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**THE HARMONY**

**IN A MIRROR**

**OF GEOMETRY**

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KOSTROMA

*PROLOGUE***:**   **" ALPHA & OMEGA "**

*Duality principle dominates in the nature. The UNIT has united the incommensurable in language of numbers and geometry. There emerged a new, structural understanding of UNIT as a set of equations, i.e. algorithms of form building. The mathematical model of wildlife forms evolution corresponding to fundamental notions of the universe in the physics, biology, philosophy and art, is the foundation of natural geometry. The challenge of constructing this model aims at explaining the reason, why the world is such as it is, instead of other.*

UNIT

Forms of natural objects, units of Being, are infinitely various. Forms of live organisms are plastic, crystals are face-centered. Forms are much like to one another, and, at the same time, they are unique. Harmony means integrity: unity of form and content. Form building is one of the most profound secrets of science and creativity.

There are two ways leading to perception of harmony of the real world. The way of art represents integrative sensual knowledge; the other way is scientific cognition. The true shows through where natural sciences and art (form building practices) interpenetrate each other using a "supernatural" mathematical language. The form and essence, phenomenon and noumenon are mutually permeating. A universal principle becomes obvious: the numerical and geometrical basis of the world is made by divarication and duplication. The world is dual at all its levels. Empirically cognized substance stands against the so-called "dark" substance; electric fields have magnetic fields as their counterpart; elementary particles of microcosm are connected and interact under the law of complementarity; the continuity of life is carried out by cell division (mitosis) and, specularly, by fusion of two complementary (male and female) germinal cells. The nature does not know other mechanisms of building the life. In such a way new Being units are created. Divarications and doublings create real world. The structure of crystals and that of live molecules, credendas of great religions and shape of outstanding buildings of the Ancient Egypt and Ancient Greece go back to the same geometrical source: to binary structure of mathematical space. But until these facts exist in our consciousness separately, until the science and art are divided, ‒ the harmony remains outside scientific discourse. The unity and integrity, as before, constitute the domain of feelings.

Specificity of architecture lies in the fact that architecture is a kind of activity which of necessity unites the science and art. The architecture embodies a search for harmony of a whole, which in turn shall be harmonized with each its component. Here we discover a key to the problem under consideration: it is a proportion. The commonly accepted notion is that the proportion (commensurability) is a relation between overall dimensions of a building and between all its parts among themselves. It is interrelationship between the width, length, height of an object, surrounding relief and natural environment. Such understanding, deprived of completeness, was mapped with the term "proportioning", an evasive, one legged word form, not articulating the essence of form building, empty of its logic, reason, wisdom. In the nature, analogy (in Greek: the proportion) is a magic key to the essence of things hidden in numbers and geometry. The proportion and the form are indivisible in their source. A visible spatial image of Being Units is both noumenon and phenomenon. The proportion is a number and, hence, a key to scientific understanding.

The science of harmony begins with understanding that human reason, when creating the greatest abstraction, integers, and their graphical representation ‒ numerals, disregarded a bulky, self-evident detail, seemingly superfluous in the mathematical text. In the world of abstractions, the Unit-number represents real Units of being, which are autonomous objects and particles of the real world. Natural units have a spatial image. Their form is both plastic and crystalline. Natural units may manifest themselves as structures or as symbols, clear to sight (pictures) or to hearing (sounds). They are inimitably unique and infinitely variable; but in the main thing they are amazingly alike between themselves and opposing one another. It is no coincidence that the riddle of the UNIT exercised the minds of great physicists, astronomers, mathematicians and thinkers, such as Galileo Galilei, Gottfried Leibniz, philosophers and mathematicians Nicolaus Cusanus, Pavel Florensky, Alexey Losev.

The barrier to a scientific explanation of unity of the form and its hidden essence is set with dissimilar algorithms of human and divine logics. The human logic builds cause-and-effect chains; the reasons are simple, the effects complicated. In the base of mathematical logic lay uniqueness, exactitude and simplicity, plus elimination of tautology. Contrastingly, the reasons in the nature are complicated, the beginnings are ambiguous. Causes and effects are closed in a ring, they change places. The mathematical language, almighty tool of scientific cognition of truths, discovers this rupture in its very source. We have to do with the first and principal sign of mathematical texts, a symbol that designates the Unit. The presented graphic symbol of "number" is incomplete. The Unit has lost two rudimentary strokes. Such "sacred simplicity" eliminated from symbol "number" something self-evident, absolute, obvious, ‒ namely: proportion. Thus the key to a science of Divine harmony has been lost.

THE PRIMARY NUMBER

**1.** Words: three, five, thirteen are deprived of sense, if it is not implied that there is a measure of counting, namely ***Unit (1).*** The concept ofNUMBER originates from comparison of TWO magnitudes (either numbers or not); there shall be, at least, TWO of them. The “two” is a preliminary to Unit. The universe structure is dual as well.

**2.**  Let's suppose that there is a certain Primary number (, alpha). We shall give it the second Name **.** It will reveal physiophilosophical sense of concept "Number". The real world is structured; number  is a structure, ***Trinity***

 =  . (1)

Two of these three symbols are numbers:  and 1, the third is sign "RATIO" (/). It is a symbol of ***connection*** between the parts of whole ( and **1),** which make the whole (. The image of triune structure ( = ) signifies inter***action***. Number (an abstraction invented by humans) has shown something similar to the units of being enjoying real life in the nature. Connection of numbers  and 1 is bidirectional. The duality principle states:

***the being of number***   =  ***presupposes the being of number***  = .

In ***the natural*** mathematics, *connection of 'straight' and inverse numbers* plays the same fundamental role, as symmetry in physical and biological structures. This fact gives a key to understanding of harmony. All four forms of ***the operations*** manifesting themselves in the nature are primordially secluded in number "***natural Unit***". Arithmetic knows these four basic operations: *subtraction, addition, multiplication and division*.

REPLICATION

**3.**  In the beginning we shall present association of antisymmetric pairs as subtraction and addition (algorithm 2), and as doubling (algorithm 3):

(-) =  -  ;  ( +) =  +  , (2)

*left-hand side right-hand side*

subtractionaddition

( -, +) **=** (-) =  -  +  ( +) =  +  = **.** (3)

(*addition of the left- and right-hand sides* *is nothing but doubling*)

The found structure (2) is a block of two antisymmetric pairs. It represents a Unit of the higher order, number (-, +)**.** The rhythm of halving and doubling of structure is created exclusively and only by number . Structure-number (-, +) is not an element of primary chaos, but "***Primary structure***", the basis of a code of self-organizing the live matter, curtailed by a symmetry principle contracted into one point – the Point of Origin.

Structure (3) is *creative* algorithm of ***replication,*** the law of halving which is the same as doubling. It represents not a trivial doubling (since one of two parts decreased by its inverse number, whereas the second one increased by the same value), but a key to combinatorics, the tool for search of new, not yet existing structures in the physics, biology and art. The tool of evolution:

(-)    (+) (4)

extraction source addition

THE TIME AND COMPLEMENTARITY PRINCIPLE

4. The thought that the ***natural Unit*** in itself contains four fundamental operations of arithmetics, that it is a compressed spring of evolution, demands to endow number (-, +) with additivity (), as well with multiplicativity. On the assumption that numbers  and  not only are subtracted and added, but also synchronously and rhythmically multiplied *by themselves*, we introduce in the Primary Number a ***time*** ordinate – a rhythm of changes, i.e. we are actually abstracting the ***co-being*** (algorithm 5).

(-) =  -   (+) = + . (5)

*left-hand branch right-hand branch*

Number-structure (-,+)possesses fundamental qualities of the metaphysical Unit built in a chain of continuous metamorphoses of life. It is a "monad" searched for by Leibniz. It represents occurrence of "other". But it becomes an algorithm adequately describing the reality only with the provision that two restrictions are imposed on structure (5).

1/ At all values of *n* both branches of number (-, +) (left-side (-) and right-side (+)) should consist exclusively and only of ***integers***,becausethe Life is quantized at all its levels; each unit of being necessarily is a closed structure.

2/ Both branches of algorithm (-,+)shall be mutually ***complementary:*** so the physical microcosm and Life are organized. The *doublings* (***from one – two***) and *halvings* (***from two – one***),which set a pace, follow the principle "complementaries are oppposites". We shall agree that ***the opposite***, in language of numbers, will be identified with ***incommensurability*** of values.

Thus it is logically proved: to present a natural Unit as ***number***, it is necessary to convolute into a certain unique number  all the requirements and restrictions listed above. A fantastic task. Seemingly, it is impossible to solve.

And nevertheless it is resolvable! In a unique case, when the role of number  fulfils the Golden section ( = **Ф,** Table 1).

TWO BRANCHES OF METAMORPHOSES OF NUMBER (-,+) =  

**5.** Let's construct the table of metamorphoses of Unit (-, +) =  . A rhythm of metamorphoses:

Number  is multiplied by itself. The Exponent increases from n = 0 to n   .

(-,+)n =    (5)

On Table 1 we see:

1/ The sequence ***of even right and odd left*** units has created additive sequence of positive integers beginning from numbers **2** and **1**.

2, 1, 3, 4, 7, 11, 18, 29, 47, ... etc.

These numbers are **integers** belonging to sequence **N**.

We have here the familiar Lucas-N series rising from numbers 2 and 1.

2/ As to the second branch, sequence ***of even left and odd right*** numbers of the series, here ***positive*** ***integers are not present***. And, basically, such numbers *cannot* arise here. Mantissas of numbers are infinite decimal fractions

0, 2,2360..., 2.2360..., 4,4721.., 6,7802.., 11,1803..,17,8885.., 46,9574..., etc.

And, nevertheless, they are ***integers***! But their base is ***incommensurable*** to number 1.

The series complementary to that of Lucas is based not on 1, but on number  incommensurable with 1 ([quod erat demonstrandum](http://alk.pp.ru:8080/c/m.exe?t=258112_1_2&s1=%F7%F2%EE%20%E8%20%F2%F0%E5%E1%EE%E2%E0%EB%EE%F1%FC%20%E4%EE%EA%E0%E7%E0%F2%FC)!)

0, 1, 1, 2, 3, 5, 8, 13, 21 , etc. .

These are ***integers*** of a  series, namely, the the additive Fibonacci  series beginning with numbers 0 and **1.** The role of Fibonacci-Lucas series in generation of biologic forms it well known, and there is no need to repeat ancient matter. But it is necessary to accentuate the distinction between the Fibonacci-Lucas series shown in Table 1 (series   ) and traditionally understood series ***F*** and ***L*** having no generic difference. Series    is shown for the first time as one ***complete structure*** ***splitted into two mutually complementaryl branches***, a space of integers of ***two*** sorts, **N** and **.**

*Table 1.*

DOUBLE HELIX COMPOSED OF NATURAL INTEGERS N (1) and NUMBERS  ().-

LUCAS-**N** and FIBONACCI- SERIES

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Exponent  **n** |  | Left branch  Difference (-)  - | | Right branch  Sum (+)  + | |
| 0 | = 1.000000 | - =0 | **0** | **N**  **2** | +  = 2.000000 |
| 1 | = 1.618034 | - = 1.000000 | **N**  **1** | **1** | + =2.236068 |
| 2 | = 2.618034 | - = 2.236068 | **1** | **N**  **3** | +  = 3.000000 |
| 3 | = 4.236068 | - =4.000000 | **N**  **4** | **2** | + =4.472136 |
| 4 | = 6.854102 | - = 6.708204 | **3** | **N**  **7** | +  = 7.000000 |
| 5 | = 11.090170 | - = 11.00000 | **N**  **11** | **5** | + =11.180339 |
| 6 | = 17.944272 | - = 17.88854 | **8** | **N**  **18** | +  = 18.000000 |
| 7 | =29.034443 | - = 29.00000 | **N**  **29** | **13** | +=29.068883 |

Numbers are paired on the principle of structures in the microcosm of physics and biology. Hence, numbers of both series, **N** and , are ***natural*** whole numbers.

The ratio of neighboring numbers of the trivial Fibonacci series or that of the Lucas series ***tends*** to number **Ф.** This property is retained in series . Moreover, it is reinforced by the factthatadjacent term of this series constitute pairs  not approximately, but with an accuracy to any decimal. Andthere emergenot two parallel lines, but a "double spiral"! The beauty of this double algorithm is amazing, as well as affinity of its structure to that of the DNA molecule, which bears main responsibility for formation of live systems – units of being – in biology.

Let's sum up.

***Number*** ***Ф***, having merged doubling, halving and mirror symmetry, has made number  komplementary-opposite to unit 1 and in doing so introduced quinary symmetry, which ***brathed life into*** ***-structure.*** But whence came from number **Ф** itself?

THE RING OF COUSES AND EFFECTS

**6.** Number **Ф** originates from idea of time, idea of growth. Antique Greeks have expressed idea of growth, idea of Being in two immortal maxims:

1/ ***The World is number***. 2/ ***From one – all, from all – one***.

Let's suppose that there is ***something one***, nihil and all simultaneously, number . When unboundedly copying itself and adding its content to itself over and over again, being multiplied on itself and developing in whole, it becomes revealed as infinitely varied "being units", closed structures, "numbers **1".** These structures are represented by an integrity equation in its direct and reciprocal forms:

,  (6)

Having solved this equation, we see that transformation of number  to Golden section number  **=** **Ф)** passes two stages.

At stage One:

***The idea of integrity generates a dichotomy, i.e. duality***.

at  **,** (7,а)

at   (7, b)

At stage Two:

***The idea of duality divides the World of Being units in two***:

а)  the сhain of numbers occupying even places in algorithm (7) – a structure with the  base – represents the world of crystals,

at ,  (8а)

at **,**   (8b)

b) the chain of numbers occupying odd places in algorithm (7) – a structure with the Golden section number as its base,

at **,**   (9а)

at,  (9b)

Golden section number  is unfailing present in wildlife structures, rhythms and forms.

**7.**  It is necessaryto take note of the primary source of these metamorphoses: ***the structure of number Ф is binary from the outset***. Whole (Ф) consists of TWO halves, namely a half of number 1 and a half of number**:**

 **= +**  **1 +** **;**  **= -**  **1 +** **.** (10)

Сами эти числа, 1 и , составлены, то и другое, из числа Ф, взятого и в прямой, и в обратной форме: These numbers, 1 and, both of them, are made up of Ф, which is taken both in direct and reciprocal forms:

**1** = **-** and  **=**  **+** ,

1 = +  -  **and**  **=** +  + 

This means ***doubling*** of the Primary number: 2Ф = 1+**.**

Causes and effects in this unique TRINITY made up a closed ring:

**Ф = f (1,2,) , 1 = f (Ф);**  **= f (Ф).**

THE SECOND PYTHAGOREAN THEOREM:  
CORNER STONE OF HARMONY

**8.**  Unit ,i.e.structure **Ф** expandedinto algorithm of integrity (6), has a space analogue. This analogue is most simple of conceivable space forms. A spherical surface, in geometrical sense a single whole, is easy to render in the language of nature – the language of dual entities – as a sphere **-N** comprisingtwo spheres nested into each other.

Any point ***k*** *belonging to a spherical surface* is the vertex at the right angle of the rectangular triangle, which hypotenuse is diameter of this sphere, and legs are distances from point k to poles. If two spherical surfaces have a general centre because their poles coincide in space, whereas the lengths of lines connecting points  and points  to poles are expressed by incommensurable whole numbers, then none of the points of sphere  can take place of any point of sphere N. The sphere is dual, it is arranged basically in the same manner as the combined Fibonacci-Lucas series (Table 1, it. 5) and is endowed with all properties of Unit **.** As such, it is a three-dimensional image of Trinity.

**9** If diameter of sphere **-N** tends to 0, then its center is the Point into which the laws of both symmetry and harmony are contracted. Sphere development is opposite to its contraction: it is an image of expansion. Expansion is shawn by the double-square Pythagorean theorem. The trivial equation + =  (where hypotenuse square  is "a bird with a sole left wing") is replaced by the equation having "two wings":

+ =  = +  (12)

Transformation of equation += +  into equations =  =

= (A + *a*)  (A  *a*) = (*b* + *B*)(  *B* )

reshapes the double-square Pythagorean theorem (12) into the symmetry-of-pairs equation

 *=* .

If numbers *A, B* in this equation are integers whole to base N = 1, and numbers a, b are integers whole to base , then it is "Alpha and Omega", number **Ф**, the Golden section, "algorithm of love":

 **Ф**  (13)

Equation (13) has countess set of solutions. In geometry, it is a sphere composed of two spheres existing in each other. The sphere is one, but, at the same time, there are TWO of them; they are ready to be divided in space, just as in the Bible Eve "had separated" from Adam. Drawings 4 and 5, 9 and 10 show how it happens.

**10.** Great Kepler believed that the geometry possesses two treasures: the Pythagorean theorem and Golden section. He compared the Pythagorean theorem to gold, and the Golden section – to a jewel. Meanwhile, it is a single treasure. The nature itself enchased the jewel in gold. The geometry based on the principle “DUALITY  DICHOTOMY” subdivides integers into numbers of two sorts. Unit  takes on two images. Principal treasure of geometry is ***one***, and its structure is identical to that of Fibonacci-Lucas series. Such structure is immanent to the double spiral of DNA molecule. The Unit  exhibited the complementarity of the male (N) and female () principles. This circle is closed, as well as begun, by dichotomy! In the symmetry-of-pairs equation (13), each of the numerator numbers (the pair of pole *A*) is composed ***of halves*** of denominator numbers; and each of the denominator numbers (the pair of pole *B*) is composed ***of halfs*** of numerator numbers.

=  + *B*; = *A* - ; (14)

***B*** { } ***A***

***А*** =  + *B* ***В*** =  -  *A* (15)

The Pythagorean theorem becomes the Golden section, when (in physical interpretation of model) the giant energy distributed over entire surface of a sphere concentrates (by the God's will) in two poles of a triune sphere. The connection created by the Pythagorean theorem (pairs of numbers АB, ab) ceases to exist. There occurs a polar interaction (linking together the heterogeneous pairs): Aa, bB. We witness a numerical and geometrical image of the "Big explosion" idea, the beginning of expansion. This model is developed in the First part of the book "The Harmony in a Mirror of Geometry", see Chapter Two ("The Integers and Symmetry of Sphere"), Chapter Three ("The integers and Second Pythagorean Theorem"), and Chapter Four ("The Language of Natural Geometry").

THE GOLDEN SPACE

**11** Chapter Five "Regular Dvision of Space" is a step to new understanding of mathematical space. Space may be thought to be either classically ***static*** or ***dynamic*** (as integrated *space-time*).

***Regular*** division of space, according to Plato, is based on assumption of the ***static*** space. Platonic regular solids are identical. They are built with respect to module 1. One edge, one face; unchangeable volume is closed by identical faces of "body", whether it be a tetrahedron, cube, octahedron, regular icosahedron or dodecahedron. Identity runs things. Golden space, on the contrary, is ***dynamic.*** It is the space of life, development, growth. Dynamics changes the meaning of term "mathematical space". ***The rule*** of space division is changed. The expansion space is built by Unit  = , where = Ф. The rhythm of changes establishing unity of the whole is predetermined by unique number  = . This gives rise to unlimited flexible combinatorial divisibility and, hence, inexhaustibility of forms in the nature. The space breaks down into bodies that hold *unchanged volume, but change the form*, which ensures evolution of genetically kept structure going back to algorithm (-, +) n =   .

**12** The plane is represented by three points (*triangle*); the space is created by the fourth point; the primitive element of space is *tetrahedron*. It is impossible to fill in the space with ***a sole*** Platonic tetrahedron. Contrastingly, ***one*** golden tetrahedron of ***immutable*** volume, which four ribs are numbers , is capable to fulfill division of unlimited space ***twice,*** either with its "minor", or with its "major" variety! Each alternative leaves room for infinitude of feasible structures. Junction of "major" and "minor" forms plus change-over to binary level of form building with two types of regular tetrahedrons as a basic structure, creates ***the symmetry-of-similarities space*** (SSS). Two thirds of the SSS make up the "A-rhombuses". They are polarly directed () and entrained in structures of tetrahedrons of left and right rotation, which cover the remaining third of the SSS. The SSS incorporates unlimited number of hierarchical levels, but it is described exclusively and only by a sole number .

**13** Chapter 6 of Part Two "*Algorithms of integrity*" is of paramount importance. It models Using the same universal algorithm, it models nonclosed, theoretically unbounded Euclidean plane, as well as hemisphere and closed curvilinear forms which are adequate to basic forms of wildlife. These natural forms are built by a square matrix: the rhythm of changes is looped by numbers . Expansion parameters of the Point of origin in reference to the center of a polar coordinate system ***in orthogonal directions*** are defined by the Golden section (numbers,).

**Architecture as Worldview.   
Geometry and Art**

**14**  Dimensionalstructure of architecture masterpieces (I mean the Egyptian pyramids in Giza, the Parthenon in Athenes, the Church of the Intercession on the Nerl River); icon painting (A.Rublyov, "Trinity"); Bach, Beethoven, Mozart's music – here is a path leading to sources of harmony. The notions of antique philosophers of substance and universe, present-day ideas relating to physical structure of microcosm, the teachings of great religions (the Judaism, Christianity, Indian Veda and Chinese Dao), it all connects the remote past and the future. The mankind, probably, has inherited a share of the high knowledge possessed by disappeared (extraterrestrial?) civilizations. Stones of ancient structures store the general laws of structuring. Slope angles of ten principal pyramids in Giza are dictated ***by geometry of the double square (1, 2,*** ***)***. More than 4.5 thousand years ago the double square was realized in the space of the Cheops Pyramid funeral chamber. The apothem section of the Cheops Pyramid strongly suggests the use of number. On a carved board discovered in a crypt of the architect who had built a complex of the first (stepped) Pyramid of Djoser, the architect is shown with two measuring staffs in hand, the length of staffs being matched as numbers 1 and , which are the side and diagonal of the double square. These values are incommensurable, 1: = 0.447. Two thousand years later, the same link has determined dimensional structure of Parthenon with simplicity, clearness and wisdom so convincingly, that it is necessary to put, at last, an end to never-ending dispute of historians of architecture and instaurators: how were calculated the proportions of the Athenian Acropolis masterpieces: in integers, or on a basis of a not confirmed in writing hypothesis about irrational relations in the double square system?

**15** Exact measurements of the Parthenon colonnade have conclusively shown that integer-valued ratios are inherent in dimensions of Parthenon. As is known, the idea of a module has left a deep mark in works of illustrious masters of architecture, such as Vitruvios, Palladio, to name but few. Irrational ratios are identified in many antique constructions and proportional compasses.

Compasses bear witness that following tools and methods were applied in classical antiquity:

а) doubling (the compasses from the German Museum, set to ratio 1/2 = 0.500);

b) Golden section (the compasses from the Naples Museum, set to ratio (+1)/2 = 0,618);

c) links between the sides and diagonal of the double square, 1/ = 0.447 and (+1)/ = 0.553, because 0.447 + 0.553 = 1 (the compasses from the Therm Museum in Rome hold fixed link (+1)/ = 0.553).

Where is the truth? Is the harmony of forms of the Athenian Acropolis ensemble created ***by integers*** or ***irrational ratios***? The ratio of Parthenon gives an unambiguous and conclusive answer to this question.

Parthenon is a temple 100 feet in width. The Parthenon stylobate proportions, its width and length, are inferred from the ratio 0.444/1 = 4:9. The height of a column trunk (31 foot) is found from the stylobate width (100 feet) by its division into two parts in a ratio of 0.449/1 = 31:69, where 31+69 = 100. Five intercolumniations of ordinary columns of the principal portico (the ratio of column spacing to height of a column trunk) also give the ratio 0.449/1 = 31:69. On the north side façade where instaurators managed to completely recreate column trunks from original stones, the proportion of intercolumniations ranges from 0.449/1 to 0.448/1. We observe the same ratio 31:69. Structural decomposition of entablement into an architrave, a frieze and a cornice establishes proportion 0.444/1 = 4:9. Furthermore, there is an impressive chain of magnitudes: capital height – mean design diameter of columns – column spacing - height of column trunk. Corresponding ratios are 0.449/1, 0.446/1, 0.449/1, with the same integer-valued relationship 31:69.

The height ***of column trunk*** is determined by *division* of the 100-foot *stylobate width* by 1/(1 + ). When measuring in foots, it yields 31:100. The column trunk is ***a smaller segment*** of the column considered, its length is 31 foot. Ordinary columns are more slender than those of mean design type, whereas corner columns are more powerful and are arranged closer to the ordinary ones. The key to arrangement of corners also gives the column trunk. Attention is drawn to analogy: *the technique which has defined the column trunk height is repeated and developed* at corners where the structure should exhibit maximum power: the spacing ***of an angular column*** defines division of the ***column trunk*** ***height***in the **Ф ratio**! ***The smaller segment*** of the trunk height isequal to the corner column spacing. These values are connected by the Golden section, as numbers 1/= 0.382/1.

**16** Such are the facts. But they still require a fundamental understanding! ***Where perception of images is involved, αναλογια*** means the associations originating in subconsciousness (emotions, feeling). The proportion awakes figurative associations in depths of subconsciousness. Architects of classical antiquity knew it: the shaft of a column and human body were named identically: “***σομα***”. The same word. Why? Human footstep (1 foot) and height of human body (5 feet) are in the ratio 1/5; commensurability 1/5 of a Parthenon column shaft is ***analogous*** to commensurability of human body! Number 0.447 connects numbers 1 and 5. Link 1/= 0.447 is the mean of numbers 1 and 5. It is, literally, the proportion, ***αναλογια***: 1: = : 5. We have found an unambiguous answer to the problem of meaning and reason for choice of integer-valued ratios 4:9 and 31: 69!

**17** The Parthenon it, at first, an ***idea,*** image; secondly, ***a material*** (Pentilean marble of a warm skin-like color, ***a flesh***); and, thirdly***, the EMBODIMENT method*** (***αναλογια***). The Parthenon is

***a hymn to the quinary symmetry, Golden section, life,*** ***human being***

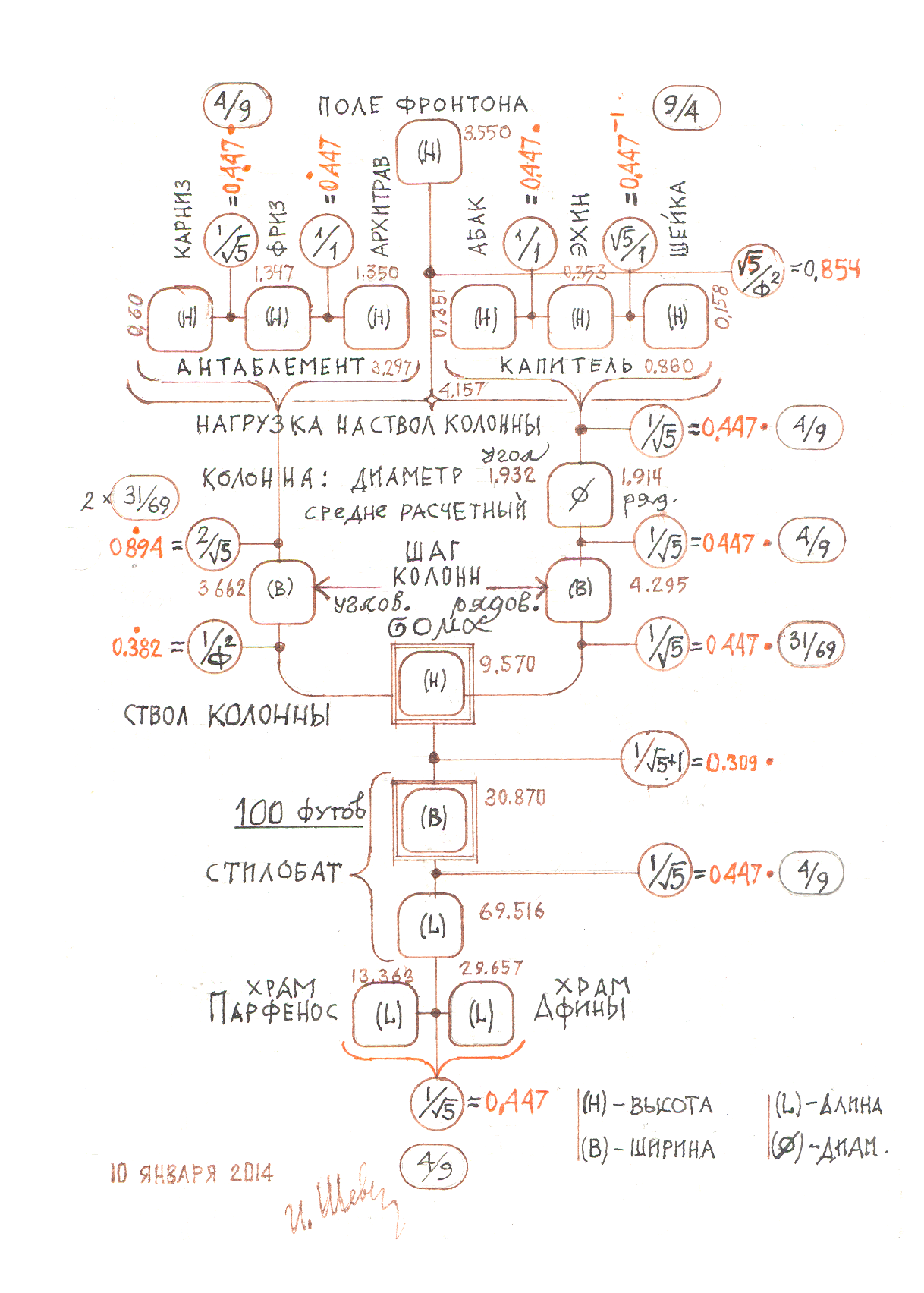
(+) = =  + 

Here is a key to the Parthenon, its proportion and image. The master has applied two integer-valued approximations to irrational link 1/. The square of the two  and square of the three  make the link 4: 9 = 0.444. These are numbers of the first ten. They create contrast ***superior*** to 1: = 0.4472; Δ = + 0.0031. Integers of the first hundred, 31:69 = 0.4493, have created contrast lesser than 1:, Δ = - 0.0021.

Both these links, 4:9 = 0.444 and 31:69 = 0.449, are two closest approximations to the link 0.447/1 connecting a side and diagonal of the double square.

**18** So the form of Parthenon showed to the world a harmony masterpiece: materially embodied image of metaphysical Unit of Being. The Parthenon speaks convincingly and incontestably: the idea dominates in the creative act. "The world is number". "In the beginning was the Word**(*λογοσ***), and the Word was with God, and the Word was God. He was with God in the beginning. All things were made through Him, and without Him nothing was made that was made" (Joh.1:1-3)

Art opens doors of the natural geometry that allows for the convergence of philosophy, religion and exact sciences.



|  |  |  |  |
| --- | --- | --- | --- |
| поле фронтона | fronton field | ряд. | regular type |
| карниз | cornice | шаг колонн | column spacing |
| фриз | frieze | углов. | corner type |
| архитрав | architrave | рядов. | regular type |
| абак | abacus | ствол колонны | column shaft |
| эхин | echinus | 100 футов | 100 feet |
| шейка | necking | стилобат | stylobate |
| антаблемент | entablement | храм Парфенос | Parthenos temple |
| капитель | capital | храм Афины | Athena temple |
| нагрузка на ствол колонны | column shaft load | высота | height |
| колонна | column | длина | length |
| диаметр | diameter | ширина | width |
| угол | corner type | диам. | dia. |
| среднерасчетный | mean design value |  |  |

**SYNOPSIS**

*Division of number* 0.447 *into two numbers* 0.444 and 0.449 has added *the breath of life* to a *scheme, has made* *a form live*. The variation is necessary: the principal "note", leitmotif of the Parthenon proportion, number ***1:*** ***= 0.447,*** is echoed with "sharp" 4:9 = 0.444 and "flat" 31:69 = 0.449.

0.4444  ***0. 4472***  0.4490.

4:9 **1/** 31:69

Using number oscillations, the master spiritualizes construction and makes the corrections dictated by specificity of visual impression. Bricklayers on the construction site conveniently reproduce this interrelation, which sounds with overtones, using a standard measuring bar. So it becomes evident that a problem “What method was used by the masters of antique classic architecture to define the dimensional-space structure of buildings?" just does not exist. The Athenian Acropolis learns us to see *the main thing* in the depth.

The architecture is the art to create images and, at the same time, it is an exact science. It joins handcrafts demanding not only engineering calculations and knowledge of geometry, but also the faculty to organize living space. Nowhere art and a science penetrate each other so densely as it is in architecture. In Russian, the Universe is named ***"мироздание***", which means “***World Building***”, when translated literally.

The humans are endowed with intuition and reason. In architectural proportions one can see the ratios of whole numbers, but overlook the world of associations, take no notice of the fact that objets d’art follow the same objectively predefined laws of the form building as the wildlife, rather than borrowed style and imitated fashion. Meanwhile, real units of Being are born by ***natural geometry.*** "In the beginning was ***λογοσ***" (reason, word, number).Creativity of original masters obeys the intuition and reason. When creating images, their creators willingly or involuntarily follow the lawsof ***natural geometry***. The heart of the Cheops Pyramid, king’s funeral chamber, which space is defined by numbers 2, 1 and , and the Parthenon of the Athenian Acropolis defined by numbers 1,  and Ф, immortalize in stone ***the Unit***, number "α and ω", a key to the harmony. On the contrary, the handcraft, as a rule, follows style and imitates a fashion. A casual form does not possess that which lays beyond the scope of imitation and affects the spectator: the secret of life. Whole *comes* *apart*.

Throughout all history of civilization, at fundamental level, the philosophy, religion, science and art are equally occupied with the essence of "Unit". The Unit is a symbol of integral Being. The enigma of Unit stirred Galileo Galilei, Nikolaus Cusanus, Gottfried Leibnitz, Pavel Florensky, Alexey Losev. It brings together "number" and "form", "essence" and "flesh". The code of "Unit", as presented here, is quantum of an information field of life. The life is information interchange.

The architecture has kept in stone of its masterpieces natural laws of form building: knowledge of the universal essence of things. Through thousand years the architecture provides a way of seeing and feeling this preserved knowledge.Genetic relationship of numerous facts of natural sciences and various properties of the mysterious Golden section, seemingly far from problems of natural sciences, religion, ontology, is revealed by mathematical model of bases of natural geometry. To build a material world by the laws of harmony contracted in Unit "Alpha-Omega" is a unique way of universal human culture.