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The Ancient-Greek Special Problems, as the Quantization Moulds of Spaces

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Abstract The Special Problems of E-geometry consist the , *Mould Quantization* , of Euclidean Geometry in it , to become → Monad , through mould of Space –Anti-space in itself , *which is the material dipole in inner monad Structure as the Electromagnetic cycloidal field* → Linearly , through mould of Parallel Theorem [44-45], *which are the equal distances between points of parallel and line* → In Plane , through mould of Squaring the circle [46] , *where the two equal and perpendicular monads consist a Plane acquiring the common Plane-meter* → and in Space (volume) , through mould of the Duplication of the Cube [46] , *where any two Unequal perpendicular monads acquire the common Space-meter to be twice each other* , as analytically all methods are proved and explained . [39-41]. The Unification *of Space and Energy becomes through* [STPL] *Geometrical Mould Mechanism of Elements , the minimum Energy-Quanta* , In monads → *Particles , Anti-particles , Bosons , Gravity –Force , Gravity -Field , Photons , Dark Matter , and Dark-Energy ,consisting Material Dipoles in inner monad Structures i.e. the Electromagnetic Cycloidal Field of monads*. Euclid's elements consist of assuming a small set of intuitively appealing axioms , proving many other propositions . Because nobody until [9] succeeded to prove the parallel postulate by means of pure geometric logic , many self-consistent non - Euclidean geometries have been discovered , based on Definitions , Axioms or Postulates , in order that none of them contradicts any of the other postulates . In [39] the only Space-Energy geometry is Euclidean , agreeing with the Physical reality , on unit AB = Segment which is The Electromagnetic field of the Quantized on AB Energy Space Vector , on the contrary to the General relativity of Space-time which is based on the rays of the non-Euclidean geometries to the limited velocity of light and Planck`s cavity . Euclidean geometry elucidated the definitions of geometry-content ,{ for Point , Segment , Straight Line , Plane , Volume, Space [S] , Anti-space [AS] , Sub-space [SS] , Cave, Space-Anti-Space Mechanism of the Six-Triple-Points-Line , that produces and transfers Points of Spaces , Anti-Spaces and Sub-Spaces in a Common Inertial Sub-Space and a cylinder ,Gravity field [MFMF] , Particles } and describes the Space-Energy beyond Plank´s length level [Gravity Length $3{,}969.10^{-62}$ m] , reaching the Point = $L_v = e^{i.\left(\frac{N\pi}{2}\right)b=10 \quad N=-\infty}$ m = 0 m , which is nothing and zero space .[43-46] -The Geometrical solution of the Special Problems is now presented .

Keywords: The ancient - Greek special problems; The Quantization moulds of Euclidean geometry.

1. Definition of Quantization

Quantization is the concept (*the Process*) that any , **Physical Quantity → [PQ]** of the objective reality (*Matter* , *Energy or Both*) is mapping the Continuous Analogous , *the points* , to only certain Discrete values . Quantization of Energy is done in Space-tanks, on the material points, tiny volumes and on points consisting the Equilibrium, Opposite Twin, of Space Anti-space.

In Geometry [PQ] are the Points only , transformed into Segments , Lines , Surfaces , Volumes and to any other Coordinate System such as (x,y,z) , (i,j,k) and which are all quantized.

Quantization of E-geometry is the way of Points to become → (Segments , Anti-segments = Monads = Anti-),(Segments ,Parallel-segments = Equal monads), (Equal Segments and Perpendicular-segments = Plane Vectors), (Un-equal Segments twice – Perpendicular -segments = The Space Vectors = Quaternion) .[46]

In Philosophy [PQ] are the concepts of Matter and of Spirit or Materialism and Idealism.
a) Anaximander, claimed that non of the elements could be, *arche* and proposed, *apeiron*, an infinitive substance from which all things are born and to which all will return.
b) Archimedes, is very clear regarding the definitions, that they say nothing as to whether the things defined exist or not , but they only require to be understood . Existence is only postulated in the case where [PQ] are the Points to Segments (the magnitude = quantization). In geometry we assume Point, Segment, Line , Surface and Volume , without proving their existence , and the existence of everything else has to be proved .
The Euclid`s similar figures correspond to Eudoxus` theory of proportion.
c) Zenon, claimed that, Belief in the existence of many things rather than, *only one thing*, leads to absurd conclusions and for, *Point and its constituents will be without magnitude*. Considering Points in space are a distinct place even if there are an infinity of points, defines the Presented in [44] idea of *Material Point*.
d) Materialism or and Physicalism , is a form of philosophical monism and holds that matter (*without defining what this substance is*) is the fundamental substance in nature and that all phenomena , *including mental phenomes and consciousness* , are identical with material interactions by incorporating notions of Physics such as spacetime , physical energies and forces , dark matter and so on .
e) Idealism , such as those of Hegel , *ipso facto* , is an argument against materialism (*the mind-independent properties can in turn be reduced to the subjective percepts*) as such the existence of matter can only be assumed from the apparent (*perceived*) stability of perceptions with no evidence in direct experience .
Matter and Energy are necessary to explain the physical world but incapable of explaining mind and so results , *dualism* . The Reason determined in itself and its relation to the world creates the very old question as, *what is the ultimate purpose of the world* ?
f) Hegel`s conceive for mind , *Idea* , defines that , mind is *arche* and is reduced to [PQ] the subjective percepts , while Materialism holds just the opposite .
In Physics [PQ] are The, Electrical charge, Energy , Light , Angular momentum , Matter which are all quantized on the microscopic level . They do not seem quantized in the macroscopic scale because the size of the steps between each possible value is sosmall.
a) De Broglie found that , light and matter at subatomic level display characteristics of both waves and particles which move at specific speeds called Energy-levels .
b) Max Planck found that , Energy and frequency of Electromagnetic radiation is quantized as relation E = h.f .
In Mechanics , *Kinematics* describes the motion while *Dynamics* causes the motion.
c) Bohr model *for Electrons in free-Atoms* is the Scaled Energy levels , *for Standing-Waves* is the constancy of Angular momentum , *for Centripetal-Force in electron orbit* , is the constancy of Electric Potential , *for the Electron orbit radii* , is the Energy level structure with the Associated electron wavelengths.
d) Hesiod Hypothesis [PQ] is ***Chaos*** , i.e. *the Primary Point* from which is quantized to *Primary Anti-Point* . [From Chaos came forth **Erebus , *the Space Anti-space*** *,* and **Black Night** , ***The [STPL] Mechanism*** *,* but of Night were born **Aether** , ***The Gravity`s dipole Field connected by the Gravity Force*** , and **Day** , ***Particles Anti-particles*** **,** whom she conceived and **Bare** , *The* ***Equilibrium of Particles Anti-particles*** *, in Spaces Anti-spaces ,* from union in love with Erebus] . [43-46]

2. The Special Greek Problems

2.1. The Squaring of the Circle

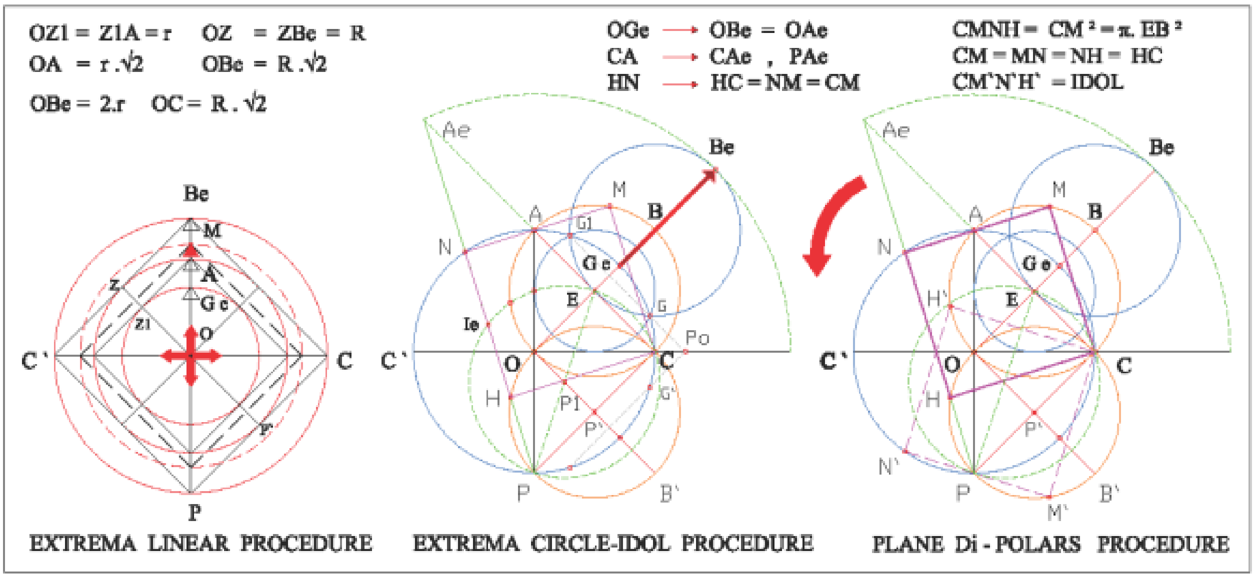
The Plane Procedure Method [45-46].

The property ,of Resemblance Ratio be equal to 2 *on a Square , is transferred simultaneously by the equality of the two areas , **when** square is equal to the circle , where that square is twice of the inscribed circle .*

This property becomes from the linear expansion in three spaces of the inscribed (O, OGe) to the circumscribed (O, OM) circle , in a circle (O, OA) as in . F-1.

The Extrema method of Squaring the circle Fig.1

F.1. *The steps for Squaring any circle* (E , EA = EC) *on diameter* CA *through the – Four-Polar Procedure method* .

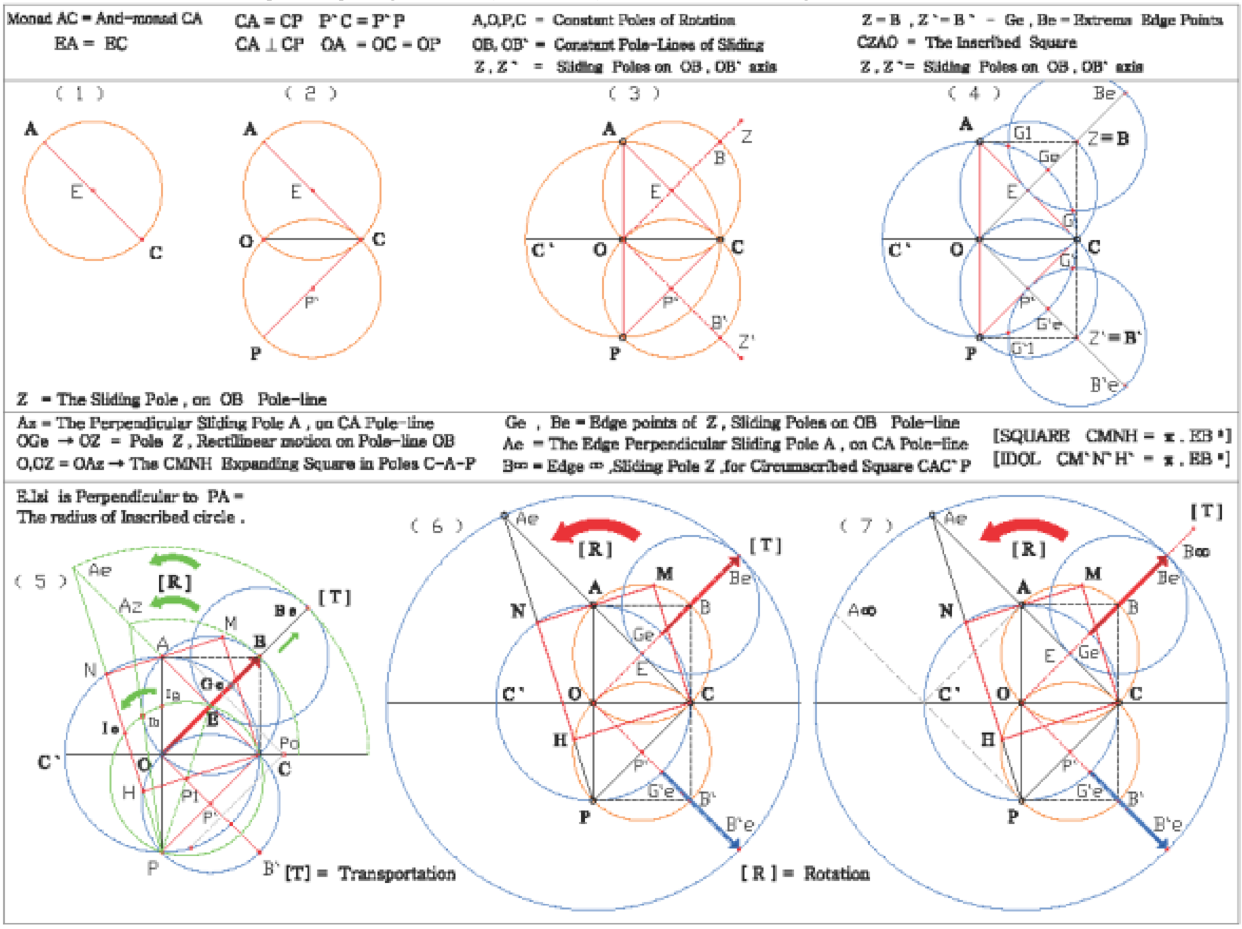


(1) (2) (3)

The Plane Procedure method is consisted of two equal and perpendicular vectors CA , CP , ***the Mechanism*** , where CA = CP and CA⊥CP ,
such , so that the Work produced is zero and this because each area is zero , with three conjugate Poles A , C , P related to central O , with three Pole-lines CA ,CP ,AP and three perpendicular Anti -Pole-lines OB , OB` , OC , and ***Converting the Rectilinear motion on the Mechanism , to Four - Polar Expanding motion.***
The formulated Five Conjugate circles with diameters → CA = OB , CP = OB` , EBe = OB , P`Pe = OB` , PoP1 = PoP2 = CA and also the circumscribed circle on them ← define
A System of infinite Changable Squares from → CBAO to → CMNH and to → CAC`P , ***through the Four - Poles of rotation .***
The Geometrical construction : F.1-(2) – F.2
1. Let E be the center , and CA is the diameter of any circle (E, EA = EC) .
2. Draw CP = CA perpendicular at point C and also the equal diameter circle (P` , P`C = P`O) .
3. From mid-point O of hypotynuse AP as center , Draw the circle (O , OA = OP = OC) and complete squares OCBA , OCB`P .
On perpendicular diameters OB , OB` and from points B , B` draw circles (B, BE = Be) , (B` , B`P`) intersecting (O, OA) = (O, OP) circle at double points [G ,G1] , [G`G`1] respectively, and OB , OB` produced at points Be , B`e , respectively.
4. Draw on the symmetrical to OC axis, lines GG1 and G`G`1 intersecting OC axis at point Po.
5. Draw the edge circle (O, OBe) intersecting CA produced at point Ae and draw PAe line intersecting the circles , (O, OA) , (P`, P`P) at points N-H , respectively.
6. Draw line NA produced intersecting the circle (E , EA) at point M and draw Segments CM , CH and complete quatrilateral CMNH , calling it the *Space = the System* .
Draw line CM ` and line M `P produced intersecting circle (O,OA) at point N ` and line AN ` intersecting circle (E, EA) at point H`, and complete quatrilateral CM`N`H` , calling it *the Anti-space = Idol = Anti-System* .
7. Draw the circle (P1, P1E) of diameter PE intersecting OA at point ,Ig, and (E,EA) circle at point Ib .
A.. Show that CMNH , CM`N`H` are Squares.
B.. Show that it is an Extrema Mechanism , on
Four Poles where , ***The Two dimensional Space (the Plane) is Quantized to a System of infinite Squares*** → CBAO → CMNH → CAC`P ,and to **CMNH *square of side* CM = HN ,** *where holds*
CM ² = CH ² = π . EA² = π . EO²

The Process of Squaring the Circle

F.2. The steps for Squaring the circle (E, EA = EC) on diameter CA through Plane Procedure Mechanism.



2.2. Analysis

In (**1**) EA = EC and the unique circle (E , EA) of Segment AC , where AC , CA is monad Anti-monad.

In (2) Since circles (E , EA) , (P`, P`P) are symmetrical to OC axis (line) then are equal (*conjugate*) and since they are Perpendicular so , → No work is executed for any motion ←.

In (**3**) Points A ,C, P and O are the constant ***Poles*** of Rotation , and OB ,OB` , OC – C A,CP, AP the Six , ***Pole*** and ***Anti – Pole*** , lines , of sliding points Z , Z `, *and* Az , A`z , while CA , CP are the constant Pole –lines { PA ,PAz ,PAe , PC `} , of Rotation through pole P.

In (**4**) Circles (E, EO) , (P`, P`O) on diameters OB, OB` follow, *My Theorem of the three circles on any Diameters on a circle* ,where the pair of points G , G1 and G`, G`1 consist a Fix and Constant system of lines GG1 and G`G`1.

When Points Z , Z ` coincide with the Fix points B,B` and thus forming the inscribed Square CBAO or CZAO , *(this is because point Z is at point* A.

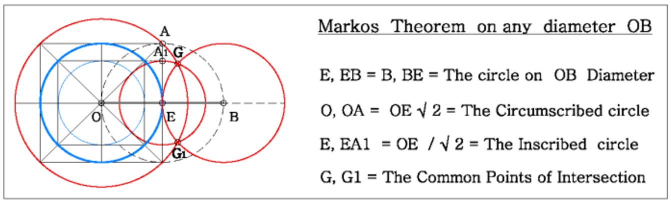
The PA , *Pole-line* , rotates through pole P where Ge , Be , are the Edge points of the sliding poles on this Rectilinear-Rotating System.

In (**5**) Points Z≡B , Z`≡B` *on lines OB,OB`*, and points Az , A`z are the Sliding points while CA , CP , are the constant Pole–lines { PA ,PAz ,PAe , PC `} , of Rotation through pole P . Sliding points Z , Z `, Az , A`z are forming Squares CMNH , CM`N`H` , *and this as in Proof* A-B *below , where* PN , AN ` are the *Pole-lines* rotating through poles P, A , and diamesus HM passes through O .The circles (E , EO),(P`, P`O) on diameters OB , OB` follow also , *my Theorem of the Diameters on a circle*.

In (**6**) , Sliding poles Z , Z ` being at Edge point Ge ≡ Z *formulates* CBAO *Inscribed square* , at Edge point Be , Be ≡ Z *formulates* CMNH *equal square to that of circle* and , at Edge point B∞ , *formulates* CAC`P square , which is the *Circumscribed square*.

In (**7**) , are holding → CBAO *the Inscribed square* , CMNH *The equal to the* (E , EO = P`O) *circle square* , and CAC`P *the Circumscribed square*.

F.3. → *Markos theorem , on any OB diameter*



***Theorem* :** [F.1-(2)] , F.3
On each diameter **OEB** of a circle **(E , E B)** we draw,
1. ***the circumscribed circle*** *(O , OA = OE .√2) at the edge point* ***O*** *as center ,*
2. ***the inscribed circle*** *(E ,OE/√2 = OA/2 = EG) at the mid-point* ***E*** *as center ,*
3. ***the circle*** *(B , BE = B.Be) = (E , EO) at the edge point B as center ,*

Then the three circles *pass through the common points G ,G1 , and the symmetrical to OB point G1 forming an axis perpendicular to OB* , which has the Properties of the circles , where *the tangent from point B* to the circle (O , OA = OC) is constant and equal to $2EB^2$, and has to do with , *Resemblance Ratio equal to 2 .*

A-B. The Common-Proof

In F.1-(2) , F.2-(5) ,

Angle < CHP = 90° because is inscribed on the diameter CP of the circle (P′, P′P) . The supplementary angle < CHN =180 – 90 = 90° . Angle < PNA = PNM = 90° because is inscribed on the diameter AP of the circle (O , OA) and Angle < CMA = 90 ° because is inscribed on the diameter CA of the circle (E , EA = EC) .

The upper three angles of the quadrilateral CHMN are of a sum of 90+90+90 = 270 , and from the total of 360° , the angle < MCH = 360 – 270 = 90° , Therefore shape CMNH is **rightangled** and exists CM ⊥ CH .

Since also CM ⊥ CH and CA ⊥ CP therefore angle < MCA = HCP .

The rightangled triangles CAM , CPH are equal because have hypotynousa CA = CP and also angles < CMA = CHP = 90° , < MCA = HCP , **therefore side CH = CM** , and **Because CH = CM , the rechtangle CMNH is Square .** The same for Square CM\`N\`H\` . (ο.ε.δ),(q.e.d) .

This is the General proof of the squares on this Mechanism without any assumptions .

From the equal triangles COH , CBM angle < CHO = CHM = 45° because lie on CO chord and so points H,O,M lie on line HM *i.e.*

Any segment PA → PAz → PAe → PC\` = CA** , ***drawn from Pole* , P ,** *beginning from* A *to* ∞ , intersecting the *circumscribed* (O,OA) *circle* , and the *circle* ( P\`, P\`P = *P\`C = EO = EC*) at the points N,H, ***Formulates Squares* CBAO ,

CMzNzHz , CAC\`P respectively , which are , ***The Inscribed* , *In-between* , *Circumscribed Squares* , *of circle* (O,OE)** = (E,EO = EB) = (P,P\`P) .

Since angles < CAzP , HCP have their sides CAz ,CP – AzP,CH perpendicular each other , then are equal so angle < PAzC = PCH = OZZm ,

and so point Az *, is common to circle* O,OZ , *Pole-line* CA , *and Pole-axis* PN , where Z.Zm the perpendicular to CM .

Since PE is diameter on (P1,P1P) circle , therefore triangle E.Ig.P is right-angled and segment ,EIg, perpendicular to OA and equal to OE/√2 = OA/2 , the radius of the Inscribed circle . Since also point ,Ig, lies on PA , therefore moves on (P1, P1.O) circle and point A on CA Pole-line and since point B is on the same circle as Az then point B moves

B. Proof : **F**.2-5

(**1**) Point **Z** , which moves on diameter OB produced , Beginning from Edge-point **Ge** of the first circle , Passing from center **B** of the second circle , Passing from Edge-point **Be** of the third circle , and Ending to infinite ∞ **, →** ***Creates on the three circles*** (O,OA) , (E,EO/√2) , (B,BE) , the ***Changeable moving Squares***

a) The Inscribed **CBAO** , at Z ≡ Ge
b) The In-between **CMzNzHz** , at Z ≡ B
c) The Extrema **CMNH** , at Z ≡ Be
d) The Circumscribed **CAC\`P** . at Z ≡ B∞

2) Through the four constant Poles A,C,P – O of the *Plane Procedure Mechanism* , pass (*rotate*) the Sides and Diamesus (*from O*) of Squares , Anti-Squares.

3) Point **Z** moving from Edge points Ge and , (*forming inscribed square* CBAO) , in-between points Ge-Be (*forming any square* CMzNzHz) , at Extrema point Be (*forming that square* CMNH *equal to the circle*) , and between points , Be - ∞ , (*forming the circumscribed square* CAC\`P) .

4) Point Ig , belongs to the Inscribed circle (E,EG) and it is the Rotating , *expanding* , Inscribed Edge poind on (P1,P1P) circle to Ig,Ib,Ie and to → P point . The other two , *Sliding* , Edge moving points B,A slide on OB , CA , Pole-lines respectively.

A – Proof (1)

Since BC ⊥ CO , the tangent from point B to the circle (O , OA) is equal to :

$\mathbf{BC^2}$ = $BO^2 – OC^2$ = $(2. EB)^2 – (EB .\sqrt{2})^2$ = 2 EB^2 = (2 EB).EB **= (2.BG) . BG** and since 2.BG = BG1 then **BC² = BG . BG1 ,** where point G1 lies on the circumscribed circle , and this means that BG produced intersects circle (O, OA) at a point G1 twice as much as BG . Since E is the mid-point of BO and also G midpoint of BG1, **so EG** is the diamesus of the two sides BO,BG1 of the triangle BOG1 and equal to 1/2 of radius OG1 = OC , *the base* , and since the radius of the inscribed circle is half (½) of the circumscribed radius **then the circle (E , EB / √2 = OA/2) passes through point G .** Because BC is perpendicular to the radius OC of the circumscribed circle , ***so BC is tangent and*** **equal to BC ² = 2 . EB ² . (o.ε.δ).(q.e.d)**

Proof F.**2- (5-6)** :

The point **Z** moving on **OB** Pole-line , defines on CA , point Az as that of intersection of circle (O,OZ) and this line. Polar-line PAz defines N,H points such that CHNM rightangled is completed as Square without any more assumptions . Following again prior A-B common proof ,

Angle < CHP = 90° because is inscribed on the diameter CP of the circle (P′, P′P) . The supplementary angle < CHN = 180 – 90 = 90° . Angle < PNA = PNM = 90° because is inscribed on the diameter AP of the circle (O , OA) and Angle < CMA = 90 ° because is inscribed on the diameter CA of the circle (E , EA = EC) . The upper three angles of the quadrilateral CHMN are of a sum of 90+90+90 = 270 , and from the total of 360° , the angle < MCH = 360 –270 = 90°, therefore shape CMNH is rightangled and exists CM ⊥ CH . Since also CM ⊥ CH and CA ⊥ CP therefore angle < MCA = HCP .

The rightangled triangles CAM , CPH are equal because have hypotynousa CA = CP and also angles < CMA = CHP = 90°, < MCA= HCP and side CH = CM therefore , rechtangle CMNH is Square on **CA,CP** Mechanism , through the three constant Poles C,A,P of rotation . The same for square CM`N`H` . (o.ε.δ)-(q.e.d) .

From the equal triangles COH , CBM angle < CHO = CHM = 45∘ and so points H,O,M lie on line HM .i.e. Diagonal **HM** of squares CMNH on Mechanism passes through central Pole O . (o.ε.δ)-(q.e.d) .

The two equal and perpendicular vectors CA , CP , *the Plane Mechanism* , of the Changable Squares through the two constant Poles C, P of rotation , is converting *the Circular motion to Four-Polar Rotational motion.*

Transferring the above property to [F.2 –(5)] then when point Z moves on OB → Point Az moves on CA and → PAz line defines on circle of diameter PE the points Iz , on circles O,OA = Circumscribed P`P`O = The Circle , and points H,N such that shapes → CHNM are all Squares between the Inscribed and Circumscribed circle .

Since Areas of above circles are →

Area of Inscribed = $\frac{1}{2}$ π.OE ²

Area of Circle = 1 π.OE ²

Area of Circumscribed = 2 π.OE ²

and those of corresponding squares , then one square of *Plane Mechanism* is equal to the circle , Which one ??.

→That square which is formed on Extrema Case.

2.3. The Plane Mechanism

The radius of the inscribed circle is AB/2 and equal to the perpendicular distance between center E and OA , so any circle of EP diameter passes through the edge-point (Ig) , and point (Ib) is the Edge common point of the two circles .

The Common Edge –Point of the three circles is (Ie) belongs to the Edge point Be of circle (B,BE = B.Be) , so exists ,

Case :	[1]	[2]	[3]	[4]
Point **Z** at →	Ge	B	Be	B ∞
Point **A** at →	A	A(I)	Ae	A ∞
Point **Ig** at →	Ig	Iz = Ib	Ie	P
	↓	↓	↓	↓
Square	CBAO ,	CmiNiHi ,	CMNH ,	CAC`P

i.e. Square CMNH of case [3] is equal to the circle , and **CM ² = CH ² = π . EA² = π . EO ²**

On the three Circles and Lines exist →

a) Circle (O,OZ = OGe) is Expanding to → (O,OZ = OBe) Circumscribed circle , for the CBAO square.

b) Point (A-Ag) to → (A-Az) is The Expanding Pole-line A-Az for the In-between CMzNzHz square ,

c) Circle (P1,P1.Ig) is Expanding to → (P1,P1.Ib) Inscribed circle (E,E.Ig) to Ib point.

d) Point (P –Pg) to → (P –Pe) is The Expanding Pole-line P –Pe for the Extrema CMNH = π.EA ² and is the square equal to the circle ,

e) Circle (O,OZ=OB∞) , Pole-line (A –AZe = A∞) , Pole-line (P –PIe = PP → P) , for CAC`P square, Point N on (O,OA) , belongs to Circumscribed circle Point Ie , on circle with diameter ,PE, ,belongs to the Inscribed circle

(E , EIg = EG) Point H, on (P`,P`O) , belongs
to the Circle.
i.e. ***It was found a Mechanism where the Linearly Expanding Squares* → CBAO – CMNH – CAC`P *, and circles* → (P1,P1E) –**
(B, BE) – (O,OA) *,which are between the*
Inscribed and Circumscribed ones ***, are Polarly – Expanded as Four – Polar Squares .***
The problem is in two dimensions determining an edge square between the inscribed and the circumscribed circle . A quick measure for radius r = 2694 m gives side of square 4775 m and
π = 3,1416048 → 11/10/2015

Segments* CM = CM ` *is the Plane Procedure Quantization of radius* EC = EO *in Euclidean Geometry , through this Mould* (*The Plane Procedure Method is called so , because it is in two dimensions* → CA ⊥CP) *as this happens also in Cube mould ***for the three dimensions of the spaces , which is a Geometrical machine for constructing Squares and Anti -Squares and that one equal to the circle . This is the Plane Quantization of , E - Geometry ,*** *i.e.* ***The Area of square CMNH is equal to that of one of the five conjugate circles , or***
$CM^2 = \pi \cdot CE^2$ *, and System with number* π *tobe a constant .*

***B – Proof* (1)**

Since circle (O,OGe) intersects CA vector at point A forming the inscribed square CBAO , the circle (O,OZ) is intersecting CA at point Az forming square CMzNzHz then edge circle (O,OBe) intersecting CA at point Ae is forming square CMNH
PA) is forming the circumscribed square CAC`P .

***B – Proof* (2)**

Since PE is diameter on (P1,P1P) circle , therefore triangle E.Ig.P is right-angled and ,EIg, perpendicular to OA and equal to OE/√2.= OA/2 , to the Inscribed circle . Since also point ,Ig, lies on PA , therefore moves on (P1,P1O) circle and point A on CA Pole-line and since point B is on the same circle as Az then B moves on OB Pole-line .

2.4. Remarks

Since Monads AC = ds = 0 → ∞ are simultaneously (*actual infinity*) and (potential infinity) in Complex number form , *this defines that the infinity exists also between all points which are not coinciding* , and **ds** comprises any two edge points with imaginary part , for where this property differs between the infinite points between edges .This property of monads shows the link between space and energy which Energy is between the points and Space on points.

In plane and on solids, energy is spread as the Electromagnetic field in surface .

The position and the distance of points , can be calculated between the points and so to ***perform independent Operations*** (Divergence, Gradient , Curl , Laplacian) on points .

This is the Vector relation of Monads , ds = CA ,(or , as Complex Numbers in their general form w = a + b. i = *discrete and continuous* **) , and which is the Dual Nature of Segments = monads in Plane, tobe discrete and continuous). Their monad – meter in Plane ,** and in two dimensions **is CM** , *the analogous length* , **in the above Mechanism of the Squaring the circle with monad the diameter of the circle .**

Monad is **ds** = CA= OB , *the diameter of the circle* (E , EA) *with* CBAO *Square , on the Expanding* by Transportation and Rotation ***Mechanism*** *which is* → {Circumscribed circle (O,OA) – Inscribed circle (E , EG = E.Ig) - Circle (B, BE) }← ***In extended moving System*** → {OB Pole-line – CA Pole-line – Circle (P1,P1.B = P1.Ig) } ,and ***Is quantized*** to CMNH square.

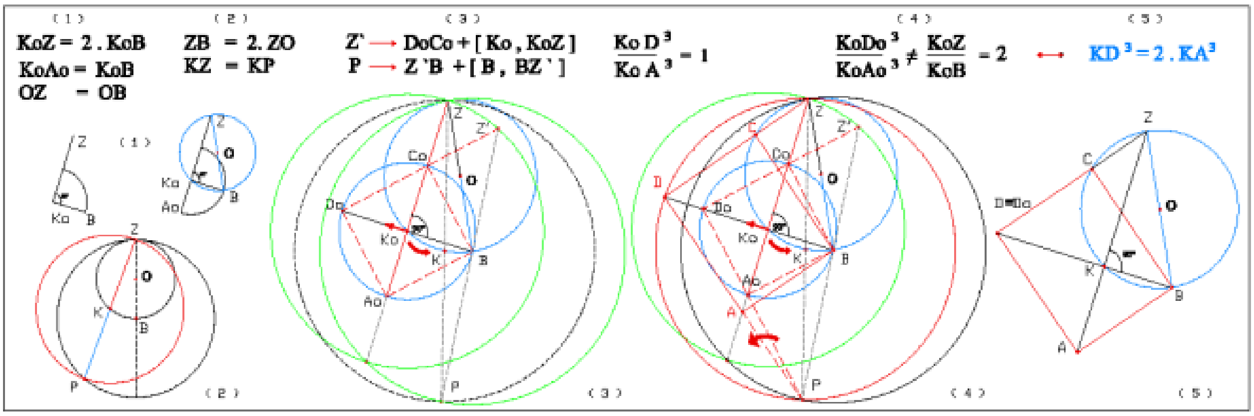
A deeper analysis for, *Mechanics and Physics* **, concerning the Theorem of the three circles and applications , in [50]**

3. The Duplication of the Cube, Or the Problem of the two Mean Proportionals

3.1. The Extrema method for the Duplication of the cube? [44-45]

This problem is in three dimensions as this first was by Archytas proposed by determining a certain point as the intersection of three surfaces , *a right cone , a cylinder, a tore or anchoring with inner diameter nil* . Because of the three master -meters *where is holding the Ratio of two or three geometrical magnitudes , is such that they have a linear relation (continuous analogy) in all Spaces* , the solution of this problem , *as well as that of squaring the circle* , is linearly transformed .
The geometrical construction in F-4 :

F.4.→ The Mechanical Extrema Poles of rotation in any circumcircle of triangle ZkoB .



Draw Line segment KoZ tobe perpendicular to its half segment KoB or as KoZ = 2.KoB ⊥ KoB and the circle (O, BZ/2) of diameter BZ . Line -segment ZKo produced to KoAo = KoB (*or and KoXo ≠ KoB*) is forming the Isosceles right-angled triangle AoKoB.

Draw segments BCo , AoDo equal to BAo and be perpendicular to AoB such that points Co , Do meet the circle (Ko,KoB) in points Co , Do respectively, and thus forming the inscribed square BCoDoAo . Draw circle (Ko ,KoZ) intersecting line DoCo produced at point Z ` and draw the circle ( B , BZ ) intersecting diameter Z `B , produced at point P (*the Pole*) . Draw line ZP intersecting (O, OZ) circle at point K , and draw the circle (K , KZ) intersecting line BDo produced at point D .

Draw line DZ intersecting (O, OZ) circle at point C and Complete Rectangle CBAD on diamesus BD .
Show that this is an Extrema Mechanism on where
The Three dimensional Space **KoA** → *is Quantized to* KoD as → $KoD^3 = 2. KoA^3$.

3.2. Analysis

In (**1**) KoZ = 2.KoB and KoAo = KoB , KoB ⊥ KoZ and KoZ / KoB = 2.
In (**2**) Circle (B, BZ) with radius twice of circle (O, OZ) is ***the extrema*** case where circles with radius KZ = KP are formulated and are the locus of all moving circles on arc BK as in F4-(2) , F.5
In (**3**) Inscribed square BCoDoAo passes through middle point of KoZ so CoKo = CoZ and since angle < ZCoO = 90▫ , then segment OCo // BKo and BKo = 2.OCo .

Since radius OB of circle (O,OB = OZ) is ½ of radius OZ of circle (B,BZ =2.BO) then ,**D**, is ***Extrema*** case where circle (O,OZ) is the the ***locus of the centers*** of all circles (Ko, KoZ) , (B, BZ) moving on arc ,KoB, as this was proved.

All circles ***centered on this locus*** are common to circle (Ko,KoZ) and (B,BZ) separately.

The only case of being together is the common point of these circles which is their common point P , where then → ***centered circle exists on the Extrema edge , ZP diameter.***

In (**4**) , F4-(4) Initial square AoBCoDo , ***Expands and Rotates*** through point B , while segment DoCo limits to DC , where ***extrema poin***t Z ` moves to Z . Simultaneously , the circle of radius KoZ moves to circle of radius BZ on the locus of ½ chord KoB . Since angle < Z `DoAoP is always 90 ° so , exists on the diameter Z`P of circle (B, BZ `) and is the limit point of chord DoAo of the rotated square BCoDoAo , and not surpassing the common point Z .

Rectangle BAoDoCo in angle < PDoZ ` is expanded to Rectangle BADC in angle < PDZ by existing on the two limit circles (B,BZ`= BP) and (Ko, KoZ) and point Do by sliding to D . On arc KoB of these limits is ***centered circle on ZP diameter ,*** i.e. ***Extrema*** happens to → ***the common Pole of rotation through a constant circle*** centered ***on KoB arc*** , and since point Do is the intersection of circle (Ko , KoB = KoDo) which limit to D , therefore the intersection of the common circle (K , KZ = KP) and line KoDo denotes that extrema point , where the expanding line DoCoZ` with leverarm DoAoP ***is rotating through Pole P***, and limits to line DCZ , ***and , Point P is the common Pole of all circles on arc KoB for the Expanding and simultaneously rotating Rectangles.***

In (**5**) rectangle BCDA formulates the two right- angled triangles ADZ , ADB which solve the problem.

Segments KoD , KoAo = KoB are the two Quantized magnitudes in Space (volume) such that Euclidean Geometry Quantization becomes through the *Mould of Doubling of the Cube* **.**

[*This is the Space Quantization of E-Geometry i.e. The cube of Segment KoD is the double magnitude of KoA cube , or monad $KoD^3 = 2$ times the monad KoA^3*] . About Poles in [5] .

Proof : F.4. (3)-(4).

1. Since KoZ = 2.KoB then (KoZ / KoB) = 2 , and since angle < ZKoB = 90° then BZ is the diameter of circle (O,OZ) and angle < ZKoB =90° on diameter ZB

2. Since angle < ZKoAo = 180° and angle < ZKoB = 90° therefore angle < BKoAo = 90° also .

3. Since BKo⊥ZKo then Ko is the midpoint of chord on circle (Ko, KoB) which passes through Rectangle (*square*) BAoDoCo . Since angle < ZDP = 90° (*because exists on diameter ZP*) and since also angle < BCZ = 90° (*because exists on diameter ZB*) therefore triangle BCD is right-angled and BD the diameter .

Since Expanding Rectangles BAoDoCo , BADC rotate through Pole , **P**, then points Ao , A lie on circles with BDo , BD diameter , therefore point D is common to BDo line and (K , KZ = KP) circle , and BCDA is Rectangle . F.4-(2) i.e. Rectangle BCDA possess AKo ⊥ BD and DCZ line passing through point Z .

4. From right angle triangles ADZ , ADB we have ,

Δ ADZ → $KD^2 = KA . KZ$ … (a)

Δ ADB → $KA^2 = KD . KB$ … (b)

and by division (a) / (b) then →

$$\frac{KD^2 = KA.KZ}{KA^2 = KD.KB} = \left|\frac{KD^2}{KA^2}\right| = \left|\frac{KA.KZ}{KD.KB}\right| \text{ or } \left|\frac{KD^3}{KA^3}\right| = \left|\frac{KZ}{KB}\right| = 2$$

(o.ε.δ),(q.e.d)

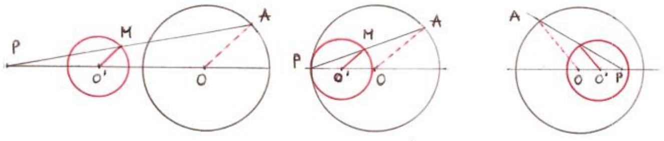
i.e. → **$KoD^3 = 2 . KoA^3$,** ***which is the Duplication of the Cube .***

In terms of Mechanics , ***Spaces Mould happen through ,*** *Mould of Doubling the Cube* ***, where for any monad*** **ds =KoA** ***analogous to*** **KoAo ,** ***the Volume or The cube of segment*** **KoD** ***is the double the volume of*** **KoA** ***cube , or monad*** **$KD^3 = 2.KoA^3$.** ***This is one of the basic Geometrical Euclidean Geometry Moulds , which create the METERS of monads → where*** **Linear** ***is the Segment*** **MA1 ,** **Plane** ***is the square*** **CMNH** ***equal to the circle and in*** **Space ,** ***is volume*** **KD^3** ***in all Spaces , Anti-spaces and Sub -spaces of monads = Segments ← i.e The Expanding square*** **BAoDoCo** ***is Quantized to*** **BADC** ***Rectangle by*** **Translation** ***to point*** **Z` ,** ***and by*** **Rotation** ***, through point*** **P** ***(the Pole of rotation) to point*** **Z .**

The Constructing relation between segments KoX , KoA is → $(KoX)^2 = (KoA)^2.(XX1 /AD)$ such that XX1 // AD , as in Fig.6 –(4).

All comments are left to the readers , 30/8/2015.

F.5. → *For any point* **A** *on , and* **P** *Out-On-In circle* [O, OA] *and* O\`P = O\`O , *exists* O\`M = OA / 2 .



(1) (2) (3)

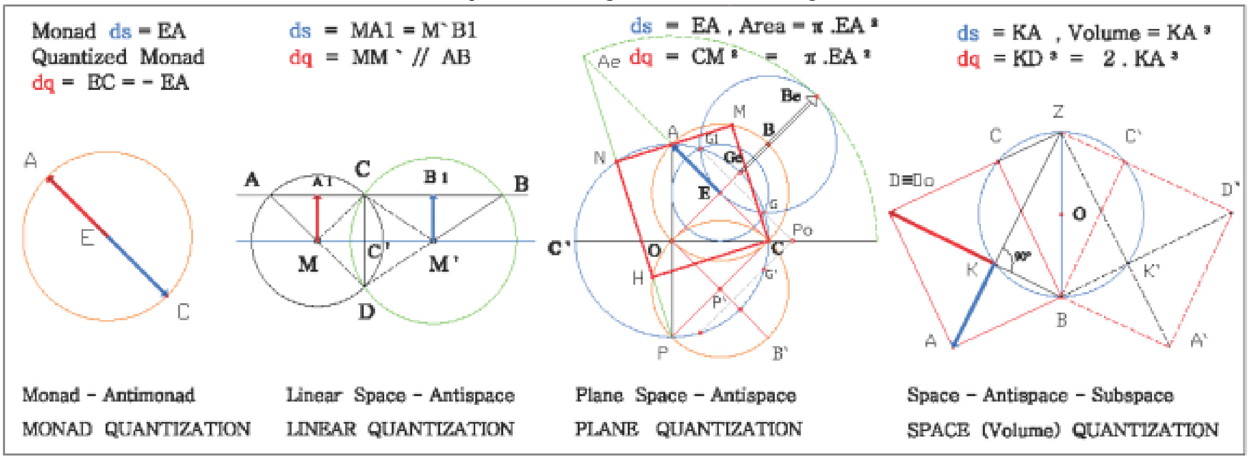
3.3. The Quantization of E-Geometry

{ Points , Segments , Lines , Planes , and the Volumes } , to its moulds F-6 .

Quantization of E-geometry is the Way of Points to become as → (Segments , Anti-segments = Monads = Anti-monads) , (Segments , Parallel-segments = Equal monads) , (Equal Segments and Perpendicular - segments = Plane Vectors) , (Non-equal Segments and twice-Perpendicular-segments = The Space Vectors = Quaternion) , by defining the mould of quantization .

The three Ways of quantization are → for Monads the mould is the *Cycloidal Curl* Electromagnetic field , ***for Lines*** the mould is that of *Parallel Theorem with the least constant distance* , ***for Plane*** the mould is the *Squaring of the circle* and , ***for Space*** is the mould of the *Duplication of cube* . All methods in, F- 6 .

F.6. → *The Point , Linear , Plane , Space (volume) Mould for E-geometry Quantization* , **of** *monad* EA *to Anti-monad* EC – **of** AB *line to Parallel line* MM\`- **of** AE *Radius to the* CM side of Square **of** KA *Segment* to KD Cube *Segment* .



(1) (2) (3) (4)

3.4. The Meters of Quantization of Monad

ds = AB ***are as*** **, In any point A ,** ***happens through*** *Mould in itself* (The material point as a → ± dipole) in [43].

In monad ds = AC , ***happens through*** *Mould in itself for two points* (The material dipole in inner monad Structure as the Electromagnetic Cycloidal field which equilibrium in dipole by the Anti-Cycloidal field as in [43]). ***For monad***

ds = EA the quantized and Anti-monad is

dq = EC = ± EA

Remark : *The two opposite signs of monads EA , EC represent the two Symmetrical equilibrium monads of Space-Antispace , the Geometrical dipole* AC *on points* A,C *which consist space* AC *as in* F6 - (1)

Linearly , ***happens through*** *Mould of Parallel Theorem* ***, where for any point M not on ds =***

± AB , the Segment MA1 = Segment M`B1 = Constant . F6 - (1-2)

Remark : The two opposite signs of monads represent the two Symmetrical monads in the Geometrical machine of the equal and Parallel monads [MM`//AB *where* MA1 ⊥ AB , M`B1 ⊥ AB and MA1 = M`B1 ] *which are* → *The Monad* MA1 – *Antimonad* M`B1 *, or* → *The Inner monad* MA1 *Structure –The Inner Anti monad structure* M`B1 = - MA1 = Idle *, and* **{** The ***Space = line AB , Anti-space = the Parallel line MM` = constant }.***

The Parallel Axiom is no-more Axiom because this has been proved as a Theorem [9-32-38-44].

Plainly , ***happens through*** *Mould of Squaring of the circle* ***, where for any monad ds = CA = CP , the Area of square CMNH is equal to that of one of the five conjugate circles and π = constant , or as*** **CM ² = π . CE ².** ***On monad ds = EA = EC , the Area = π.EC² and the quantized Anti-monad dq = CM ² =***

± π. EC² . F6-(3)

Remark : *The two opposite signs represent the two Symmetrical squares in Geometrical machine of the equal and perpendicular monads* [CA⊥ CP *, and CA* = *CP*] *, which are → The Square CMNH – Antisquare CM`N`H`, or → The Space – Idle= Anti-space .*

In Mechanics this propety of monads is very useful in Work area , where two perpendicular vectors produce Zero Work . {***Space = square CMNH ,Anti-space = Anti-square CM`N`H` }.***

In three dimensional Space , ***happens through*** *Mould Doubling of the Cube* ***, where for any monad ds = KA , the Volume or , The cube of a segment*** **KD** ***is the double the volume of*** **KA** ***cube , or monad*** **KD ³ = 2.KA ³ .**

On monad ds = KA the Volume = KA³ and the quantized Anti-monad , dq **= KD ³ = ± 2. KA³ .** F6-(4)

Remark : *The two opposite signs represent the two Symmetrical Volumes in Geometrical machine of triangles* [Δ ADZ ⊥ Δ ADB] *, which are → The cube of a segment KD is the double the volume of KA cube – The Anti-cube of a segment K`D` is the double the Anti-volume of K`A` cube , Monad ds = KA , the Volume = KA³ and the quantized Anti-monad dq = KD ³ = ± 2. KA³ .* {The ***Space = the cube*** **KA ³ ,** The ***Anti-space = the Anti-cube*** **KD ³ } .**

In Mechanics this property of Material monads is very useful in the Interactions of the Electromagnetic Systems where Work of two perpendicular vectors is Zero .{ Space = Volume of KA , Anti-space = Anti – Volume of KD, and this in applied to Dark-matter , Energy in Physics } . [43]

Radiation of Energy is enclosed in a cavity of the tiny energy volume λ , (which is the cycloidal wavelength) with perfect and absolute reflecting boundaries where this cavity may become infinite in every direction and thus getting in maxima cases (the limits) the properties of radiation in free space .

The electromagnetic vibrations in this volume is analogous to vibrations of an Elastic body (Photo-elastic stresses in an elastic material [18]) in this tiny volume , and thus Fringes are a superposition of these standing (*stationary*) vibrations .[41]

Above are analytically shown , the Moulds (The three basic Geometrical Machines) of Euclidean Geometry which create the METERS of monads Linearly is the Segment **MA1 ,** ***In Plane the square*** **CMNH** ***, and in Space is volume*** **KD ³** ***in all Spaces , Anti-spaces and Sub-spaces .***

This is the Euclidean Geometry Quantization in points to its constituents , i.e. the

1. ***METER*** *of Point* A ***is the Material Point*** **A ,**

2. ***METER*** *of line* ***is the discrete Segment*** **ds = AB =** ***monad = constant , the***

3. ***METER*** *of Plane* ***is that of circle on Segment = monad , which is the Square equal to the area of the circle , and the***

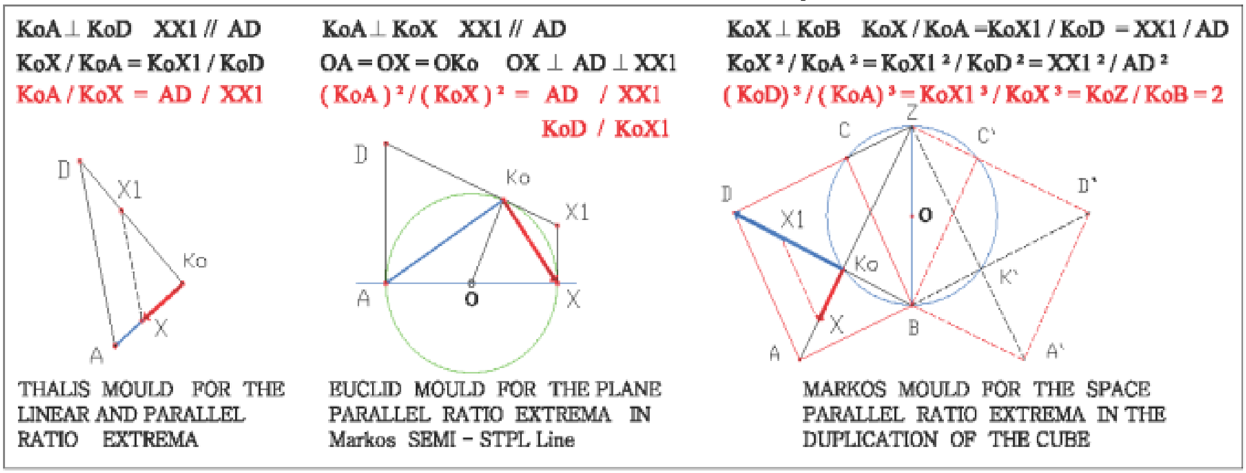
4. ***METER*** *of Volume* ***is that of Cube on any Segment = monad , which is the Double Cube of Segment and Thus is the measuring of the Spaces , Anti-spaces and Sub-spaces in this cosmos .*** markos 11/9/2015 **.**

3.5. The Three Master - Meters in One

For E-geometry Quantization , F-7

It is the linear relation of the Ratio (continuous analogy) of geometrical magnitudes , in all Spaces and Anti-spaces.

F.7.→ The Thales , Euclid , Markos Mould , for the Linear – Plane - Space , Extrema Ratio Meters .



(1) (2) (3)

Saying **master-meters** , we mean That the Ratio of two or three geometrical magnitudes , is such that they have a linear relation (*continuous analogy*) in all Spaces , *in one in two in three dimensions*, as this happens to the Compatible Coordinate Systems as it is the Rectangular [x,y,z] , [i,j,k] , the Cylindrical and Spherical -Polar . The position and the distance of points can be then calculated between the points , and thus to ***perform independent Operations*** (Divergence , Gradient , Curl , Laplacian) on points only .

Remarks:

In F7-(1) ,The Linear Ratio , *for Vectors* , begins from the same Common point Ko , of the two Non-equal , Concentrical and Co-parallel Direction monads .

In F7-(2) ,The Linear Ratio , *for Plane* , begins from the same Common point Ko , of the two Non-equal , Concentrical and Co-perpendicular Direction monads.

In F7-(3) ,The Linear Ratio , *for Volume* , begins from the same Common point Ko , of the two Non-equal , Concentrical and Co-perpendicular Direction monads.

In (1) → Segment KoA ⊥ KoD , Ratio KoX / KoA = KoX1 / KoD , and Linearly (*in one dimension*) the Ratio of KoA / KoX = AD / XX1

i.e. in Thales linear mould [XX1 // AD] , ***Linear Ratio of Segments XX1 , AD is , constant and Linear , and it is the Master key Analogy of the two Segments , monads .***

In (2) → Segment KoA⊥KoX , OKo =OA= OX and since OX1 , OD are diameters of the two circles then KoD = AD , KoX1 = XX1 , and Linearly (*in one dimension*) the Ratio of KoA / KoX = AD / XX1 , in Plane (*in two dimensions*) the Ratio [KoA] ² / [KoX] ² = AD / XX1 ,

i.e. in Euclid`s Plane mould [KoA⊥KoX] ,

***The Plane Ratio square of Segments* – KoA , KoX - *is constant and Linear , and for any Segment* KoX *on circle* (O,OKo) *exists KoA such that* , → KoA ² / KoX ² = AD / XX1 = KoD / KoX1 ←**

***i.e. the Square Analogy of the sides in any rectangle triangle* AKoX *is linear to Extrema Semi-segments* AD , XX1 *or to* KoD , KoX1.**

In (3) → Segment KoB ⊥KoX , OKo = OB = OZ and since XX1 // AD , then KoA / KoD = KoX / KoX1 = AD / XX1 , and Linearly (*in one dimension*) the Ratio of KoA / KoX = AD / XX1 and in Space (*Volume*) (*in three dimensions*) the Ratio [KoA] ³ / [KoD] ³ = [KoX / KoX1] ³ = ½ .

i.e. in Euclid`s Plane mould [KoA // KoX , KoD // KoX1] , ***Volume Ratio of volume Segments* – KoA , KoD - , *is constant and Linear , and for any Segment KoX exists KoX1 such that* → KoX1 ³ / KoX ³ = 2 ←**

i.e. the Duplication of the cube.

In F-7 , The ***three*** dimensional Space [KoA ⊥ KoD ⊥ Ko…] , where XX1 // AD , The ***two*** dimensional Space [KoA ⊥ KoX] , where XX1// AD , The ***one*** dimensional Space [XX1 // AD] , where XX1 // AD , is constant and Linearly Quantized in each dimension.

i.e. All dimensions of Monads coexist linearly in *Segments – monads* separately (*they are the units of the three dimensional axis* x,y,z - i , j, k -) and consequently in Volumes , Planes , Lines , Segments , and Points of Euclidean geometry, which are all the one point only and which is nothing. For more in [49-50] . 25/9/2015

At the beginning of the article it was referred to Geometers scarcity from which instigated to republish this article and to locate the weakness of prooving these Axioms which created the Non -Euclid geometries and which deviated GR in Space-time confinement .Now is more referred ,

a). There is not any Paradoxes of the infinite because is clearly defined what is a Point and what is a Segment .

b). ***The Algebra of constructible numbers and number Fiels is an Absurd theory*** based on groundless Axioms as the fields are , and with directed non-Euclid orientations which must be properly revised .

c). *The Algebra of Transcental numbers has been devised to postpone the Pure geometrical thought* , which is the base of all sciences , by

changing the base-field of solutions to Algebra as base . Pythagorians discovered the existence of the incommensurable of the diagonal of a square in relation to its side without giving up the base , which is geometrical logic.

d). All theories concerning ***the Unsolvability of the Special Greek problems are based on Cantor`s shady proof*** , < *that the totality of All algebraic numbers is denumerable* > and not edifyed on the geometrical basic logic which is the foundations of all Algebra. The problem of Doubling the cube F.3 , as that of the Trisection of any angle , is a Mechanical problem and could not be seen differently and the proposed Geometrical solutions is clearly exposed to the critic of all readers .

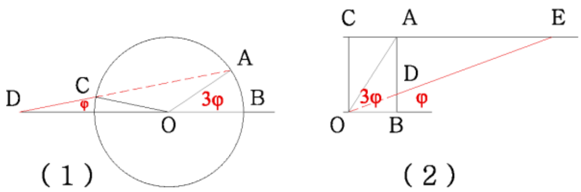
All trials for Squaring the circle are shown in [46] and the set questions will be answer on the Changeable System of the two Expanding squares ,*Translation* [T] *and Rotation* [R] . The solution of Squaring the circle using the Plane Procedure method is now presented in F.1,2 , and consists an , *Overthrow* , to all existing theories in Geometry , Physics and Philosophy .

e). Geometry is the base of all sciences and it is the reflective logic from the objective reality and which is nature.

4. The Trisection of Any Angle

Because of the three *master-meters* , where is holding the Ratio of two or three geometrical magnitudes , is such that they have a linear relation (*a continuous analogy*) in all Spaces , the solution of this problem , as well as of those before , is linearly transformed . The present method is Plane method *, i.e. straight lines and circles ,* as the others and is not required the use of conics or some other equivalent.

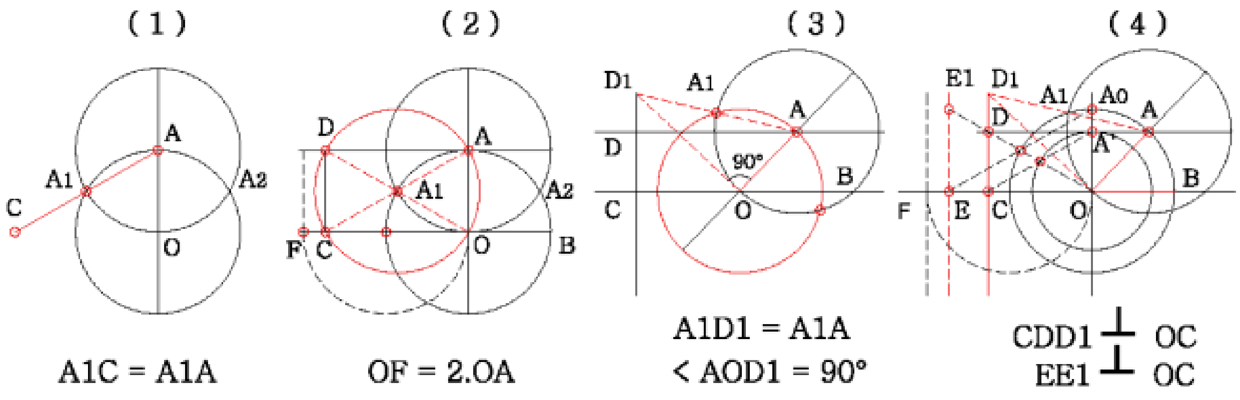
F .8.→ (1) *Archimedes* , (2) *Pappus Method*



4.1. The Present Method

It is based on the Extrema geometrical analysis of the mechanical motion of shapes related to a system of poles of rotation .The classical solutions by means of conics , or reduction to a , νεύσις , is a part of Extrema method . This method changes the Idle between the edge cases and *Rotates* it through constant points , *The Poles* , [11] . The steps of the Rotating Triangle AOD1 :

F.9.→ *The proposed Contemporary Trisection method*



We extend Archimedes method as follows.

a . F9.-(2) **. Given an angle < AOB =AOC= 90▫**

1.. Draw circle (A , AO = OA) with its center at the vertex A intersecting circle (O , OA = AO) at the points A1 , A2 respectively .

2. Produce line AA1 at C so that A1C = A1A = AO and draw AD // OB .

3. Draw CD perpendicular to AD and complete rectangle AOCD .

4. Point F is such that OF = 2 . OA

b . F9.(3-4) . **Given an angle < AOB < 90▫**

1. Draw AD parallel to OB .

2. Draw circle (A , AO = OA) with its center at the vertex A intersecting circle (O , OA = AO) at the points A1 , A2 .

3. Produce line AA1 at D1 so that A1D1 = A1A = OA.

4. Point F is such that OF = 2 .OA = 2.OAo

5. Draw CD perpendicular to AD and complete rectangle A′OCD .

6. Draw Ao E Parallel to A′ C at point E (or sliding E on OC) .

7. Draw AoE′ parallel to OB and complete rectangle AoOEE1 **.**

8. In F10 - (1-2-3) , Draw AF intersecting circle (O,OA) at point F1 and insert on AF segment F1F2 equal to OA → F1F2 = OA.

9. Draw AE intersecting circle (O , OA) at point E1 and insert on AE segment E1E2 equal to OA → E1 E2 = OA = F1 F2 .

To show that

a). For all angles equal to 90▫ Points C and E are at a constant distance OC = OA . √ 3 and OE = OAo . √ 3 , from vertices O , and also A′C //AoE .

b). The geometrical locus of points C , E is the perpendicular CD , EE1 line on OB .

c). All equal circles with their center at the vertices O , A and radius OA = AO have the same geometrical locus EE1 ⊥ OE for all points A on AD , or All radius of equal circles drawn at the points of intersection with its Centers at the vertices O , A and radius OA = AO lie on CD , EE1 .

d). Angle < D1OA is always equal to 90▫ and angle AOB is created by rotation of the right-angled triangle AOD1 through vertex O .

e). Angle < AOB is created in two ways , by constructing circle (O , OA = OAo) and by sliding , of point A1 on line A1 D Parallel to OB from point A1 , to A .

f). Angle < AOB is created in two ways , by constructing circle (O , OA = OAo) and by sliding , of point A′ on line A′ D Parallel to OB from point A′ , to A .

g). The rotation of lines AE , AF (*minimum and maximum edge positions*) on circle (O, OA = OAo) from point E to point F which lines intersect circle (O , OA) at the points E1 , F1 respectively , **fixes a point** G on line EF and a point G1 common to line AG and to the circle (O , OA) **such that** G G1 = OA .

Proof

a) .. F.9 .(1 - 2)

Let OA be one-dimensional Unit perpendicular to OB such that angle < AOB = AOC = 90▫

Draw the equal circles (O,OA) , (A , AO) and let points A1 , A2 be the points of intersection . Produce AA1 to C .

Since triangle AOA1 has all sides equal to OA (AA1 = AO = OA1) then it is an equilateral triangle and angle < A1AO = 60 ▫

Since Angle < CAO = 60 ▫ and AC = 2. OA then triangle ACO is right-angled and angle < AOC = 90▫ , and so the angle ACO = 30 ▫.

Complete rectangle AOCD , and angle < ADO = 180 – 90 – 60 = 30 ▫ = ACO = 90 ▫ / 3 = 30 ▫

From Pythagoras theorem $AC^2 = AO^2 + OC^2$ or $OC^2 = 4.OA^2 - OA^2 = 3.OA^2$ and ***OC = OA* . √ *3* .**

For OA = OAo then AoE = 2. OAo and **OE = OAo . √ 3 .**

Since OC / OE = OA / OAo → then line CA′ is parallel to EAo .

b) .. F.9.(3 - 4)

Triangle OAA1 is isosceles , therefore angle < A1AO = 60 ▫ . Since A1D 1 = A1O , triangle D1A1O is isosceles and since angle < OA1A = 60 ▫ , therefore angle < OD1A = 30 ▫ or , Since A1A = A1D 1 and angle < A1AO = 60 ▫ then triangle AOD1 is also right-angle triangle and angles < D 1OA = 90 ▫ , < OD 1A = 30 ▫.

Since the circle of diameter D1A passes through point O and also through the foot of the perpendicular from point D1 to AD , and since also ODA = ODA′ = 30 ▫ , then this foot point coincides with point D , therefore the locus of point C is the perpendicular CD1 on OC . For AA1 > A1D1 , then D1 is on the perpendicular D1E on OC.

Since the Parallel from point A 1 to OA passes through the middle of OD1 , *and in case where* AOB = AOC = 90 ▫ *through the middle of* AD , then the circle with diameter D1A passes through point D which is the base of the perpendicular , **i.e.**

The geometrical locus of points C , or E , is the perpendicular CD , EE1 on OB .

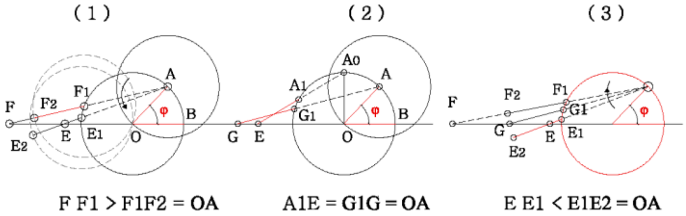
c) .. F.9.(3 - 4)

Since A1A = A1D 1 and angle < A1AO = 60▫ then triangle AOD1 is a right-angle triangle and ***angle < D1OA = 90*** ▫.

Since angle < A-D1-O is always equal to 30 ▫ ***and angle* D1-O-A *is always equal to* 90** ▫ **,** ***therefore angle < AOB is created by the rotation of the right - angled triangle A-O-D1 through vertex O .***

Since tangent through Ao to circle (O , OA′) lies on the circle of half radius OA then this is perpendicular to OA and equal to A′A . (F.8)

F.10. → *The three cases of the Sliding segment* OA = F1F2 = E1E2 *between a line* OB *and a circle* (O,OA) *between the Maxima - edge cases* F1F , E1E *or* F,E *points* . F-9



On AF, AE lines exists :
FF1 > OA GG1= OA , A1E = OAo EE1< OA
F2F1= OA A1E =OAo , EA1= OA E1E2= OA

d). F.9-(4) - (F.10)

Let point **G** be sliding on OB between points **E** and **F** where lines AE , AG , AF intersect circle (O , OA) at the points E1 , G 1 , F1 respectively where then exists FF1 > OA , GG1= OA , EE1 < OA .

Points E , F are the limiting points of rotation of lines AE , AF (because then for angle < AOB = 90 ▫ → A1C = A1A = OA , A1Ao = A1E = OAo and for angle < AOB = 0▫ → OF = 2 . OA) . Exists also E1E2 = OA , F1F2 = OA and point G1 common to circle (O , OA) and on line AG such that GG1 = OA .

AE Oscillating to AF passes through AG so that GG1 = OA and point G on sector EF. When point G1 of line AG is moving (rotated) ***on circle (E2 , E2E1 = OA***) and Point G1 of ***G1G is stretched on circle (O , OA)*** then G1G ≠ OA .

A position of point G1 is such that , when GG1 = OA point G lies on line EF.

When point G1 of line AG is moving (rotated) ***on circle (F2 , F2F1 = OA***) and point G1 of ***G1G is stretched on circle (O, OA)*** then length G1G ≠ OA .

A position of point G1 is such that , when GG1 = OA point G lies on line EF without stretching .

For both opposite motions there is only one position where point G lies on line OB and is not needed point G1 of GA ***to be stretched*** on circle (O , OA).

This position happens at the common point , P, of the two circles which is their point of intersection. At this point P exists only rotation and is not needed G1 of GA to be stretched on circle (O , OA) so that point G to lie on line EF. This means that point P lies on the circle (G, GG1 = OA), or GP = OA.

Point A of angle < BOA is verged through two different and opposite motions, i.e.

1. From point A′ to point Ao where *is done a parallel translation* of CA′ to the new position EAo , *this is for all angles equal to 90* ▫ , and from this position to the new position EA by rotating EAo to the new position EA having always the distance E1 E2 = OA.

This motion is taking place on a circle of center E1 and radius E1 E2.

2. From point F , *where OF = 2. OA , is done a parallel translation of A′F to FAo,* and from this position to the new position FA by rotating FAo to FA having always the distance F1 F2 = OA.

The two motions coexist again on a point **P** which is the point of intersection of the circles (E2, E2E1 = OA) and (F2 , F2F1 = OA). f) . (F.9 .3 - 4) **-** (F.10 -3).

4.2. Remarks – Conclusions

1. Point E1 is common of line AE and circle (O, OA) and point E2 is on line AE such that E1 E2 = OA and exists E E1 < E2 E1 **.** Length E1 E2 = OA is stretched ,*moves* on EA so that point E2 is on EF . Circle (E , E E1 < E2 E1 = OA) cuts circle (E2 , E2 E1 = OA) at point E1.

There is a point G1 on circle (O , OA) such that G1G = OA , *where point G is on EF* , ***and is not needed G1G to be stretched*** on GA where then , circle (G , GG1 = OA) cuts circle (E2 , E2 E1 = OA) at a point P .

2. Point F1 is common of line AF and circle (O,OA) and point F2 is on line AF such that F1 F2 = OA and exists F F1 > F2 F1 **.** Segment F1 F2 = OA is stretched , *moves* on FA so that point F2 is on FE . Circle (F , F F1 > F2 F1 = OA) cuts circle (F2 , F2 F1 = OA) at point F1 .

There is a point G1 on circle (O ,OA) such that G1G = OA , *where point G is on FE* , ***and is not needed G1G to be stretched*** on OB where then circle (G , GG1 = OA) cuts circle (F2 , F2 F1 = OA) at a point P .

3. *When point G is at such position on* EF *that* GG1 = OA , *then point G must be at* A COMMON , *to the three lines* EE1 , GG1 , FF1 , *and also to the three circles* (E2,E2E1= OA),(G ,GG1= OA),(F2,F2 F1=OA)

This is possible at the common point* P *of Intersection of circle (E2 , E2E1 = OA) ***and*** **(** F2 , F2F1 = OA) ***and since* GG1 *is equal to* OA *without* G1G *be stretched on* GA , *then also* GP = OA .**

4. In additional , for point G1:

a. Point G1 , *from point E1* , moving on circle (E2 , E2 E1 = OA) formulates AE1E such that E1E = G1G < OA , for G moving on line GA. There is a point on circle (E2 , E2 E1 = OA) such that GG1 = OA .

b. Point G1 , *from point F1*, moving on circle (F2 , F2 F1 = OA) formulates AF1F such that F1F = GG1 > OA , for G moving on line GA . There is a point on circle (F2 , F2 F1 = OA) such that GG1 = OA .

c. Since for both Opposite motions there is a point on the two circles that makes GG1 = OA then point say P , is common to the two circles .

d. Since for both motions at point P exists GG1 = OA then circle (G , GG1 = OA) passes through point P , and since point P is common to the three circles , then fixing point P as the common to the two circles (E2 , E2 E1 = OA) ,

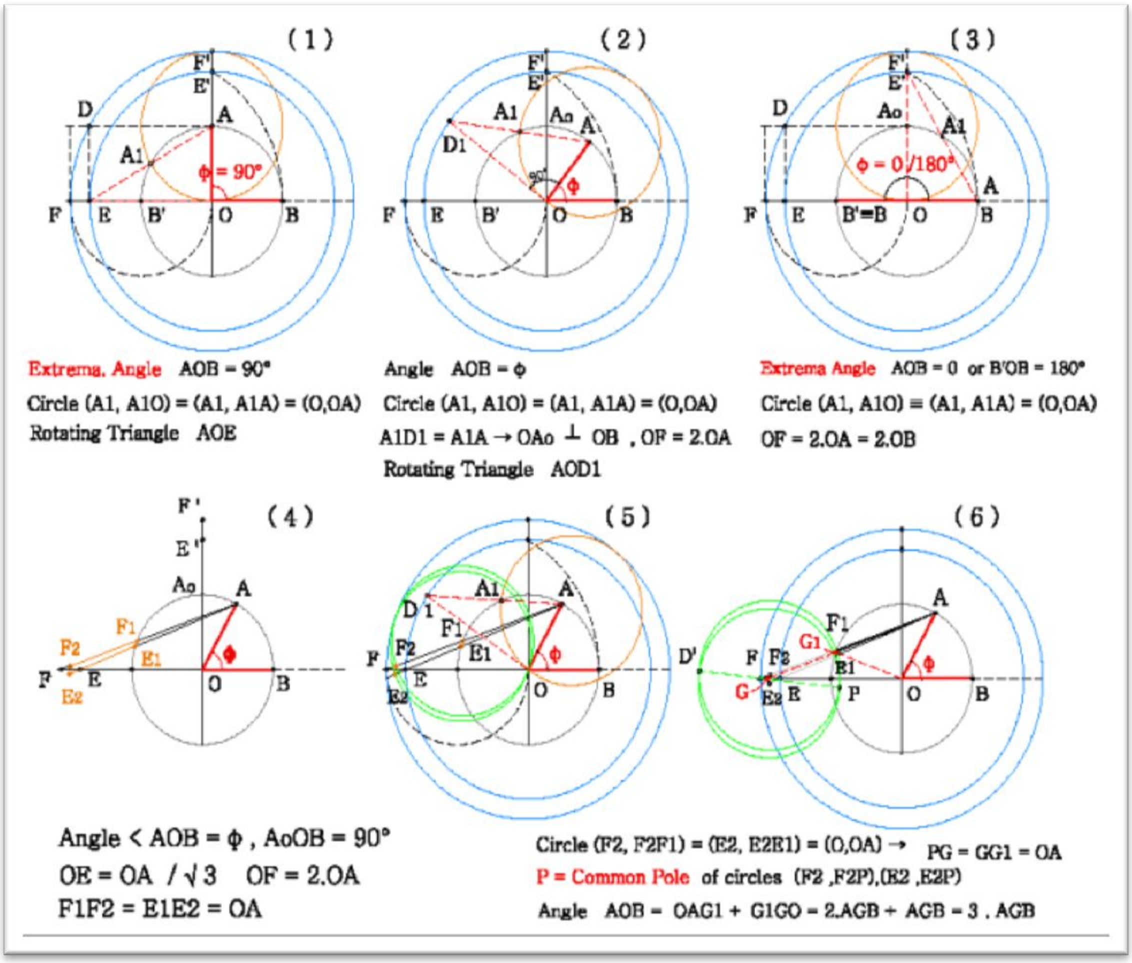
(F2 , F2 F1 = OA) , then point G is found as the point of intersection of circle (P,PG = OA) and line EF.

This means that the common point P of the three circles is constant to this motion .

e. Since also happens , motion of a constant Segment on a line and a circle , then it is Extrema Method of the moving Segment as stated . The method may be used for part or Blocked figures either sliding or rotating .

From all above the geometrical trisection of any angle is as follows , Fig.11.

F. 11. → The extrema Geometrical method of Trisection of any angle < AOB.



f. ***The steps of Trisection of any angle < AOB* = 90 ▫ → 0 ▫** F.11-[1-6]

1. Draw circles (O , OA) , (A , AO), intersected at A1 point.

2. Draw OAo ⊥ OB where point Ao is on the circle (O, OA) and circle (Ao , AoE = 2OA) which intersects line OB at the point E .

3. Fix point F on line OB such that → OF = 2. OA

4. Draw lines AF , AE intersecting circle (O,OA) at points F1 , E1 respectively .

5. On lines F1A , E1A fix points F2 , E2 such that F1F2 = OA and E1 E2 = OA .

6. Draw circles (F2 , F2 F1 = OA) , (E2, E2 E1 = OA) and fix point P as their common point of intersection .

7. Draw circle (P , PG = OA) intersecting line OB at point G and draw line GA intersecting circle (O ,OA) at point G1. ***Then Segment* GG1 = OA *, and angle* < AOB = 3. AGB.**

Proof

1. Since point P is common to circles (F2, F2F1 = OA) , (E2 , E2 E1 = OA) , then PG = PF2 = PE2 = OA and line AG between AE , AF intersects circle (O,OA) at the point G1 such that GG1 = OA. (F10.1 - 2) - (F.11-5)

2. Since point G1 is on the circle (O , OA) and since GG1 = OA then triangle GG1O is isosceles and angle < AGO = G1OG .

3. The external angle of triangle GG1O is < AG1O = AGO + G1OG = 2. AGO .

4.The external angle of triangle GOA is angle < AOB = AGO + OAG = 3.AGO .

There for angle < AGB = (1 / 3). (AOB)

…. (o.ε.δ.)

4.3. Analysis

Since angle < D1OA is always equal to 90▫ then angle AOB is created by rotation of the right-angled triangle AOD1 through vertex O . The circle (A , AO = A1O) and triangle AOD1 consists the geometrical Mechanism which creates the maxima at positions from , AOE , to AoOE and to BOF` triangles , on (O , OE = √3.OA) , (O, OF = 2.OA) circles.

In (1) Angle AOB = 90▫ , AE = 2.OA = OF , and point A1 common to circles (O , OA) , (A, AO) define point E on OB line such that A1E = OA . This happens for the extrema angle AOB = 90▫ .

In (2) Angle is , 0 < AOB < 90▫ , AE = 2.OA and point A1 common to circles (O,OA) , (A,AO) defines point D1 on (O,OE =√3.OA) circle such that A1D1 = OA and on (O, OF = 2.OA) circle at point Df .

In (3) Angle < AOB = 0 or B`OB =180▫ , AE = 2.OA = BB` and point A1 common to (O , OA) , (A, AO) circles define point E on OAo line such that E ≡ E`, where then point D ≡ F` .This happens for the extrema angle AOB = 0 or 90▫ **.**

In (4-5) where angle is , 0 < AOB < 90▫ , and Segments F1F2 = E1E2 = OA the equal circles (F2,F2F1),(E2,E2E1) define the common point P . Since this geometrical formulation exists on Extrema edge angles , 0 *and* 90▫ , then this point is constant to this formulation , and this point as centre of a radius OA circle defines the extrema geometrical locus on it.

In (6) Since angle AOB is , 0 → 90▫ , and point P is constant , *and this because extrema circle (P,PG =OA) where G on OB line* , then is defining (G,GG1) circle on GA segment such that point G1 , *tobe the common point of segment* AG *and circles* (O, OA) , (G,GG1).

5. The Parallel Postulate, Axiom is a Theorem

5.1. The Parallel Postulate F.12

General: Axiom or Postulate is a statement checked if it is true and is ascertained with logic (the experiences of nature as objective reality).

Theorem or Proposition is a non-main statement requiring a proof based on earlier determined logical properties.

Definition is an initial notion without any sensible definition given to other notions.

Definitions, Propositions or Postulates created Euclid geometry using the geometrical logic which is that of nature, the logic of the objective reality.

Using the same elements it is possible to create many other geometries but the true uniting element is the before refereed.

1. The First Definitions (**D**), of Terms in Geometry but the true uniting D1: A point is that which has no part (Position).

D2: A line is a breathless length (for straight line, the whole is equal to the parts) .

D3: The extremities of lines are points (equation).

D4: A straight line lies equally with respect to the points on itself (identity).

D: A midpoint C divides a segment AB (of a straight line) in two. CA = CB any point C divides all straight lines through this in two.

D: A straight line AB divides all planes through this in two.

D: A plane ABC divides all spaces through this in two .

2. Common Notions (**Cn**)

Cn1: Things which equal the same thing also equal one another.

Cn2: If equals are added to equals, then the wholes are equal.

Cn3: If equals are subtracted from equals, then the remainders are equal.

Cn4: Things which coincide with one another, equal one another.

Cn5: The whole is greater than the part.

3. The Five Postulates (**P**) for Construction

P1. To draw a straight line from any point A to any other point B .

P2. To produce a finite straight line AB continuously in a straight line.

P3. To describe a circle with any centre and distance. P1, P2 are unique.

P4. That, all right angles are equal to each other.

P5. That, if a straight line falling on two straight lines make the interior angles on the same side less than two right angles, if produced indefinitely, meet on that side on which are the angles less than the two right angles, or (for three points on a plane) . Three points consist a Plane .

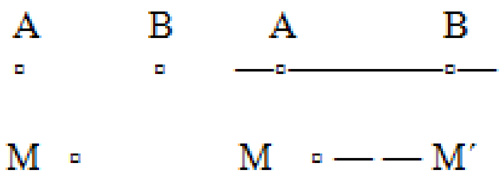
P5a. The same is plane's postulate which states that, from any point M, not on a straight line AB, only one line MM΄ can be drawn parallel to AB.

Since a straight line passes through two points only and because point M is the third then the parallel postulate it is valid on a plane (three points only).

AB is a straight line through points A, B , AB is also the measurable line segment of line AB , and M any other point . When MA+MB > AB then point M is not on line AB . (differently if MA+MB = AB , then this answers the question of why any line contains at least two points) ,

i.e. for any point M on line AB where is holding MA+MB = AB , *meaning that line segments* MA,MB *coincide on* AB , is thus proved from the other axioms and so D2 is not an axiom . → To prove that, one and only one line MM΄ can be drawn parallel to AB.

F.12→ *The three points (in a Plane).*

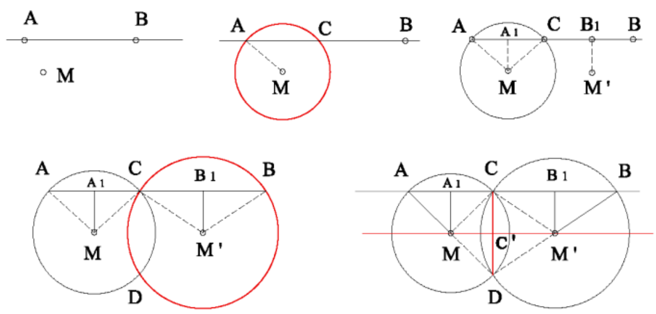


In F.13 , in order to prove the above Axiom is necessary to show :

a. The parallel to AB is the locus of all points at a constant distance **h** from the line AB, and for point M is MA1,

b. The locus of all these points is a straight line.

F.13. → *The Parallel Method*



Step 1

Draw the circle (M, MA) be joined meeting line AB in C. Since MA = MC, point M is on mid-perpendicular of AC. Let A1 be the midpoint of AC, (it is A1A+A1C = AC because A1 is on the straight line AC). Triangles MAA1, MCA1 are equal because the three sides are equal, therefore angle < MA1A = MA1C (CN1) and since the sum of the two angles < MA1A+MA1C = 180° (CN2, 6D) then angle < MA1A = MA1C = 90 °.(P4) so, MA1 is the minimum fixed distance **h** of point M to AC.

Step 2

Let B1 be the midpoint of CB,(it is B1C+B1B = CB because B1 is on the straight line CB) and draw B1M΄ = h equal to A1M on the mid-perpendicular from point B1 to CB. Draw the circle (M΄, M΄B = M΄C) intersecting the circle (M, MA = MC) at point D.(P3) Since M΄C = M΄B, point M΄ lies on mid-perpendicular of CB. (CN1)

Since M΄C = M΄D, point M΄ lies on mid-perpendicular of CD. (CN1) Since MC = MD, point M lies on mid-perpendicular of CD. (CN1) Because points M and M΄ lie on the same mid-perpendicular (This mid-perpendicular is drawn from point C΄ to CD and it is the midpoint of CD) and because only one line MM΄ passes through points M, M ΄ then line MM΄ coincides with this mid-perpendicular (CN4)

Step 3

Draw the perpendicular of CD at point C΄. (P3, P1)

a..Because MA1 ⊥ AC and also MC΄ ⊥ CD then angle < A1MC΄ = A1 CC΄. (Cn 2,Cn3,E.I.15) Because M΄B1 ⊥

CB and also M΄C΄⊥ CD then angle < B1M΄C΄ = B1CC΄. (Cn2, Cn3, E.I.15)

b..The sum of angles A1CC΄ + B1CC΄ = 180▫ = A1MC΄ + B1M΄C΄. (6.D), and since Point C΄ lies on straight line MM΄, therefore the sum of angles in shape A1B1M΄M are < MA1B1 + A1B1M ΄ + [B1M΄ M + M΄MA1] = 90▫ + 90▫ + 180▫ = 360▫ (Cn2) , i.e. The sum of angles in a Quadrilateral is 360▫ and in Rectangle all equal to 90 ▫. (m)

c.. The right-angled triangles MA1B1, M΄B1A1 are equal because A1M = B1M΄ and A1B1 common, therefore side A1M΄ = B1M (Cn1). Triangles A1MM΄,B1M΄M are equal because have the three sides equal each other, therefore angle < A1MM΄ = B1M΄M, and since their sum is 180▫ as before (6D), so angle < A1MM΄ = B1M΄M = 90▫ (Cn2).

d.. Since angle < A1MM΄ = A1CC΄ and also angle < B1M΄M = B1CC΄ (P4), therefore the three quadrilaterals A1CC΄M , B1CC΄M΄, A1B1M΄M are Rectangles

(CN3). From the above three rectangles and because all points (M , M΄ and C΄) equidistant from AB, this means that C΄C is also the minimum equal distance of point C΄ to line AB or , h = MA1 = M΄ B1 = CD / 2 = C΄C (Cn1) Namely , line MM΄ is perpendicular to segment CD at point C΄ and this line coincides with the mid-perpendicular of CD at this point C΄ and points M , M΄ ,C΄ are on line MM΄. Point C΄ equidistant ,h, from line AB , as it is for points M ,M΄, so the locus of the three points is the straight line MM΄, so the two demands are satisfied, (h = C΄C = MA1 = M΄B1 and also C΄C ⊥ AB , MA1 ⊥ AB, M΄B1 ⊥ AB) . (o.ε.δ.) –(q.e.d)

e.. The right-angle triangles A1CM , MCC΄ are equal because side MA1= C΄C and MC common so angle < A1CM = C΄MC, and the Sum of angles C΄MC + MCB1 = A1CM + MCB1 = 180▫

4.2. The Succession of Proofs

1. Draw the circle (M , MA) be joined meeting line AB in C and let A1, B 1 be the midpoint of CA, CB.
2. On mid-perpendicular B1M΄ find point M΄ such that M΄B1 = MA1 and draw the circle (M΄, M΄B = M΄C) intersecting the circle (M , MA = MC) at point D.
3. Draw mid-perpendicular of CD at point C΄.
4. To show that line MM΄ is a straight line passing through point C ΄ and it is such that MA1 = M΄B1 = C΄C = h , i.e. a constant distance h from line AB or , also The Sum of angles C΄MC + MCB1 = A1CM + MCB1 = 180 ▫

4.3. Proofed Succession

1. The mid-perpendicular of CD passes through points M , M ΄.

2. Angle < A1MC΄ = A1 MM΄ = A1CC΄, Angle < B1M΄C΄ = B1M΄M = B1CC΄ < A1MC΄ = A1CC΄ because their sides are perpendicular among them i.e.

MA1⊥CA , MC΄⊥CC΄.

a. In case < A1MM΄ + A1CC΄= 180▫ and B1M΄M + B1CC΄ = 180▫ then < A1MM΄ = 180▫ - A1CC΄, B1M΄M = 180▫ - B1CC΄, and by summation < A1MM΄ + B1M΄M = 360▫ - A1CC΄- B1CC΄ or Sum of angles < A1MM΄ + B1M΄M = 360 - (A1CC΄ + B1CC΄) = 360 -180▫ = 180▫

3. The sum of angles A1MM΄ + B1M΄M = 180▫ because the equal sum of angles A1CC΄ + B1CC΄ = 180▫, so the sum of angles in quadrilateral MA1B1M΄ is equal to 360▫.

4. The right-angled triangles MA1B1 , M΄B1A1 are equal , so diagonal MB1 = M΄A1 and since triangles A1MM΄, B1M΄M are equal, then angle A1MM΄ = B1M΄M and since their sum is 180 ▫, therefore angle < A1MM΄ = MM΄B1 = M΄B1A1 = B1A1M = 90 ▫

5.. Since angle A1CC΄ = B1CC΄ = 90▫, then quadrilaterals A1CC΄M , B1CC΄M΄ are rectangles and for the three rectangles MA1CC΄, CB1M΄C΄, MA1B1M΄ exists MA1 = M΄B1 = C΄C

6. The right-angled triangles MCA1 , MCC΄ are equal , so angle < A1CM = C΄MC and since the sum of angles < A1CM + MCB1 = 180 ▫ then also C΄MC + MCB1 = 180 ▫ → which is the second to show , as this problem has been set at first by Euclid.

All above is a Proof of the Parallel postulate due to the fact that the parallel postulate is dependent of the other four axioms (***now is proved as a theorem from the other four***). Since line segment AB is common to ∞ Planes and only one Plane is passing through point M (Plane ABM from the three points A, B, M, then the Parallel Postulate is valid for all Spaces which have this common Plane , as Spherical, n-dimensional geometry Spaces. It was proved that it is a necessary logical consequence of the others axioms, agree also with the Properties of physical objects, d + 0 = d , d * 0 = 0 , now is possible to decide through mathematical reasoning , that the geometry of the physical universe is Euclidean . Since the essential difference between Euclidean geometry and the two non-Euclidean geometries , Spherical and hyperbolic geometry , is the nature of parallel line, i.e. the parallel postulate so ,

<< ***The consistent System of the – Non - Euclidean geometry - have to decide the direction of the existing mathematical logic*** >>.

The above consistency proof is applicable to any line Segment AB on line AB,(segment AB is the first dimensional unit, as AB = 0 → ∞), from any point M not on line AB, [MA + MB > AB for three points only which consist the Plane. For any point M between points A, B is holding MA+MB = AB i.e. from two points M, A or M, B passes the only one line AB. A line is also continuous (P1) with points and discontinuous with segment AB [14] ,which is the metric defined by non- Euclidean geometries ,and it is the answer to the cry about the < crisis in the foundations of Euclid geometry >

5.4. A Line Contains at Least Two Points , is Not an Axiom Because is Proved as Theorem

Definition D2 states that for any point M on line AB is holding MA+MB = AB which is equal to < segment MA + segment MB is equal to segment AB > i.e. the two lines MA, MB coincide on line AB and thus this postulate is proved also from the other axioms, thus D2 is not an axiom, which form a system self consistent with its intrinsic real-world meaning. F.12-13.

5. Conclusions

5.1. Quadrature

The exact Numeric Magnitude of number ,π, may be found only by numeric calculations .

All magnitudes exist on the < ***Plane Formation Mechanism of the first dimentional unit AB*** > as geometrical elements consisting , ***the Steady Formulation ,*** (The Plane System of the Isosceles Right-angle triangle ACP with the three Circles on the sides) and ***the moving and Changeable Formulation of the twin , System-Image ,*** (This Plane Perpendicular System of Squares , Anti-squares is such that , *the Work produced in a closed area to be equal to zero*).

Starting from this logic of correlation upon Unit , we can control *Resemblance Ratio* and construct all Regular Polygons on the unit Circle as this is shown in the case of squares .

On this **System** of these three circles (The Plane Procedure Mechanism which is a Constant System) is created also , a *continues* and , a *not continues* Symmetrical Formation , the changeable System of the Regular Polygons , and the ***Image*** (Changeable System of Regular anti-Polygons).

Idol , as much this in **Space** and also in **Time ,** and it is proved that in this Constant System , *the Rectilinear motion of the Changeable Formation is Transformed into a twin Symmetrically axial - centrifugal rotation (the motion) on this Constant System* .

The conservation of the Total Impulse and Momentum , as well as the conservation of the Total Energy in this Constant System with all properties included , exists in this Empty Space of the un-dimensional point Units .

All the forgoing referred can be shown (maybe presented) with a Ruler and a Compass , or can be seen , live , on any Personal Computer .

The theorem of *Hermit-Lindeman* that number , pi , is not algebraic , is based on the theory of Constructible numbers and number fields (*on number analysis*) and not on the < *Euclidean Geometrical origin-Logic on unit elements basis* >

The mathematical reasoning (*the Method*) is based on the restrictions imposed to seek the solution < *with a ruler and a compass* > . By extending Euclid logic of Units on the Unit circle *to unknown and now proved Geometrical unit elements* ,thus the settled age-old question for the unsolved problems is now approached and continuously standing solved . All Mathematical interpretation and the relative Philosophical reflections based on the theory of the non -solvability must properly revised.

5.2. Duplication

This problem follows the three dimensional dialectic logic of ancient Greek, Αναξίμανδρος,

[« τό μή Ον , Ον γίγνεσθαι » The Non-existent Exists when is done , ' The Non - existent becomes and never is] , *where* ***the geometrical magnitudes*** *, have a linear relation (* continuous analogy *) in all Spaces as , in one in two in three dimensions , as this happens to the Compatible Coordinate Systems* .

The Structure of Euclidean geometry is such [8] that it is a Compact Logic where ***Non - Existent*** is found everywhere , and ***Existence*** , *monads* , is found and is done everywhere .

In Euclidean geometry points do not exist , but their position and correlation is doing geometry. The universe cannot be created , because becomes and never is .

According to Euclidean geometry ,and since the position of points (*empty Space*) creates the geometry and Spaces , Zenon Paradox is the first concept of Quantization . In F- 4

In terms of Mechanics , Spaces Mould happen through ,*Mould of Doubling the Cube ,where for any monad* ds = KoA *and analogus to* KoD , *the Volume or The cube of segment* KoD *is the double the volume of* KoA *cube , or monad* $KoD^3 = 2.KoA^3$. *This is one of the basic Geometrical Euclidean Geometry Moulds , which create the METERS of monads which* → ***Linear*** *is the Segment* MA1 , ***Plane*** *is the square* CMNH *equal to the circle ,and in* ***Space*** *is volume* KoD^3*, in all Spaces , Anti-spaces and Sub -spaces of monads* ← *i.e The Expanding square* BAoDoCo *is Quantized to* BADC *Rectangle by* Translation *to point* Z `, *and by* Rotation *through point* P ,(*the Pole of rotation)* . The Constructing relation between any segments KoX , KoA is → $(KoX)^3 = (KoA)^3$. (XX1 /AD) as in F.7

5.3. Trisection

This problem follows the two dimensional logic, *where* , ***the geometrical magnitudes and their unique circle*** *, have a linear relation (* continuous analogy *) in all Spaces as , in one in two in three dimensions , and as this happens to Compatible Coordinate Systems , happens also in Circle-arcs.*

The Compact-Logic-Space-Layer exists in Units , (***The case of 90*** ▫ ***angle***) ,where then we may find a new machine that produces the 1/3 of angles as in F.11.

Since angles can be produced from any monad OB ,*and this because monad can formulate a circle of radius* OB , *and any point* A *on circle can then formulate angle* < AOB , therefore the logic of continuous analogy issues also and on OA radius equal to OB.

5.4. Parallel Line

A line (*two points only*) is not a great circle (*three not coinciding points*) , so anything built on this logic is a mislead false .

The fact that the sum of angles on any triangle is 180▫ is springing for the first time, in article (Rational Figured numbers or Figures) [9].

This admission of two or more than two parallel lines, instead of one of Euclid's, does not proof the truth of the admission. The same to Euclid's also, until the present proved method. Euclidean geometry does not distinguish , Space from time because time exists only in its deviation - Plank's length level -,neither Space from Energy - because Energy exists as quanta on any first dimensional Unit AB , which as above connects the only two fundamental elements of Universe , that of points or Sector = Segment = Monad = Quaternion , and that of Energy. [23]-[39].

The proposed Method in articles , based on the prior four axioms only , proofs , (not using any admission but a pure geometric logic under the restrictions imposed to seek the solution) that , through point M on any Plane ABM (three points only that are not coinciding and which consist the Plane) , passes only one line of which all points equidistant from AB as point M , i.e. the right is to Euclid Geometry.

The what is needed for conceiving the alterations from Points which are nothing , to segments , i.e. quantization of points as , *the discreteting = monads = quaternion* , to lines , plane and volume , is the acquiring and having Extrema knowledge .

In Euclidean geometry the inner transformations exist as ***pure*** Points , segments , lines , Planes , Volumes, etc. as the Absolute geometry is (*The Continuity of Points*) , automatically transformed through the three basic Moulds *(the three Master moulds and Linear transformations exist as one Quantization*) to Relative external transformations , which exist as the , ***material*** , Physical world of matter and energy *(Discrete of Monads)* . [43]

The new Perception connecting the Relativistic
Time and Einstein`s Energy , is Now Refining
Time and Dark –matter Force, clearly proves
That Big -Bang have Never been existed .

In [17-45-46] is shown the most important ***Extrema Geometrical Mechanism in this Cosmos*** , that of STPL lines , that produces and composite , All the opposite space Points from Spaces to Anti-Spaces and Sub -Spaces in a Common Circle , *it is the Sub-Space* , to lines or to Cylinder .

This extrema mould is a Transformation , i.e. a Geometrical Quantization Mechanism , for the Quantization of Euclidean geometry, *points* , to the Physical world ***, to Physics ,*** and is based on the following geometrical logic ,

Since Primary point ,A, is nothing and without direction and it is the only Space , and this point to exist , *to be* , at any other point ,B, which is not coinciding with point ,A, then on this couple exists the Principle of Virtual Displacements $W = \int_A^B P.\,ds = 0$ or [ds.(PA + P B) = 0] , i.e. for any ds > 0 Impulse P = (PA + P B) = 0 and [ds. (PA + PB) = 0] , *Therefore* , Each Unit AB = ds > 0 , exists by this Inner Impulse (P) where PA + P B = 0

i.e. The Position and Dimension of all Points which are connected across the Universe and that of Spaces , exists , because of this equilibrium Static Inner Impulse and thus show the Energy-Space continuum . Applying the above logic on any monad = *quaternion* (s + $\bar{v}$**.**∇i), *where*, s = the real part and $\bar{v}$.∇i) the imaginary part of quaternion so , Thrust of two equal and opposite quaternion is the , Action of these quaternions which is ,

(s +$\bar{v}$**.**∇i) . **(**s + $\bar{v}$**.**∇i) = **[** s+$\bar{v}$.∇i] ² = s²+|$\bar{v}$|²**.**∇i² + 2|s|x|$\bar{v}$|**.**∇i = s² - |$\bar{v}$|² +2|s|x|$\bar{w}$.$\bar{r}$ ∴ |**.**∇i =

[s²] – [|$\bar{v}$|² **]** + [2$\bar{w}$.|s| |$\bar{r}$|**.**∇i]

where,

[+s²] → s² = (w.r)² , → is the real part

of the new quaternion which is , the positive Scalar product , of Space from the same scalar product ,s,s with ½ ,3/2,,, spin and this because of ,w, and which represents the massive , Space , part of quaternion .

[-s²] → - |$\bar{v}$|² = - |$\bar{w}$.$\bar{r}$|² = - [|$\bar{w}$|.|$\bar{r}$|]² = - (w.r)² → is the always , the negative Scalar product , of Anti-space from the dot product of ,$\bar{w}$,$\bar{r}$ vectors , with -½ ,-3/2, spin and this because of , - w , and which represents the massive , Anti-Space , part of quaternion.

[∇i] → 2.|s| x | $\bar{w}$.$\bar{r}$ ∴ |.∇i =2|wr|.|(wr)|.∇i = 2.(w.r)² → is a vector of , the velocity vector product , from the cross product of $\bar{w}$,$\bar{r}$ vectors with double angular velocity term giving 1,3,5, spin and this because of , ± w, in inner structure of monads , and represents the , Energy Quanta , of the Unification of the Space and Anti-Space through the Energy (*Work*) part of quaternion . A wider analysis is given in articles [40-43] .

When a point ,A, is quantized to point ,B, then becomes the line segment AB = vector AB = quaternion [AB] and is the closed system ,A B, ***and since*** also from the law of conservation of energy , *it is the first law of thermodynamics* , which states that the energy of a closed system remains constant , therefore *neither increases nor decreases without interference from outside* , and so the total amount of energy in this closed system , AB , in existence has always been the same , ***Then*** the Forms that this energy takes are constantly changing . This is the unification of this Physical world of , *Matter and Energy* , and that of Euclidean Geometry which are , *Points* , *Segments* , *Planes and Volumes* . *For more in* [48]

The three Moulds (i.e. The three Geometrical Machines) of Euclidean Geometry which create the METERS of monads and which are , *Linear* for a perpendicular Segment , *Plane* for the Square equal to the circle on Segment , *Space* for the Double Volume of initial volume of the Segment and exist on Segment in Spaces , Anti-spaces and Sub-spaces .

This is the Euclidean Geometry Quantization to its constituents (i.e. Geometry in its moulds). The analogous happens when E-Geometry is Quantized to Space and Energy monads [48]. METER of Points A is the Point A , the METER of line is the Segment ds = AB = monad = constant and equal to monad , or to the perpendicular distance of this segment to the set of two parallel lines between points A,B , the METER of Plane is that of circle on Segment = monad and which is that Square equal to the circle , the METER of Volume is that of Cube , on Segment = monad which is equal to the Double Cube of the Segment and Measures all the Spaces , the Anti-spaces and the Subspaces in this cosmos .

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