caribbean Garden of Eden.*

*I BECAME CONVINCED THAT CONTEMPORARY BIOLOGY PAYS TOO LITTLE ATTENTION TO THE IMPORTANT ROLE OF COOPERATION, because its Darwinian roots emphasize life's competitive nature."*

(Aya's capitals)

Charles Darwin, an unhappy man in his personal life, projected his gloomy view of life unto generations of scientists who, living themselves in unhappy societies within a world undergoing huge historical transitions, were also convinced that life is a battleground for survival of the physically powerful, a hopeless & meaningless random venture where nature is making war to nature. On the other hand, Darwin's predecessor in proposing a theory of evolution, Jean-Baptiste Lamarck emphasized the cooperative nature of evolution through symbiotic relationships (what is now called 'systems biology'). However, Lamarck was soon vilified and the Darwinian *dog-eat-dog* conception of biology, evolution and LIFE prevailed.

B. Lipton is championing the role of cells as teachers of cooperation, emphasizing the fact that the 'individual' human being is actually a 'cooperative community or rather nation of 60+ trillion cells or 'single-celled citizens'.

*"Almost all of the cells that make up your body are amoeba-like, individual organisms that have evolved a cooperative strategy for their mutual survival... Using these cell communities as role models, I came to the conclusion that we are not victims of our genes, but masters of our fates, able to create lives overflowing with peace, happiness and love."*

In *Spontaneous Evolution* (2009), B. Lipton reiterates: *"A new operating principle for a sane world might be this: life is a cooperative journey among powerful individuals who can program themselves to create joy-filled lives"*. To move from a biology locked on individuals to a biology focusing on community, all we have to do is suspend the obsolete & destructive beliefs we have gobbled up from the scientific & media establishments and then

**FREELY JUMP INTO THE EXCITING, PROACTIVE, CO-CREATIVE RE-INVENTION OF LIFE AS A COOPERATIVE OF HUMANS.**

**If 60+ trillion cells are able to maintain a human body in optimum balance and functionality in spite of the many abuses we bring to these bodies, we can ask:  
HOW DIFFICULT CAN IT BE FOR THE MERE 7 BILLION MEMBERS OF THE HUMAN SPECIES TO COOPERATE WITHIN THE GLOBAL SUPER-ORGANISM OF A HARMONIC HUMANITY?**

## SG204.3.4.3 The Universe of the Cell (3) Cells as Mini Humans...

### ... and humans as mini universes

*"After years behind a microscope, I had become humbled by the complexity and power of what at first appear to be anatomically simple, moving blobs in a Petri dish... These smart cells employ technologies that scientists have yet to fully fathom..."*

*The biochemical mechanisms employed by cellular organelle systems are essentially the same mechanisms employed by our human organ systems... There is not one 'new' function in our bodies that is not already expressed in the single cell: each eukaryote (nucleus-containing cell) possesses the functional equivalent of our nervous system, digestive system, muscle and skeletal system, circulatory system, excretory system, endocrine system, integument (skin), reproductive system and even a primitive immune system..."* (B. Lipton. *Biology of Belief*).

Here are some of the latest discoveries of cell biology in support of the complex intelligence as cells as "mini-humans":

- **Cells are smart.** They display intent & purpose. *"They actively seek environments that support their survival while simultaneously avoiding toxic or hostile ones. Like humans, single cells analyze thousands of stimuli from the microenvironment they inhabit. Through the analysis of this data, cells select appropriate behavioral responses to ensure their survival."*

- **Single cells are able to learn** from their experiences and to create cellular memories that they can pass on to their progeny. The classical example that has been unraveled around 2000 is the antibody created by cells in order to protect the body against measles. As explained by B. Lipton, when a measles virus infects a young child, an immature cell is called in to create a protective protein antibody. In the process, the cell must create a new gene to serve as a blueprint in manufacturing the measles antibody protein. Through a complex and very precise process of fine-tuning and literally 'sculpting' the antibody, the final custom-shaped 'medicine' is produced that will perfectly lock onto the virus, deactivate it and mark it for destruction. *"The cell retains the genetic memory of this antibody, so that in the future if the individual is again exposed to measles, the cells can immediately launch a protective immune response. The new antibody gene can also be passed on to all the cell's progeny when it divides."*  
So, the cell LEARNS and retain a MEMORY that will be inherited and passed on by the daughter cells.

- **The brain of the cell is not the DNA** contained in the nucleus but the cell membrane and partly also the cytoskeleton or cell's connective tissue. Cell membrane and cytoskeleton are now understood as receiver-antenna systems (broadcast stations) for sending to the DNA instructions received from monitoring the inner and outer environments of the body through complex feedback information loops. (Next page offers more details about the membrane). Physicist Herbert Fröhlich found that cells oscillate in a collective way that sets up in the body a cooperative information field (these vibrations are now known as the *"Fröhlich oscillations"*).

- **Cells grouping together in multi-cellular organisms have evolved strategies for successful sustainability.** The 60+ trillion cells of a human being have learned to share energy, to support each other and to take care of their collective well being. They have (or follow) an intelligent plan, a strategy of optimal global harmony and longevity or "thrival" (versus mere "survival").

**Each one of us is an entire civilization!**



## SG204.3.4.4 The Universe of the Cell (4) The Cell's Membrane

Bruce Lipton describes his awakening, both as a scientist and a person, as going from "a nucleus-centered biologist to a membrane-centered biologist". Now Lipton, along with other frontier biologists, has data supporting the cell's membrane as the real "brain" of the cell. Indeed, de-nucleated cells can survive and function well whereas cells with a coating blocking the receptivity of their membrane are dead cells: they can no longer communicate with larger wholes.

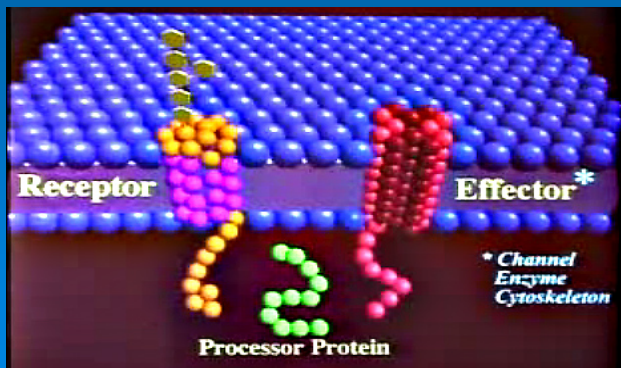
Lipton further elaborates: "When I started studying cell biology in the 1960s, the idea that the membrane was the cell's brain would have been considered laughable... One reason scientists misjudged the membrane is that it is so thin. Membranes are only 7 millionths of a millimeter thick. In fact they are so thin that they can only be seen with an electron microscope, which was developed after WWII."

Frontier cell biologists no longer believe that the standard model of the sodium-potassium membrane pump theory is correct. The membrane turns out to be an extremely complex interface communication system, best described as "a liquid crystal semi-conductor with gates and channels" - which is the definition of a silicon chip. The cell's membrane is an ORGANIC CHIP, whose 'keyboard' to enter data is its entire fractal surface dotted with Integral Membrane Proteins (IMPs) or nano-antennas. The study of IMPs is now an important field called "Signal Transduction", thus bringing the membrane to the center stage as the "brain" of the cell. The antennas on the membrane come in two main functional types: *receptor* proteins and *effector* proteins.

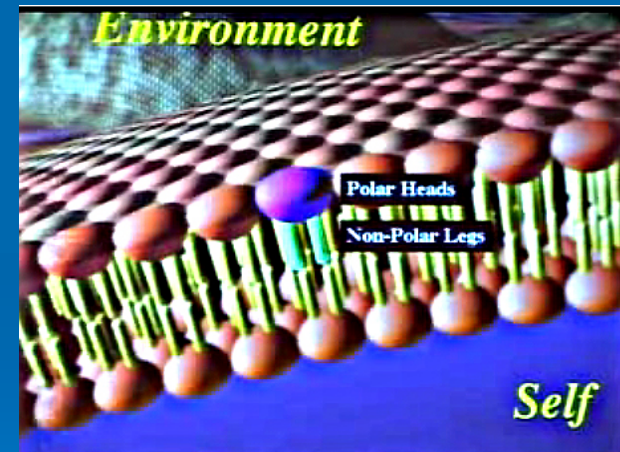
### The Receptor Proteins.

Cells have a uniquely "tuned" receptor protein for every environmental signal that needs to be read. These antennas are the cell's sense organs and respond to physical and/or vibrational signals that the environment "types" onto the membrane. For instance, an estrogen receptor is designed to complement the shape & charge distribution of an estrogen molecule: when estrogen is around, the receptor locks on to it, changes its charge and shifts into an active configuration.

Receptors can also read energy fields such as light, sound or radio frequencies: their antennas vibrate like tuning forks. This means that cells can be influenced by non-visible, non-chemical forces, including thoughts & intentions.



- ← The 2 forms of IMPs:
- Receptor IMP (left) with an "antenna" sticking out.
  - Effector IMP (right) receiving a signal from the receptor (through a processor protein) and sending the signal to the cell's inner systems.



↑ The cell's membrane as a double layer "semiconductor"

Credit: images from B. Lipton's video lecture.  
[www.enlightenmentnetwork.com](http://www.enlightenmentnetwork.com)

## SG204.3.5 Fractal Evolution

Fractal geometry has been found to be the mathematics of nature. [◆SG203A.1] As we have seen, fractals have self-similarity: the part looks like the whole and this embeddedness continues to infinity. The great advantage that biology derives from fractals is that the repetitive self-similarity (or recursiveness) of this branching-within-branching structure is the most efficient way to get the most surface area within a 3D space. In other words, fractals allow for maximum compaction (fractal packing) while preserving individual identity. They also point to a model of evolution whereby the pattern of the human is seen in the parts (cells) of the human. From a larger perspective, if the structure of humans is a self-similar image of their own cells, the structure of human civilization represents a self-similar structure of its parts (the humans). One could also say that cells are a fractal image of humanity: this is fractal evolution.

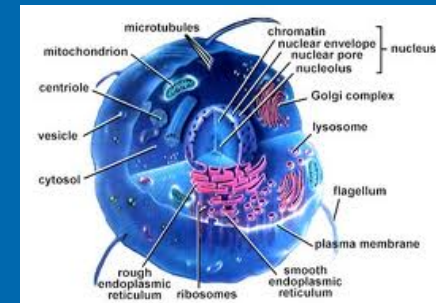
This concept of course brings us directly back to Sacred Geometry since the property of the Golden Ratio is precisely a 3-tiered fractal structure: *the small is to the large as the large is to the whole*. Actually, the Golden Ratio creates THE OPTIMUM, most coherent FRACTAL STRUCTURE. The rediscovery of the fractal structure of all biology and all nature is the re-emergence of seeing HARMONIC PROPORTION as the template of the universe and the optimum relationship pattern/rhythm for exchange & transfer of information/energy in a super-conductive way i.e. with no or minimal loss of signal power.

Below are two updates as biology progressively uncovers the fractal-like structure of cells and complex cells:

• **Fractality of the cell's membrane.** As cells regroup & cooperate to form larger organisms, they seek to increase their awareness of communication signals in and out of the membrane. How to increase the density of the nano-antennas in the form of *receptor and effector proteins* (IMPs) functioning as gates and channels of information/energy? Nature's answer is to fold the membrane into a fractal, just like the coastline of Britain is a folded fractal, the lungs are fractalized or a tree branches into more self-similar branches... Potentially, infinite information can be stored in a fractal structure.

*"Since evolution is the modeling of the membrane awareness (related to its surface area), the efficiency of modeling provided by fractal geometry would most likely reflect that chosen by nature"* (B. Lipton).

• **Fractality within the cell.** In new experiments, S. Huet and A. Bancaud of the European Molecular Biology Laboratory in Heidelberg, Germany, tracked the movement of molecules within cells in a lab dish, then compared the pattern of movement against mathematical models. Large molecules, they found, moved according to the same rules as small molecules suggesting that their environment was truly fractal... By tracking fluorescent molecules injected into live mouse cells in a lab dish, Huet and Bancaud found that the molecules did indeed move as if they were having to navigate obstacles. Surprisingly, when the team looked at the behavior of different-sized molecules, they saw that large molecules were obstructed to the same degree as small ones. The result suggested that these molecules were 'seeing' the same crowded environment, regardless of scale. In other words, the environment seemed to be fractal. The team then watched how different kinds of proteins moved around and bound to two forms of *chromatin: euchromatin* and *heterochromatin*. Intriguingly, this suggested that the two forms were both fractal in different ways. Euchromatin seems to have a higher fractal dimension, which means it takes up more 3D space, exposing a large and rough surface to the molecules interacting with it. Heterochromatin's low fractal dimension makes it flatter and smoother, with a smaller surface area.



↑ A cell, integral part of the human being.



← The Earth, a cell upon whose membrane we are IMPs.



## SG204.3.6 Quantum Communication in Biology

All current evidence is pointing to a constant flow of communication between living systems. What used to be thought the exclusive (and "weird") property of the quantum world is now found in the macro-world of "matter" and living systems. Biologists are discovering that every organism, from bacteria to human beings, appears to be in perpetual quantum communication.

The now classic *Backster experiments* about the influence of human intention on plants and "plant telepathy" were decried and ignored at the time of their disclosure by Steve Backster, a specialist of the polygraph techniques of lie detection. Using his equipment on plants, Backster demonstrated in the 1970s that living organisms read (and respond to) a person's thoughts. He even showed that they can do it at a distance: plants could register the death of a "fellow" organism three doors away.

The implication of these observations is that **ALL LIFE FORMS ARE EXQUISITELY IN TUNE WITH EACH OTHER**. As Lynn Mac Taggart puts it: *"Living things must be registering and passing telepathic information back & forth at every moment, particularly at moments of threat or death."* Now, with the discovery of quantum entanglement in living systems and the possible carrier mechanism of biophotons, the new biology is ready to accept the findings of earlier experimenters and take them much further and much larger. In fact, it seems that every event in the universe is entangled with every other event, so everything, at some primordial level, affects everything else and reciprocally is affected by everything else.

The flood of new observations about interconnectedness in the web of life makes us the privileged pioneers of a new generation of awakened humans able to witness and fully honor the exquisite dance orchestration of the universe, thus reminding us, in a timely way, of the ancient wisdom of Sacred Geometry describing universal harmony and the oneness of the Whole.

### Korotkov and the Gas Discharge Visualization (GDV).

In the 1980s, quantum physicist Konstantin Korotkov (St Petersburg Technical University) wanted to improve on the "Kirlian bio-electrography" techniques discovered by S. D. Kirlian in the 1940s and claiming to capture people's life energy on film. Building a state-of-the-art equipment blending light measurement optics, photography and computer pattern recognition, Korotkov took pictures of the field of light around each finger of a subject. Software would then extrapolate a real-time image of the "bio-field" of the person and deduce a health diagnostic. Being an established scientist in a country where this type of research is officially encouraged, Korotkov convinced the Russian Ministry of Health to sponsor the use and application of his GDV technique for diagnosis and treatment of many illnesses.

Korotkov went further in his private research and investigated the connection between "biofields" and human intention (such as directed healing from confirmed healers or even ordinary "thoughts" from ordinary people). The effects were clear: remarkable changes occurred in the corona discharges of healers while they were sending healing and every strong emotion or thought from ordinary people produced a direct effect on the light discharge of the recipients.

As Lynn McTaggart concludes: *"Every last thought appeared to augment or diminish something else's light."* And maybe all participants in this Dance of Life are eventually gaining an expansion of awareness drawing them back to the Quantum Source.

*We are at minimum a humanity and at maximum an infinity.*

## SG204.3.7 Emergence of a Quantum Biology

Biologists have now understood that the study of life cannot possibly be isolated from its environment because fields permeate everything. The question arises: where does exactly stop this "environment"? Of course, one can arbitrarily define a limit to an environment: the skin body, the energy body, the neighborhood, the biosphere, the solar system...

But, if everything is entangled in a non-local way, if every parcel of creation and every organism have the wave functions of every other one entangled within it, then really there is no environment per se and neither there is an inside and an outside: the universe has no environment because it is a whole in itself. Nothing is ever isolated or truly separated and "lost": it only may appear to be so if we fail to expand our consciousness to sense the pervading fullness. The universe actually is the only environment there is, it is the "minimum scale" and the minimum size context of quantum consciousness. The universe is a single region of holographic super-coherence as a pure quantum system of generalized ubiquity (omni-quity) and omni-simultaneity merging into Presence. Home is everywhere and family is everyone, as all mystics have always asserted. All beings, whatever the beliefs of their perceptual mind might be and beyond their personal isolated will, are fully and intimately engaged with each other in an infinite dance of creation and un-creation of the entire universe. The universe and all biology are fractal "ecologies", fully integrated harmonic systems, simultaneously being form and energy.

This all means that studying life forms on planet Earth is actually studying the whole universe along with the dynamics of consciousness that seems to play at taking life in and out of the quantum substratum. Any science is entangled with consciousness, just like any manifested matter is entangled with quantum potential energy. In fact the way we unfold our consciousness (and the way science & knowledge evolve) follows the same pattern as any other part of the universe: it is an organic holographic fractality of resonance, with its ebbs and flows. Many scales but all in tune. One breath for all.

### Landmarks on the road of recognizing the primordial role of the Quantum Field in biology:

- 1960. Nobel Prize physiologist Albert Szent-Györgyi urged life scientists to see the importance of quantum physics in biological systems. He was ignored.
- 1970s & 1980s. Many studies have shown that non-chemical information and energy signaling are profoundly impacting every aspect of biology.
- 1990s. Walter Schempp, a mathematician who revolutionized MRI machines by applying "quantum holography" to them, proved that the quantum fluctuations of the ZPE field carry the 3D images of living systems.
- 1990s. Developments of Karl Pribram's work on the holographic nature of the brain and quantum perception.
- 2000. Pophristic & Goodman showed that quantum laws, not molecular chemistry laws, control the twisting & folding of molecules into complex shapes.
- 2000s. *Electron tunneling* (quantum micro-teleportation) is a process in which an electron disappears in one location and instantaneously appears somewhere else without having traveled the intermediate distance. It has been found at work behind a range of organic phenomena, from our sense of smell and the activities of our enzymes to the neutralization of free radicals with anti-oxidants.
- 2007. Science Express (Feb. 17th). Horst Stormer and al. Quantum Hall effect observed at room temperature.
- 2008. Iannis Kominis. The magnetic field detection in birds is governed by a fundamental quantum phenomenon, the quantum Zeno effect.
- 2008. Physical Review (A 78, 052110). The human eye as "*mantanglement*". By transferring the quantum properties of a single photon to an ensemble of photons, researchers at the University of Geneva are using the human eye as a detector of quantum entanglement.
- 2010. Nature #463. In experiments with algae, E. Collini and al. provide compelling evidence (at 21° C), that distant molecules of photosynthetic proteins are wired together by quantum coherence for super efficient light-harvesting. Another team in Chicago has replicated the results at 3° C.
- 2010. Editorial of New Scientist (03 February 2010): "*Quantum biology has come in from the cold*". First came news that birds see magnetic fields, thanks to quantum effects. Now it seems that pigments used in photosynthesis use quantum calculations to harness light... The implication is that we, too, could possess quantum computers. We may only need to look into our own eyes to find the evidence, in the form of the pigment rhodopsin.



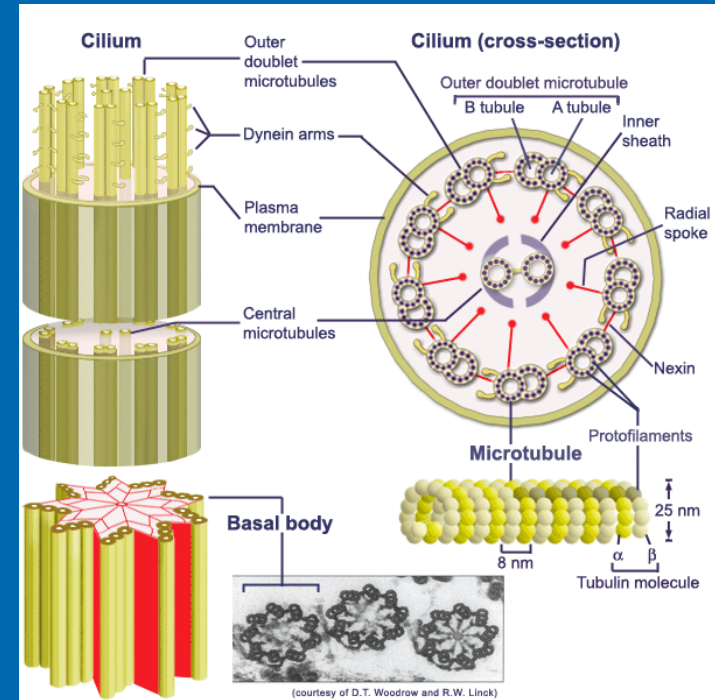
## SG204.3.8.1 Microtubules (1) Coherence

*Microtubules* (MTs) are straight, hollow cylinders, composed of *tubulin* protein polymers. They are found throughout the cytoskeleton of all eukaryotic (i.e. with nucleus) cells and act as the scaffolding of the cell. Standard biology ascribes to MTs the following functions: maintenance of the primary structure/shape of the cell, transportation as a highway system along which organelles can be carried, mediation in cell division.

However, more recent MT studies, in the mid 1990s, have shown that MTs are exceptional wave guides: they conduct energy/information pulses in such a way that frequencies sent in one end travel through groups of proteins and arrive unchanged at the other end. Stuart Hameroff and others also discovered that neighboring MTs display a high level of *coherence*: the vibration of one MT entrains the resonance of its neighbors *in unison*.

It further occurred to Hameroff that MTs in the cells of dendrites and neurons might be "light pipes" acting a fiber optic lines for photons, thus distributing light throughout the brain without any loss of energy. MTs might be the Internet of the human body-mind system. As noted by Lynn McTaggart: "Each neuron of the brain could log on at the same time and speak to every other neuron simultaneously via the quantum processes within."

The cytoskeleton, and particularly the tube-shaped microtubules and the tubulins, are ideal quantum mechanical resonators (in contrast to bulky cells, for example). Resonance in the cytoskeleton might support the existence of a Bose-Einstein condensate (quantum coherence) across the brain...



↑ MTs in cilia (<http://scienceblogs.com>)

*"To summarize, cytoskeletal microtubules are likely candidates for quantum coherence relevant to consciousness because..."*

- *Microtubule individual subunit (tubulin) conformations may be coupled to quantum-level events (electron movement, dipole, phonon) in hydrophobic protein regions.*
- *Microtubule paracrystalline lattice structure, symmetry, cylindrical configuration and parallel alignment promote long-range cooperativity and order. (Hints of Sacred Geometry)*
- *Hollow microtubule interiors appear capable of water-ordering, waveguide super-radiance and self-induced transparency."*

Stuart Hameroff, *Quantum Coherence in Microtubules* (1994)



← Spiral arrangement of microtubules in the cross-section of an axopod from an animal-like microorganism (protist).

(<http://creationwiki.org>)

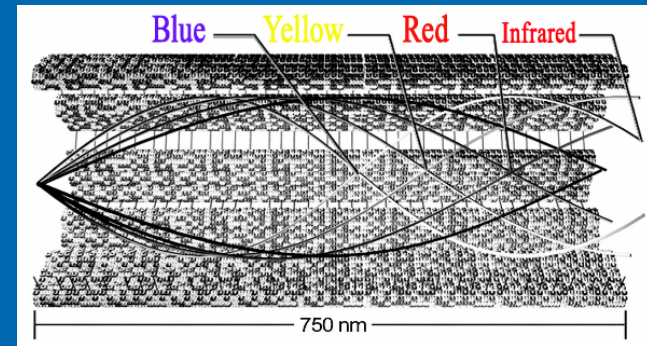
## SG204.3.8.2 Microtubules (2) Super-Radiance & Transparency

In 1994, the seminal paper by Jibu and al. ("*Quantum optical coherence in cytoskeletal microtubules*") showed that "*laser-like, long-range coherent quantum phenomena may occur biologically within cytoskeletal microtubules.*" This paper presented a prediction of the occurrence in biological media of 'super-radiance' and 'self-induced transparency', phenomena where microtubules play the roles of non-linear coherent optical devices. Supercoherence of microtubules and other cytoskeletal structures may provide a basis for biomolecular cognition and a substrate for consciousness. (More on MTs and brain/consciousness next chapter).

### Super-radiance

First described in 1954, *Super-radiance* is an effect which can convert disordered energy of various kinds into coherent phase energy. It is a "*collective emission of an ensemble of atoms or ions after coherent excitation usually with an optical pulse*". (Encyclopedia of Laser Physics & Technology).

Super-radiance is a specific quantum mechanical ordering phenomenon with characteristic times much shorter than those of thermal interaction. Consequently, optical signaling (and computation) in microtubules would be free from both thermal noise and loss. As theorized by Jibu and al., *super-radiant optical computing* in networks of microtubules and other cytoskeletal structures may provide a basis for biomolecular cognition and a substrate for consciousness. Note: IF optimized by Phi fractality.



↑ A microtubule as a "light pipe" or quantum optical device.

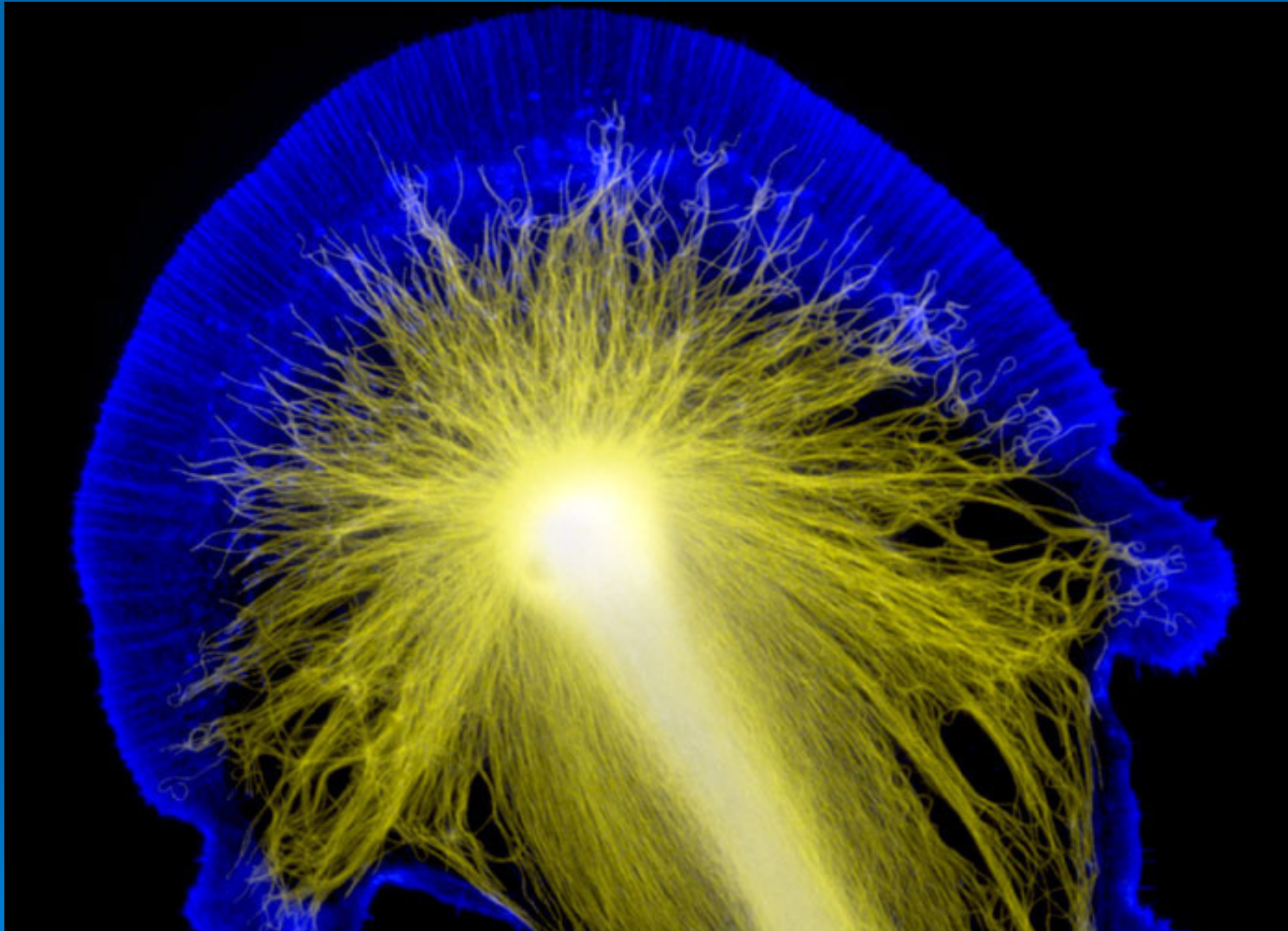
### Self-induced Transparency

In optics, *Self-induced Transparency* (SIT) is a phenomenon in which a pulse of coherent light, with a certain frequency, amplitude, and duration, is transmitted by a normally opaque medium. Energy absorbed from the first half of the pulse, whose frequency is at or near the average resonance peak of a band of coherent atomic two-quantum-level optical oscillators, is returned to the last half of the pulse by the medium in the form of coherently emitted light. SIT is the optical equivalent of superconductivity.

In terms of photons & microtubules, once coherence is achieved, the photons can travel along the light pipes as if they were transparent. Photons can then penetrate the core of the MT and communicate with other photons throughout the body, causing collective cooperation of wave functions in MTs throughout the brain. Lynn McTaggart comments: "*It would account for unity of thought and consciousness... and provide an explanation for the instantaneous operation of our brains*" (between 1/10,000th and 1/1,000th of a second - a speed that exceeds the speed of communication between axons or dendrite in neurons)... *Hameroff observed that electrons glide easily along these light pipes without getting entangled in their environment - that is settling into a single state: this means they can remain in the quantum state (a condition of all possible states) enabling the brain to finally choose among them... At every moment our brains are making quantum choices.*"



### SG204.3.8.3 Microtubules (3) Micro Image

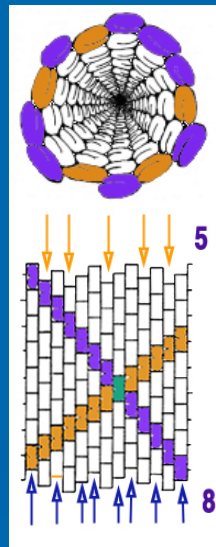
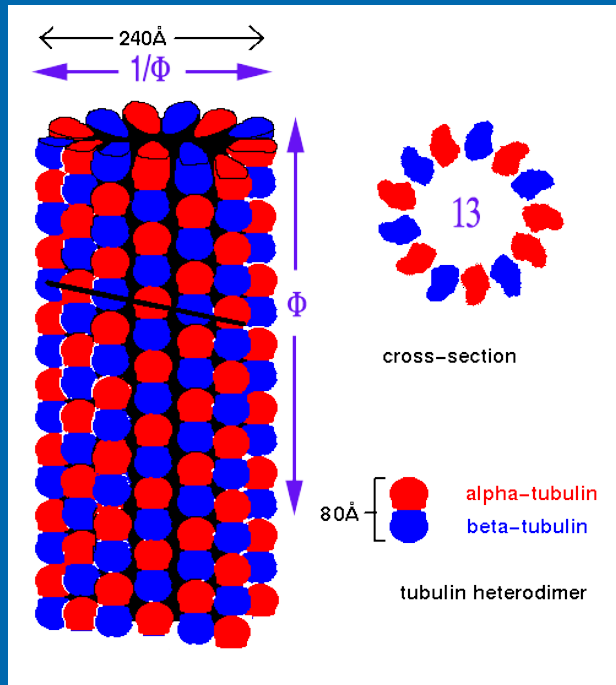


Filamentous *actin* and *microtubules* in the growth cone of a bag cell neuron (800x). Dylan T. Burnette.  
Nikon Microscopy Galleries ([www.microscopyu.com](http://www.microscopyu.com))

## SG204.3.8.4 Microtubules (4) Fibonacci Geometry

### What is the Relevance of MTs to Sacred Geometry?

"Coherence" and "super-radiance" are aspects of HARMONY and scientists have noticed in MTs the appearance of the Fibonacci numbers: the *tubulin* proteins self-assemble into hollow cylinders whose walls are elegant lattices which are both hexagonal and helical, the helical winding patterns exhibiting Fibonacci geometry.

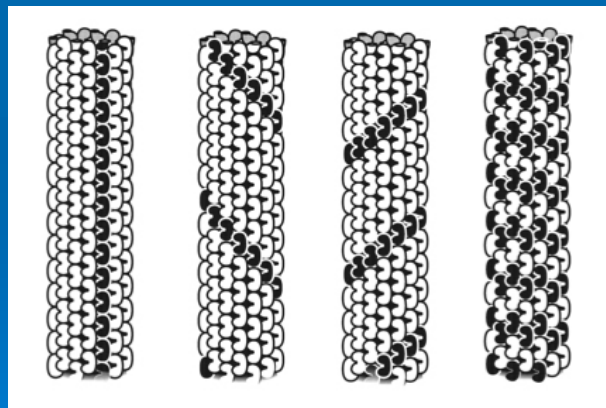


↑ The 8/5 pattern

- Stuart Hameroff notes: "As computational lattices, microtubules are unique. Not only are they cylindrical with hexagonal lattices, but their skewed geometry results in winding pathways whose intersections on any protofilament reflect the Fibonacci series... MTs appear to have quantum error correction topology based on Fibonacci series winding pathways which match biomechanical resonances. Qubits based on winding pathways are thus very robust."

(Quantum Aspects of life. World Scientific Books. 2007)

- In his *Shadows of the Mind: A Search for the Missing Science of Consciousness* (1994), Roger Penrose makes the following remarks: "The organization of mammalian microtubules is interesting from a mathematical point of view... (The pattern of) 13 columns seems to be almost universal amongst mammalian microtubules... The skew hexagonal pattern is made up of 5 right-handed and 8 left-handed helical arrangements... The number 13 features here in its role as the sum: 5 + 8. Also it is curious that the double microtubules that frequently occur seem normally to have a total of 21 columns of tubulin dimers forming the outside boundary of the composite tube - the next Fibonacci number!"



↑ Winding pathways in MTs. Winding patterns along adjacent tubulin dimers or monomers. Intersections of the patterns (not shown) match attachment sites of MAP proteins.

But as Dan Winter points out: MT pioneer biology seems to stop short of pursuing the clues and go from "It is interesting & curious..." to take the next steps. The "winding pathways" look too similar to the PHI-based phyllotactic patterns in plants to not call for deeper study.

The perfect phi recursive microtubule concentricity is what allows waves to collapse toward their own center infinitely without destruction of inertia or information. This is only possible with phase conjugation based on PHI whether we look at the DNA's dodeca nesting, the emission lines of hydrogen, the spectra of EKG or microtubules.

Perfect branching and infinite compression (fractal) is solved by GOLDEN RATIO.



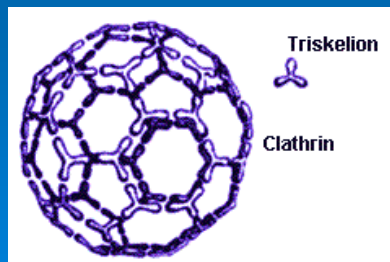
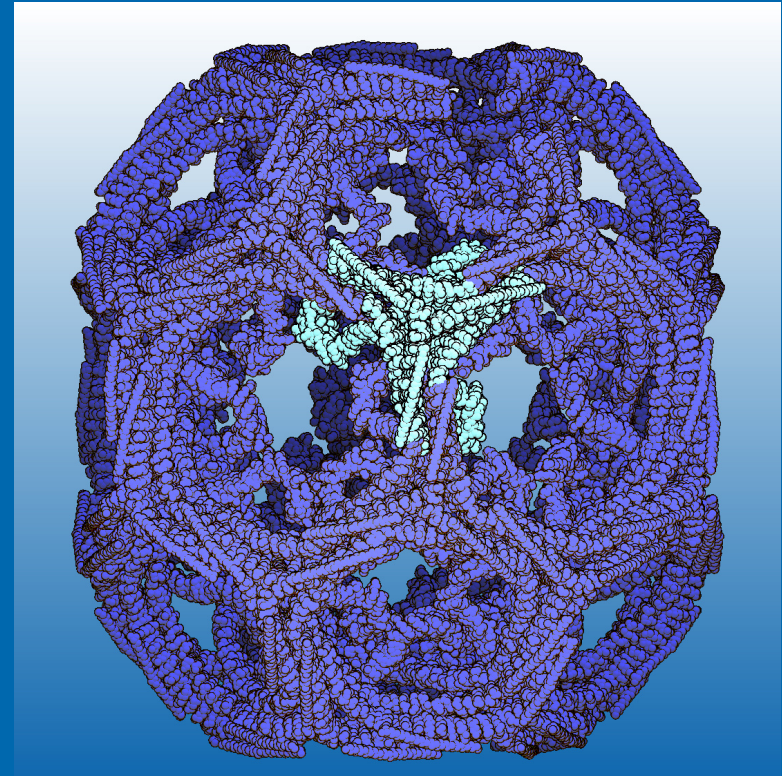
## SG204.3.9 Clathrins as Buckyballs

A clathrin is a protein that plays a major role in the formation of coated vesicles. Coat-proteins, like clathrin, are used to build small vesicles in order to safely transport molecules between cells.

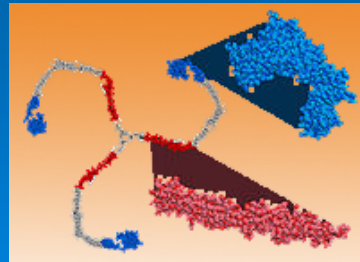
A clathrin forms a *triskelion* shape composed of three heavy and three light chains. When the triskelion chains interact they form a polyhedral lattice that surrounds the vesicle. In a cell, a triskelion floating in the cytoplasm binds to an adaptor protein linking one of its three feet to the membrane at a time. This triskelion will bind to other membrane-attached triskelia to form a rounded lattice of hexagons and pentagons ("Buckyball" fullerene) that pulls the membrane into a bud. By constructing different combinations of 5-sided and 6-sided rings, vesicles of different sizes may assemble.

Clathrins involved with the release of neurotransmitter chemicals appear in association with microtubules in the presynaptic endings of axons. These clathrins have the structure of a truncated icosahedron, one of the 13 Archimedean solids (also known as "Buckyball" fullerene and the shape of a soccer ball). One could say that the human body management system created "soccer balls" as the most efficient way to package and shoot to another destination neurotransmitter chemicals - just like with a fleet of mail messengers. However, clathrins are much larger than fullerene molecules since an entire clathrin triskelion, a structure involving several amino acids, takes the place of the fullerene's single carbon atom.

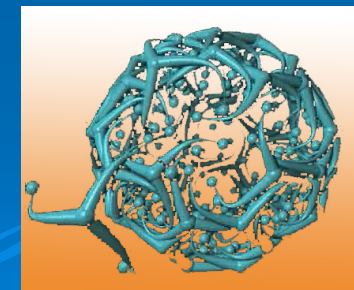
At the 10th Foresight Conference on Molecular Nanotechnology (2002), L. R. Matija and D. L. Koruga presented a paper about the *Golden Mean as a Driving Force of Molecular Self-Assembly*. Since nanotubes are similar to microtubules like the  $C_{60}$  molecule is similar to clathrin, the authors propose to use the knowledge from nanobiology (self-assembly of phi-based clathrins and microtubules) and implement it into molecular nanotechnology.



↑ A clathrin molecule has a "buckyball" geometry (truncated icosahedron, one of the 13 Archimedean solids), but the clathrin is made out of triskelion proteins rather than carbon atoms.



↑ Spiral triskelion (*triskele*), found in Celtic artwork.



See Utube animation:  
[www.youtube.com/watch?v=eRslV6lrVxY](http://www.youtube.com/watch?v=eRslV6lrVxY)

## SG204.3.10 Golden Fractal Biology: Quantum Harmony?

Physicist David Bohm's insight of a "world of unbroken wholeness" is becoming the foundation of the new paradigm Biology. The old model of molecular biology based on mechanistic chemical interactions is dead: it cannot possibly account for the instantaneous multi-tasking of living organisms. Photons and quantum field processes are required. Gene reductionism has been proven to be myopic ("Your genes are programming you" starts to sound like a voodoo curse). An expanded quantum-based view of Biology is fast becoming the only exciting biology for the new generation of scientists.

In the next chapter we introduce the new model of genetics: *wave genetics* where DNA is seen as an intermediary factory of proteins & bio-molecules which is receiving fine-tuned signals from a meta-context of exogenous sources of fractally scaled (embedded) information fields: electromagnetic, torsional, quantum... Epigenetics is another name for the study of genetic information-signaling beyond DNA itself.

Courageous pioneers have opened the way to understand the role of biophotons information transfer between living cells. The ultra-weak UV biophoton radiation is now understood as controlling cell metabolism and directing replication & transcription of DNA.

The overall concept of an quasi-instantly interconnected and resonant universe informed by meta-fields is a view of waveforms or oscillations interfering, beyond space/time limitations, within a FRACTAL SPECTRUM that repeats itself in self-similar ways on all scales. Energy-Information is traveling along every possible direction at the same time. For instance, instead of following a single trajectory like the electrons on a silicon chip, the energy in photosynthesis has been found to explore all of its options and to collapse the quantum process only after the fact, retroactively deciding upon the most efficient pathway.

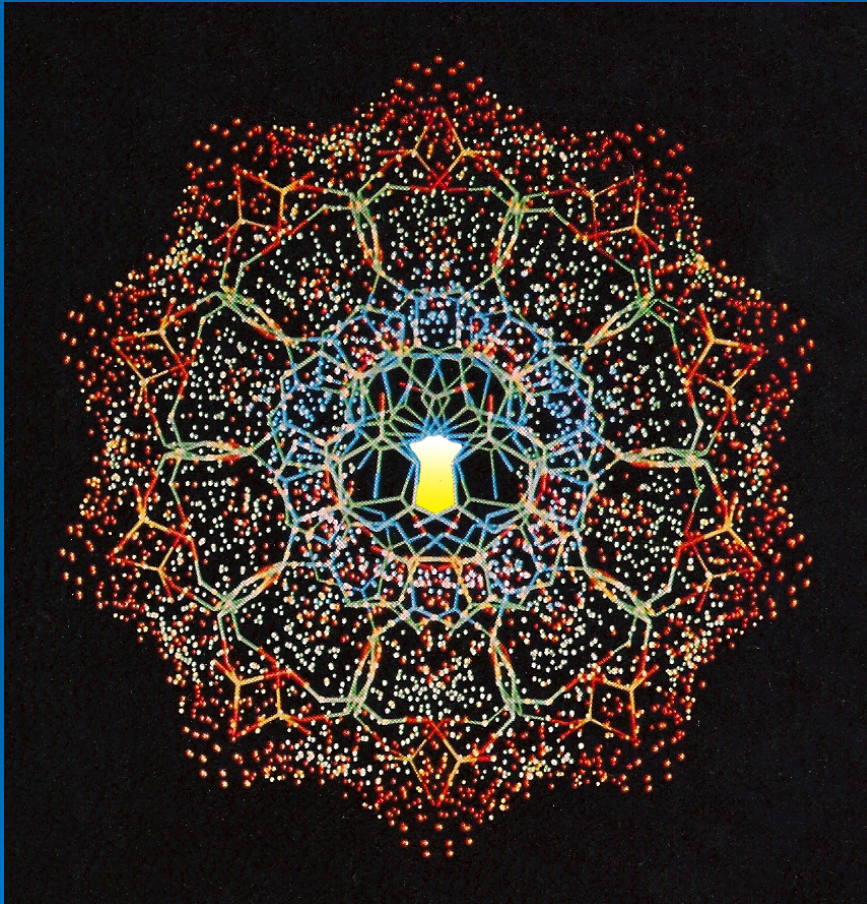
We predict that within Quantum Biology,  
FRACTAL PHI-BASED BIOLOGY will be the new standard of understanding biology.  
Quantum Universal Harmony may become a household expression...



← StarWheel #71.  
"Grail Sutra".



## SG204. Chapter 4 PHI Resonance in DNA



It has been a long way since 1953, the year Watson & crick published in Nature their double helix model of the DNA. For the next 5 decades or so, genetics built a quasi- empire based on innovative but mechanistic manipulations of molecular components...

... until questions arose and more refined experiments showed that genes were not the master controls they were proclaimed to be: the Human Genome project mapped out 5 times less genes than predicted, the DNA code was not a fixed genetic given but also responded to wave function resonances and, generally speaking, biology was, beyond mere chemistry, a complex orchestration of light & quantum processes.

Real biology turns out to be much more instantaneous and non-local (ubiquitous) than the slow chemical pathways still taught in medical schools. Epigenetics (the study of what is "beyond" genetics) showed that real biology constantly interacts, in fractal holographic ways, with the greater information flows of the larger cosmos and the Zero Point Field.

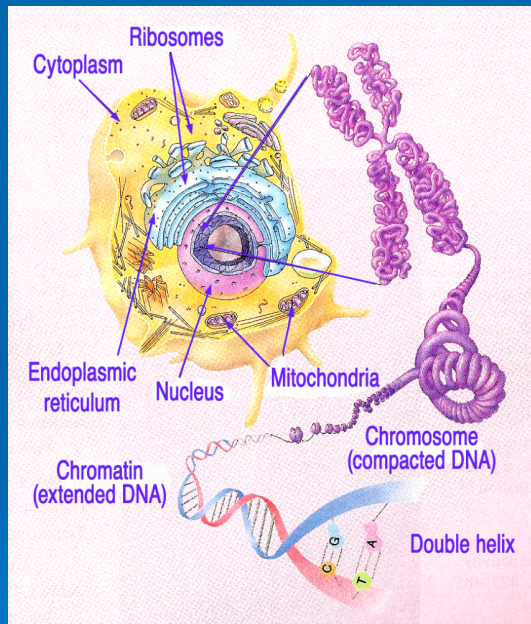
The way is now open for a New Paradigm biology to understand and apply "wave genetics" which includes consciousness, attention and belief in the co-creation of biology and the "human hologram".

## SG204.4.1.1 DNA Reminder (1) Structure

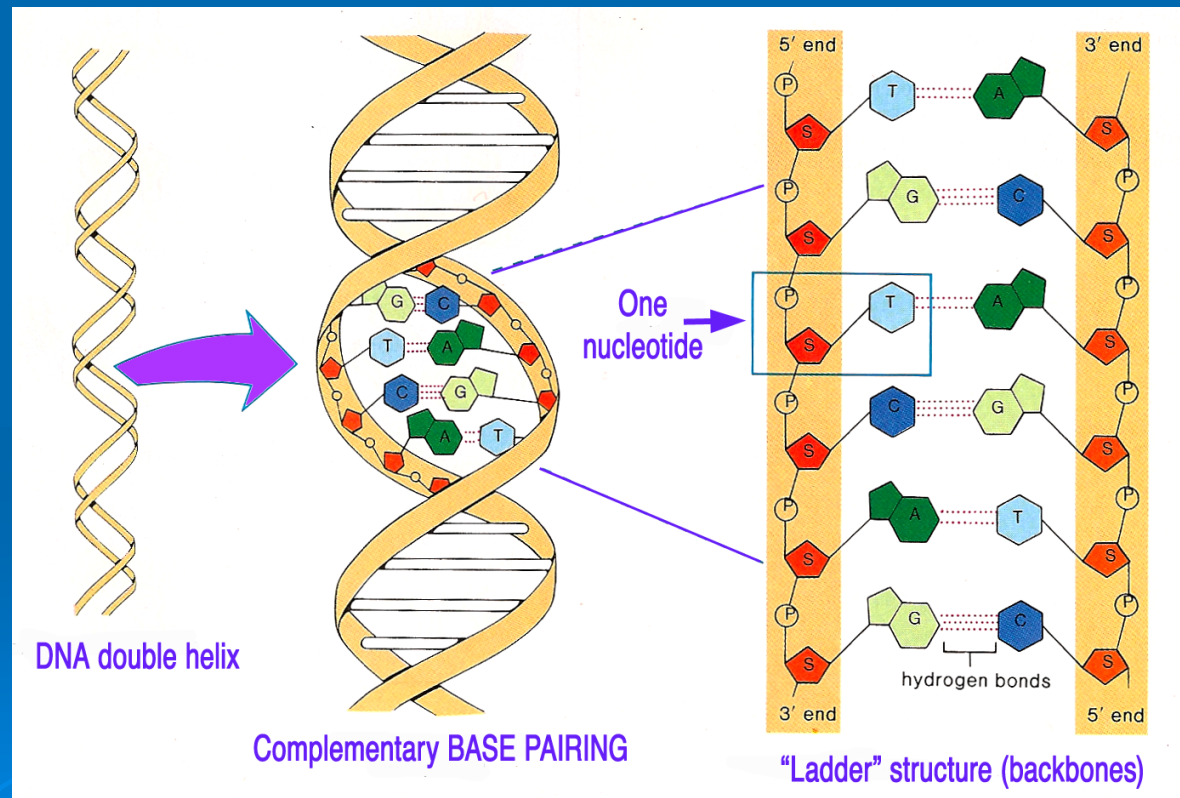
DNA (deoxyribonucleic acid) is a double helix of two long polymer strands composed of simple units called nucleotides, with backbones made of sugars (S) and phosphates (P). Attached to each sugar is one of four types of molecules called bases:

- 2 *Purines*: Adenine (A) & Guanine (G)
- 2 *Pyrimidines*: Thymine (T) & Cytosine (C)

It is the sequence of these 4 bases along the backbone that encodes information. The 4 bases assemble into triplets of 3 bases called "codons". This information is read using the genetic code, which specifies the sequence of the amino acids within proteins.



↑ A generic cell and its components. The DNA double helix is the extension of the DNA compacted in the chromosomes within the nucleus.



↑ Basic structure of DNA.



## SG204.4.1.2 DNA Reminder (2) Genetic Code

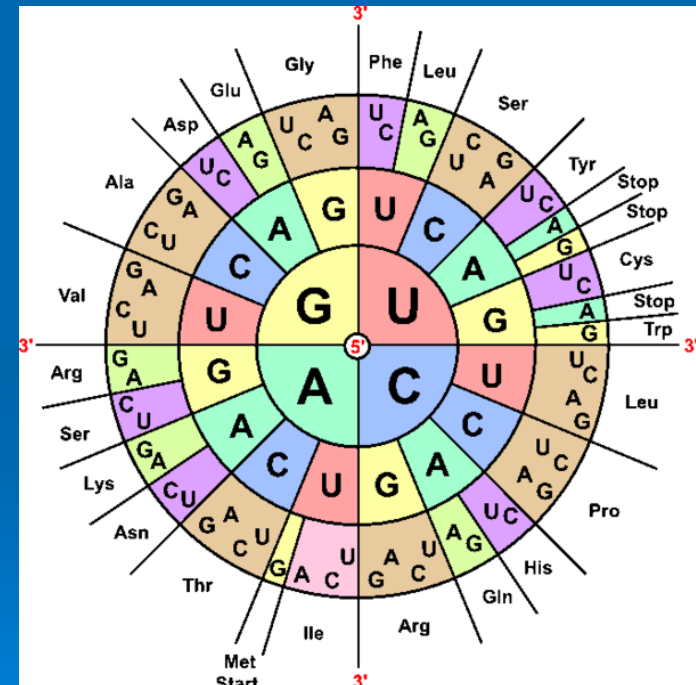
The DNA contains the Genetic Code whose message is passed to mRNA (messenger RNA) during transcription or the making of a RNA molecule that is complementary to a portion of DNA. Following transcription, RNA moves into the cytoplasm of the cell.

The genetic code is the set of rules by which information encoded in genetic material (DNA or mRNA sequences) is translated into proteins (amino acid sequences) by living cells. The code defines a mapping between tri-nucleotide sequences, called codons, and amino acids. With some exceptions, a triplet codon in a nucleic acid sequence specifies a single amino acid. Because the vast majority of genes are encoded with exactly the same code, this particular code is referred to as the canonical Genetic Code.

61 of the 64 triplet codons stand for particular amino acids, and the other 3 codons are "stop" codons (signifying polypeptide termination). During translation, the instructions - in the form of mRNA base sequences - are used to determine the order of amino acids in a polypeptide.

	U	C	A	G
U	UUU (Phe/F) Phenylalanine	UCU (Ser/S) Serine	UAU (Tyr/Y) Tyrosine	UGU (Cys/C) Cysteine
	UUC (Phe/F) Phenylalanine	UCC (Ser/S) Serine	UAC (Tyr/Y) Tyrosine	UGC (Cys/C) Cysteine
	UUA (Leu/L) Leucine	UCA (Ser/S) Serine	UAA Ochre (Stop)	UGA Opal (Stop)
	UUG (Leu/L) Leucine	UCG (Ser/S) Serine	UAG Amber (Stop)	UGG (Trp/W) Tryptophan
C	CUU (Leu/L) Leucine	CCU (Pro/P) Proline	CAU (His/H) Histidine	CGU (Arg/R) Arginine
	CUC (Leu/L) Leucine	CCC (Pro/P) Proline	CAC (His/H) Histidine	CGC (Arg/R) Arginine
	CUA (Leu/L) Leucine	CCA (Pro/P) Proline	CAA (Gln/Q) Glutamine	CGA (Arg/R) Arginine
	CUG (Leu/L) Leucine	CCG (Pro/P) Proline	CAG (Gln/Q) Glutamine	CGG (Arg/R) Arginine
A	AUU (Ile/I) Isoleucine	ACU (Thr/T) Threonine	AAU (Asn/N) Asparagine	AGU (Ser/S) Serine
	AUC (Ile/I) Isoleucine	ACC (Thr/T) Threonine	AAC (Asn/N) Asparagine	AGC (Ser/S) Serine
	AUA (Ile/I) Isoleucine	ACA (Thr/T) Threonine	AAA (Lys/K) Lysine	AGA (Arg/R) Arginine
	AUG <sup>[A]</sup> (Met/M) Methionine	ACG (Thr/T) Threonine	AAG (Lys/K) Lysine	AGG (Arg/R) Arginine
G	GUU (Val/V) Valine	GCU (Ala/A) Alanine	GAU (Asp/D) Aspartic acid	GGU (Gly/G) Glycine
	GUC (Val/V) Valine	GCC (Ala/A) Alanine	GAC (Asp/D) Aspartic acid	GGC (Gly/G) Glycine
	GUA (Val/V) Valine	GCA (Ala/A) Alanine	GAA (Glu/E) Glutamic acid	GGA (Gly/G) Glycine
	GUG (Val/V) Valine	GCG (Ala/A) Alanine	GAG (Glu/E) Glutamic acid	GGG (Gly/G) Glycine

↑ GENETIC CODE: Forward table  
(from codons to amino acids)



↑ GENETIC CODE: Reverse table  
(from amino acids to codons)

## SG204.4.1.3 DNA Reminder (3) Human Genome Project

The idea of the Human Genome Project (HGP) first began in the 1970s when biologists started to investigate human genes at the molecular level. As biochemical analysis of DNA became possible, it became clear that certain segments of DNA (called markers) were associated with particular conditions. Various countries started to map parts of the human genome in the 1980s but the international project really got under way when, in 1989, the Human Genome Organization (HUGO) was founded by leading scientists in the field to coordinate the massive international effort involved in unraveling the human genes.

A feat so vast that at first it seemed unachievable and heralded as the "Everest" of modern biology, the project's goal was to determine the sequence of chemical base pairs which make up the DNA (approximately 3.3 billion base-pairs) and to identify & map the approximately 20,000-25,000 human genes from both a physical and functional standpoint. It was a "mega-project" and a costly undertaking, involving advanced biotechnology, and took many years to complete. A first draft of the human genome was announced in June 2000. In February 2001, the publicly funded Human Genome Project and the private company Celera jointly announced that they had mapped the bulk of the human genome. In April 2003, the 50th anniversary of the publication of the structure of DNA, the completed map, was announced. The final sequence covers 99 per cent of the gene-containing regions of the genome.

The "finalized" version (August 2003) of the human genome entitled "BUILD34" - Note the fibonacci number - is available on the web here: [//hgdownload.cse.ucsc.edu/goldenPath/hg16/chromosomes/](http://hgdownload.cse.ucsc.edu/goldenPath/hg16/chromosomes/)

### The Revolutionary findings of the HGP

Conventional genetic science held that the human genome would contain a minimum of 120,000 genes located in the 23 pairs of human chromosomes (1 gene for each of the 100,000+ different proteins that make up then human body and 20,000 regulatory genes).

It turned out that the entire human genome consists of approximately 25,000 genes. More than 80% of the presumed DNA does not exist!

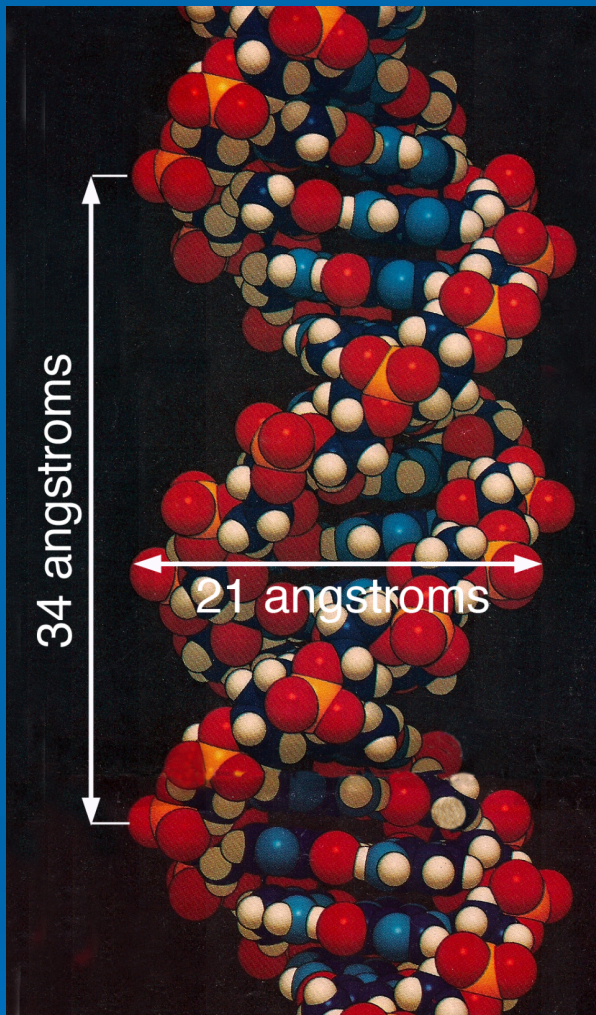
In the words of Bruce Lipton: *"The one-gene, one protein concept was a fundamental tenet of genetic determinism... No longer is it possible to believe that genetic engineers can fix all our biological dilemmas. There are simply not enough genes to account for the complexity of human life."* (The Biology of Belief. 2005)

- Human Genome = about 25,000 genes (1/5 of the expected count)
- One-gene / one-protein concept is obsolete.
- Humans have about the same number of genes as mice or worms.
- *"It is clear that we do not gain our undoubted complexity over worms and plants by using more genes... Understanding what does give us our complexity remains a challenge for the future."* (David Baltimore. 2001. Nature 409: 1189-1190)

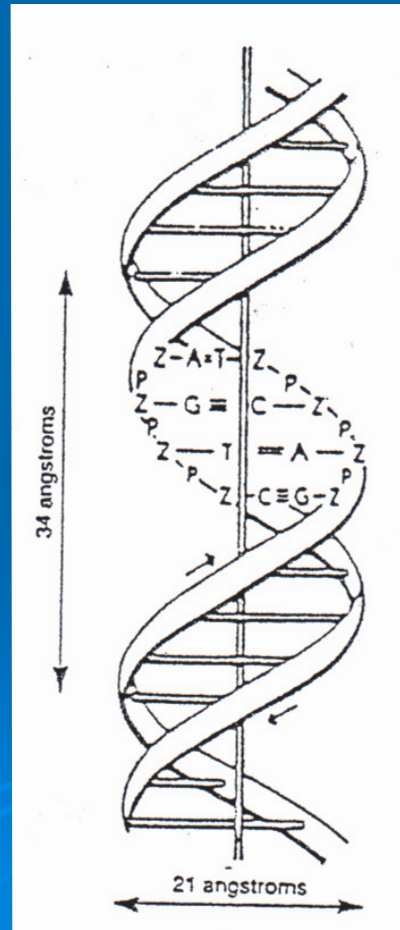


## SG204.4.2.1 DNA - Helix Geometry (1) Side View

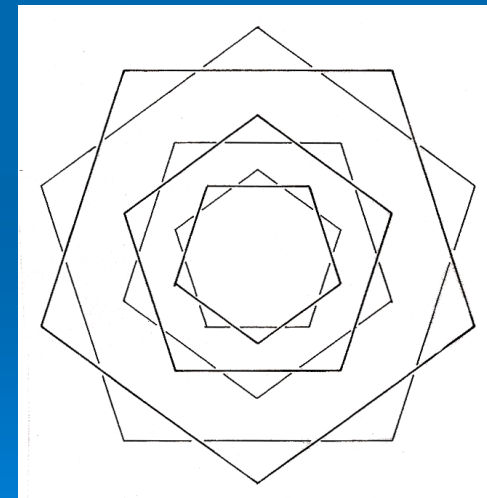
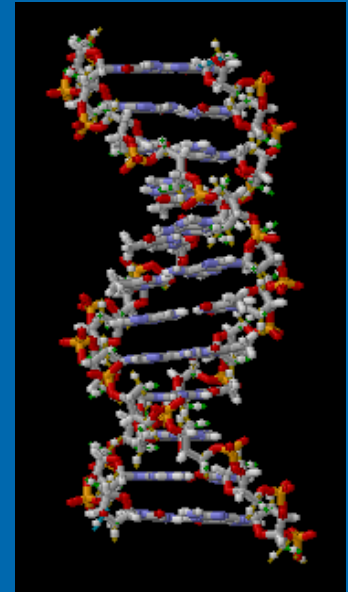
Seen from outside (side and top views), the geometric proportions of the DNA helix are based on Fibonacci numbers 21 and 34 as the two sides of a Golden Rectangle.



DNA side view ↑→  
(Golden Rectangle Proportion:  
Height = 34 Å  
Width = 21 Å)

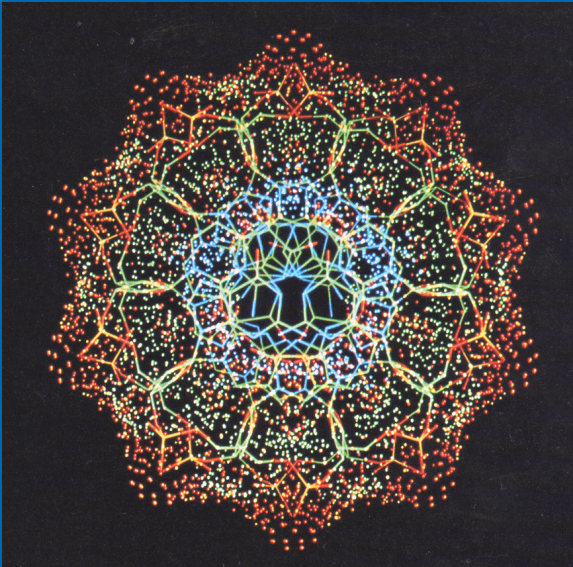


1 angstrom (Å)  
=  $1.0 \times 10^{-10}$  meters  
or one ten-millionth  
of a millimetre.

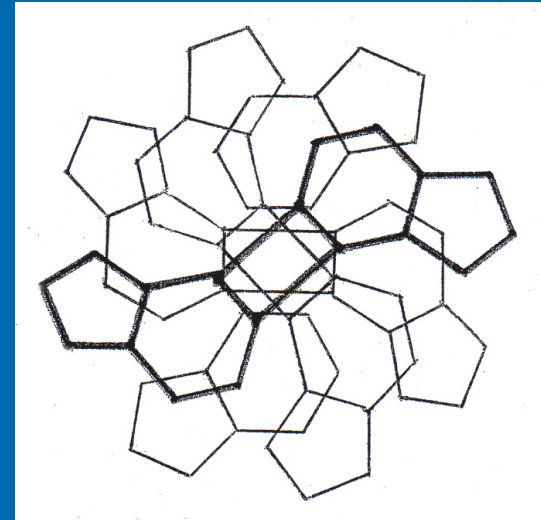
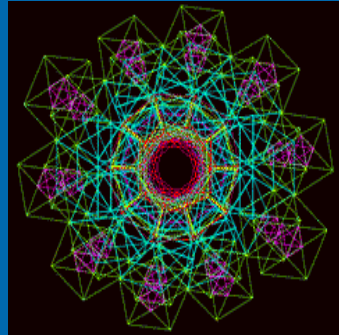


Imagine being Light  
and traveling through your DNA

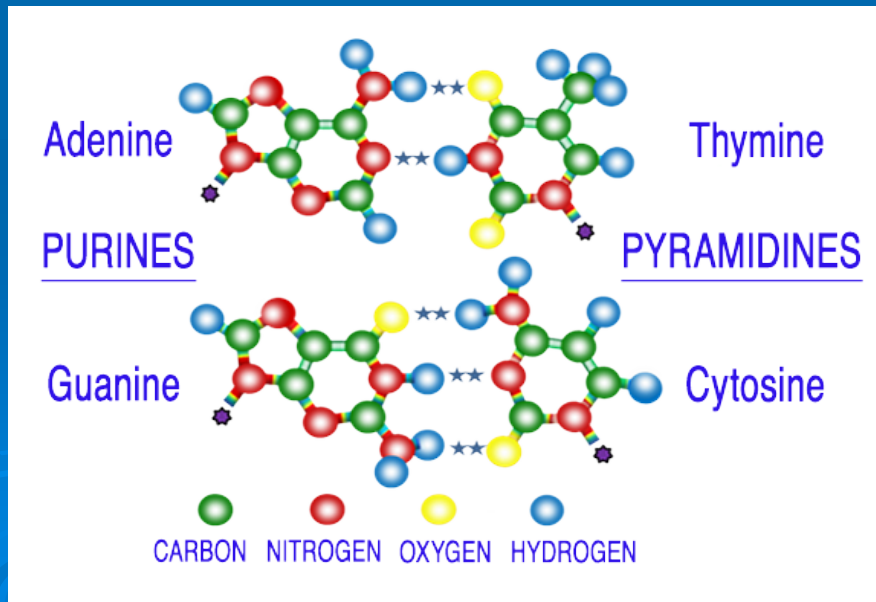
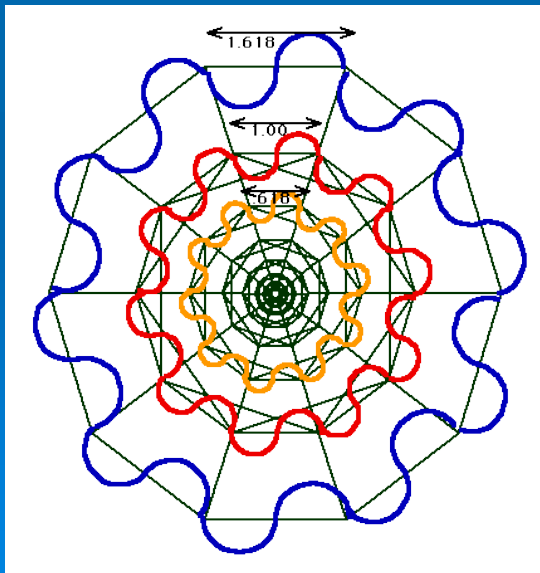
SG204.4.2.2  
**DNA - Helix  
 Geometry (2)  
 Top View**



↑↓ DNA top view  
 (5-fold symmetry)



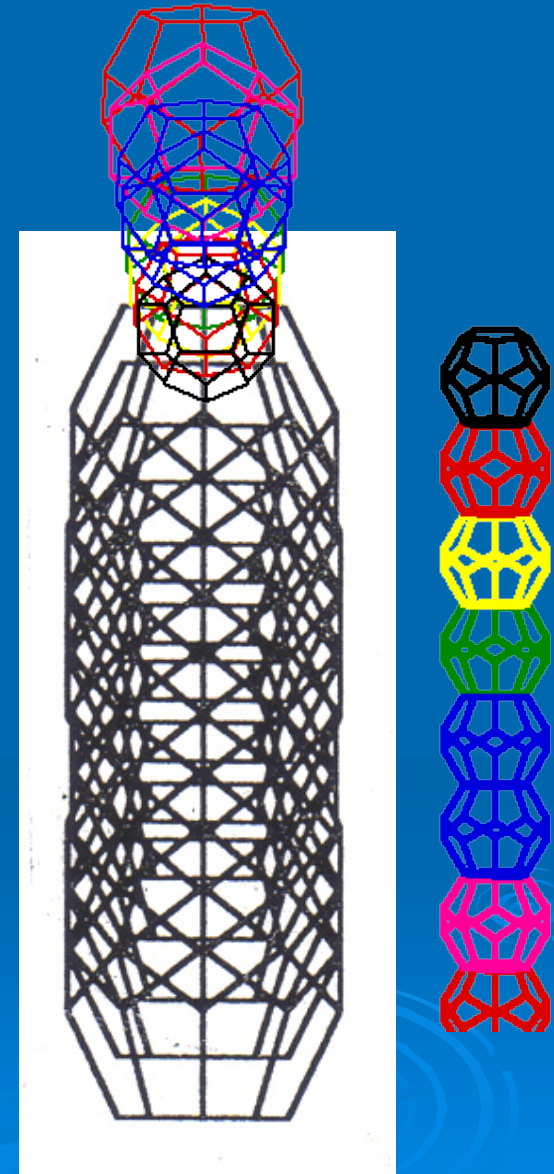
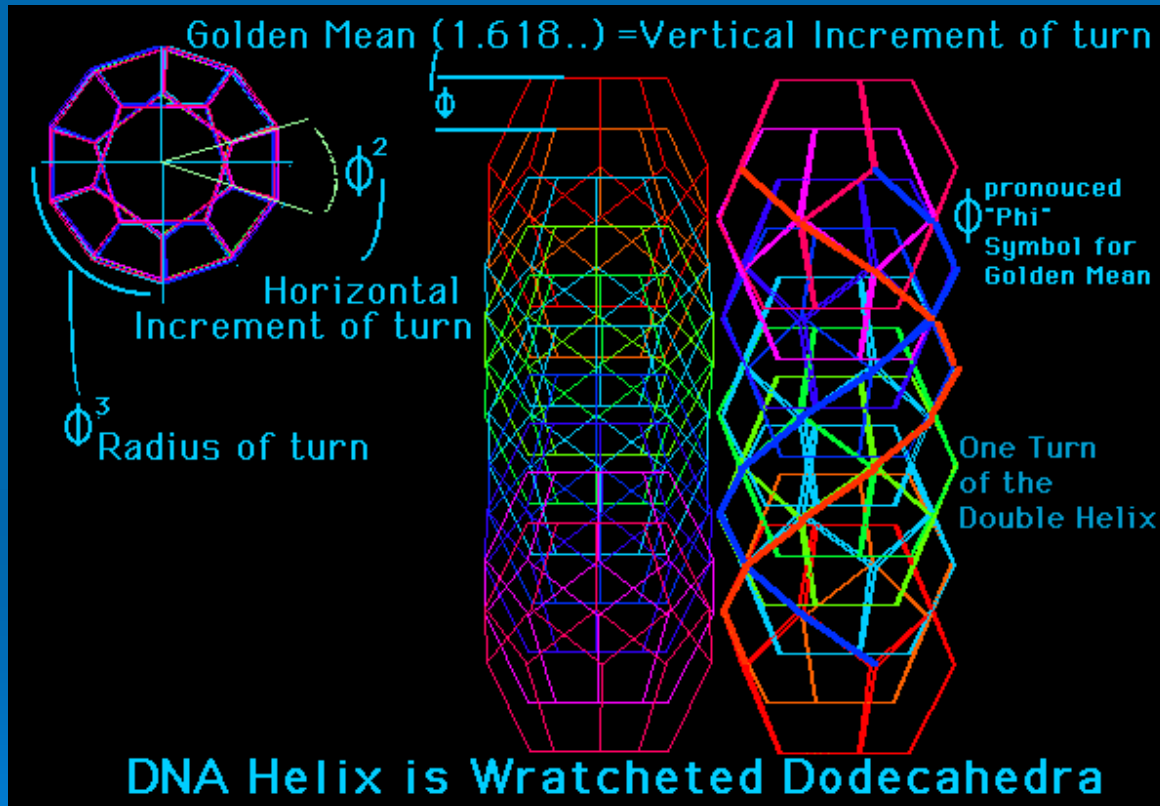
↑ Two fused pairs of hexagons & pentagons  
 are joined by a Golden Rectangle.





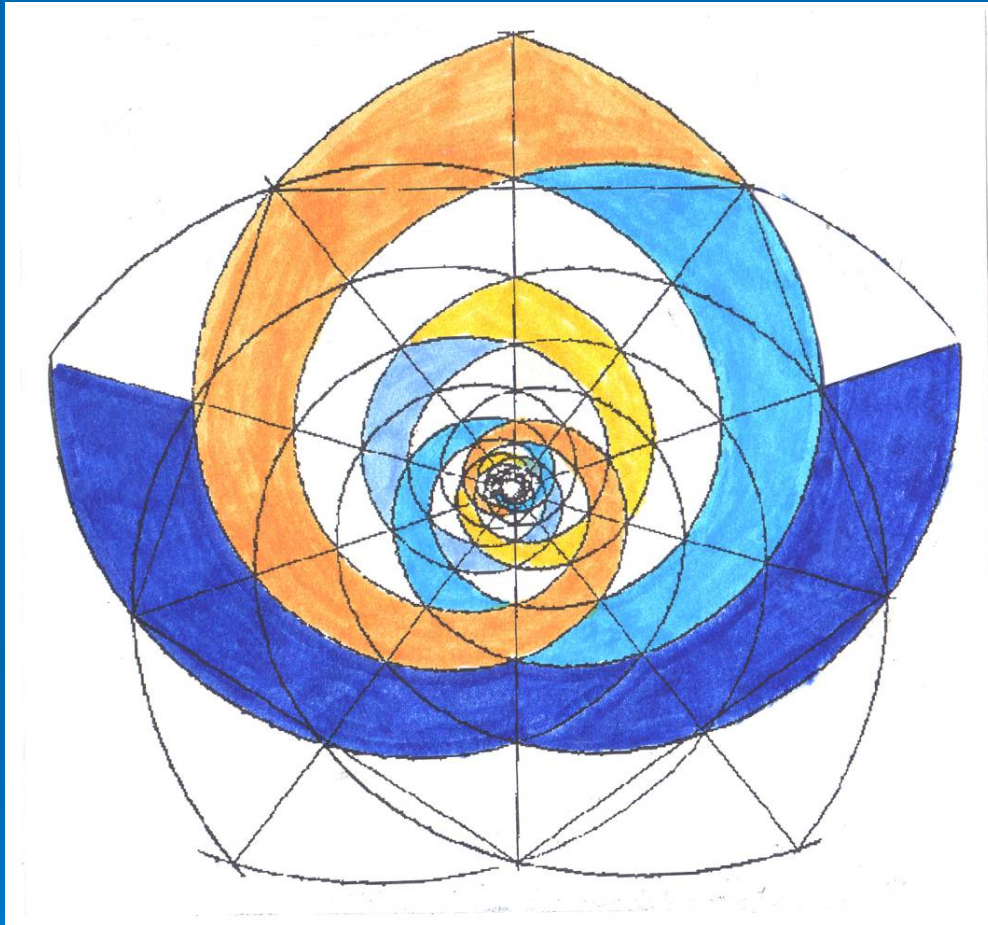
# SG204.4.2.3 DNA - Helix Geometry (3) Dodeca Structure

The DNA helix is a ratcheted cascade of dodecahedra.



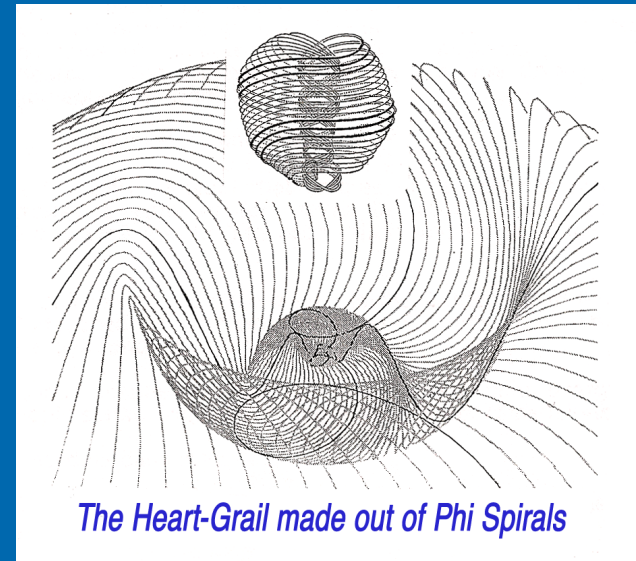
(Images from Dan Winter)

# SG204.4.2.4 DNA - Helix Geometry (4) Nested Spirals

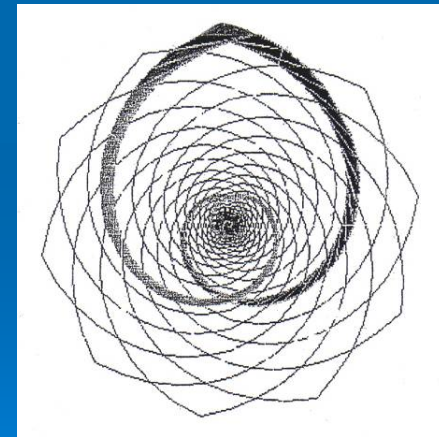


The “Grail-Cup” of a Phi vortex nest of golden proportions

(After Dan Winter) [www.goldenmean.info](http://www.goldenmean.info)



*The Heart-Grail made out of Phi Spirals*



Nested decagons create 3D  
fractal harmonic cascades

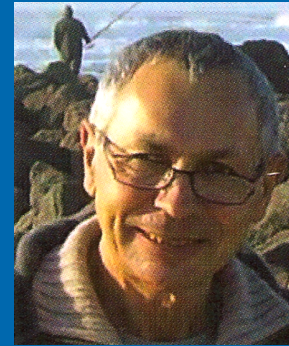


# SG204.4.3.1 DNA Golden Code

## (1) Meet J. C. Perez

In his seminal 1997 book *L'ADN Décrypté* (DNA Deciphered), mathematician and computer scientist Dr. Jean-Claude Perez methodically explains how, going beyond the mere geometry of the DNA, he uncovered a revolutionary fact: the DNA is woven with a Supra-Code of multi-layered resonances that constitute a hidden yet precise language.

The sequences of the four DNA bases ACTG are harmonically interconnected through properties based upon the Fibonacci & Lucas series, and therefore the Golden Ratio. J. C. Perez calls these properties “Resonances” and their global patterns of music-like pulses the “DNA Supra-Code”. This is the subject of the first book published by Dr. Perez "L'ADN Décrypté".



↑ Jean-Claude Perez

In the second book of his announced triptych, *"Codex BioGenesis I"* (2009), Dr. Perez uses the finalized data of the Human Genome Project to compute deeper and more complex numerical & golden relationships in the DNA. In the words of Dr. C. J. Calleman: *"A fundamental conclusion that can be drawn from the relationships that Dr. Perez has discovered is that the DNA sequences of all organisms must have emerged AS A WHOLE. They have in other words not emerged through random chemical reactions. I believe Dr. Perez has here discovered something that simply cannot be accommodated by the previous scientific paradigm that looks upon biological evolution as a whim of nature."* (Preface to Codex Biogenesis).

This is BIG NEWS and heralds a fundamentally new paradigm in the bio-sciences and science in general. Thank you J. C. Perez for pointing to a higher order behind the emergence of biological organisms and for opening the way to a purposeful meaning in the universe.

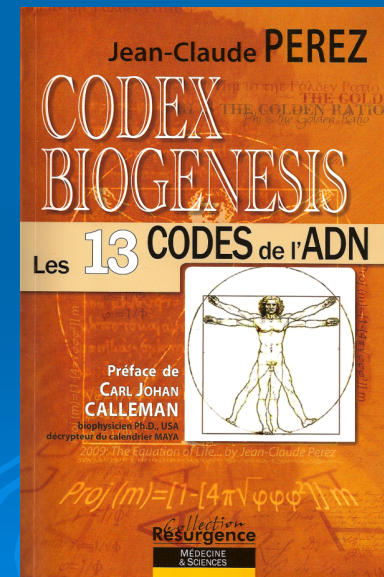
And yet this discovery has not penetrated within the walls of official biology, even though it was made in 1990 and regularly expanded upon since 1991. But soon, when the "time comes" for updating obsolete scientific models, it will suddenly seem natural and obvious: YES, of course, the DNA is a harmonic and musical score, a grand orchestration of life with exquisite chords in tune with PHI Major and Phi Minor. The two Leonardos (Fibonacci and Da Vinci) would have been thrilled.

In the next pages, we are describing this discovery and some of the "13 codes and harmonies of DNA" as discovered by J. C. Perez.

Quote from correspondence with Dr. Perez: "The Fibonacci resonances described in *L'ADN Décrypté* concern the sequences of all coding DNA (2% of the genome...). In non-coding DNA (98% of genome or "junk DNA"), this type of pattern is superseded by other levels of structure, still based on the Golden Number".



1997



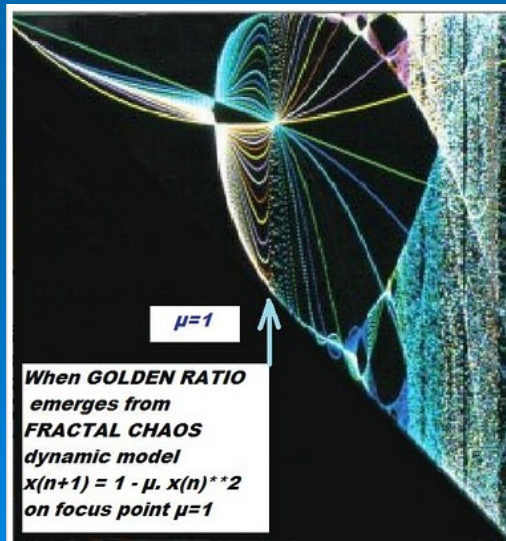
2009

## SG204.4.3.2 DNA Golden Code (2) Origins of Discovery (1)

Originally an engineer with IBM-France, Dr. Perez worked on artificial neural networks and neuronal computers. While studying fractal chaos models along the lines of the Prigogine models, he zeroed in into a fractal attractor that suggested the presence of the Golden number in the DNA. Says J. C. Perez: "*I was not looking for the Golden number nor the Fibonacci numbers but the information emerging from these (fractal chaos) images imposed on me to research the Golden Number and Fibonacci numbers in the DNA.*" (International Conference on Neural Networks, June 1990).

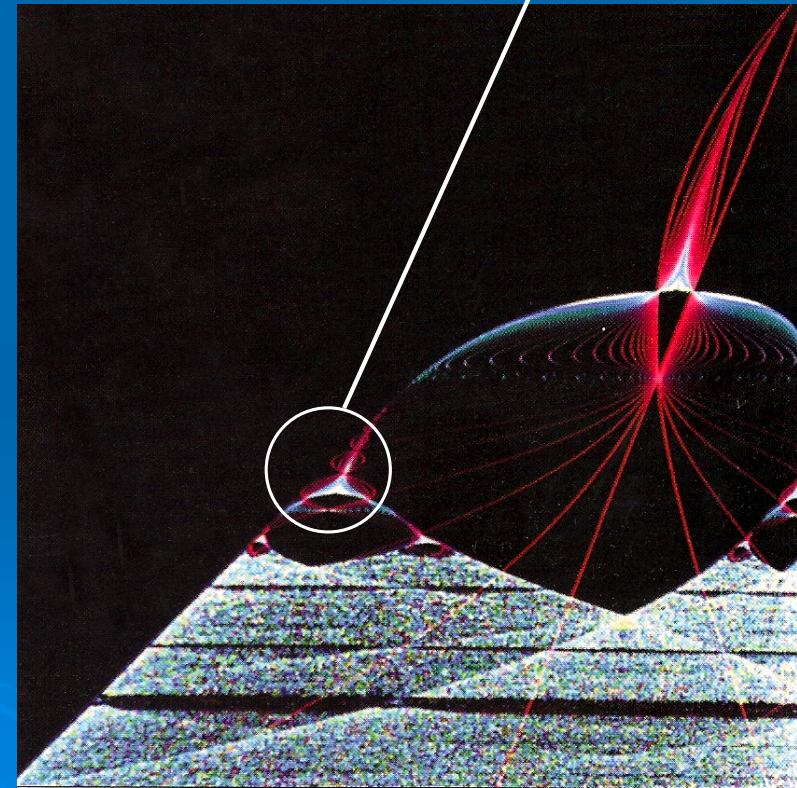
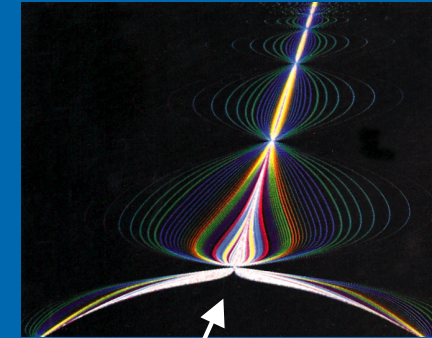
In 1991, Dr. Perez published a paper entitled "*Chaos, DNA and Neuro-computers: A Golden Link*" (Speculations in Science & Technology, Vol. 14, Nb 4-199 - [Link](#)) in which he proved the existence of a long-range order, formatted as a global genetic language, that is controlling the overall structure of nucleotide sequences in the genome. The central "key" to this order is related to the strong links between chaos, fractals and Fibonacci / Lucas integer number properties.

The term "DNA Supra-Code" was born (as suggested by Professor Luc Montagnier, 2008 Nobel Prize in Medicine - [Link](#)): relative proportions of TCAG nucleotides within the DNA Genetic coding obey the same Phi ratios. Golden Ratio and Fibonacci/Lucas integer numbers define strong relationships between DNA gene-coding region sequences and Fibonacci embedded TCAG gene sequence patterns.



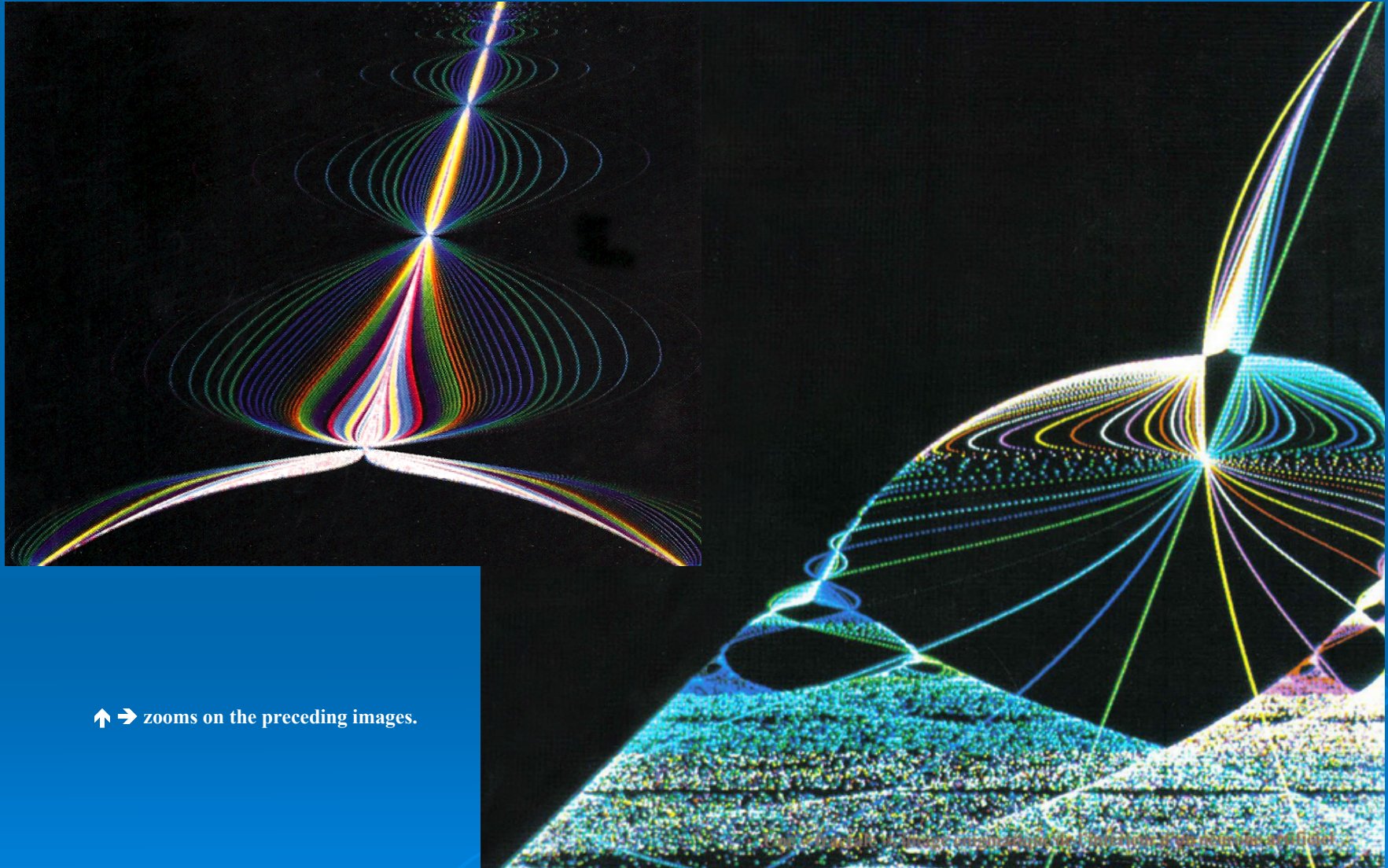
→ The center point where all curves converge is the Golden number.

→ Zooming on a region of the "Golden Fractal": the proportion between the heights of the two bigger "bulbs" =  $\Phi$  or the Golden Number 1.618





### SG204.4.3.3 DNA Golden Code (3) Origins of Discovery (2)



↑ → zooms on the preceding images.

## SG204.4.3.4 DNA Golden Code (4) DNA Deciphered (1)

In 1997, the optimality of the DNA patterns was proven in "*L'ADN Décrypté*". The nucleotides TCAG of the DNA tend to self-organize harmonically: they optimize their relative proportions according to the Fibonacci/Lucas numbers series and therefore according to the Golden Number (or its powers). ([Link](#))

Let us recall that, not long ago, Francis Crick, the co-discoverer of the DNA double helix, plainly stated that there was no order in the DNA: the mutual arrangement of the DNA nucleotides was to be attributed to random chance. It is only in 1992 that John Maddox, the (in)famous editor of Nature who tagged Sheldrake's book *A New Science of Life* (about morphogenetic fields) as a "book for burning", highlighted an article proposing the concept of long-range correlations between the relative distributions of the DNA bases (purines & pyrimidines).

The pioneering book by J. C. Perez extensively explored the numerical properties involved in the global harmony of the DNA and now called the "DNA Supra-Code". J. C. Perez conducted exhaustive combinatorial searches of resonances within gene-coding DNA sequences. Examples involving evolution and pathogen analysis include genes or small gene-rich genomes, especially the HIV genome.

A "resonance", as defined by J. C. Perez, is a harmonious proportion of exact Fibonacci/Lucas nucleotide numbers. For example:

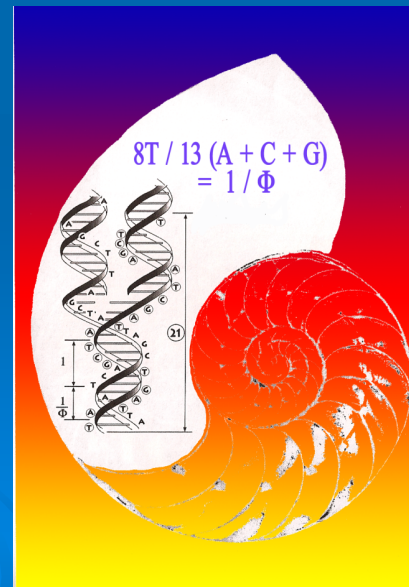
If 89 consecutive nucleotides comprise  
55 Adenine, Cytosine or Guanine bases and 34 Tyrosine bases,  
the proportion of this sequence is a "resonance" of type FFF (Fibonacci 89 - 55 - 34)  
(Note: Other resonances are FF1 (Fibo-Fibo-Lucas), LFF and LLL.)

Gene-rich genomes like HIV (Human Immunodeficiency Virus responsible for AIDS) have thousands of resonances, where the longer ones overlap 2/3rds of the whole genome length. The HIV genome has over 9,000 bases and is organized in over 50,000 significant resonances - of which more than 1,000 have a length larger than 2,000 genes. Called by J. C. Perez a "genetic architecture", these resonances can be computed with simple, deterministic and reproducible protocols. 13 main types of resonances were studied: simple resonances (T/ACG, C/TAG, A/TCG and G/TCA), bi-resonances (TC/AG, TA/CG, TG/CA) and meta-resonances (T/C, T/A, T/G, C/A, C/G, A/G).

Reminder:

FIBONACCI: 1 1 2 3 5 8 13 21 34 55 89 144 233...  
LUCAS : 1 3 4 7 11 18 29 47 76 123 199 322 521

[◆SG104]



← Illustration from "*L'ADN Décrypté*" showing a simple Fibonacci resonance (8 / 13) in sequences of 21 nucleotides.



## SG204.4.3.5 DNA Golden Code (5) DNA Deciphered (2)

```

CAGGTTCTTGCTGGTGTGAAATGACTGAGTACAACTGGTGGTGGTTGGAGCAGGTGGTG
TTGGGAAAAGCGCACTGACAATCCAGCTAATCCAGAACCACTTTGTAGATGAATATGATC
CCACCATAGAGGTGAGGCCAGTGGTAGCCCGATTCTTACAGAAAACAAGTGGTTATAGA
TGGTGAAACCTGTTTGTGGACATACTGGATACAGCTGGACAAGAAGAGTACAGTGCCAT
GAGAGACCAATACATGAGGACAGGCGAAGGCTTCCTCTGTGTATTTGCCATCAATAATAG
CAAGTCATTTGCGGATATTAACCTCTACAGGTAAGGAGTCATTATTTTGGAGCAGATT
AAGCGAGTAAAAGACTCGGATGATGTACCTATGGTGCTAGTGGGAAACAAGTGTGATTTG
CCAACAAGGACAGTTGATACAAAACAAGCCACGAAGTGGCCAAGAGTTACGGGATTCCA
TTCATTGAAACCTCAGCCAAGACCAGACAGGGTGTGAAGATGCTTTTTACACACTGGTA
AGAGAAATACGCCAGTACCGAATGAAAAAACTCAACAGCAGTGATGATGGGACTCAGGGT
TGTATGGGATTGCCATGTGTGGTGTATGATA
    
```

As an example of J. C. Perez methodology, here is a simple gene: the oncogene N-RAS, present in all humans and involved in certain forms of cancer. The N-Ras DNA comprises 630 bases: the gene itself of 570 bases and 60 "introns" or DNA regions that are non-coding (not translated into protein).

Table #1 (top) shows the entire sequence. Table #2 (bottom) shows the distribution of the very first bases (bases 1 to 15) into the 13 types of resonance. Note that this is the precursor of the gene, i.e. a DNA region that is non-coding and therefore, according to the current understanding, should have little significance. Yet, a high level of Supra-code structure was observed, as listed in Table #2. For instance, starting from the 9 first bases, 57 resonances of more than 47 bases were found.

← Table #1. DNA sequence of the 630 bases - oncogene N-RAS

BASES	TC/AG	TA/CG	TG/CA	T/CAG	C/AGT	A/GTC	G/TCA	T/C	T/A	T/G	C/A	C/G	A/G
1	0	0	0	0	0	199	76	0	0	0	144	123	0
1	0	0	0	0	0	123	55	0	0	0	89	89	0
2	76	0	0	0	0	89	199	0	0	0	144	0	0
2	0	0	0	0	0	123	0	0	0	0	89	0	0
2	0	0	0	0	0	0	0	0	0	0	55	0	0
2	0	0	0	0	0	0	0	0	0	0	47	0	0
3	76	0	0	0	0	89	199	0	0	0	0	89	0
3	0	0	0	0	0	0	0	0	0	0	0	76	0
4	0	0	0	0	0	0	199	76	0	0	0	123	47
4	0	0	0	0	0	0	123	0	0	0	0	89	0
5	0	0	0	0	0	0	123	123	47	0	0	0	0
5	0	0	0	0	0	0	0	55	0	0	0	0	0
6	76	0	76	0	0	0	123	47	0	0	0	0	0
7	76	0	76	47	0	0	0	47	0	0	144	123	0
7	0	0	0	0	0	0	0	0	0	0	89	89	0
7	0	0	0	0	0	0	0	0	0	0	47	55	0
8	76	0	76	47	0	0	47	47	0	0	0	0	0
8	47	0	0	0	0	0	0	0	0	0	0	0	0
9	89	0	0	0	0	0	0	0	0	47	0	0	0
9	76	0	0	0	0	0	0	0	0	0	0	0	0
9	55	0	0	0	0	0	0	0	0	0	0	0	0
10	89	0	0	0	0	0	0	0	0	47	0	55	0

← Table #2. The 13 types of resonance in N-Ras, looking at bases 1 to 15.

Note the appearance of Fibonacci (55, 89, 144...) and Lucas (47, 76, 123, 199...) numbers.

## SG204.4.4.1 Codex Biogenesis - DNA Codes (1)

Based on the data available from the finalized version of the Human Genome Project, J. C. Perez shared in 2009 the first series of comprehensive new "codes of harmony" he uncovered in the human genome. This is "Codex Biogenesis I". ([Link](#)). The second series of these codes illustrating the hidden "musical" order orchestrating the 3 billion bases TCAG in human DNA will be published in "Codex Biogenesis II". In the next pages, we describe some of these codes of harmony in the human genome:

- The ratio 13/1 (2 most frequent codons)
- The ratio 2/3 (32 most frequent codons)
- The presence of harmonic octaves in human DNA
- The  $\Phi^2/10$  ratio (proportions and atomic masses)
- The ratio 8/5 (8 last twin codons CG)

Finalized version of Human Genome Project  
[//hgdownload.cse.ucsc.edu/goldenPath/hg16/chromosomes/](http://hgdownload.cse.ucsc.edu/goldenPath/hg16/chromosomes/)

Visit the blog of Dr. Perez: [//golden-number-in-dna.blogspot.com/](http://golden-number-in-dna.blogspot.com/)

### DNA Meta-Code #1: the ratio 13/1

The numerical ratio BETWEEN the cumulative population of the 64 codons of the genome AND the population of the two most frequent codons (two dominant codons among the 64) is: 13. Inversely, the ratio between the population of the 62 less frequent codons and the population of the 2 most frequent codons is: 12.

**Total population of all the codons = A = 2,843,411,612**

**Population of the two dominant codons (TTT and AAA) = B = 218,734,983**

**A / B = 2,843,411,612 / 218,734,983 = 12.999 = ~13**

**Total population of the 62 less frequent codons = C = 2,624,676,629**

**C / B = 2,624,676,629 / 218,734,983 = 11.999 = ~12**

As J. C. Perez states: *"The collective intuition of humanity has given much significance to the number 12 (at the foundation of our calendar and astrology) and to the number 13 (at the foundation of the Mayan calendar and multiple beliefs linked to destiny or luck)... These numbers 12 and 13 are two facets of a deeper truth: the balance of relative populations of codons in the entire DNA of the human genome."*

### DNA Meta-Code #2: the ratio 2/3

The population of the 32 most frequent codons of the genome represents two thirds (2/3) of the total population of human codons. In other terms, it is twice (x 2) the population of the 32 less frequent codons. Inversely, the population of the 32 less frequent codons is one third (1/3) of the total population.

**Population 32 dominant codons / population 32 less dominant codons = 2 / 3**

Comments by J. C. Perez: *"The population of the 32 dominant codons shows a 'wave' relationship with the population of the 32 less dominant codons that is precisely a doubling of the frequency... As a musical analogy, the dominant population plays the musical note 'C' (for instance 10 hertz) while the less dominant population plays the same note at a lower octave (10/2 = 5 hertz)... A break in the relative proportions of the codons at the scale of the entire genome would shatter this perfect attunement and usher a 'musical cancer'..."*



## SG204.4.4.2 Codex Biogenesis - DNA Codes (2)

### DNA Meta-Code #3: Harmonic Octaves

This numerical exploration is sorting out the 64 populations of codons by decreasing order of appearance and then further grouping them by clusters of 8: the 8 most frequent codons form the first "octave", the next 8 most frequent codons form the second octave and so on... The numerical relationships between the different ratios are then analyzed.

Oct 1	Oct 2	Oct 3	Oct 4	Oct 5	Oct 6	Oct 7	Oct 8
TTT AAA	TAT ATA	TTC GAA	CAT ATG	GGA TCC	GCT AGC	GCC GGC	CCG CGG
ATT AAT	CTG CAG	TCA TGA	CCT AGG	GTG CAC	GAT ATC	GGT ACC	CGT ACG
TCT AGA	TGT ACA	TTG CAA	CTC GAG	GTT AAC	GGG CCC	GTA TAC	GCG CGC
TTA TAA	CTT AAG	TGG CCA	AGT ACT	TGC GCA	TAG CTA	GTC GAC	TCG CGA
201,626,221	153,554,748	145,371,295	130,877,827	112,632,228	101,137,579	83,976,857	18,627,112

← Distribution of the 64 codons among the 8 octaves.

### Significant ratios:

- **RATIO #1:**  $1 + 2 + 3 + 4 / \text{Sum all 8} = 631,430,091 / 947,803,867 = 0.66620 = \sim 2 / 3$  (see preceding page: Supra-code #2)
- **RATIO #2:**  $\text{Sum all 8} / 1 + 2 + 3 + 4 + 5 = 947,803,867 / 744,062,319 = 1.27382 = \sim \sqrt{\Phi}$  [Note:  $\sqrt{\Phi} = 1.27200$ ]
- **RATIO #3:**  $\text{Sum all 8} / 2 + 3 + 4 + 5 + 6 + 7 + 8 = 947,803,867 / 746,177,646 = 1.27021 = \sim \sqrt{\Phi}$   
Inversely,  $746,177,646 / 947,803.867 = 0.78727 = \sim 1 / \sqrt{\Phi}$  [Note:  $1 / \sqrt{\Phi} = 0.78615$ ]
- **RATIO #4:**  $5 + 6 + 7 / \text{Sum all 8} = 297,746,664 / 947,803,867 = 0.314143 = \sim \pi / 10$  [Note:  $\pi = 3.141592$ ]
- **RATIO #5:**  $\text{Sum all 8} / 5 + 6 + 7 + 8 = 2.99583 = \sim 3$
- **RATIO #6:**  $\text{ratio \#4} / \text{ratio \#3} = 0.314143 / 0.78727 = .399028 = \sim 2/5$  or  $(\pi / 10) / (1/\sqrt{\Phi}) = \pi\sqrt{\Phi} / 10$

## SG204.4.4.3 Codex Biogenesis - DNA Codes (3)

### DNA Meta-Code #4: the ratio $\Phi^2 / 10$

The ratio of the C & G bases of the 32 most frequent codons (called *major*) to the C & G bases of the 32 less frequent codons (called *minor*) is related by  $\Phi^2 / 10$  to the ratio of the T & A bases of the 32 most frequent codons to the T & A bases of the 32 less frequent codons. This can be written as:

$$(\text{Major CG} / \text{Minor CG}) / (\text{Major TA} / \text{Minor TA}) = \Phi^2 / 10$$

Detail of calculations for the human genome:

$$\text{Major C} + \text{Major G} = 857,106,311 + 857,309,551 = 1,714,415,862$$

$$\text{Major T} + \text{Major A} = 1,985,989,068 + 1,982,488,350 = 3,968,477,418$$

$$\text{Minor C} + \text{Minor G} = 885,972,717 + 886,719,273 = 1,772,691,990$$

$$\text{Minor T} + \text{Minor A} = 537,655,334 + 536,994,232 = 1,074,649,566$$

$$\text{RATIO 1 (Major CG} / \text{Minor CG)} = 0.9671256325$$

$$\text{RATIO 2 (Major TA} / \text{Minor TA)} = 3.692810702$$

$$\text{RATIO 1} / \text{RATIO 2} = .2618941805 \text{ (Note: } \Phi^2 / 10 = .2618033989)$$

$$\text{Since } \Phi^2 / 10 = .2618033989, \text{ the error is } = 0.00009078157758 \text{ or } 90/1,000,000$$

Moreover, Dr. Perez found that the same supra-code applies when looking at the atomic mass numbers of the bases TCAG. This is expressed as:

$$(\text{Mass Major CG} / \text{Mass Minor CG}) / (\text{Mass Major TA} / \text{Mass Minor TA}) = \Phi^2 / 10$$

$$\text{Mass Strand 1 Major C} + \text{Major G} = 2.230608998$$

$$\text{Mass Strand 1 Major T} + \text{Major A} = 5.143489452$$

$$\text{Mass Strand 1 Minor C} + \text{Minor G} = 2.30653882$$

$$\text{Mass Strand 1 Minor T} + \text{Minor A} = 1.392851573$$

$$\text{RATIO 1 (Major CG} / \text{Minor CG)} = 0.9670806224$$

$$\text{RATIO 2 (Major TA} / \text{Minor TA)} = 3.692776424$$

$$\text{RATIO 1} / \text{RATIO 2} = 0.2618844228 \text{ (Note: } \Phi^2 / 10 = .2618033989)$$

$$\text{Since } \Phi^2 / 10 = .2618033989, \text{ the error is } = 0.00008102388274 \text{ or } 81/1,000,000$$

It is quite astounding to see that the Phi-related HARMONIC ORDER presiding over the proportions of millions of nucleotides TCAG is also found at the level of their atomic masses. Quite a "supra-code"! Thank you J. C. Perez!



## SG204.4.4.4 Codex Biogenesis - DNA Codes (4)

### DNA Meta-Code #5: the ratio 8/5

The new harmonic relationships found by Dr. Perez are revolutionary for biology and herald a huge update of our understanding of genetics, the DNA and the universe. Among the wealth of these discoveries, we present here yet another supra-code: the Ratio 8/5 or perfect tuning of the last 8 twin codons CG.

By sorting out the rate of appearance among then 64 co of the entire human genome, one finds a sudden loss at the level of the 8 last codons. These 8 rarest codons are: CCG - CGC - CGT - ACG - GCG - CGC - TCG - CGA. Each of these 8 codons is between 3 & 14 times rarer than any other 56 other codons.

CCG	CGG
CGT	ACG
GCG	CGC
TCG	CGA

↑ The 8 rarest codons

Dr. Perez discovered a specific numerical relationship between the populations of "CG" codons and the populations of "GC" codons:

The ratio between the *sum* of the codons including GC or CG (i.e. GC + CG) and the *difference* between the codons including GC and the codons including CG (i.e. GC - CG) = 1.6 (or 16/10 or 8/5)

J. C. Perez comments: *"This discovery shows the existence, at the scale of our entire genome, of a kind of TUNING and ADJUSTMENT of the populations of CG and GC codons. This tuning is extremely precise and modulated."*

Dr. Perez believes that the bases C and G are the support of master code he calls the "UNIVERSAL BIOLOGICAL CODE". This Universal Code would control and unify the totality of the biological information: bio-atoms constituting life (C, O, N, H, S, P), the 3 types of bio-information (DNA, RNA and amino-acids) and the genomes themselves. [◆[infra SG204](#)]

The whole Human Genome is controlled by two BINARY CODES ATTRACTORS which provide a kind of self-organized bi-stable binary code ... like in computers! With the central following difference: the binary code within computers was invented artificially by humans, whereas the binary code of Life has emerged spontaneously or by self-organization. MEANWHILE, there are facts:

- The ratio between both bi-stable states is exactly equal to 2 (the space between two consecutives octaves in Music...)
- The top state is exactly matching with the GOLDEN RATIO...
- The bottom state is also exactly related to the Golden Ratio...

Top level =  $\phi$  (lower case) =  $1 / \Phi$

Bottom level =  $\phi / 2 = 1 / 2\Phi$

Top / Bottom = 2

Where  $\Phi$  is the Golden Ratio...

## SG204.4.5 DNA - Musical Genes

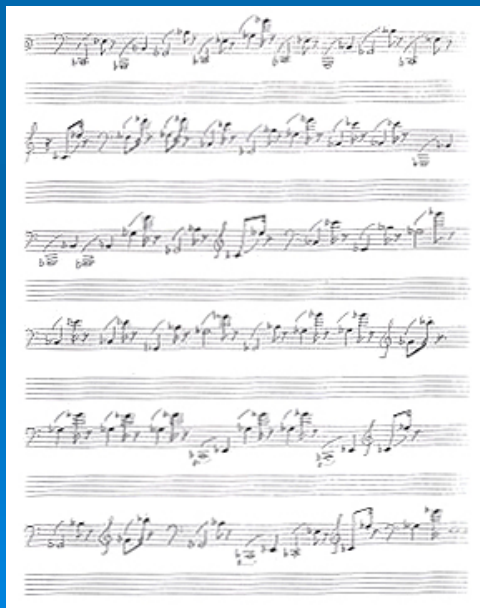
Observing the dynamics of Fibonacci's DNA supra-code resonances, Jean-claude Perez had the intuition of showing this pattern in a different media: MUSIC...

Then, to explore the aesthetic dimensions of this discovery, Perez published in 1994 an audio CD entitled: *"The First Music of the Genes"*.

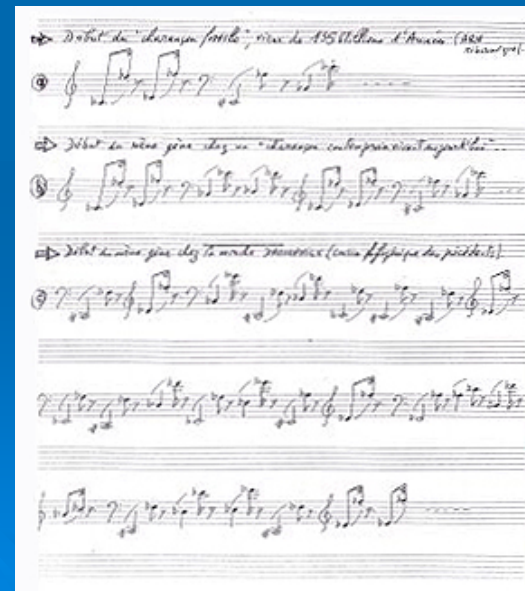


← The "Music of the Genes" cd by J. C. Perez.

For downloading audio tracks of the "Music of the Genes", go to:  
[//golden-ratio-in-dna.blogspot.com/](http://golden-ratio-in-dna.blogspot.com/)  
 (J. C. Perez main website)  
[Link to the 10 DNA music tracks](#)  
 (Google link)



→ Beginning of the musical score for the "Charançon Fossile" track.



← Beginning of the musical score for the oncogene Kiras.



# SG204.4.6 DNA - Fractal Supra-conductivity

## Optimizing High Temperature Superconductors by Golden Ratio

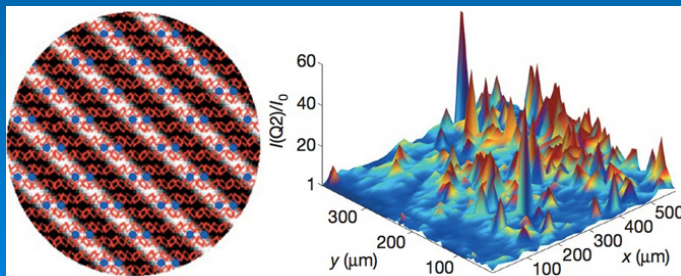
The question of how superconductivity emerges spontaneously from high-temperature superconductors is one of the major unsolved problems of theoretical physics.

In 2010, the discovery by Antonio Bianconi et al. published in NATURE (Nature, Vol. 466 No. 7308, August 12, 2010) shows evidence of fractal structure in high temperature superconductors. As commented by Brandon Keim in Wired Science ([www.wired.com](http://www.wired.com)):

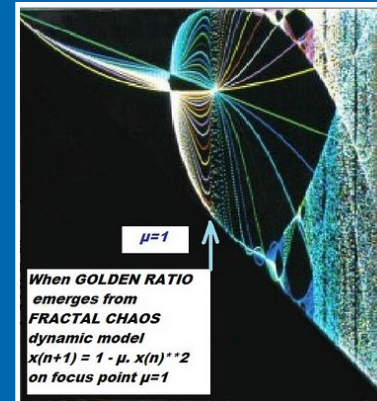
*"What seemed to be flaws in the structure of a mystery metal may have given physicists a glimpse into as-yet-undiscovered laws of the universe. The qualities of a high-temperature superconductor (a compound in which electrons obey the spooky laws of quantum physics, and flow in perfect synchrony, without friction) appear linked to the fractal arrangements of seemingly random oxygen atoms... Those atoms weren't thought to matter, especially not in relation to the behavior of individual electrons, which exist at a scale thousands of times smaller. The findings are a physics equivalent of discovering a link between two utterly separate dimensions..."*

*In Bianconi's samples, larger fractals correlated with higher superconductivity temperatures. When the fractal disappeared at a distance of 180 micrometers, superconductivity appeared at 32 degrees Kelvin. When it vanished at 400 micrometers, conductivity went quantum at 42 degrees Kelvin... That fractal arrangements are seen in so many other systems — from leaf patterns to stock market fluctuations to the frequency of earthquakes — suggests some sort of common underlying laws, but these remain speculative."*

Image credit:  
[www.nature.com](http://www.nature.com)



↑ Left: organization of oxygen atoms (blue) in superconductors. Right: superconductive temperatures with fractal structure.



← Evidence of Golden ratio hyper-sensitivity in a specific region of the "fractal chaos" neural network model.

As early as 1994, J. C. Perez published an international patent proposing to optimize high temperature superconductors using a specific region of the FRACTAL spectrum: GOLDEN RATIO (*method for the functional optimization of high temperature superconductors by controlling the morphological proportions of their thin layers*).

In fact, J.C. Perez's main science quest is about this "mysterious trilogy": fractal worlds - Golden ratio - and high level structures emerging from matter (high temperature superconductors) or life (DNA)... In a response to the Wired article, Dr. Perez explains:

*"The next step of optimal superconductors will be this specific Golden ratio area within the fractal spectrum..."*

At the end of his Codex Biogenesis, Dr. Perez presents his "E = mc<sup>2</sup> of biology" (or "Equation of Life"):

$$\text{Proj}(m) = [1 - (4\pi\sqrt{\phi\phi^2})]m$$

With  $\sqrt{\phi} = 1 / \sqrt{\Phi}$   
 $\phi = 1 / \Phi \quad \phi^2 = 1 / \Phi^2$

This non-linear projection formula provides a common whole number-based code unifying bio-atoms, nucleotides, codons, RNA, DNA and amino acids.

## SG204.4.7 DNA as Cosmic Phi Antenna

In his most recent article (Codon populations in single-stranded whole human genome DNA Are fractal and fine-tuned by the Golden Ratio 1.618 - <http://www.resurgence.be/pdf/ADN-perez.pdf>), Dr. Perez first reviews the latest DNA research:

1. 1991 (Speculations in Science & Technology): J. C. Perez first exposed Fibonacci/Lucas relationships in DNA sequences. [◆supra SG204]
2. 1992 (Nature 356): Peng et al. found trace evidence of fractals in DNA sequences.
3. 1997: Dr. Perez published his book "*L'ADN Décrypté*" (DNA Deciphered).
4. 2008 (Bulletin of Mathematical Biology 70): Yamagishi et al. proposed evidence of Fibonacci-based organization and verified it at a statistical global level across the human genome.
5. 2008 (The cerebellum Springer 7): Pellionicz advanced "*principle of recursive genome function*".
6. October 2009 (Science magazine 326): Liebermann-Aiden et al. probed the 3D architecture of the whole genome. Exploring the chromatin conformation folding of the human genome on a megabase scale, they found it to be consistent with a fractal model. The cover of the same issue of Science shows a folding Hilbert fractal curve. Dr. Eric Lander (Science Adviser to the President) states "*Mr. President, the Genome is Fractal!*". Since the physical structure of the genome is fractal, it logically follows that the informational function is also fractal.
7. 2009: In *Codex Biogenesis*, J. C. Perez showed a convergence of numerical/proportional evidence for whole genome fractal organization.
8. 2010 (Science magazine 327): Coldea et al. reported the presence of the golden ratio in the atomic scale [◆SG203B]

### Abstract of the paper ("*Codon populations...*") by J. C. Perez:

*Abstract:* This new bio-informatics research bridges Genomics and Mathematics. We propose a universal "*Fractal Genome Code Law*": the frequency of each of the 64 codons across the entire human genome is controlled by the codon's position in the Universal Genetic Code table. We analyze the frequency of distribution of the 64 codons (codon usage) within single-stranded DNA sequences. Concatenating 24 Human chromosomes, we show that the entire human genome employs the well known universal genetic code table as a macro structural model. The position of each codon within this table precisely dictates its population. So the Universal Genetic Code Table not only maps codons to amino acids, but serves as a global checksum matrix.

The frequencies of the 64 codons in the whole human genome scale are a self-similar fractal expansion of the universal genetic code. The original genetic code kernel governs not only the micro scale but the macro scale as well. Particularly, the 6 folding steps of codon populations modeled by the binary divisions of the "*Dragon fractal paper folding curve*" show evidence of 2 attractors. The numerical relationship between the attractors is derived from the Golden Ratio.

We demonstrate that:

1. The whole Human Genome Structure uses the Universal Genetic Code Table as a tuning model. It predetermines global codons proportions and populations. The Universal Genetic Code Table governs both micro and macro behavior of the genome.
2. We extend the Chargaff's second rule from the domain of single TCAG nucleotides to the larger domain of codon triplets.
3. Codon frequencies in the human genome are clustered around 2 fractal-like attractors, strongly linked to the golden ratio 1.618.

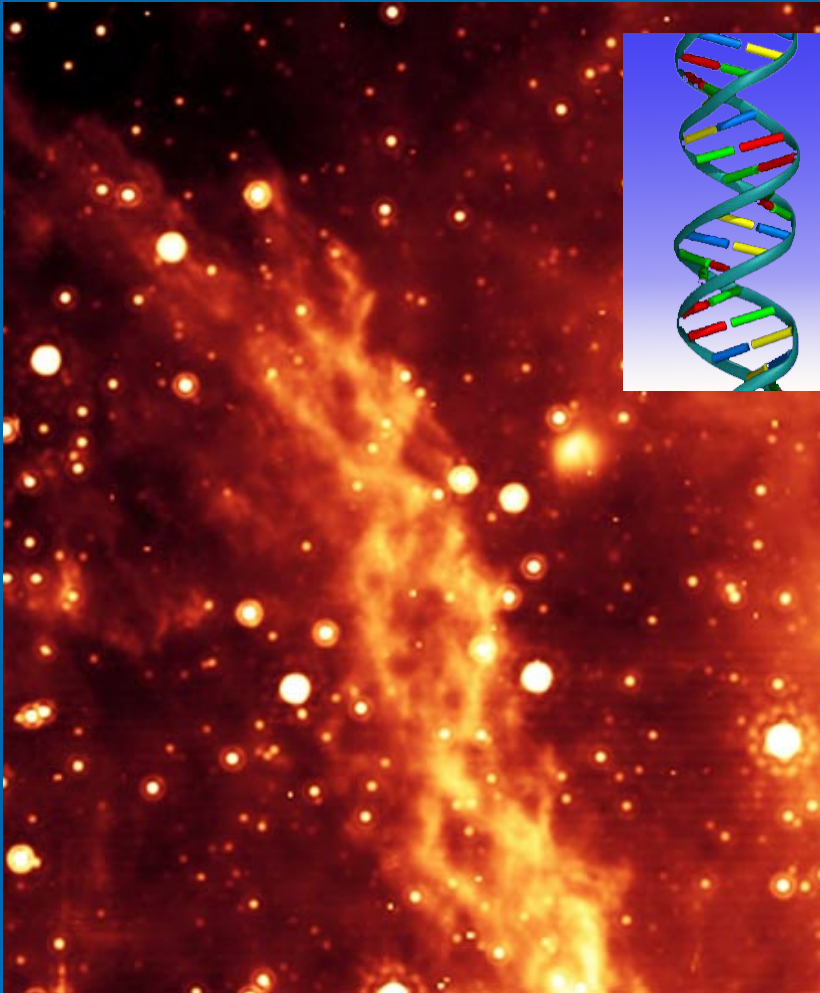
Links to review the research of Dr. Perez:

Scribd Synthesis: [Link](#) Bio-mathematics intro: [Link](#)

Google link: <https://sites.google.com/site/codexbiogenesis/home>

Beijing Conferences: [Link](#) Montevideo Conferences: [Link](#)





[www.dnareplication.info](http://www.dnareplication.info)

## SG204.4.8 Double Helix Nebula

Magnetic forces at the center of the galaxy have twisted a nebula into the shape of DNA, a new study reveals.

The double helix shape is commonly seen inside living organisms, but this is the first time it has been observed in the cosmos. *"Nobody has ever seen anything like that before in the cosmic realm,"* said the study's lead author Mark Morris of UCLA. *"Most nebulae are either spiral galaxies full of stars or formless amorphous conglomerations of dust and gas-space weather. What we see indicates a high degree of order."*

These observations, made with NASA's Spitzer Space Telescope, are detailed in the March 16 (2006) issue of the journal *Nature*.

[www.space.com](http://www.space.com)

↑ Color enhanced version of the infrared signals from the Double Helix Nebula.  
The spots are mostly red giants and red supergiants. Many other stars are present, but are too dim to appear.  
Credit: NASA/JPL-Caltech/UCLA

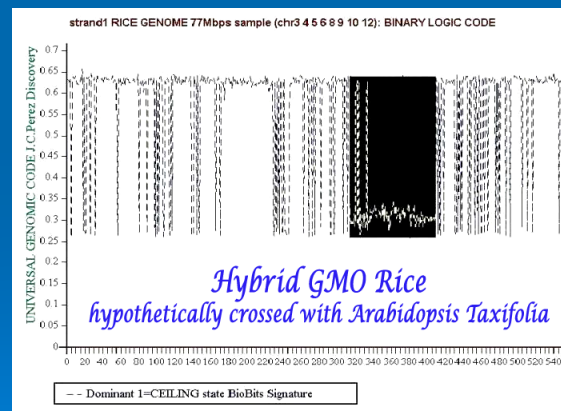
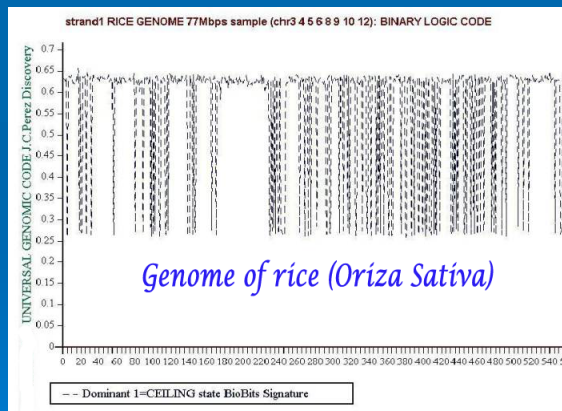
## SG204.4.9 DNA - Transgenic Planet

The discoveries of Dr. Perez directly bear upon the debate about GMOs. Given the evidence uncovered by Perez of a global unity, a precise & balanced resonance, and an overall integrity at the scale of entire genomes, the question arises: what happens to these delicate "equilibria" when genetic engineering randomly inserts some fragment of a genome belonging to another species? What happens to the "music of the genes"?

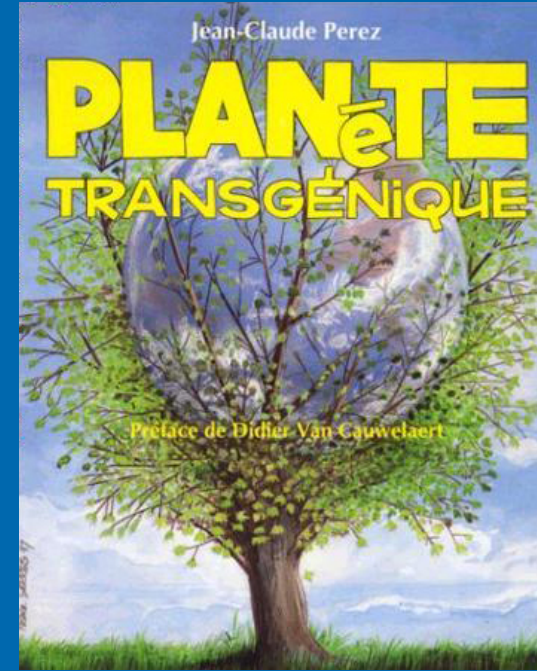
The answer is: the optimal ratios and resonances would be "detuned". Detuning is defined as follows: "Shifting the frequency of one harmonic - i.e. detuning it - will cause it to be segregated from the rest of the complex, and heard as a separate tone; shifting it in time so that it starts earlier or later than the remaining tones will similarly inhibit the fusion of simultaneous tones".

Moreover, Dr. Perez demonstrated that each species differs from other species by "adjusting" its genome through a precise & perfect "tuning" around two attractor numbers (genomic numbers) specific to this species. These two numbers are always simple expressions of the Golden ratio PHI. In the case of GMOs, the genomes of the host and of the transgene would have two different genomic numbers and would thus present the risk of a slight or intensely damaging DIS-HARMONIZATION.

Dr. Perez gives the following example of GMO disharmony.



Paraphrasing Antoine de Saint-Exupery, Perez states: "... Upon the planet of the Little Prince, there were terrible seeds, the seeds of weeds. They were GMO seeds. The soil of the planet was infested. The thing with weeds is that, if you are too late, you can no longer get rid of them. They take over your planet and their roots pierce it all through. And, if the planet is small and the GMOs are too many, the planet will explode..."



↑ Cover of the 1997 book by J. C. Perez.



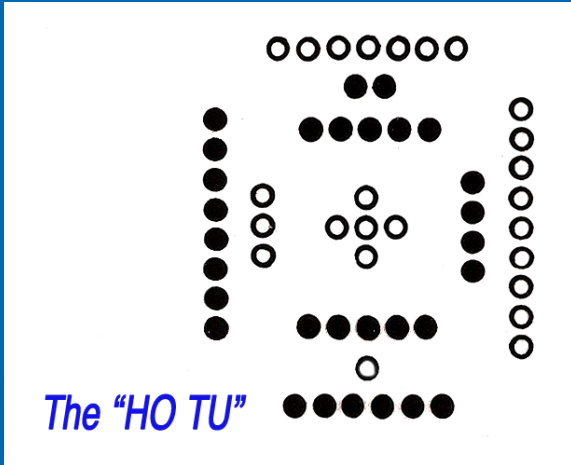
↑ "GloFish", the first genetically modified animal to be sold as a pet.



# SG204.4.10.1 DNA & I Ching (1)

Ever since Leibniz got acquainted with the binary fractality of the I Ching (or Book of Changes/Mutations) through the reports of the Jesuit missionaries in China, the I Ching has been a source of fascination, mystery and intense research for many people, from scientists to just curious people. Lately, the correspondence between the 64 hexagrams of the I Ching and the 64 DNA codons has inspired many interpretations.

In 1994, German-American researcher Katya Walker published her book "The Tao of Chaos" in which she disclosed new correlations. Her main breakthrough was to see the ancient Chinese magic squares, the Ho Tu and the Lo Shu, as molecular and atomic dot diagrams: the Ho Tu being the DNA plan and the Lo Shu the RNA transcribing the plan. Katya Walker sums up by stating: "*The Ho Tu is a stylized atomic map of the H-bonded base pairs of DNA, rearranged for mnemonic retention over time*". K. Walker sees the I Ching and the genetic code as "*springing from the same archetypal co-chaos super-system*". We summarize below the traditional information about the two Chinese diagrams and show the DNA correlations found by K. Walker.



The "Ho Tu" translates as "The Plan of the Yellow River"

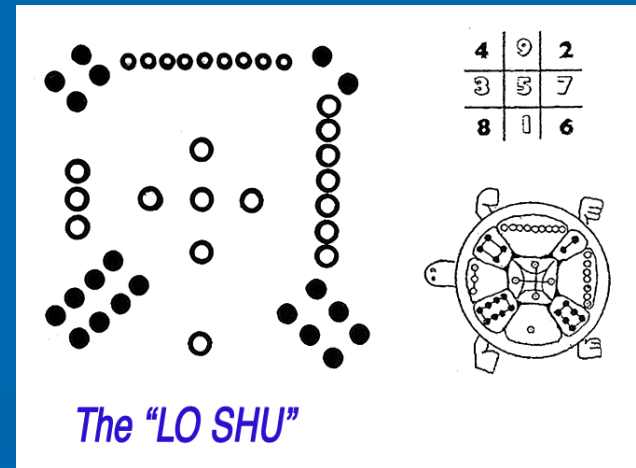
Ancient Chinese stories say that, around 3,000 B.C.E., Fu Xi (legendary emperor and father of the Chinese culture) saw a dragon-horse rise out of the Ho river and, from looking at the spots on its back, he was inspired to write down the *Ho Tu* diagram.



↑ Yu-the-Great is best remembered for teaching the people techniques to tame rivers and lakes during an epic flood.



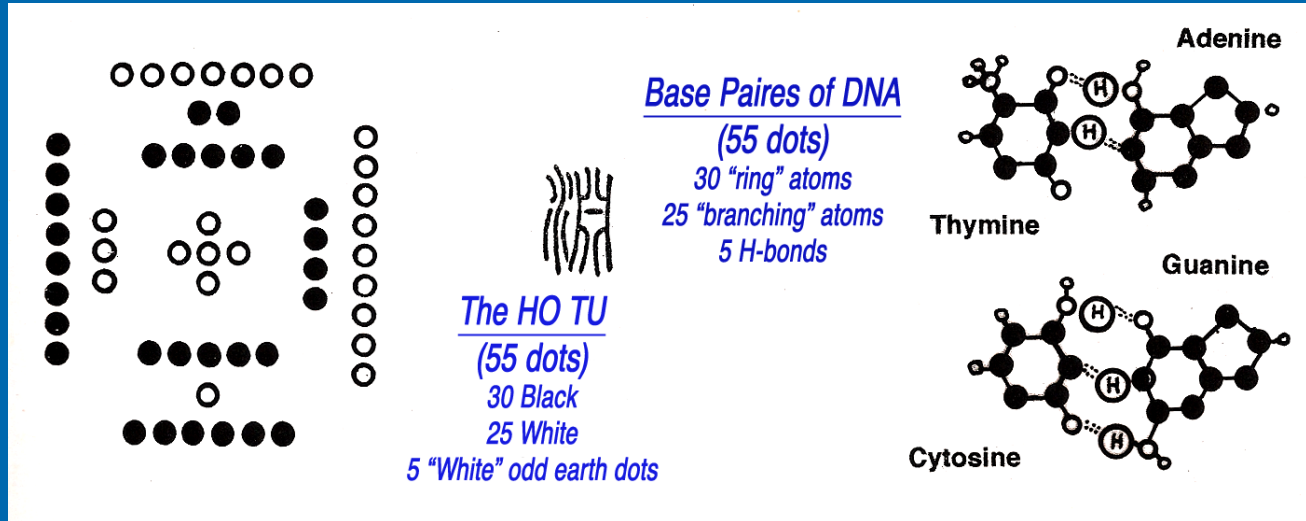
↑ In charge of Cosmic Harmony & Contemplation, Fu Xi invented the 8 Trigrams.



"Lo Shu" means "The Writing of the Lo River".

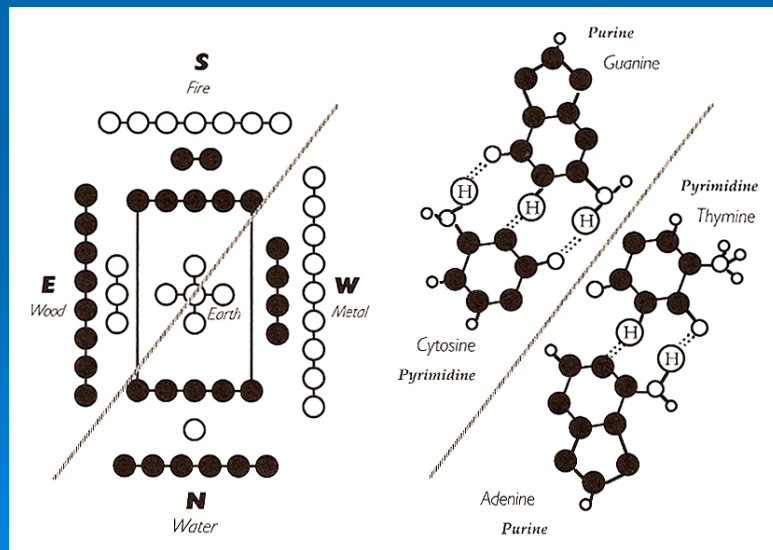
According to the Chinese legend, it came from the Lo river, in around 2200 B.C.E. The emperor Yu ("Yu-the-Great") was busy inspecting public works when he saw markings on the back of a tortoise rising out of the Lo river. From these markings, he created the *Lo Shu* as a magic square and saw its connection with the already ancient *Ho Tu*.

## SG204.4.10.2 DNA & I Ching (2)



← Katya Walker's comparison between the Ho Tu diagram and the base pairs of the DNA.

Setting the molecule pairs into opposition on the Ho Tu, there is a precise match, even to the central 5 of the hydrogen atoms bonding the pairs of A-T and C-G.



← Another configuration by making the molecule pairs adjacent.

K. Walker comments: "This layout has an elemental harmony to it. The pair of Wood-C and Fire-G support each other, as do the pair of Metal-T and Water-A... The adjacent pair of North and West partake of each other's qualities, as do South and East..."

Things go into balance when grouped SE and NW. Now the purines and pyrimidines are grouped appropriately...

Also the yang and yin dots are properly distributed between the pairs of molecules. Now there are 15 black holding dots in each pair of adjacent directions, just as there are 15 central ring atoms in each pair of bases."



## SG204.4.10.3 DNA & I Ching (3)

... as seen by the 13-20 Natural Time Calendar.

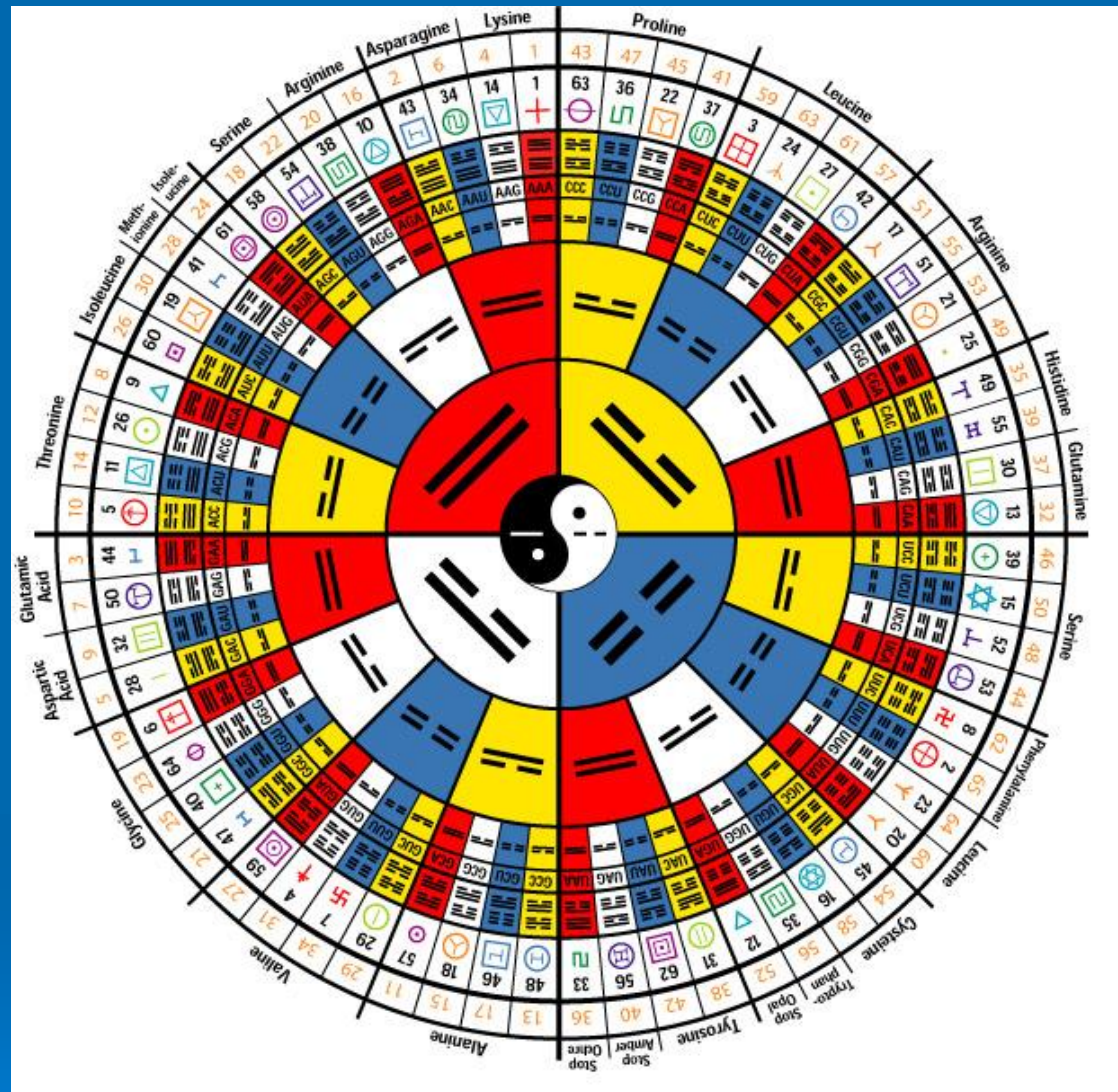
The I Ching encourages us to take an active role in the evolution of our own DNA. It utilizes the power of the 7 days multiplied by the power of 13 weeks and multiplied again by 4 quarters or seasons to effect changes in ourselves on the cellular level.  $7 \times 13 \times 4 = 364$ .

Each week we utilize one I Ching hexagram which corresponds to a DNA codon. The following week, one line of the hexagram changes. This continues for 13 weeks, moving the hexagram, the rune symbol and the DNA codon through all of their possible permutations. In other words, all the way to its opposite and back to its original form. This allows us to clear and reset our DNA to its original form, one codon at a time.

Like the genetic code is made up of 64 different "code-words" or combinations, the I Ching is made up of 64 different "hexagrams" or six-line structures. Each line is designated either a yin or yang. In the same way the code letters are formed in the Western scientific model of the genetic code, in the Eastern model two lines form a code letter:

- Adenine - Two unbroken lines.
  - Thymine - Two broken lines.
  - Guanine - A broken line below an unbroken line.
  - Cytosine - An unbroken line below a broken line.
- Three of these code letters combine to form the 64 hexagrams or "code-words or DNA codons.

Diagram: [www.tortuga.com](http://www.tortuga.com)



*"The ancient Chinese mind contemplates the cosmos in a way comparable to that of the modern physicist, who cannot deny that his model of the world is a decidedly psychophysical structure."*

Carl Jung.

## SG204.4.11.1 Russian DNA Research - Wave Genetics (1)

### Review of the higher functions of DNA:

As now validated by abundant research worldwide, the primary function of DNA lies less in protein synthesis than in the realm of bio-acoustic, bio-photonic and quantum field communication. Bio-phonons & bio-photons establish a highly complex communication hologram throughout the physical organism that interfaces with interpenetrating signals of the Quantum Field carrying higher-dimensional information. We may just be harmonic nodes (and notes) of wave convergence and de-convergence in an immense, purposeful orchestra of co-creation. DNA is even found to be directly programmable by conscious intention, as proven by the Garjajev group in Russia.

### The Research of the Garjajev Group in Russia:

Although quite ignored in the Western countries, the research group headed by P. P. Garjajev (Academy of Sciences of Russia) has been spearheading fundamental discoveries in understanding the role of the DNA as a multi-dimensional *antenna*. The account below is largely based on a report (Raum & Zeit, Special #1, 2002, [www.raum-energie-forschung.de](http://www.raum-energie-forschung.de)) by Dr. Hartmut Müller, the discoverer of Global Scaling and its fractal structure [◆SG203B].

- 1988. V. I. Sherbak (Russia) proved the exogenous origin (external to the DNA) of the collective symmetries in the genetic code: the probability of the genetic code resulting from natural selection/evolution is zero. The DNA molecule is quite ambiguous because of the existence of homonymous & synonymous DNA-sequences. A purely biochemical control of protein synthesis would be prone to many errors.
- 1996. The Garjajev group described resonant frequencies that were identical and shared by DNA molecules, ribosomes and collagens. These frequencies were likely to carry bio-information codes. At the same time, the group discovered chromosomes and DNA to be "laser-active media". They realized that "*DNA can be read on different levels of scale in different ways whereby the choice of scale for the reading is being controlled by a WAVE-RESONANCE background mechanism*". The ambiguous nature of the code is therefore superseded by binding the homonym in a LARGER CONTEXT, just like any natural language does. To be optimized, the local wave-resonant code must be embedded in a meta-context, a global META-WAVE - which includes the natural electromagnetic, gravitational & acoustic fields of the earth environment as well as higher quantum-level fields of information.
- Genetic molecules themselves were proven to generate electromagnetic & acoustical waves. Acoustically vibrating holographic structures were discovered within the chromosomes of neurones. The DNA itself was proven to carry out similar acoustic oscillations. In 1994, Maslov & Garjajev proved that chromosomes do indeed generate laser light (super-coherent photons) across a very large frequency range.
- Further research by the Garjajev team turned out a mathematical model of DNA that interprets nucleotides as oscillators in a chain system. This is similar to the Theory of Global Scaling whereby the universe's intrinsic oscillations form a fractal spectrum that repeats itself in a self-similar way on all levels of scale. For instance, the sequence of nucleic acids of chromatin form fractal, language-type structures. This also dovetails quite well with the research of J. C. Perez as we have just reviewed re: the highly specific numerical code structure found in the human genome. Perez went further by pointing out the essential wave-guiding role of the Golden ratio and the Fibonacci/Lucas series in orchestrating the resonant harmonic transfer of information within the DNA system and its super-system interface with the Meta-Wave cosmic context.



## SG204.4.11.2 Russian DNA Research - Wave Genetics (2)

### DNA as Universal Language

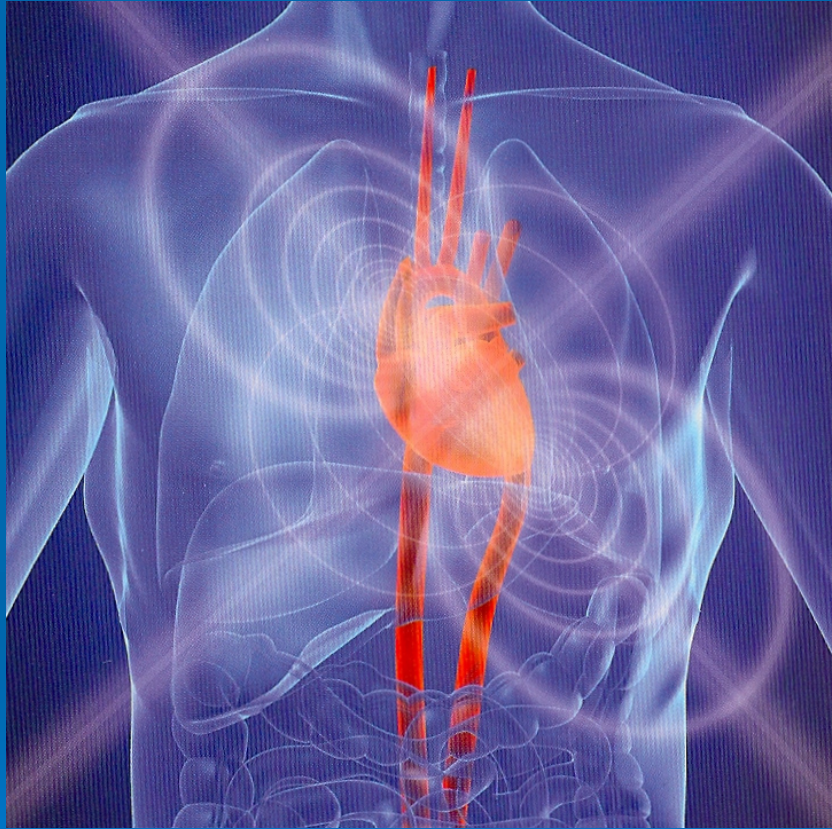
The research by the Garjajev group and others has shown that the human DNA is a "sacred text" written in an ancient, primordial language, possibly precursor to all historical languages. The genetic code may be a Phi-optimized holographic language using scale-invariant nestedness (self-similarity).

While Western scientists are busy cutting & splicing genes for dubious experiments, the Garjajev's team has been creating sophisticated devices in order to influence cellular metabolism through sound & light frequencies engaging human language phonetics and wave geometries. In the process they re-discovered the optimal harmonizing power of certain sound/color/shape frequencies that have been traditionally called *mantras*, *mandalas* or *yantras*.

Russian researchers found that the genetic code follows regular grammar and usage rules similar to those of human languages. This proves wrong modern linguistic theories stating that language results from evolutionary randomness. It now appears that language reflects our genetic structure. The implied conclusion is that DNA can be activated through conscious "impression" of linguistic signatures into the human bio-energy fields - and those in turn will transmit/transduce the message into light, EM and radio wave signals to reprogram the protein-making apparatus of DNA which appears now to be highly "flexible". We highlight below some of these discoveries & their implications.

- 1990. H. Jeffrey showed that the structures built by the 4 letters of the genetic alphabet in DNA texts are not just semantic keys but also geometric & fractal structures functioning on different scales.
- Maslov & Garjajev showed that similar fractal-geometric structures were found in the textual structures of natural languages. *"The genetic self-similar structures control letter sequences in semantically meaningful and syntactically correct ways, just like texts in English, French or Russian"*.
- 1993. Dsjan Kandshen (China) patented a device for the electro-magnetic remote-transfer of wave-genetic information.
- 2000. Garjajev constructed a language-modulated wave-genetic generator *"with which he demonstrated that under certain circumstances, the genetic apparatus interprets different phrases as its own and triggers unexpected biochemical reactions."* For instance, it was proven that plant genomes "understand" the human language.
- 2005. G. Bradden, in his "The God Code", puts forth the hypothesis that the 4 letters Hebrew name for God (YHVH) encodes the 4 nucleotides of DNA. The connection makes sense in the new understanding of wave-genetics as language but it seems based, in the specific case of Hebrew, on a stretched relationship with the atomic masses of nitrogen, oxygen, hydrogen and carbon.
- The theory coming out of this wave-genetic research is the concept of an original human language: all natural languages may be based on the common denominator of a universal grammar that is identical with the genetic code. Also, just like embryos cannot develop in artificial isolation, the genetic code cannot properly function without the input of a meta-context: the two-way communication of genetic elements with epigenetic (external) signals is vital.
- This new understanding gives a strong basis to vibrational medicine. But it also means that un-informed electro-magnetic pollution can have highly detrimental effects on genetic structures. A new wisdom re: the cosmic laws of Harmony is both the legacy of Sacred Geometry and the teaching of the genetic code.

## SG204 Chapter 5. Phi Harmonics in Heart & Brain



Of the three main centers of intelligence in human beings (belly/emotional intelligence, heart/love intelligence and head/brain intelligence), the latter (brain) has been given an overwhelming priority by the Western conventional view of the world: the belly is just a digestive system, the heart is only a pump but the brain is the real source of valid information leading to "intelligent" decisions.

New biology science is making this view completely obsolete: the brain works in resonance with the heart and many other nodes of intelligence (such as the belly) as an integral part of a complex super-system of fractally nested loops of information and management of perceptions, emotions, thoughts, performance, behaviors, thoughts etc... The real "brain" is the whole human super-resonant holographic system as it is seeking & maintaining harmonic coherence and interactive balance with other humans, the environment and the meta-context of the larger cosmos.

Think about it: the 60 to 70 trillion cells comprising a human being are capable of quite a feat! They cooperate with each other in such an efficient way that they keep us going for an average lifetime, often in spite of our ignoring or abusing our bodies. By contrast, the 7-8 billion humans upon planet Earth have been struggling for millennia to establish peace, balance, harmony and cooperation among themselves. Relearning from our own cells, we may finally succeed in co-creating a civilization of harmony on Earth...



## SG204.5.1 Traditions of the Heart

In spiritual traditions around the world, the heart is assigned much mystical significance, either as metaphor, as a gateway for the soul or as an organ believed to have spiritual or divine attributes.

- To the Egyptians, the heart (or *ib*) rather than the brain, was the source of human wisdom and the center of emotions and memory. Because of its apparent links with intellect, personality and memory, it was considered the most important of the internal organs. It could reveal the person's true character, even after death, so the belief went, and therefore, the heart was left in the deceased body during mummification.
- In the Hindu tradition, the heart (*anahata*) contains a cave (*guha* - the *Cave of the Heart*) that can be filled with light to become  *jyotir guha* (Cave of Light).
- Many classical philosophers and scientists (such as Aristotle) considered the heart the seat of thought, reason or emotion, and rejected the value of the brain.
- A main symbol in the Sufi tradition is a heart with wings. It explains that the heart is between soul and body, a gateway interfacing spirit and matter.

### The Egyptian Ceremony of "Weighing of the Heart"

The ancient Egyptians believed that, when they died, they would be judged on their behavior during their lifetime before they could be granted a place in the Afterlife. The heart portion of the soul was weighed in a balance against the feather of the Goddess Ma'at, symbolizing Truth, in the ceremony called the "Weighing of the Heart" as recorded in chapter 125 of the Egyptian *Book of the Dead*.



www.sodahead.com

The ceremony was believed to take place before *Osiris*, the God of the Afterlife, and a tribunal of 43 deities. Standing before the tribunal the deceased was first asked whether he/she had committed any offences, ranging from raising the voice to stealing. This was the "negative confession". If found innocent, the deceased was allowed to proceed to the ritual "Weighing".

The weighing scene above shows the deceased being lead by *Anubis* (jackal head). It is Anubis who performs the weighing, placing the heart on the left scale and the feather of *Maat* on the right. The God *Thoth* (ibis head) stands ready to record the result, while the "monster" *Ammit* (the 'Devourer of the Dead') waits in anticipation: if the heart is heavier than the feather of Truth, Ammit gets to devour the heart and the deceased will suffer the final complete death. In the very top part of the scene the deceased also makes offerings to 12 of the major gods who sit in judgment. If the heart is LIGHT, the soul enters the halls of Afterlife.

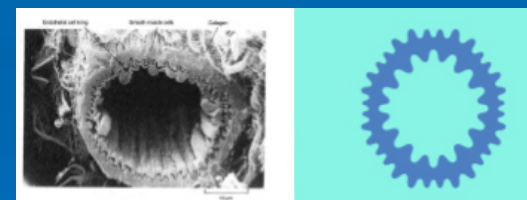
## SG204.5.2.1 The Heart (1) New Data

In addition to all the wisdom & mystical teachings pointing to the essential nature of the Heart as a doorway of consciousness, we now have new biology data that are completely changing the old concept of the heart as a "sophisticated pump".

- As explained by John James (The Great Field, 2007): *"Were the heart just a pump, it would need to be the size of a tug to move so much blood along these kilometers of small piping. In fact, the whole body moves the blood. The vessels themselves join in the rhythmic contractions of the heart, some veins are ruffled to smooth the way for the blood, while blood cells themselves get smaller as the vessels reduce in size. In one sense, the whole body vibrates and shimmies with each (blood) pulsation"*.
- It is estimated that 2/3 of the cardiac cells are neurons in clusters of ganglia *"with exactly the same axon-dendrites as found in the brain"* (G. Rein & R. McCraty). The heart as a "management center" cooperates closely with the brain - this is a new field of research called *neurocardiology*.
- All the neurotransmitters and peptides found in the brain exist in the heart as well. In *"Molecules of Emotion"* (1999), Candace Pert has shown that the brain extends throughout the body via peptides (short chains of amino acids). It has also been discovered that direct neural connections exist between the "brain" of the heart, the limbic brain and all major organs. These inter-connections are now understood to function beyond the chemical level, in a quantum communication way, i.e. by quasi-instantaneous "bio-entanglement". It is this network of primordial connections that allows the heart to maintain an encompassing harmony between the different organs.
- In fact embryogenesis shows that, in the evolution of the fetus, **THE HEART FORMS BEFORE THE BRAIN**. It has to be so because *"it is the heart that has to deal with signals from the growing organs in the gut and to maintain harmony between their differing needs - long before there is anything to 'think' with"* (J. James). In this sense, the brain is an instrument of the heart.
- Another way the heart influences the brain is through hormones. For instance, the atrium area of the heart produces a hormone (ANF) which modulates the functions of the emotional-cognitive system. Other heart-generated hormones are the tranquilizing hormones produced during pregnancy.
- The heart's intelligence is not cerebral, but holistic, managing complex feedback loops in real time. This is possible because the heart's torus-vortex magnetic field is holographic: at any point of the heart's field, the frequencies of the entire heart's spectrum are present. Because of the power of the heart's field, a reading can be taken 3 feet from the body. Guess what people sense when they get close...



↑ The fractality of blood circulation: veins in a leaf or rivers on the land. (Angiography image. Taj Books, 2002)



↑ Left: the "ruffled" structure of a blood vessel helps moving the blood.

Note: recall the observations of Viktor Schauberg and his log flumes with built-in "spiral fins". [◆SG203B.5]

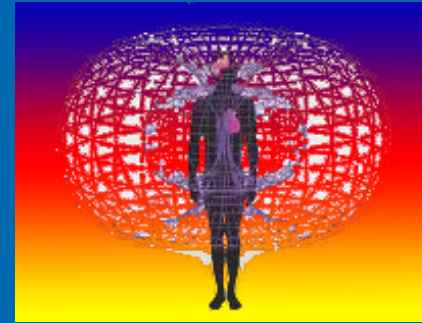
↑ Right: design for fractal synthetic blood vessel.



## SG204.5.2.2 The Heart (2) The Heart's Fields

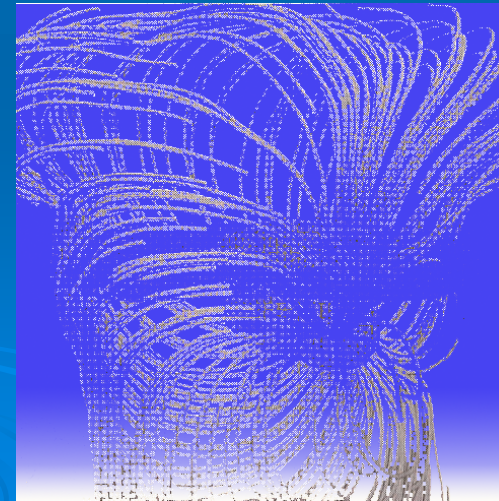
The fields emitted by the heart are much stronger than the fields emitted by the brain:

Electrical field of Heart = 60 times stronger  
Magnetic field of Heart = 5,000 times stronger



← The magnetic field of the heart is shaped like a torus or vortex and extends 12 to 15 feet from the body. The heart's torus is holographic in nature.

- With its electrical field so much stronger than the brain, the heart creates a consistent and all-encompassing energy field supporting all the 60-70 trillion cells of the body which are continuously bathed in it. The heart's field embraces and coheres the whole human system.
- In other words, the heart has the ability to entrain all organs and systems of the body to its vibrational frequency. The brain and body organs are, by evolutionary dynamics, fashioned to vibrate with the heart's frequency field: they respond, interpret and relay back to the heart an evaluation that in turn changes the heart's fields. As stated by Toni S. Petrinovich (<http://www.sacredspaceswa.com>): *"The brain relies on the wavelengths emitted by the heart to create cortical facilitation that allows the cortex of the brain to evaluate experiences and promote the appropriate responses. When the rhythms of the heart are jagged or irregular, the brain experiences cortical inhibition and cannot perceive, think and consequently act in a desirable manner."* In this sense also, the brain is an instrument of the heart.
- Joseph C. Pearce, in *"The Biology of Transcendence"* (2002), explains that the heart's fields affect water and DNA, and have a measurable physiological impact on people at a considerable distance. *"This is why connections with fields beyond ours is, in the universal sense, the job of the heart... As no feeling or desire in us can remain just a local event, but has some impact on all of us, the energetic fields of the heart share themselves with everyone, and everything, everywhere."* (J. James).
- When there is a field alignment or attunement between heart and other systems such as the brain there is *System Coherence*, which is experienced as a sense of inner peace & harmony. Vibrational entrainment with the heart's frequency field creates a coherent unified field experience, i.e. the 'Oneness' of union. We can also call it *"Harmonic Fielding"* as this can cascade up to other energy bodies when coherence increases with expanding harmonic attunement.
- This new understanding brings up the issue of "Heart Ethics": what level of heart coherence are we sharing around and how conscious are we about it? How can we learn to improve the frequency quality of our heart fields so as to contribute to the uplifting and harmonizing of the collective field of humanity's consciousness, rather than disrupting or polluting the global field with incoherent thoughts/emotions?



← Magnetic image of the currents near the heart. Credit: U of Utah. (in J. C. Pearce. *Biology of Transcendence*. 2002)

This is showing the origin of the "torus-vortex" of the heart.

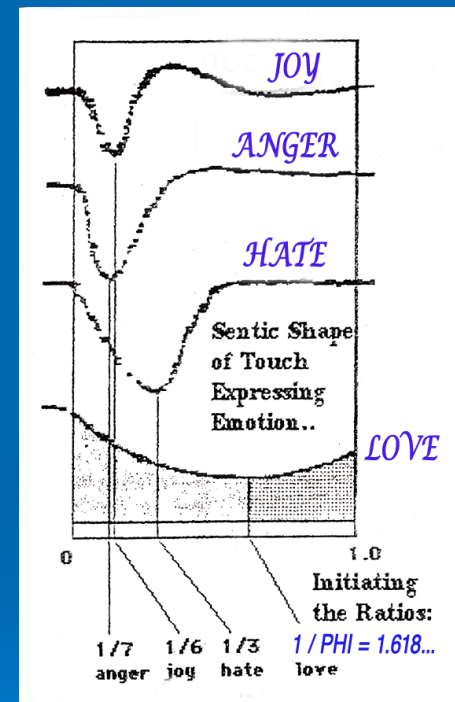
## SG204.5.3.1 Heart Coherence & Love-Compassion (1)

During the 1990s, in Eden, NY and at the HeartMath Institute, Boulder Creek, CA, Dan Winter & colleagues have researched the effects of coherent emotion on the heart's frequencies, on DNA and on the immune system. Researchers were looking for the specific geometries of the waveforms carrying the *sentic* (emotional) impulses, using EKG (electro-cardiogram) readouts. Below are the main results.

- The spectrum analysis graphs indicate that it is possible to consciously affect the frequency content of your own heart.
- It is also apparent that when love is being felt, the ratio between the power spectra peaks of the EKGs is the same ratio as in the structure of the DNA, i.e. the Golden mean ratio... This discovery shows a direct link between the heart "electricity" and the DNA... The DNA is like a radio receiver and the heart is like the transmitter.
  - There is also new evidence showing that the heart frequencies contain a highly ordered or encoded intelligence that is ultimately responsible for the instructions sent to the DNA.

Some other early findings by Dan Winter & associates provide a context for understanding why the Golden mean geometries appear to optimize fractal transmission on all scales.

- The universe can be best described as a geometry of pressure. Pressure occurs when waves meet.
- Ratio is sacred, scale is profane. The Golden Mean ratio is the only ratio that allows complete information / memory / identity to cascade down the harmonic series without any loss. Size is unimportant where information is concerned since information can travel to any scale via the waveguide, and be manifested. The universe is a hologram: the tiniest part contains information about the whole.
- Coherence at any level is coherence at every level.
- In a universe made of waves, focus is the only medium that creates. Focus makes a pathway for waves to meet. Focus converges the harmonics (waves that fit into each other) into nests which stand: this is what we call matter.
- The best pathway to maintain a nest is the Golden Mean ( $\Phi = \text{PHI}$ ) symbolized by the dodecahedron. The closer a material comes to this shape and path, the greater the conductivity. DNA is a 4D dodecahedron.
- Love causes the coherence and ratio necessary to send energy up and down the harmonic series, from the higher organizational dimensions to the DNA.



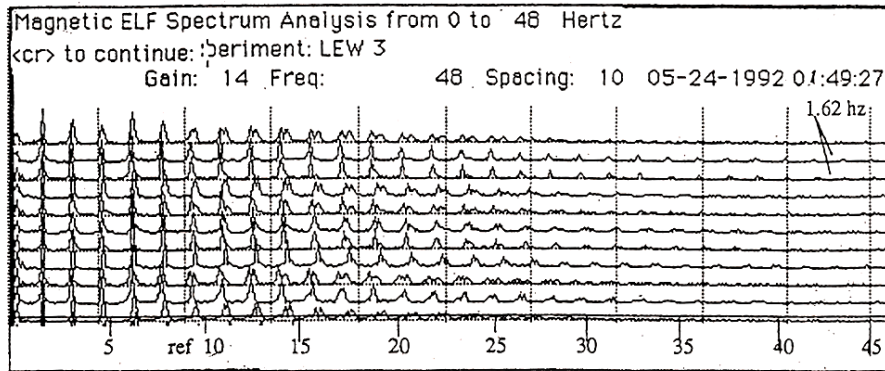
↑ In the 1970s, the research of Dr. Manfred Klynes on "Sentic" showed the waveform of LOVE to be a prolonged smooth curve connected with the Golden ratio. (Sentic. 1977)

[References: Dan Winter. [www.goldenmean.info](http://www.goldenmean.info). EarthHeart (2005). Alphabet of the Heart (1992)].



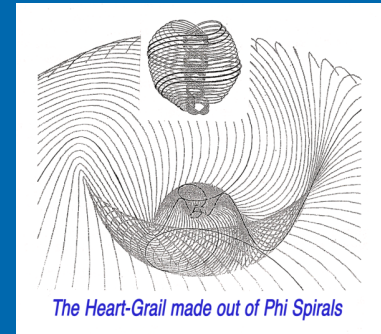
# SG204.5.3.2 Heart Coherence & Love-Compassion (2)

## Phi Coherence and Compassion

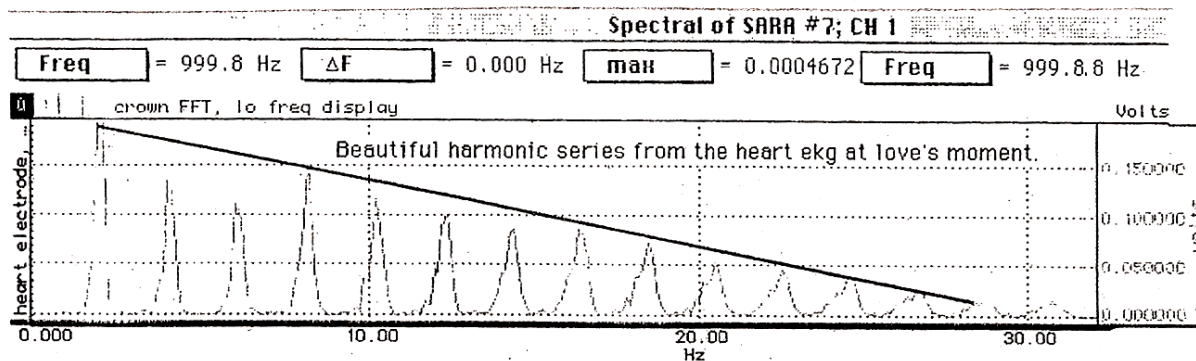


à b

Egyptian hieroglyph  
for "Heart"



*Above & below: two ELF spectrum analysis charts showing harmonic frequency cascades linked to the Golden ratio, at moments of love & compassion. (Dan Winter research).*



## SG204.5.4.1 New Heart Wave Research - HRV (1)

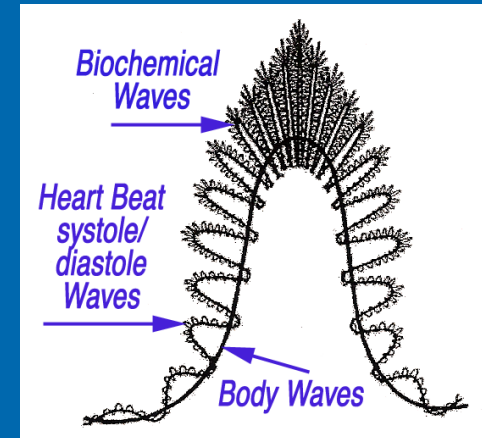
Fractals are not just objects in space. They also are processes in time, like music or heart pulses. With the body being recognized as an integrated system of biological oscillators, an unexpected experimental result has already emerged, with better measurements of the Heart Rate Variability (HRV), a measure of evenness of consecutive heartbeats.

**INCREASE IN HRV = GOOD HEALTH**  
**DECREASE IN HRV = DISEASE**

This means that the classical medical model of health as *homeostasis* (ideal stability) is gravely flawed. In clinical fact, the opposite is now proven: (apparent) irregularity and unpredictability ("variability") are essential aspects of healthy physiological systems.

In particular, a healthy heart is highly variable: it pulses and fluctuates ("dances") in complex ways that have a FRACTAL SIGNATURE. Disease in the heart (and in other body systems) is now understood as decreased variability along with the breakdown of the complex fractal structure.

To sum up: the heart is now seen as a harmonic oscillator orchestrating a highly evolved music/dance of resonant & coherent rhythms throughout all the systems of the bio-field. With its electromagnetic field properties, its neuronal and hormonal functions and its quantum holographic communication abilities, the heart is recognized as the master hub of bio-intelligence.



↑ The "Super-looping" of biochemical waves within heartbeat waves within behavioral body waves.

Ary Goldberger (M.D. and researcher in cardiovascular dynamics at the Harvard Medical School) comments:  
*"Why is it healthy to be fractal/chaotic? It leads to a large repertoire of responses and it gives the capability to cope in a unpredictable environment. Our system can't be too organized, but it can't be too random either: a fractal structure is a nice in-between".*  
(A. Goldberger. *The Heart of Complexity*.)

Irving Dardik (M.D., vascular surgeon and Founding Chairman of the US Olympic Sports Medicine Council) elaborates:  
*"The decrease in HRV is a single common risk factor for virtually all chronic diseases at all ages... No other single risk factor has been implicated so convincingly and in such a wide range of conditions".*  
(I. Dardik. *Cycles* Vol. 46, #3, 1996)

Dr. Dardik (see infra) has developed the concept of the "Heart Wave Continuum" or "super-looping". He describes it as "waves waving within waves". *"What is extraordinary about heart waves is that it is an inherent wave continuum connecting two different levels of hierarchical structure: the heart and the whole organism. In stark contrast, medicine and science currently treat the heart and the whole organism as two separate 'parallel' levels of structure."* The Heart Wave Continuum is understood by Dr. Dardik as the "master wave of all behavioral waves" since "all of our behaviors have a common underlying language of waves." This wave language, says Dr. Dardik, is the long sought-after mind-body connection. Clinical studies show that increasing the swings of biochemical oscillations ("variability") prevents necrosis by preserving the myocardium. The conclusion is that medicine should steer away from drugs and become vibrational:

**DISEASE CAN BE TREATED BY INCREASING THE HEART WAVE RANGES**

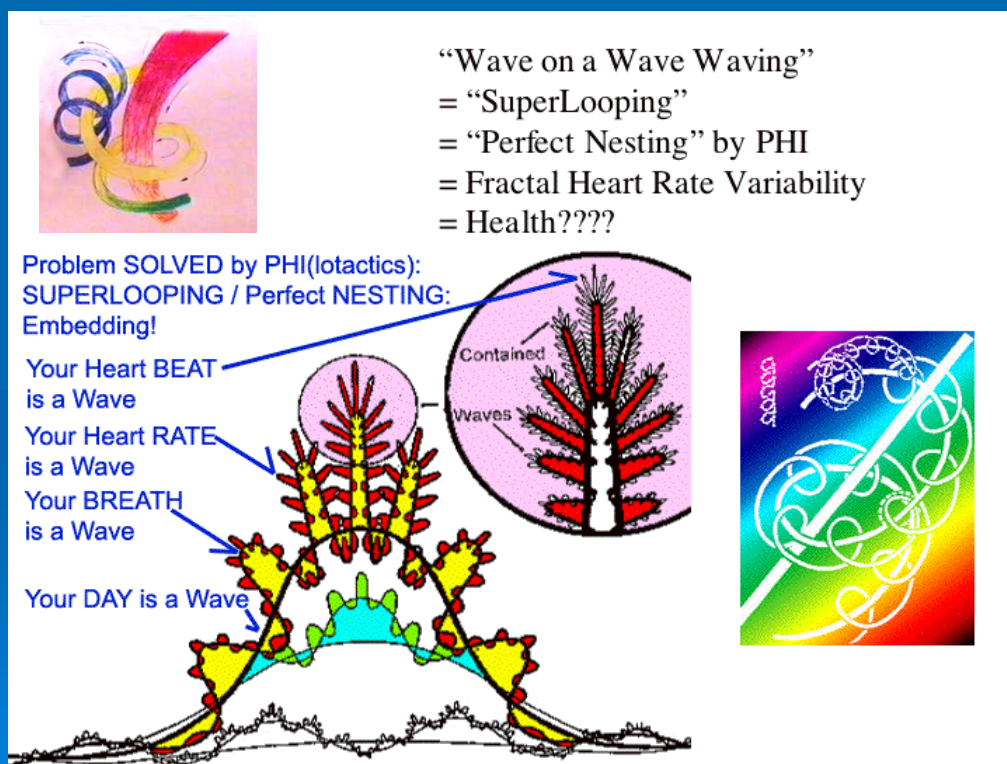


## SG204.5.4.2 New Heart Wave Research - Superlooping

Dan Winter, the inventor of two devices to teach fractality (the HeartTuner and the BlissTuner) puts the new HRV research in simple terms for his customers:

*"A healthy heart is NOT one where the heart RATE does not change. The first thing we say to folks using our HeartTuner - is to watch whether their HEART RATE VARIES. We always say: IF YOUR HEART RATE IS STUCK, THEN a) YOUR EMOTIONS ARE STUCK - and b) YOU ARE GOING TO ATTRACT DISEASE. It really is as simple as this: being a 'couch potato' (forgetting to exercise) you lose the RANGE OF CHANGE in your heart RATE and THEREFORE you lose the RANGE OF CHANGE for your EMOTIONS! When your heart (and your psyche) is able to RELAX between beats, this is allowing the ENVIRONMENT to fractally fit INSIDE your heart's charge. Your heart will then fractally modulate the amount of time it needs before its next beat."*

In other words, our heart is our teacher: we can relearn from the heart's great ability of holographic inclusiveness how to consciously inter-connect again with the many nested harmonic levels of our spatial environment as well as our energy environment, thus reaching into subtle spiritual levels of quantum oneness.



“Wave on a Wave Waving”  
= “SuperLooping”  
= “Perfect Nesting” by PHI  
= Fractal Heart Rate Variability  
= Health????

Problem SOLVED by PHI(lotactics):  
SUPERLOOPING / Perfect NESTING:  
Embedding!

Your Heart BEAT is a Wave  
Your Heart RATE is a Wave  
Your BREATH is a Wave  
Your DAY is a Wave

↑ “Superlooping” within the Heart Wave. Superlooping is Dr. Dardik’s term for fractal nestedness or embeddedness. *"In Nature the different hierarchical 'levels' are inherently continuous as waves within waves."* (I. Dardik). (Slide by Dan Winter).

While Dr. Dardik's Superlooping concept is directly introducing multi-level fractality (in a way similar to Global Scaling) and therefore overall inclusiveness (whole systems oneness) in describing the connectedness of the human body-mind system, what is missing is the next "Sacred Geometry" step: the optimization by the precise golden ratio "attractor" which adds & multiplies the wavelengths & velocities in fractal (Phi) geometry.

How can we consciously support the heart's function of golden fractal inclusiveness? Besides technological props (HeartTuner), there are traditional and rediscovered yogas of coherence involving practices of breath, heart, brain and chakras waves harmonic attunement. A key element is learning how to activate and fractally ride the Kundalini waves and the field-physiology of bliss in inner dances of super-coherent oneness with the Cosmic Plenum.

*"The Heart Wave is the 'master wave' that represents the collective simultaneity of all the behavioral waves waving within one another."*  
(I. Dardick. CYCLES Vol.46, #3, 1996)

An extensive explanation of the Phi fractality implications opened by HRV research can be found here:  
[www.goldenmean.info/hrv/index.html](http://www.goldenmean.info/hrv/index.html)

## SG204.5.5 Making Heart



↑ Making Heart in the River of Life...

This playful scene captures the dynamics of the heart and the vortex  
(unknown "traveling pilgrim" web image)



## SG204.5.6 Making Waves - Irving Dardik

The medical research, discoveries and concepts of Dr. Irving Dardik are yet another story of scientific innovation that was fiercely opposed by the science establishment only to be eventually incorporated and accepted by a new generation of scientists.

Throughout his entire life, Dr. Dardik has been going against the conservative advice children used to receive: "Don't make waves!". Not only did he turn medicine & health around but he also came up with a universal Theory-Of-Everything, the SuperWave Principle.

- 1971. Irving Dardik, a vascular surgeon, had a revelation in the operating room: let's use the human umbilical cord as a 'biograft' to replace defective arteries. Upon being told by the medical establishment that it was impossible, Dr. Dardik doggedly pursued his idea, with the help of his brother, also a vascular surgeon.
- 1971-75. The two brothers improved and tested the procedure, first in the house basement and then in a medical facility. In 1975, they published their paper: *"The Use of the Umbilical Cord as a Vascular Prosthesis."* Despite attempts by medical colleagues to steal their idea, the Dardik brothers were able to claim their legal rights.
- 1975-77. The new procedure saves the life of hundreds of patients. Within a year, surgical teams around the world were using the umbilical cord biograft, particularly in lower leg vascular disease.
- 1976. Dr. Dardik, as the Chairman of the US Olympic Sports Council, is in charge of all the sport medicine in the US. He develops a training protocol (Rhythmic Interval Training Exercise) that accentuates the wave pattern of standard interval training ("Run then Jog").
- 1986. Fired from the Olympic scene, Dr. Dardik developed with his wife a new protocol called *"Cardiocybernetics"* (or "cyclic exercise"), a program involving bursts of intense exercise interspersed with recovery as many as 20 times over a period of a single day. Taking clues from Nobelist Ilya Prigogine who said that living systems are healthier when they are oscillating, Dardik explains that health depends on a balanced relationship between stress and recovery. This is now validated by the research on high HRV as indicator of health (see supra) and marks the end of "sustained exertion training".
- 1990. A leading and highly laudatory article in New York magazine created a tsunami-like response from potential clients wanting to be on the program. A business structure was created and many people were healed from a wide variety of diseases & dysfunctions.
- 1991. An "AMA plot" unfolds. A "fraud buster" got on the program, having determined to put Dr. Dardik "out of business". The heavy wheels of the medical establishment were set in motion and, predictably, Dr. Dardik's license to practice medicine in New York was revoked.
- 1994. Dr. Dardik publishes his *SuperWave Theory* under the title *"The Great Law of the Universe"*. Waves are fundamental, not only to health but to the very "nature of nature". *Wave-energy* unifies wave & particle.
- 1996. The Cyclic Exercise Protocol is refined to include the circadian rhythm mapped unto the lunar cycle, as a fractal of each other. Controlled studies validate the fact that the program (waves of exertion and recovery) helps people at all levels of health and well-being. *"HRV is a window onto ALL physiological functions"*, says Dardik who advocates spending as much time training the body's recovery physiology (heart relaxes) as training the body's exertion physiology (heart contracts).
- 2001. A lab is set up to test inputting current in a SuperWave (Fibonacci fractal) form to boost a cold fusion experimental process. The test is successful.
- 2003. The SuperWave principle is applied to the mixing of molten metals. Great technological improvements are accomplished.
- The SuperWave Theory views *wave-energy* as the organizing principle of the universe. As explained by R. Lewin: *"Through wave-energy, everything is connected to everything else. The whole and the part are unified, including the living and non-living parts. This is in contrast with traditional science's view of matter being discontinuous and separate from space & time. The SuperWave perspective (also includes) the realization that the universe is not uncertain and chaotic but coherent and ordered, mediated by wave-energy through SuperWaves."* In Dardik's words:

*"There is no separation between hierarchical levels: all is waves.*

*The fundamentality of waves explains the ubiquitous finding of fractal scaling in Nature."*

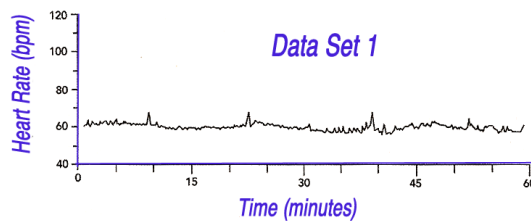
*By affecting any of the frequencies of a system, you affect them all, at all scales.*



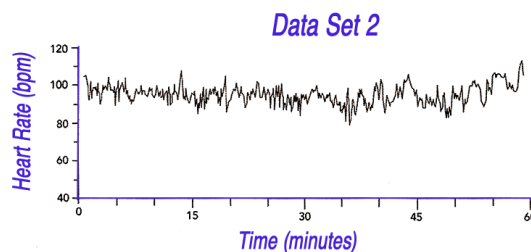
## SG204.5.7.1 HRV (1) The More Harmonics... The More Life

Following the recent Heart Rate Variability (HRV) and Phi-Compassion findings, two new (and yet ancient) principles are increasingly accepted among researchers: *"The More Harmonics, the More Life"* and *"The More PHI, the More Awareness"*.

- Professor Philip Callahan, an entomologist and pioneer in "insect communication systems", has shown that the more harmonics which were present in the weak capacitor field around a tree, the healthier the tree was.
- Dan Winter, dynamic systems engineer, heart-compassion pioneer and Phi scientist, elaborates in the following manner: *"The concept the more harmonics, the more life is perfectly reflected in the EKG literature. The fractality and inclusiveness of the HRV is a very reliable predictor of immune health and longevity. The more waves of electrical charge can simultaneously agree to meet at once - in any biological oscillator - the more ALIVE it is. When a biological structure finds a way to attract waves of charge, it sucks in the energy of its environment. The more waves of charge it can suck in at one time, the more energy and life it absorbs.... The more frequencies you can invite into your heart, the stronger your resistance to most chronic diseases."*
- Dr. Dardik argues that, like an animal yanked from its natural habitat and caged in a zoo, modern people are cut off from the natural SuperWave context of cascading fractal waves, harmonically nested within each other. *"Ill health happens when there is dissociation between the internal rhythms and the external rhythms."* Causing health is about reconnecting to the rhythms of nature and tuning the body to be in sync with these natural waves.



(Credit: Irving Dardik. In Making Waves. 2005)



**Effect of cyclic exercise on complexity of heart function**  
Data set 1 shows an individual prior to the protocol  
= low complexity associated with disease.  
Data set 2 shows the same individual after 3 months on the protocol  
= increased complexity associated with health.

### Quotes from Irving Dardik

*"Causing health is not about outward appearance; causing health is about INWARD health through shaping healthy waves... The biggest pharmacy is inside your own body... Causing health is about synchronizing patterns of communication throughout your body, following the rhythms of nature... (Causing health is also about creating powerful waves of relationship)... Families, workplaces, and communities are healthier when they experience a palpable rhythmicity..."*

### Quotes from Dan Winter

*"HARMONIC INCLUSIVENESS will predict the survival expectancy of every living thing!  
This includes your DNA, your forest, your planet, your SUN and your galaxy."*

*The understanding of constructive harmonic fractality of as many different waves as possible is survival information for each living thing. .... The concept that charge implosion is feeding LIFE - is also why it is so essential for science to understand the fractal symmetry of charge which creates gravity, self organization, implosion, DNA and life in general. Those who understand shudder with horror to realize that our schools, farms and hospitals are built with non-fractal electric fields which BLEEDS the DNA of all those who enter!"*



## SG204.5.7.2 HRV (2) The More PHI... The More Awareness

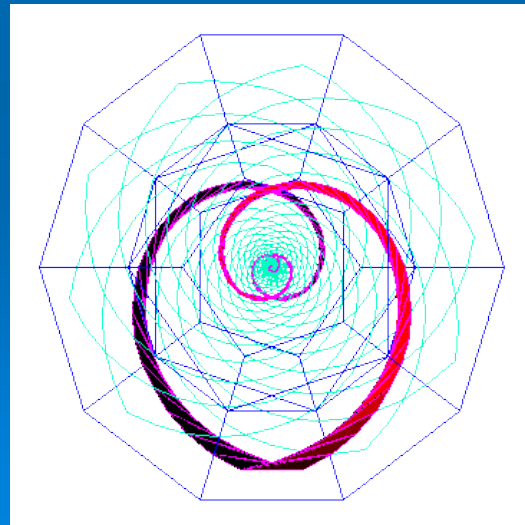
The work of Dan Winter suggests that the onset of Golden Mean or Phi numbers (both geometric and arithmetic cascades) in biology's power spectra (EKG and EEG) indicates that biology is using & teaching the geometry of successful fractal nesting as an optimized attractor for life force. The perfectly coherent heart ("*a content heart*") locks, as a self-aware entity, to harmonic ratios of the Golden Mean.

Golden Ratio harmonics are the key to self-organizing (embedding/nesting) for all wave systems in the universe - not just the DNA and heart/brain. For D. Winter, "Making Life" with harmonically nested (recursive) capacitors is the key to re-invent architecture, agriculture, culture and art by placing/constructing wave structures (buildings, shapes, colors, music...) in Golden Mean progressions [◆SG207]. It is also the key to making gravity thrust electrically and to provide the much needed 'zero-point energy' technologies.

*"The geometry of successful self-similarity is the geometry of successful compression (nesting)... and permissivity to touch." (D. Winter).*

*"In practical terms, this means we can point any chaotic oscillator (like a heart, brain or power grid) towards self-organization by simply nudging a critical few of its key wavelengths towards PHI (Golden Mean) embeddability. The 'tricky' part is that whenever we do this, we are waking up a being who will become Self-aware and have intention..."*

*The moment the heart chooses to experiment with the new (harmonic & fractal) symmetry of dimpling the little donut to reach out to bigger ones, is an inversion moment, an IMPLOSION moment." (Implosion Group. [www.goldenmean.info](http://www.goldenmean.info)). Note: This moment has been traditionally called the time of 'inner conversion': it is both an inversion in the physics of energy and a turn-around in consciousness when the focus becomes the harmonic bridging to Oneness.*



← The Heart-Grail.  
Graphics by D. Winter.

## SG204.5.8 Harmony in the 4 Brains

In the 1960s, neuroscientist Paul MacLean proposed his *Triune Brain* model which maps out onto brain structures & functions 3 major animal groups of evolution: reptilian, paleo-mammalian and neo-mammalian. Although outdated in terms of the neuro-anatomical location of specific brain structures, MacLean's model, in its conceptual triadic form, is a starting point to understand the Human Hologram. The Triune Brain model describes "3 brains in one":

- The "*reptilian brain*" or brain structures related to territoriality, ritual behavior and other "reptile" behaviors. This the "sensory-motor" system (the "guts" or "courage").
- The "*limbic brain*" or brain structures associated with social and nurturing behaviors, mutual reciprocity, and other behaviors and affects that arose during the age of the mammals. This is the "emotional-cognitive" system (the "heart" or "feelings").
- The "*neocortex*" or cluster of brain structures involved in advanced cognition, including planning, modeling and simulation. This is the "verbal-intellectual" system (the "head" or "thinking").

The neocortex is relying on a polar structure: the two hemispheres.

These 3 brain structures evolve in the womb as a nested hierarchy in the order of their appearance in evolutionary history: the reptilian brain (R-complex) begins to function in the first trimester of gestation, the paleo-mammalian (limbic complex) gets activated in the second trimester and the neo-cortex in the third trimester. A FOURTH BRAIN, the pre-frontal cortex, is the latest evolutionary development: it makes its major debut after birth. We now know that the 4 "brains", far from being isolated executive agencies, are an integral part of the complex holographic human field of consciousness.

### The Right & Left hemispheres

A longitudinal fissure separates the human brain into two distinct cerebral hemispheres. Even though the sides resemble each other, cognitive functions are dominated by one side or the other: they are lateralized. A neural band (the *corpus callosum*) bridges the two hemispheres and allows the left hemisphere to take material from the right and operate on that material in relative isolation.

The left hemisphere is a later evolutionary addition: it forms later *in utero* ("in the womb") and has fewer direct connections with the previous brain (limbic system) than the right but a direct connection with the fourth brain or pre-frontal lobes. In his book "*The Executive Brain*", Dr. Elkhonon Goldberg proposed that the right hemisphere is adept at handling novel material while the left is processing these data into logical, more fully developed patterns of knowledge.

The well-known left hemisphere "independence" from the boundary conditions of the lower brain structures can lead to brilliant intellectual adventure, but, as remarked by Joseph C. Pearce, it can be devoid of "intelligence" defined as "the generalized move for well-being generated by the heart and the emotional systems". The left hemisphere's "advanced thinking" (as seen in runaway technology) can be out of touch with the survival of humanity or ecology and therefore needs to be grounded and embraced by the right hemisphere's balancing, integrative intelligence of System HARMONY.

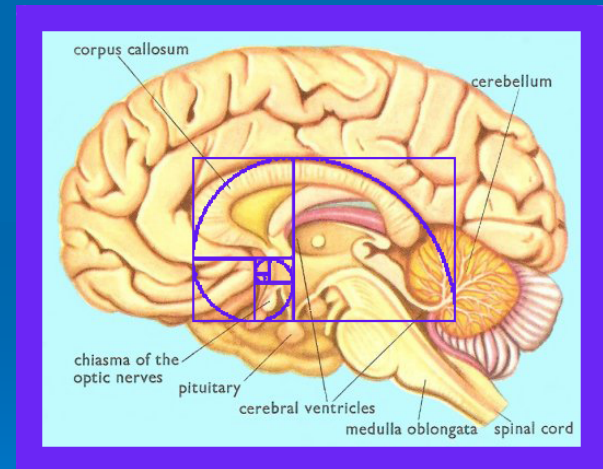
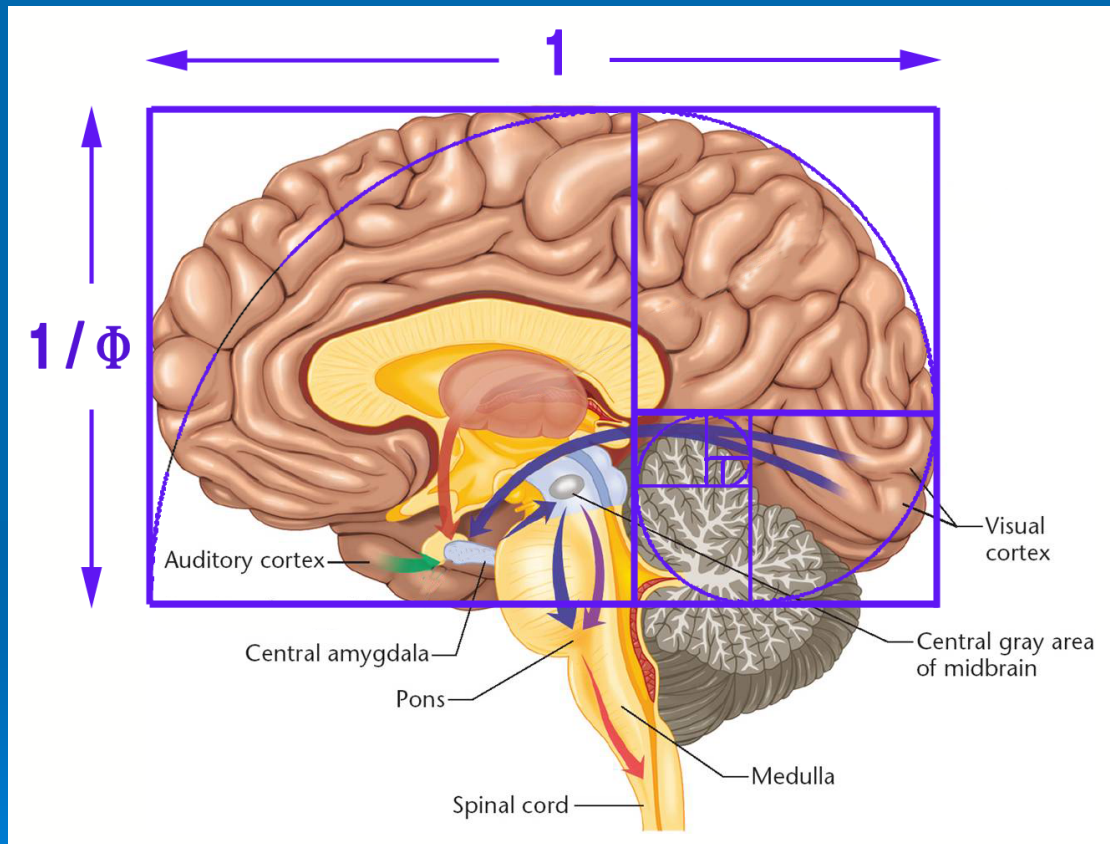


As explained by Joseph C. Pearce: "*All brain systems are a dynamics that move in two directions -between the old and the new- so that some of the essence of the higher is absorbed by the lower even as the lower is itself incorporated into the higher... (There is) an inter-dependence of the 3 brains.*"

(The Biology of Transcendence).



## SG204.5.9 Phi in Brain Structures



↑ The average brain fits into a Golden Rectangle and approximates a Golden Spiral curve.  
(After brain image from [www.johnwalckmd.com](http://www.johnwalckmd.com))

## SG204.5.10 Golden Ratio & Coherence in Brain Waves

Neuroscience is starting to discover the presence and benefits of the Golden Ratio in brain waves, not only at times of peak inner harmony (see supra) but also as an overall life attractor and orchestra conductor that unifies and synchronizes the coherent "superlooping" of the many oscillators of the human system. This "Phi Pulse" is a set of floating harmonics based on Golden Ratio cascades that can integrate brainwaves, heartwaves and all our other life processes into a meaningful fractal signal in tune with the larger environment of the web of life and cosmic plenum.

However, Dan Winter is the most consistent and eloquent pioneer of PHI FRACTALITY as the *cause* of life force and consciousness itself. In his words:

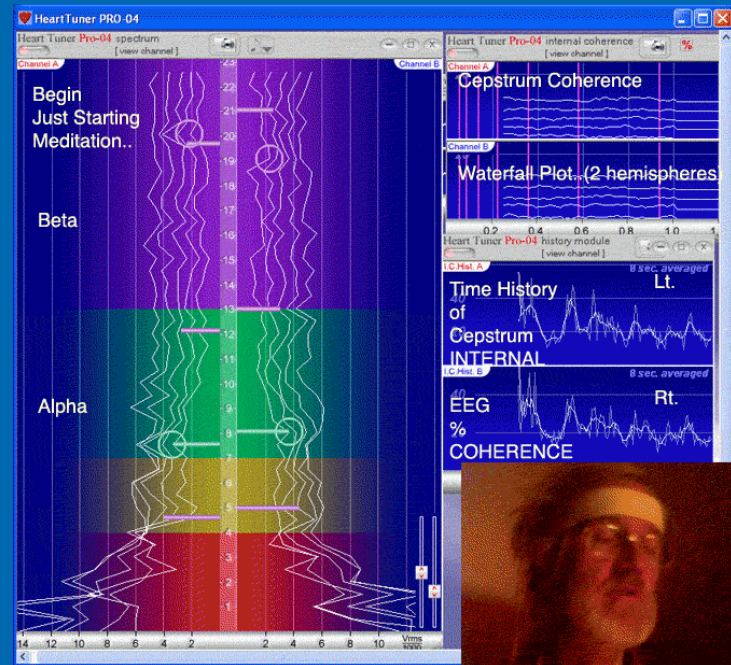
*"The brain is in the business of making a large coherent electrical field involving the higher cortical functions in a massive coherence effect - which has 2 basic symmetries: 1. Hex/ cube (EEG harmonics in octaves), and 2. Pent (EEG harmonics in Golden Ratio). The brain chooses between them depending on whether its macro coherence field needs to segregate / store charge in a matrix (rectilinear accumulation), versus needing to implode / attract / radiate charge in a dodeca nest. (Bliss / Ecstasy / Peak Perception / Peak Experience / Enlightenment)... The bigger picture (available through the Heart/Bliss Tuner ) is to measure and optimize for the INCLUSIVE COHERENCE which links ALL frequencies... (Refer to HRV research supra). Coherence is the mathematics of the climax of harmony, and fractality (Golden Ratio perfected) is the mathematics of the climax of Coherence!"* ([www.goldenmean.info](http://www.goldenmean.info))

### Two neuroscience papers mentioning Phi in Brain Waves.

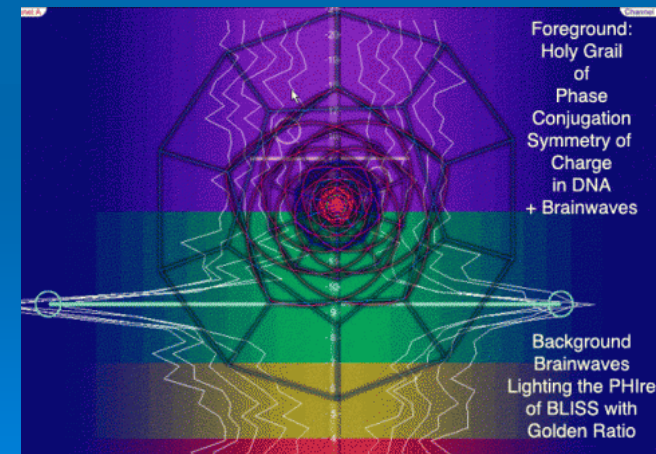
Harald & Volkmar Weiss. *The Golden Mean as Clock Cycle of Brain Waves.* (Chaos, Solitons & Fractals. Vol. 18, Issue 4, Nov. 2003, pp. 643-652).

Abstract: "The metric of brain waves can always be understood as a superposition of  $n$  harmonics times  $2\Phi$ , where half of the fundamental is the golden mean  $\Phi$  ( $\approx 1.618$ ) as the point of resonance. Such wave packets scaled in powers of the golden mean have to be understood as numbers with directions, where bifurcations occur at the edge of chaos, i.e.  $2\Phi = 3 + \phi^3$ . Similarities with El Naschie theory for high energy particle physics are also discussed."

Anita K. Roopun et al. *Temporal Interactions between Cortical Rhythms.* (Front. Neurosci. 2008 December; 2(2): 145-154) "... However, in using phi as a common ratio between adjacent frequencies in the EEG spectrum, the neocortex appears to have found a way to pack as many, minimally interfering frequency bands as possible into the available frequency space."



↑ Animation by Dan Winter.



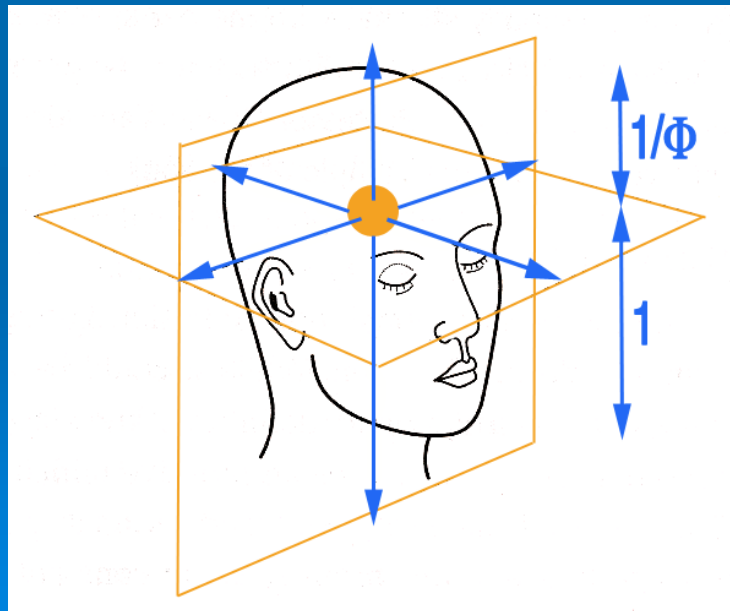
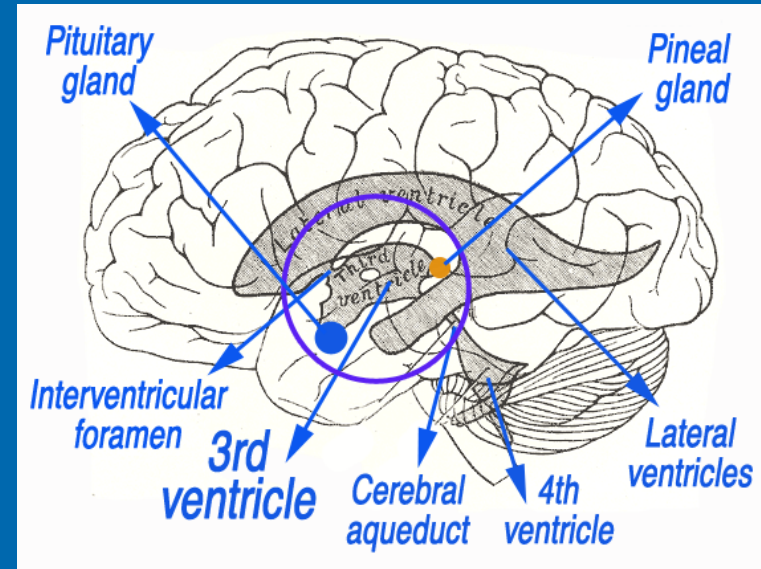
↑ Superposition of a dodeca vortex ("Grail") and Phi-coherent EEG.



## SG204.5.11 The Third Ventricle: Temples on the Lake

In traditional teachings about the sacred anatomy of the human body, the "center of the head" has always been emphasized as having a strategic location and importance. This is the cavity or "throne chamber" of the third ventricle, entrained to vibrational resonance by specific yogic techniques of mantra singing. Anatomically, the third ventricle (*ventriculus tertius* or *little belly #3*) is one of the main four fluid-filled cavities comprising the ventricular system within the human brain. It is a median cleft between the two thalami, and is filled with *cerebrospinal fluid* (CSF - see next page). It is in the midline, between the left and right lateral ventricles and develops from the central canal of the neural tube.

Floating in this cavity as upon an inner lake, are the pineal gland (the body's magnetic detector and "third eye") and the pituitary gland (the master gland for the endocrine chain). The pineal & pituitary glands are anchored by narrow stalks, like lotus flowers.

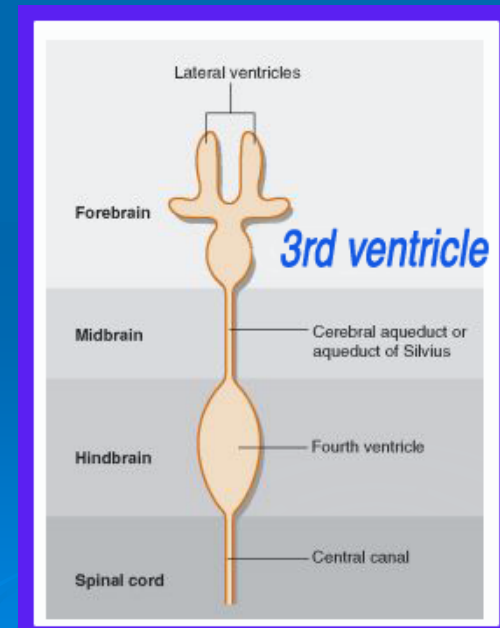


Schematic cross-section of the ventricular system →

The *foramen* and the *aqueduct* are two delicate "suspension bridges" insuring the precise attunement of the 3rd ventricle as a frequency control instrument.

← The "center of the head", location of the 3rd ventricle.

(After Robin Kelly. *The Human Antenna*. 2008. [www.humanantenna.com](http://www.humanantenna.com))



## SG204.5.12 The Cerebro-Spinal Fluid: Heavenly Dew

Here is the current medical understanding about the cerebro-spinal Fluid (CSF):

The CSF or *Liquor cerebrospinalis*, is a clear bodily fluid circulating in the ventricular system, around and inside the brain and spinal cord. In essence, the brain "floats" in it. The CSF constitutes the content of all intra-cerebral (inside the brain, cerebrum) ventricles, cisterns, and *sulci* (fissures in the brain), as well as the central canal of the spinal cord. The main physiological functions of the CSF are:

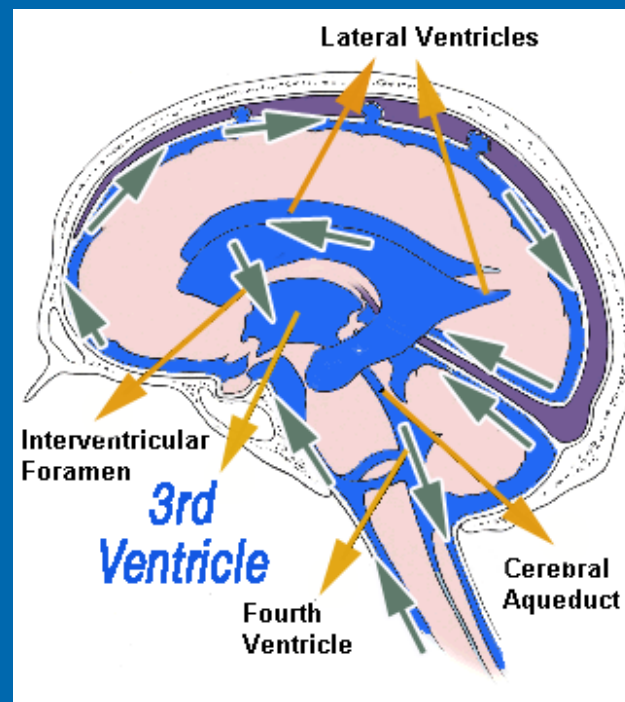
- It acts as a "cushion" or buffer for the cortex, providing a basic protection to the brain inside the skull in the form of buoyancy: the actual mass of the human brain is about 1400 grams; however, the net weight of the brain suspended in the CSF is equivalent to a mass of 25 grams. The brain therefore exists in neutral buoyancy, which allows the brain to maintain its density without being impaired by its own weight, which would cut off blood supply and kill neurons in the lower sections without CSF.
- **Chemical stability:** CSF flows throughout the inner ventricular system in the brain and is absorbed back into the bloodstream, rinsing the metabolic waste from the central nervous system through the blood-brain barrier. The CSF is produced at a rate of 500 ml/day. Since the brain can contain only 135 to 150 ml, large amounts are drained primarily into the blood and also possibly into the lymphatic system. The CSF turns over about 3.7 times a day.

But there must be more to the CSF. Ancient mystical traditions, both from the East and the West, consistently talk about the properties of a certain "heavenly water" which can be activated and optimized through special yogic practices of "awakening". In its normal condition this is the "life force", *prana* or *chi* sustaining regular biological functioning. In its activated condition, it is variously called: "tears of the sky god", *kundalini*, "nectar of life", "divine fluid", "magical dew", *liquid light*... and explained as higher grades of life-force, *prana* or *chi*.

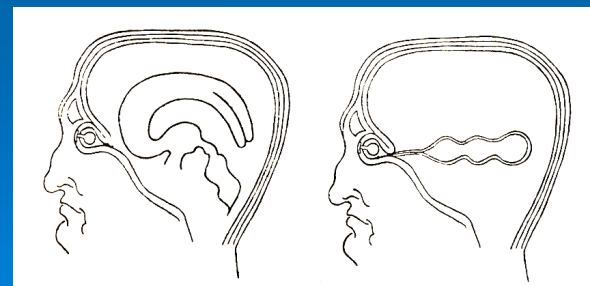
In all traditions, the importance of the "Central Chamber" (3rd ventricle) is emphasized. Manly P. Hall, in his *Man Grand Symbol of the Mysteries*, gives these examples:

- Occultism holds that, in normal humans, the pineal gland is a little door that separates the lateral ventricles from each other. When activated, the pineal gland rises and becomes an open door allowing free flow between the ventricles.
- Rosicrucians mention the "dew in the brain" that must be gathered "descending upon the top of the mountain". The purified vessel apt to receive this *Universal Solvent* or *Elixir of Life* is of course the regenerated body-mind of the alchemist.
- The Hindu tradition mentions the *Brahma Randhra* or Chamber of Brahma where the sacred *amrita* (the sweet-sounding water of immortality or *soma* juice) is secreted.

[More information & re-discoveries about aspects of esoteric physiology  
and Sacred Geometry will be shared in [SG307](#).]



↑ The circulation map of the cerebro-spinal fluid is an intricate network of pools, lakes and canals bathing all areas of the central nervous system in a vortex-like dynamic motion.  
(The green arrows indicate the direction of flow).



↑ Leonardo da Vinci.  
Drawings of the ventricular system.  
(Da Vinci papers).

## SG204.5.13 The Quantum Holographic Brain

Quantum Biology is fast becoming the standard biology.

Shocking the world in the 1960s with his description of the brain as a quantum hologram, Stanford neurophysiologist Karl Pribram's model of the *holonomic nature of the brain* is now well accepted as one the various models of "Quantum Mind" neuro-biology.

Pribram was drawn to the holographic model by the puzzle of how and where memories are stored in the brain. For decades numerous studies have shown that rather than being confined to a specific location, memories are dispersed throughout the brain. Pribram believes memories are encoded not in neurons, or small groupings of neurons, but in patterns of nerve impulses that crisscross the entire brain in the same way that patterns of laser light interference crisscross the entire area of a piece of film containing a holographic image. In other words, Pribram believes the brain is itself a hologram and uses the language of wave interference to store and transfer information. The brain (as well as the other senses - smell, taste, hearing) functions as a "highly discriminating frequency analyzer" and processes information through holographic transformation of wave interference patterns.

In the process of these New Paradigm breakthroughs, the traditional concerns of Sacred Geometry about harmony, coherence and resonance were found essential as applied to wave functions. The discoveries, at all scales of nature, about the use of Fibonacci Sequencing to optimize harmonic relationships and create fractal super-conductivity are now generating a new type of engineering in biology and science in general: Golden Ratio Fractality Engineering as a form of cosmo-bio-mimicry.

As a hologram, the human brain process is the closest example we have of the exquisite non-local inter-connectedness of nature. Indeed one of the most amazing things about human awareness is that, just like in a hologram, every piece of information seems instantly cross-correlated with every other piece of information.

Working with other scientists, Pribram came to the conclusion that our higher cognitive functions result from an interaction with the Zero Point Quantum Field. Human perception seems to occur at the fundamental level of the quantum: we do not really see objects but only their quantum holographic information out of which we construct our image of the world. If the "objective" reality is an illusion, consciousness is no longer a product of the brain but it is consciousness that creates the appearance of the brain. As commented in a blogspot: *"Maybe reality is nothing more than a consensus among humanity, formulated and ratified at the level of the human unconscious at which all minds are infinitely interconnected. If this is true, it is the most profound implication of the holographic paradigm of all, for it means that there are no limits to the extent to which we can alter the fabric of reality. What we perceive as reality is only a canvas waiting for us to draw upon it any picture we desire."* ([//liberty-moonbeam.blogspot.com](http://liberty-moonbeam.blogspot.com))

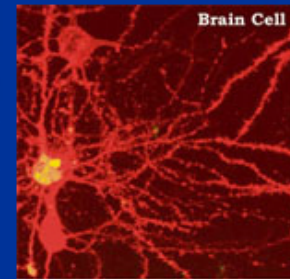
*"Through practices of deep meditation, prayer, and others states of higher consciousness that elevates the coherence of cerebral waves, this universal interconnectedness becomes expanded by synchronizing the functioning of the cerebral hemispheres and unleashing a highly coherent brain state... In brain mapping studies this highly synchronized harmonic state shows brain waves perfectly ordered, in a unique harmonic wave, as if all frequencies of all neurons from all cerebral centers played the same symphony... This highly harmonic synchronized state generates a nonlocal holographic informational cortical field creating a flux of consciousness interconnecting the human mind with the Holographic Cosmic Consciousness."*

(Alfredo Pereira Jr. [//network.nature.com](http://network.nature.com))

*Cosmological scale*



*Biological scale*





## SG204.5.14.1 The Human Hologram (1) Super-Resonance

If a hologram of a sunflower is cut in half and then illuminated by a laser, each half will still be found to contain the entire image of the sunflower because every part of a hologram contains all the information possessed by the whole.

Western science has long believed that the best way to understand a physical event or process, whether a "laboratory frog" or a molecule, is to dissect it and study its respective parts. Holograms are now teaching old paradigm science that some things in the universe may not lend themselves to this reductionist approach. If we try to take apart something constructed holographically, we will not get the pieces of which it is made, only smaller FRACTAL wholes.

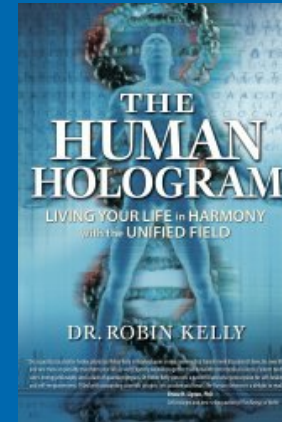
University of London physicist David Bohm has come to believe that objective reality does not exist: despite its apparent solid objectiveness the entire universe itself is a gigantic and splendidly orchestrated hologram. The holographic model extends to n-dimensions and therefore constitutes a fundamental description of the universe and of our quantum embedding within the greater cosmic field.

Bohm says that the reason subatomic particles are able to remain in contact with one another (regardless of the distance separating them) is because their separateness is an illusion. He argues that, at some deeper level of reality, such particles are not individual entities, but are actually extensions of the same fundamental field of "*implicate order*". Bohm explains that we perceive separation because we are only seeing a portion of reality. "Separate" objects are facets of a deeper and more underlying unity, like petals of the same flower. If the apparent separateness of subatomic particles is illusory, it means that at a deeper level of reality all things in the universe are infinitely interconnected.

As the wisdom teachings of the East have long upheld, the material world is an illusion, and although we may think we are physical beings moving through a physical world, this too is an illusion. Yet there is utmost and essential meaning to this human experience of embodying infinity in a holographic form: we are capable of sensing, seeking and co-creating HARMONY in its most wide-spread manifested quality: LOVE.

The Human Hologram is a vortex of cosmic consciousness fractally embedded within the larger part of planet Earth and the whole of the Cosmos. We are cosmic holographic antennas, made of trillions of tinier fractal mini, micro and nano-antennas, and floating/flying/swimming through a fractal ocean of frequencies. What we extract (receive & transmit) from this ocean and translate into physical reality is but one channel out of the super-hologram and yet each one of us is in instant resonance and cooperative resonance with the worldwide web of life - all the plants, animals & organisms forming this sacred Earth being. And, in turn, we and the Earth are fractally harmonized with the Golden Cosmos.

**The small part, the larger part and the whole: the same sacred proportions and the same musical chords.  
This is the Golden Music of Harmony.  
Can you hear and feel yourself?**

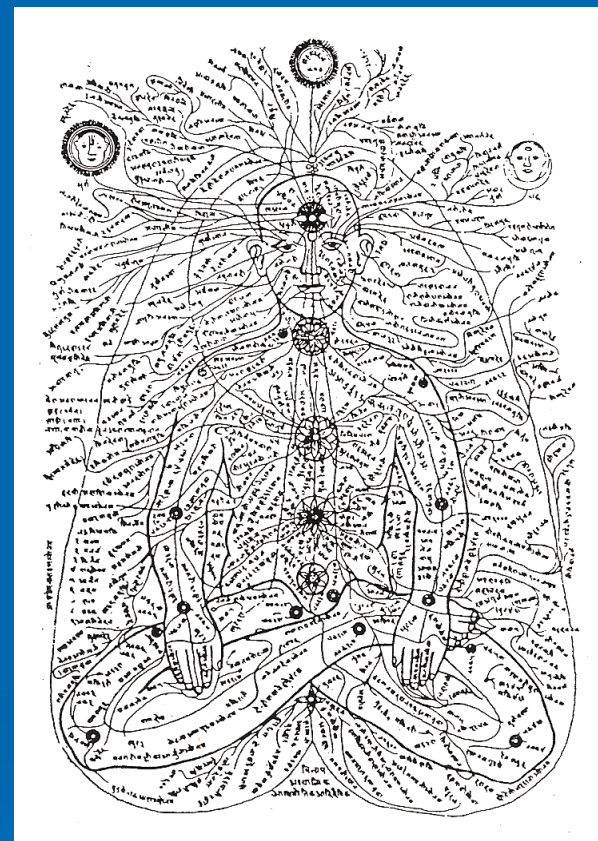
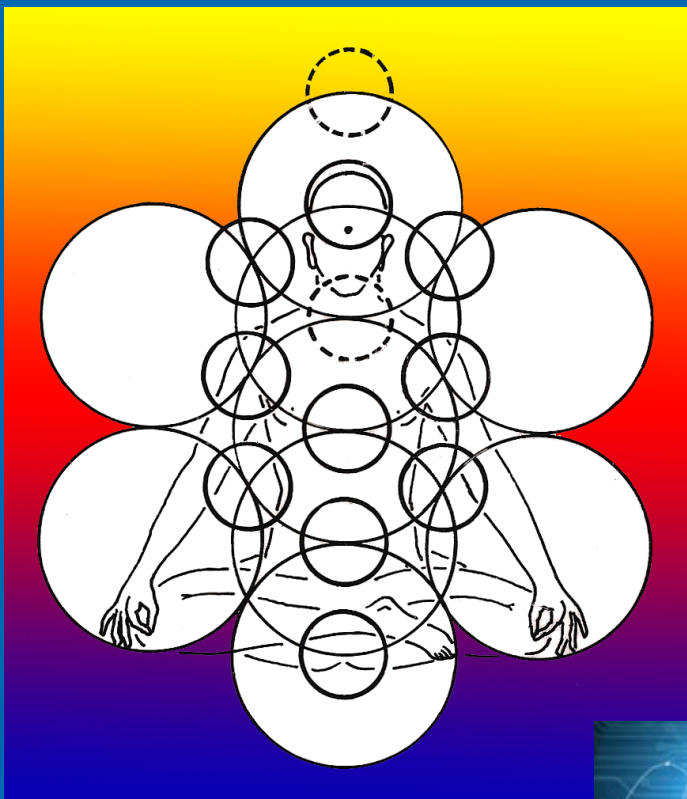


↑ Cosmic Man, 2011.



↑ Cosmic Man in the Indian tradition.

## SG204.5.14.2 The Human Hologram (2) - Harmonics of Energy Bodies



In **SG307** we will look into the Sacred Geometry & Harmony inherent in traditional as well as contemporary systems of vibrational healing and mystical yogas.



*"You can't go anywhere in your subtle body alone. It is too weak to move beyond its physical counterpart. To travel into other realms you must identify with your causal body while in the subtle body".*

(Swami Muktananda)



## SG204.Ca Conclusion - Human Life as a Harmonic Dance

*Man, know thyself in true  
proportion.*

*The Oracle of Delphi.*

*Man is all symmetry,  
full of proportions,  
one limb to another,  
and all to all the world besides.  
Each part may call  
the farthest brother,  
for head with foot  
hath private amity,  
and both with moons and tides.*

*George Herbert (1593-1633,  
English priest & poet)*



## SG204.Cb Online SG School Curriculum: Intro & Intermediate

### Sacred Geometry Introductory Level: 8 Modules

SG 101	Intro I	Sacred Geometry: Universal Order & Beauty
SG 102	Intro II	History & Traditions of Sacred Geometry
SG 103	Intro III	Sacred Geometry: A Grand Tour
SG 104	Intro IV	PHI: the Golden Ratio & the Fibonacci Series
SG 105	Intro V	The Golden Rectangle & Golden Spiral
SG 106	Intro VI	Pentagons, Pentagrams & the Penta-Modules
SG 107	Intro VII	The Five Platonic & 13 Archimedean Solids
SG 108	Intro VIII	The Vesica Piscis: Cosmic Womb of Creation

### Sacred Geometry Intermediate Level: 8 modules

SG 201	Interm I	The Monochord, Music & Cymatics
SG 202	Interm II	The Power of Archetypal Numbers
SG 203A	Interm IIIA	Sacred Geometry Resurgence in Science - Part 1
SG 203B	Interm IIIB	Sacred Geometry Resurgence in Science - Part 2
SG 204	Interm IV	PHI in the Human Body, Biology & DNA
SG 205A	Interm VA	The SG of Nature - Part 1: Plants & Phyllotaxis
SG 205B	Interm VB	The SG of Nature - Part 2: Animals & Minerals
SG 207	Interm VII	SG in Architecture, Sacred Sites & Green Design

## SG204.Cc Online SG School Curriculum: Advanced

### Sacred Geometry Advanced Level: 8 modules

SG 301	Adv I	Golden Cosmos: Planets, Stars & Cosmology
SG 302	Adv II	SG in Art, Culture & Creativity
SG 303	Adv III	Universal Symbols: Primordial Knowledge
SG 304	Adv IV	Labyrinths: a Mini-Pilgrimage to Self
SG 305	Adv V	Mandalas & Yantras: Sacred Vortices
SG 306	Adv VI	Languages & Gematrias: Sacred Communication
SG 307	Adv VII	Sacred Geometry in the Healing Arts
SG 308	Adv VIII	Harmony on Earth: Science & Consciousness of Harmony

*Upon completion of each level (Introductory, Intermediate & Advanced), a Certificate of Graduation from the Sedona School of Sacred Geometry will be presented to Certification Students.*

*Postgraduate seminars on current Sacred Geometry research, discoveries & updates will be organized in harmonic time.*

Questions: [phi@schoolofsacredgeometry.org](mailto:phi@schoolofsacredgeometry.org)

SG204.Cd Star Wheel Blessing



SW17. "Blossom Flower". www.starwheels.com





## SG204.Ce Contact Info

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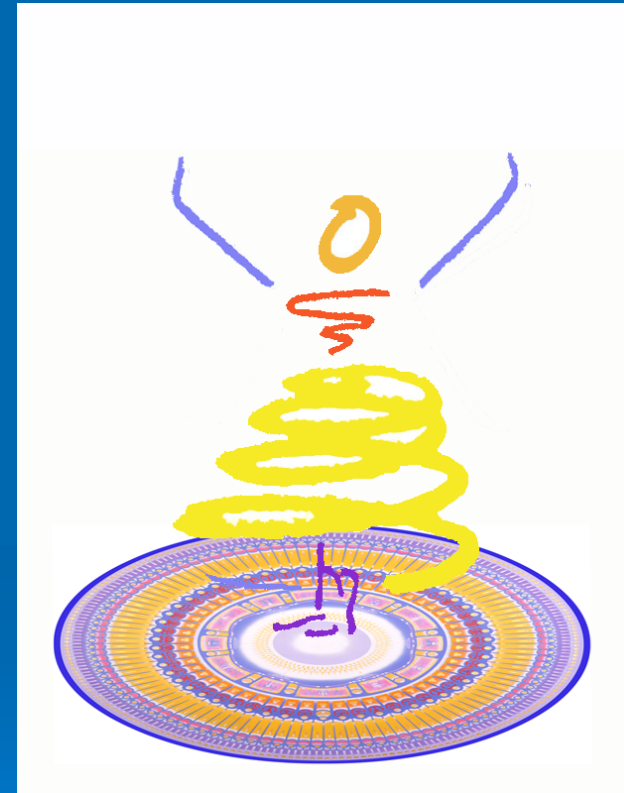
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**On Facebook: Aya Sheevaya**  
**FB Group: Sedona School of Sacred Geometry**



Φ celebration



## SG204.Cf About Aya

A native of France, Aya is a visionary artist and celebration yogi who has dedicated his life to serve humanity and to develop sacred arts education. In his late 20's, Aya realized that his professional life in the French diplomatic service was not fulfilling his heart's desires; he quit everything to go on an extended vision quest. His path took him around the world to visit a variety of sacred sites & cultures and to receive inspiration from many teachers.

In 1985, in Santa Monica, CA, Aya was gifted with a spiritual vision prompting him to create a series of 108 airbrushed neo-mandala paintings: the "StarWheels". The StarWheels, a happy family of vibratory flowers for the Earth, are looking for sacred spaces to be graced with their presence... ([www.starwheels.com](http://www.starwheels.com) / [www.starwheelmandalas.com](http://www.starwheelmandalas.com))

Moving to Sedona, Arizona, in 1997, Aya has been involved with sacred arts classes & events, mandala creation, Sedona guided tours, labyrinth making and Sacred Geometry teaching. Aya has presented several StarWheel art exhibits, has sponsored community awareness events at the Sedona Library, has developed, in collaboration with Gardens for Humanity, the Peace Garden arboretum at the Sedona Creative Life Center, was a speaker at the Sacred Geometry Conference (Sedona, 2004), co-designed several labyrinth sites (The Lodge at Sedona, Mago's Ranch...), and was on the management team of the Raw Spirit Festival in 2006 - 2008.

Realizing that Sedona was progressively becoming a global spiritual university for many seekers from around the world, Aya founded in 2005 the Sedona School of Sacred Geometry. The school is offering online access to Sacred Geometry PDF modules, with 17 modules completed so far. In the school's website, Aya states: *"We are living at the extraordinary and exciting times of a global transformation to a higher order of human consciousness... Sacred Geometry is the expression and resurrection of our deep innate wisdom, now awakening from a long sleep: seeing again the all-encompassing, fractal-holographic unity of nature, life and spirit... The keyword is HARMONY."* ([www.schoolofsacredgeometry.org](http://www.schoolofsacredgeometry.org))

Aya's visionary dream, supported by his non-profit educational organization, the StarWheel Foundation, is the co-creation of an international eco-village "The School of Celebratory Arts" - a green, tropical environment encouraging young people of all nations to develop their creative consciousness and thus contribute to a new, spirited, life-respecting global civilization on Earth. ([www.starwheelfoundation.org](http://www.starwheelfoundation.org)).

Since 2012, Aya is dancing the body divine, after his re-discovery of Yoga, Partner Yoga and AcroYoga. Aya is currently the AcroYoga.org Jam coordinator for Sedona and a teacher of yoga swing asanas.

Blessings in Anjali!