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# EVOLUTION OF MATTER I

## ANNOTATION

This is the first part of the work - the physic - chemical direction from the complete "Evolution of Matter" - physical; chemical; astrophysical: biological directions covering broad directions of their material development in multiple paths of their passage.

It is a compact amalgamation of previous , "fragmentary", works with some refinements and additions.

It presents "ASNOVA" - the formation of a functionally closed primary element of matter - its particle, with all kinds of its manifested "activity", in the multi-stage process of its transformation by "annihilation", representing its evolution.

And incomplete, "fragmentary" parts of works in astrophysical and biological directions can be seen at **2208.0087** and **2304.0101** , **2012.0112** , respectively .

## DESCRIPTION

Let us clarify that those marked * the places will be described subsequently.

**1.** Education

Let us construct this "basic" element of matter **L^S** formed, in the construction of the plasma of the Star, from the result of the formation of the front of the shock wave – in the dense nebulae: " Rims " located on the boundary of the "Globules" and obtained as a result of compression of their regions of interstellar hydrogen **HII** by **HI** with a degree their ionization from complete to almost zero and the temperature value **TE** and pressure **TP** of their "thermal environment" - **(TE,TP)** , taking on extreme possible values: **HII – (TE,TP)** $^{max}$ ;
**HI – (TE,TP)** $^{min}$ .

The formation of this front takes place in the compressible merger of the resulting heating compression pulses - "sources", with their uniform concentration there.

They may be "conditionally covered".

And the "cubic coating" will be the most compact for them.

And we will depict the covered "sources" themselves as nested spheres - images of the action that heats them.

The formation of a shock wave front, under the accepted conditions, leads to the formation of a strong shock wave, which means that the increase in temperature behind its front will be proportional to the square of its speed: $c^2$ .

This leads to the instability of the "sources" themselves - their disintegration: the individual action of their shock waves as a result of such a compressible merger.

Each face of the cubic covering of the "source" is adjacent to the neighboring one as a result of the action of this decay with the resulting concentration of them **(TE,TP)** $^{max}$ : **TE** $\infty$ $c^2$ ;
**TP** $\infty$ **TE** , at the vertices of these coverings.

The result of this will be a concentrated and rarefied image of **S** – “proton”, and **L** – “formative” .
There will be 8 pairs of them - from each vertex of the covering.

These will be closed formations obtained by the action of cubic compression with a meaningful structure from **(TE,TP)** $^{\underline{max}}$ and **(TE,TP)** $^{\underline{min}}$.

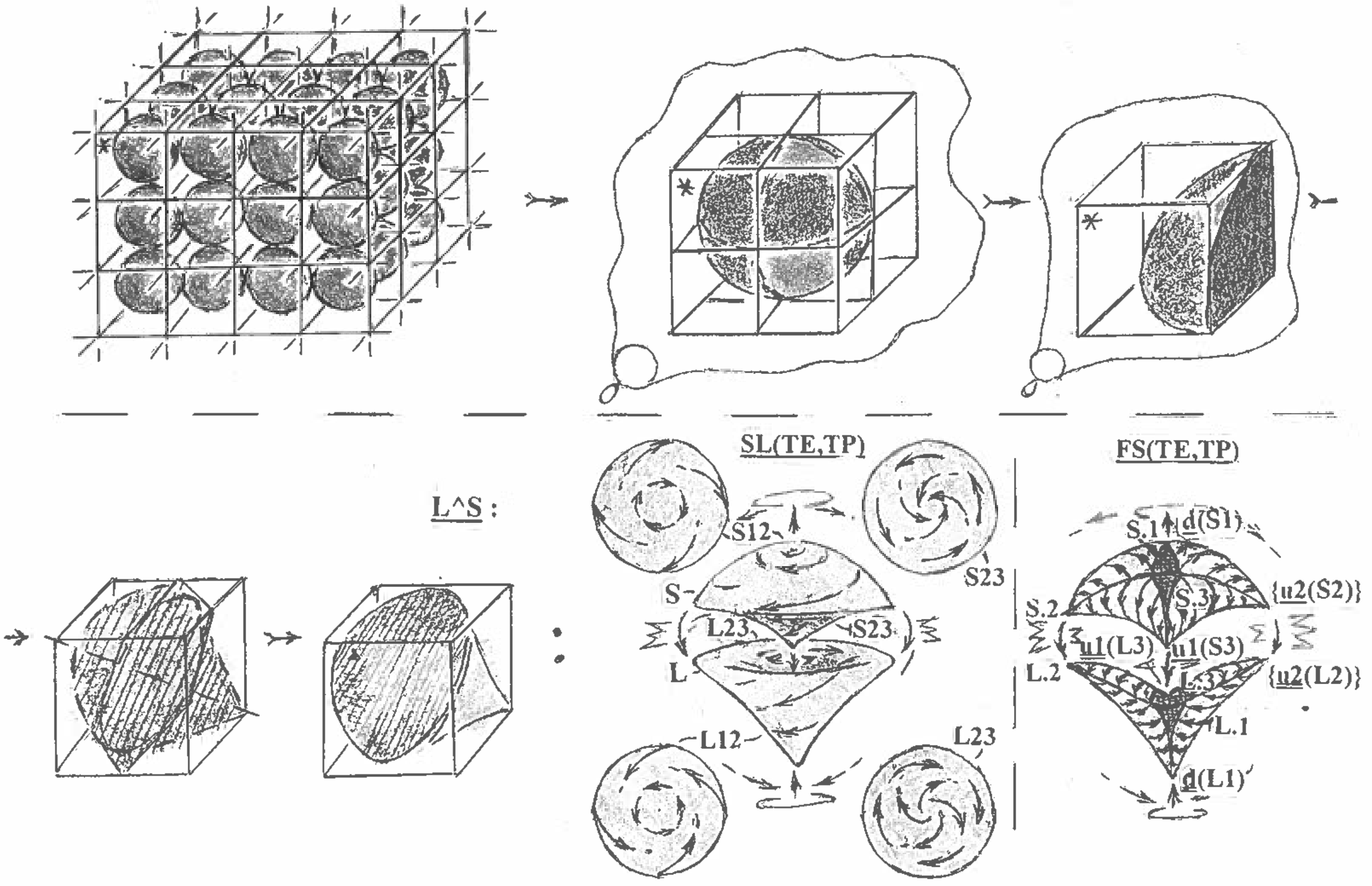
Their structural image determined the type of action of this compression in the chain of its passage.

It’s not hard to construct it by logically going through this chain .
Each pair of elements **S** and **L** represents a particle **L^S** of matter .

Digressing in the description, we note that if in the formula of the basic energy of particles: $\mathbf{E = mc^2}$ , perceive the value $\mathbf{c^2}$ equivalent to **TE** - their filler, the formula itself automatically passes into the “equation of state” with the transition of **E** into **TP** and will express <u>the action of the forces of the filler of the particle from its complete disintegration.</u>

This digression provides a "visual" view of particle energy .

Everything described is reflected, briefly, in Fig. :




Note that the action of the forces of the structural filler of the elements of the particle **L^S** in the environment will be repulsive for **S** , and for **L** compressible

**2.** <u>Structure of elements .</u>

The structure of the elements **S** and **L** was formed in the axial rotational compression / rarefaction of their fillers along the diagonal - the center of the “source” and the top of its covering, thereby forming their “layer-by-layer” images **SL(TE,TP)** in the “skeletal” form **FS(TE,TP)** .

The “layer-by-layer” structural image of the elements was determined by the process of their axial rotation during formation, and the “skeletal” one by their compression / rarefaction and is reflected along the axial cut of the previous one.

The type of formation of elements is formed by symmetrical axial forms: **S.1**; **S.2**; **S.3** and **L.1**; **L.2**; **L.3** , their structural directions in the “skeletal” image, open – by gap, at the boundaries and “special” points of their “layered” structural surfaces: **S12**; **S23** and **L12**; **L23**, with power images: from almost round – in the initial sections, with a transition to a pronounced spiral - in the final sections .

These intermittent sections: **S1**; {**S2**}; **S3** and **L1**; {**L2**}; **L3** , with their open, ongoing structurally “polar” actions – “quarks”: **d**; {**u2**}; **u1** and **d**; {**u2**}; **u1** , and determine the contact - interaction, of their elements through the environment – having previously completed their formative transition into it, thereby showing their “activity”.

And the interaction: ↺, of these elements: **S** with **L** , and determine the particle **L^S** :

- **d** ↺ **d**: through **S1** and **L1** from the outer surface of the elements;

- {**u2**} ↺ {**u2**}: through {**S2**} and {**L2**} from the boundaries of the surface of the elements;

- **u1** ↺ **u1**: through **S3** and **L3** from the inner surface of the elements .

The distance arrangement of interacting particles **S** and **L** in **L^S** is determined by the structural distinctiveness of their interacting “quarks” and depends on the state of the environment .

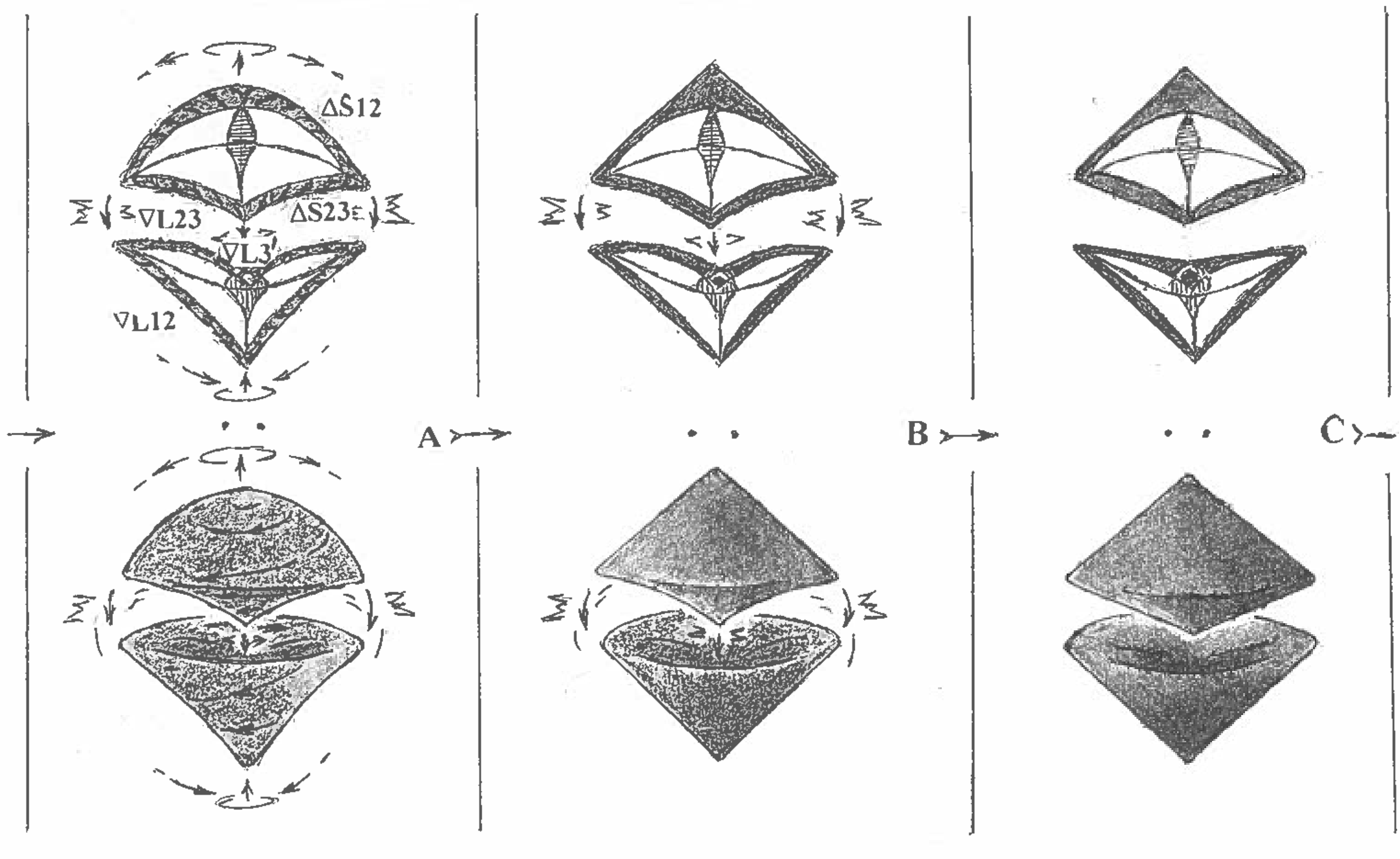
And in a free state the particle **L^S** represents a hydrogen atom – **H.**

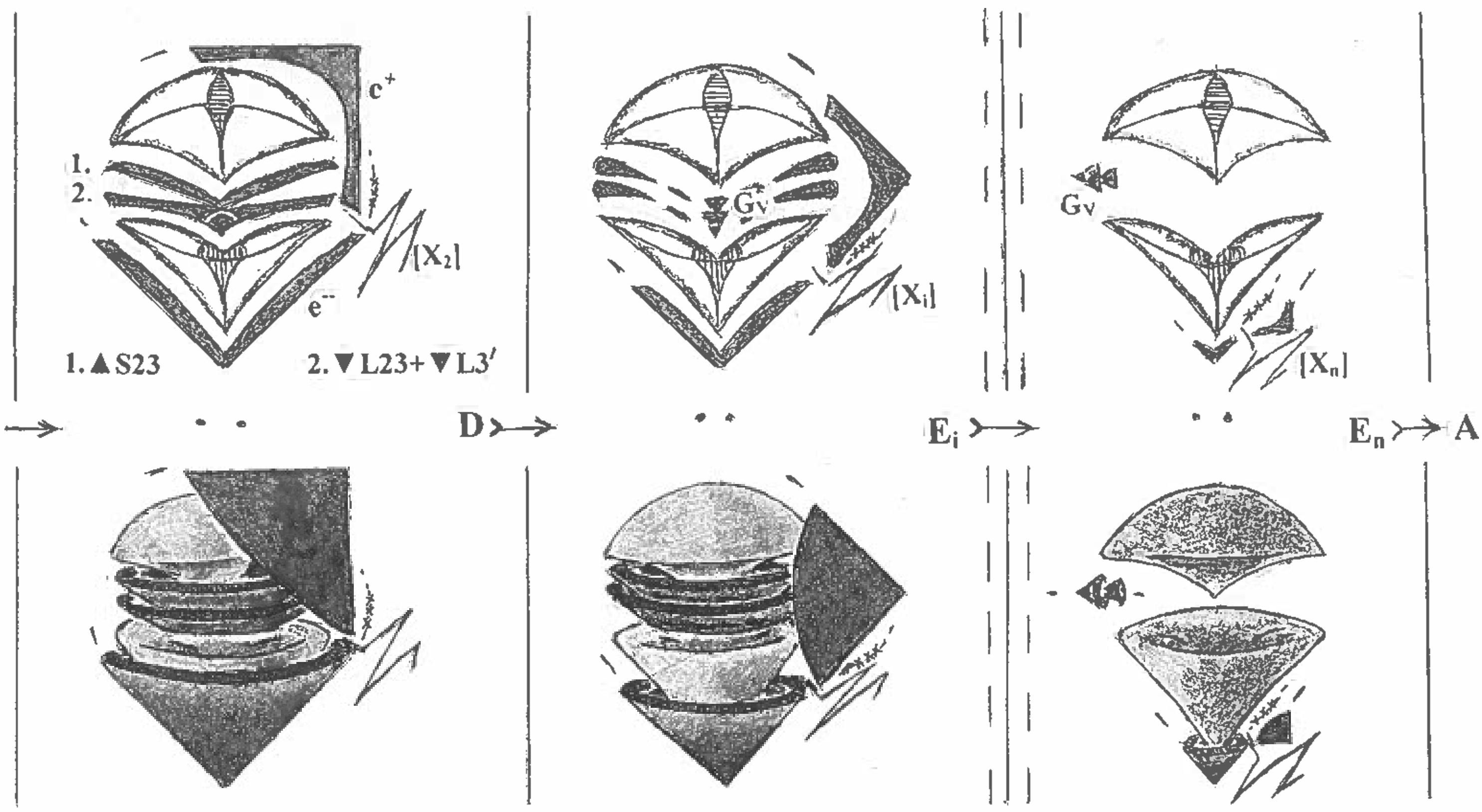
**3.** Functioning of the particle .

**L^S** particle is always in a state of continuous step-by-step cyclic process:

**A**
↗ ↘
**E** **B**
↖ ↙
**D** ← **C**

Let's describe it, presenting the overall picture in Fig. :






**A :** The interaction of elements **S** and **L** in **L^S** leads to a structural "weakening" of the layers of their surfaces, which entails their growth and compression, respectively :

**S12→ ΔS12; S23→ ΔS23** and **L12→ ∇L12; L23→ ∇L23+∇L3′**

**B , C :** The continuing "weakening" of these surfaces, to the conical shapes of their coatings, leads to the consistent blocking of the sources of their contact from **d (S1)** and **d (L1)** .

**D :** As a result, their fragmented "weakened" surfaces break and peel off: **ΔS12→ $c^+$** :

**ΔS23→ ▲S23** and **∇L12→ $e^-$** : **∇L23→ ▼L23+▼L3′** , with its resulting "activity": **$c^+$** ÷ {**u2**}:

**▲S23** ÷ **u1** and **$e^-$** ÷ {**u2**}; **▼L23** ÷ **u1**; **▼L3′** ÷ **u 11** .

Where **$c^+$** is a "positron", **$e^-$** is an "electron", **▼L3′** is a "boson": obtained by "weakening" **L3(L.3)** .

And the remaining surface of elements **S** and **L** the **L^S** particle will remain inactive until its surface structure is "combed" from the result of the "cut" .

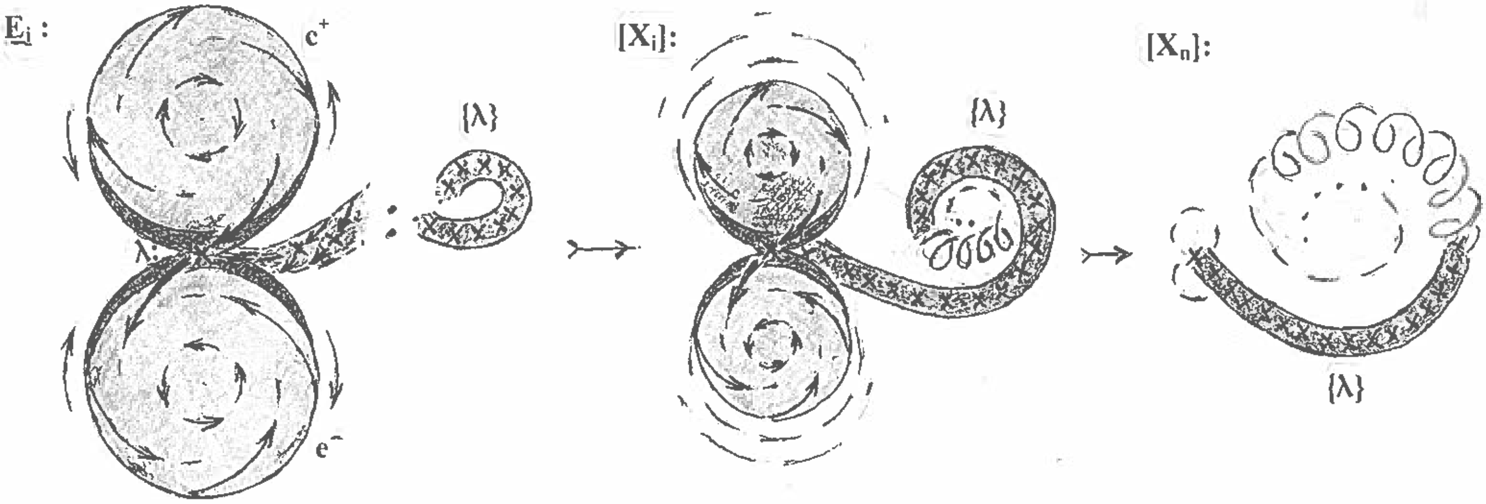
Subsequent events of this step process will occur simultaneously on the external - description **Da** , and internal - description **Db** , parts of the surfaces of the particle **L^S.**

Description **Da** .

"Activity" **$c^+$** and **$e^-$** through {**u2**} and {**u2**} lead them to object connection .

If there are no additional conditions to this, then such a connection in their rotation , by the degree of "activity" of their connection, leads them to a "stage-by-stage" annihilation (passing steps **$E_i$** ) from their common point.

It represents the unwinding into a "crawling snake" of additionally "weakening" "point" interactions - elements of the quantum **λ** , forming an "electronic orbital " {**λ**} :




And its complete image will be determined by the functional structure of the set {L^S} – the atomic type of matter .

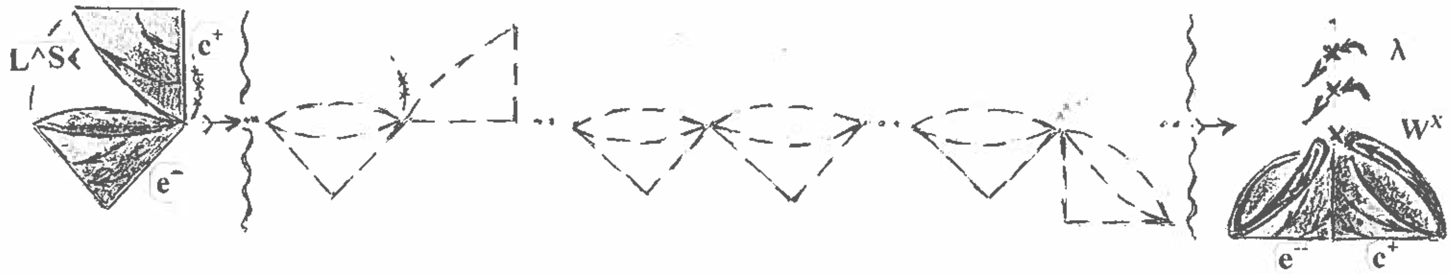
This emerging "crawling snake" in the fading "activity" of its elements λ passes into the process of "complete" annihilation from the initial place of its formation.

The process of "complete" annihilation is a "short" stage that transforms the fading "activity" of sources into a structural-phase form of space **(TE,TP)** , which is a "Vacuum" filled with "activity".

And the path of its passage is determined by the structural appearance of the source itself and determines its properties - electromagnetic and so on .

And if in the described process of connecting $c^+$ with $e^-$ from **L^S** to them in some section $[X_i]$ an additional connection is formed with another object that has a homogeneous connection with it with a different frequency of its passage, then the result of this connection is from the "alignment" of its frequencies leads to a change in the images of these objects – a change in the arrangement of their constituent elements .

An object with $c^+$ and $e^-$ from **L^S** has a maximum frequency of its connecting passage - as a result of the continuous formation of a "crawling snake" from its λ , which means its change is only possible in a "smaller" direction - with a reversal of the image of its constituent objects into Zug form $W^X$ and completion of the formation of a "crawling snake" :



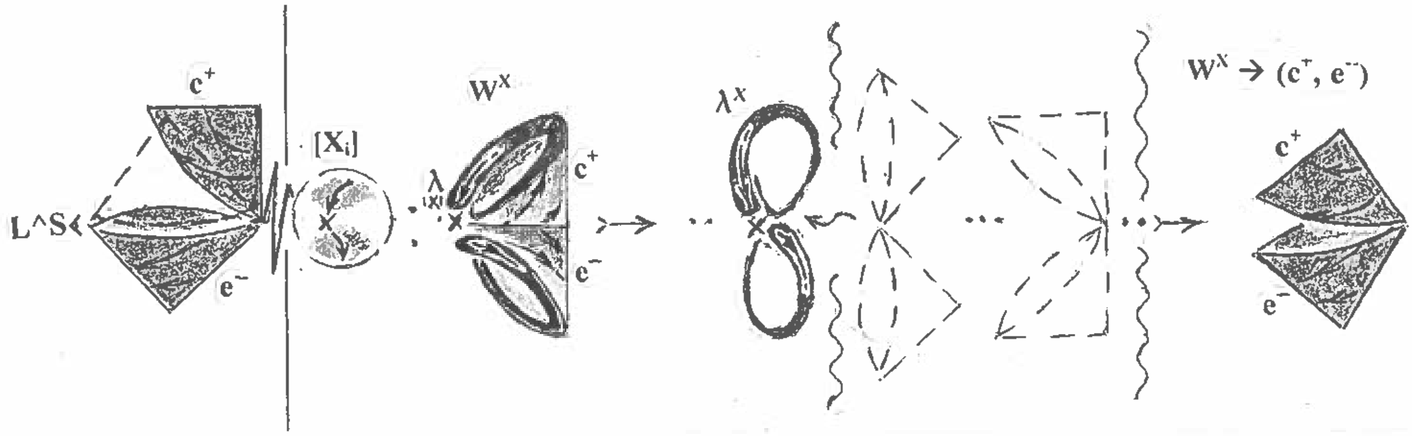

The edges of the conical bases of the $W^X$ components are structurally open and, through their continued "activity," expand into the surrounding environment .

This means that they will interact through a contact located at a distance Δ from the common point of the bases of their cone images $c^+$ , $e^-$ and will be identical in their action to the original image .

This contact, by means of an additional "weakening" of the bases of these conical images – in the direction of expansion and compression – outward and inward from their edges, brings the edges of these bases to a single vector direction of interaction .

It represents the element of quantum λ in $W^X$ , discretely obtained and then discretely separated in an ongoing process of "complete" annihilation from its conical components $c^+$ , $e^-$ .

Thus, from $W^X$ we obtain a connecting object with an object: $c^+$ with $e^-$ from $L\wedge S$ , on [ $X_i$ ] its section with a "minimum" passage of the connecting cycle – as a result of the discrete formation of its $\lambda$ :




This connection, on the part of $W^X$, leads to the "increasing" of the passage of its connecting cycle – the reversal of its constituent elements into the form of an image of the connecting object: $c^+$ with $e^-$ from $L\wedge S$ .

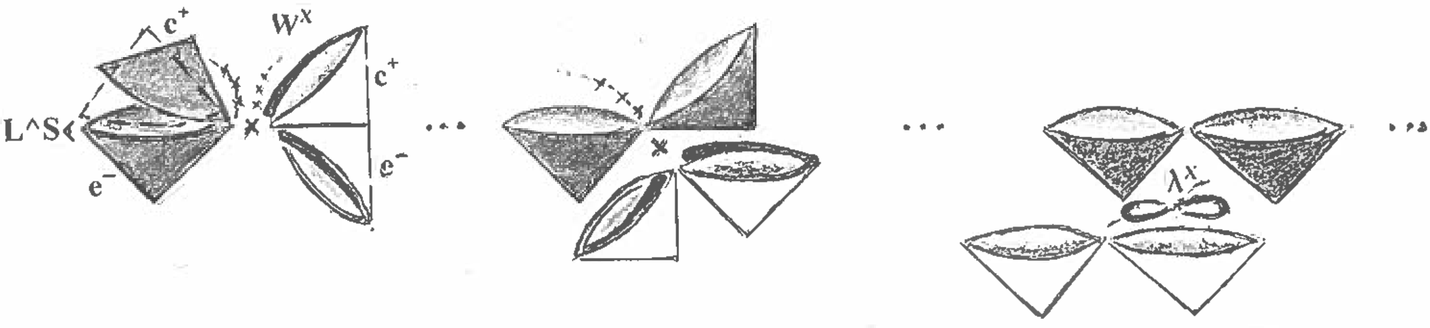
It begins with the "build-up" $\lambda$ : of a <u>quantum</u> $\lambda^X$, with its subsequent detachment and transition to an <u>electromagnetic wave</u> : <u>optical</u> $\lambda^{X=O}$ from $W^{X=O}$ on section [$X_2$], and <u>ultraviolet</u> $\lambda^{X=F}$ from $W^{X=F}$; <u>X-ray</u> $\lambda^{X=N}$ from $W^{X=N}$; <u>ϒ rays</u> $\lambda^{X=\Upsilon}$ from $W^{X=\Upsilon}$ on sections [$X_i$] in continuation .

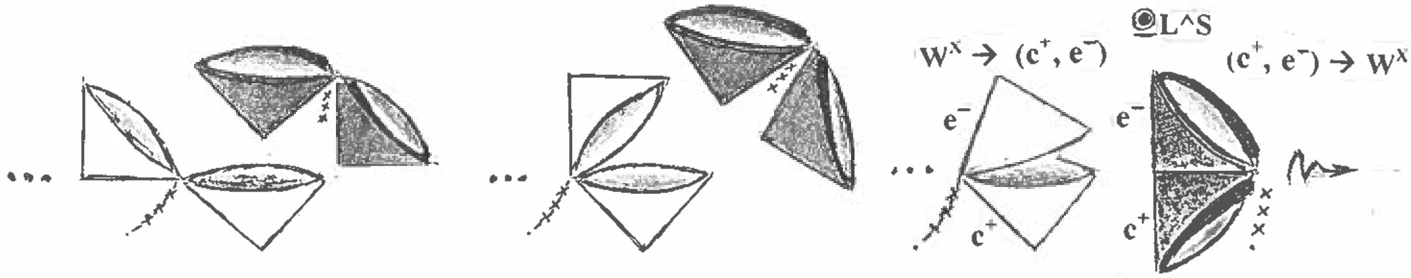
The transition of a quantum $\lambda^X$ into an electromagnetic wave is the process of its "complete" annihilation, from the "stage-by-stage" in its receipt, taking the from of a spiral image :


This form of image is determined by the "activity" of the quantum $\lambda^X$ – in the circular advancing direction, from its structural form, in its annihilation .

And for the primary , "volumetric", <u>optical</u> $\lambda^O$ this narrowed sequence of attenuation gives <u>its spectrum</u> .

And the picture of the described "transitional" transformations takes the following form :



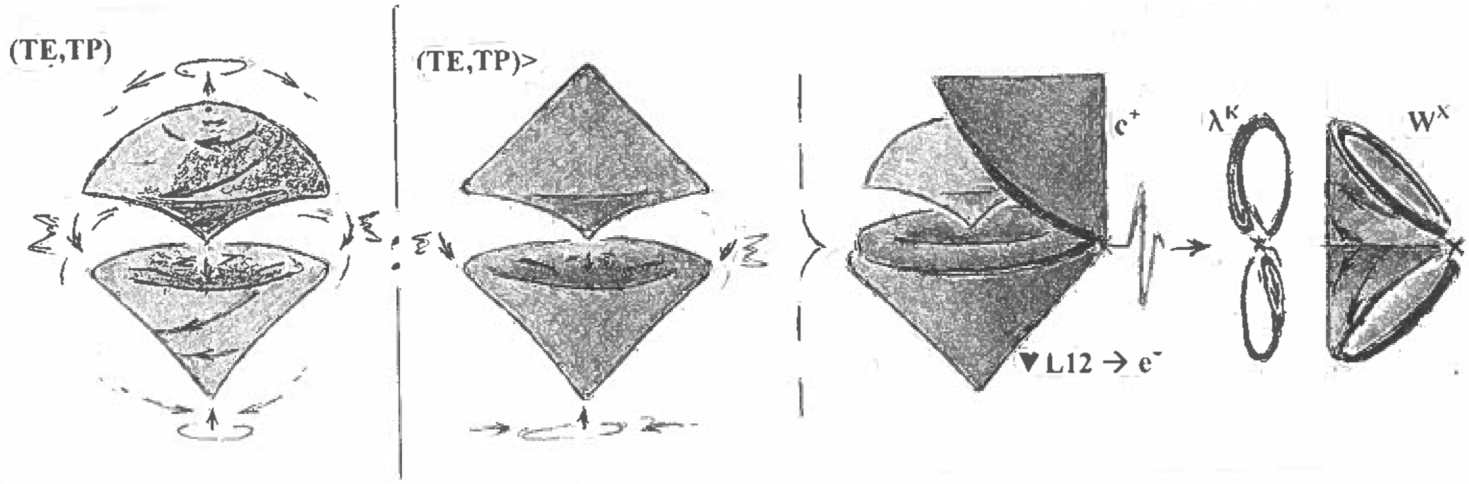



Result :

- if to the functioning particle **L^S** a connection with the Zug $W^X$ is formed, then its electron - positron the couple will pass into the image of this Zug, and Zug himself will pass into the continued action of this pair, from his own, with the emission of an quantum – a electromagnetic wave .

Let turn to primary education $W^X$ .

Let us consider the functioning of the particle **L ^ S** at a high value **( TE , TP )** of its environment :




When the value **(TE,TP)** of the particle's environment **L^S** is high , the "activity" of its **d (S1)** element **S** will be weaker than the **d (L1)** element **L** .

Therefore, its “blocking”, with subsequent ones on **S** , will be completed faster .

As a result, we get a break : **ΔS12→** $c^+$ , followed by its connection with **∇L12** via **{u2}** ↺ **{u2}** .

Their rotation will begin to differ – in the smaller direction at $c^+$ .

And this leads to the completion of the formation and rupture: **∇L12→** $e^-$ , with the “cutout” of the quantum – electromagnetic wave: the first – infrared $\lambda^K$ , and the formation of a Zug $W^{X=O}$ with the absence of the primary structural layer .

If the value **(TE,TP)** of the particle’s environment **L^S** is even greater, then the infrared slice from $W^X$ will be “more voluminous” - covering $\lambda^O$ and further, thereby forming Zugs of smaller sizes : $W^{X=F}$; $W^{X=N}$; $W^{X=\Upsilon}$, in continued.

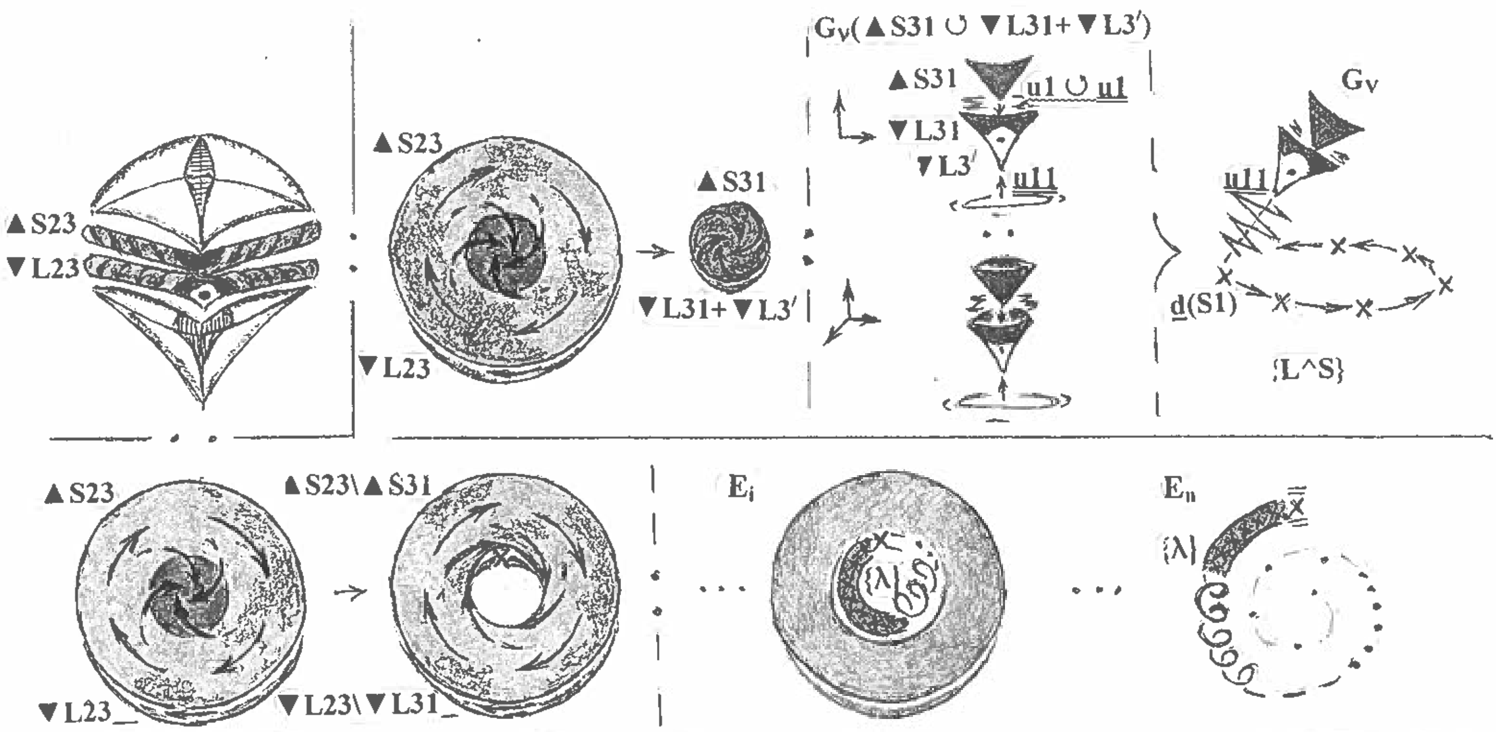
We obtain primary formations $W^X$ .

And its interaction with the object: $c^+$ with $e^-$ from **L^S**, on **[**$X_i$**]** its section will occur after the annihilation process of this object moves to this section .

And at the end of the “Description **Da**“ we can conclude that everything in the observed space is, basically, Zugs, and light with other quantum-wave manifestations are formed, briefly, at the moment of interaction of these Zugs with matter.

This explains the corpuscular-wave properties of radiation .

Description **Db .**




The "activity" **of ▲S23** and **▼L23** through **u1** and **u1** leads them to an object connection in the middle of the interior of the particle **L^S** .

But the resulting nucleus - "boson" ∇**L3**′ with its adjacent structure ∇**L31** is "cut off" from **▼L23** together with its interacting ΔS31 from **▲S23** , the result of its "activity" **u11** , forming a Gravitational quantum **Gv (▲S31 ↻ ▼L31+▼L3**′**)** .

And the remaining "cut" layer of the object, having the shape of a truncated cone contour : **▲S23\▲S31** and **▼L23\▼L31** , goes into the process of annihilation – in the likeness of an "electron orbital", from the common "oscillating" point of the ring "activity" of these components in the cut .

This is due to the distinctiveness of the conical shapes that complete them - more "flat" in **▼L23** .

The completion of this process will be the release of **Gv** from the particle **L^S** .
The gravitational quantum **G v** moves in the direction of its free "activity" **u 11** from **the L ^ S** that gave birth to it .

And on its way, encountering the action of the "activities" of the material set **{L^S}** it slows down and goes into oscillatory rotation, from **u1** ↻ **u1** , covering with this the set of particles **L^S** from **{L^S}** by its "activity" **u11** .

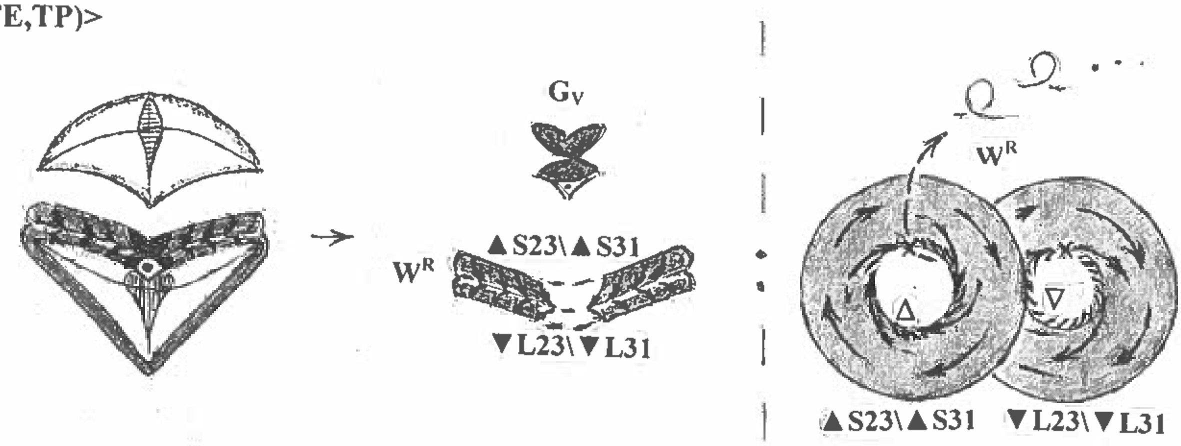
The directed, preferential, action of "activity" **u11,** from **Gv**, on a specific **d (S1)** from **L^S** from **{L^S}** does not receive "compensation" back to itself due to its oscillatory displacement , thereby performing a "pulling" action of this entire connecting set **{L^S}** .

This is how the effect **Gv** on matter is carried out .

Let us omit its numerical solution .

Now consider the Description of **Db** at a high value **(TE,TP)** of the particle's environment **L^S** :

(TE,TP)>




The "activity" of ▲S23 and ∇L23 through u1 and u1 leads them to a "dense" connection on the surface with the latter, which has not yet been "formed".

Their rotation will become different - smaller for ▲S23.

This means that their "alignment" from the resulting connection leads to detachment :

∇L23→▼L23, with a cut "before the taking shape" of the Gravitational quantum $G_V$ and the formation, from the remaining "slice", of Radio Zug $W^R$ (▲S23\▲S31, ▼L23\▼L31) with their release from the particle L^S.

We also note the possibility of additional emission of radio waves * from the primary layer $W^R$, in the likeness of "infrared" radiation, which may represent "relict radiation".

Radio Zug $W^R$ is a layered shape of a conical outline in truncation from : ▲S23\▲S 31 and ▼L23\▼L31, with its ring "activity" from the ring interaction of these components in the formed slice $G_V$.

"Activity" $W^R$ is manifested by the discrete radiation of its "spiral snakes" – "rings in motion", from its elements – point interactions λ.

They are formed in the similarity, described earlier, of their annihilation process on the Δ layer of "activity" $W^R$, caused by the environment (TE,TP) – having the distinctiveness of its state in its impact on this "activity", transferring this Δ layer to different conical contours.

And the formation of an Electromagnetic Radio Wave: $\lambda^R$, occurs during interaction $W^R$ with an object that has a different – "higher" degree, the frequency of passage of this connection.

And the resulting assortment $W^{R=\dots}$, with different wavelengths, is formed in the similarity of formations $W^{\lambda=}$....

Concluding the descriptions of the sections, we note the "omission" of premature descriptions of the details of the routes for the passage of "activities" in the described connections.

And in the end :

Everything described represents variations in the evolution of Vacuum from the type of its extreme state (TE,TP) $^{(\text{max},\,\text{min})}$ to the intermediate – current (TE,TP) :

$$(TE,TP)^{(\max,\,\min)} \rightarrow \{\,..\rightarrow ..\,\} \rightarrow (TE,TP)$$

This "theme", already of a "philosophical" direction, has its evolutionary continuation :

$$..\rightarrow \{\,(TE,TP)^{(\max,\,\min)} \rightarrow \{\,..\rightarrow ..\,\} \rightarrow (TE,TP)\,\} \rightarrow ..$$

in a separate work.

3. Atomic structure.

Let's consider an assortment of atoms covering the largest range of their properties :

- radioactivity ;
- varieties of " orbitals " ;

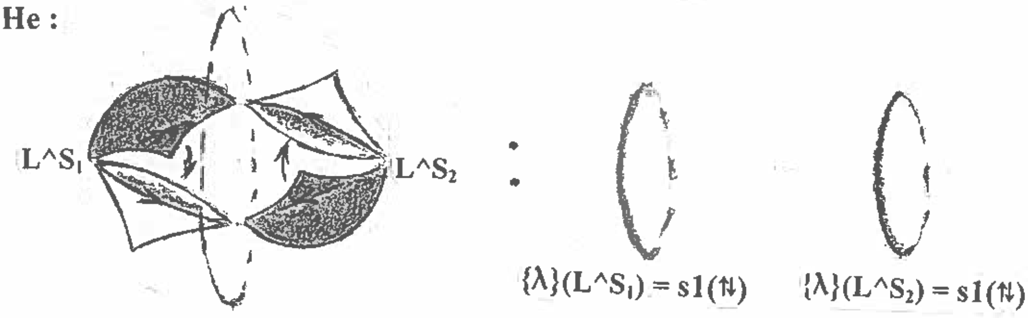
- excess mass ;
- ...............

These will be: Isotopes of Helium ( **He** ); Oxygen ( **O** ); Beryllium ( **Be** ); Carbon ( **C** ). And the Hydrogen atom ( **H** ) has already been mentioned .

**A.** Isotopes of Helium ( **He** ).

One of the possible connections of two particles **L^S** gives the Helium ( **He** ) atom :

**He :**

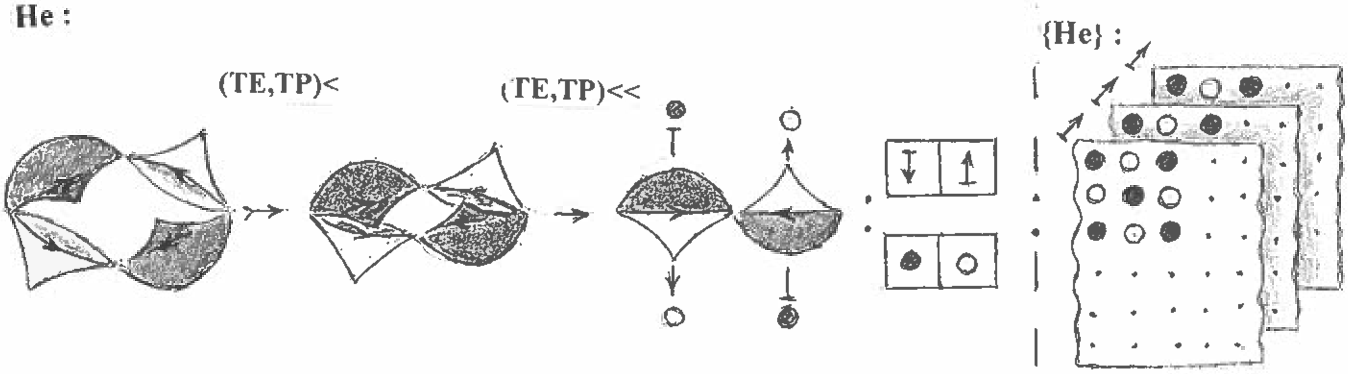



Angle of connecting inclination of elements **S** and **L** in each **L^S** from **He** does not interrupt their interactions **u1**(S3) ↺ **u1**(L3), with the passage of cyclic processes of these particles and the formation from them of two identical “crawling snakes” - “electron orbitals ”: **s1**( ⇅ ) and **s1**( ⇅ ) $^{*}_{-}$.

Decrease: < , values **(TE,TP )** : **(TE,TP)<** , environment **He** leads to a decrease in the connecting angles of its elements **S** and **L** from **L^S** .

And at some stage: **(TE,TP )<<** , **He** will move to the image of interaction from the standard forms of particles **L^S** , through {**u2**(S2)} ↺ {**u2**(L2)} , with their opposite orientation in location :

**He :**




This interaction is "correct", but not sufficient - in the symmetrical relation of the connection.

This “drawback” eliminates the “weak” structural - phase space **(TE,TP)<<** , the environment of the gas set from **He** . allowing in to implement its homogeneous continuous connection in { **He** } .

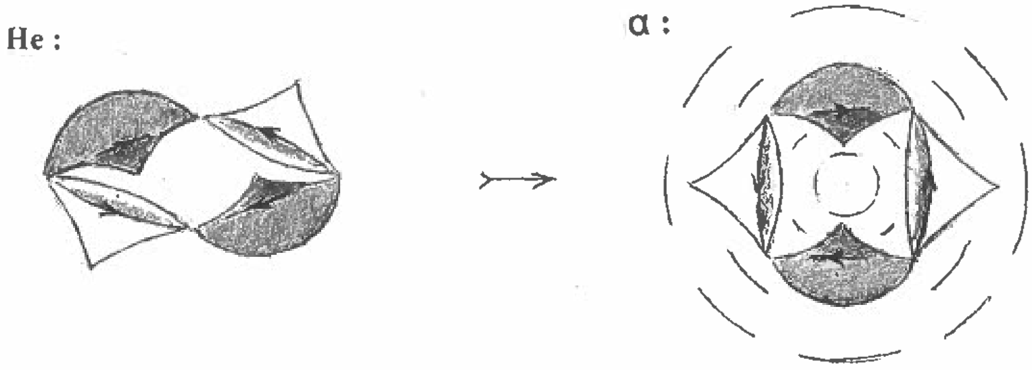
We obtain the set {**He**} – liquid state .

It is formed even when they approach **L^S** to the standard form .

And already in the combination of its **L^S** from standard forms, it assumes a superfluid state , allowing any of its particles to move in the direction of its homogeneous direction, without a reverse reaction to this, with deformation of the overall appearance, thereby exhibiting the ability of “leakage”.

Now let's change the angles of the connecting inclination of the elements **S** and **L** in each particle **L^S** from **He** by **90** $^{0}$ .

We get the particle α ( Alpha ) :




Such a change breaks the connection between **u1**(S3) and **u1**(L3) from **S** and **L** for particles **L^S ,** and hence the subsequent passage of their cyclic processes with the formation of "electrons" and so on, thereby "destroying" the particles themselves into their components in the compound .

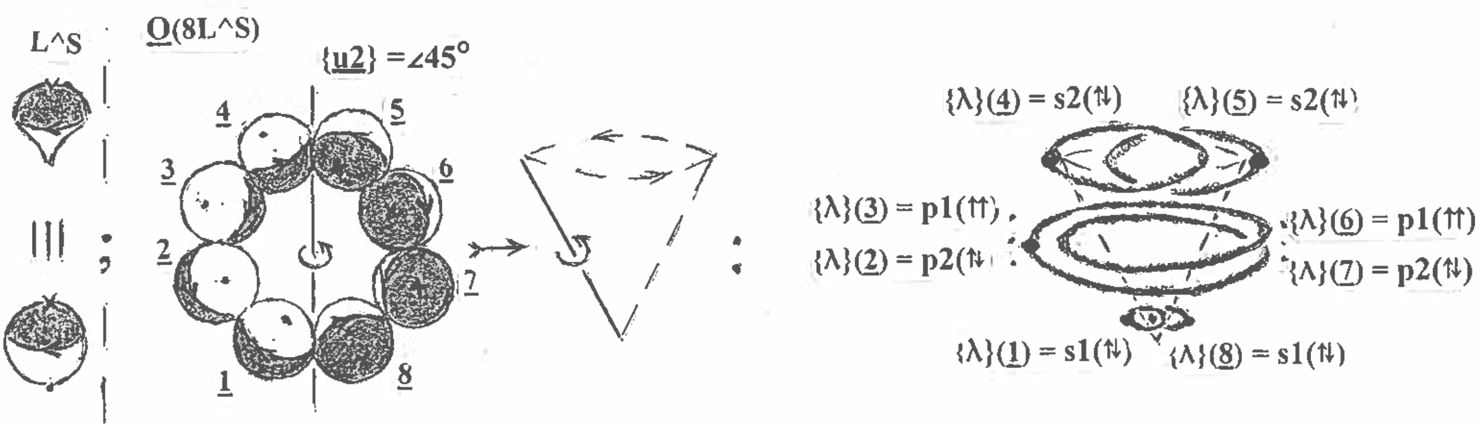
And their "polar" interaction of "quarks" covers the outer and inner parts of the α - particles without making any additional changes .
And if we take into account that radioactivity is a " bombardment " of "burns" and "hypothermia" from the action of free "quarks" of the elements **S** and **L** , then α - particles it will be absent .

**b .** Oxygen ( **O** ).

For the convenience of multiple representation of **L^S** particles in an atomic structural compound, we will depict them as "spherical coatings" with the application of acting "quarks" on them .

The stability of a structural atom from its constituent set **{L^S}** gives the identity of the angles of connections from **{u2(S2)}** ∪ **{u2(L2)}** : **{u2}**, each of its particles .

For {**L^S**} of **8** particles - atom Oxygen (O) , it will have the following form:




This "arbitrary" shape can be changed while maintaining the equality of the angles of the connections of the particles in {**L^S**}.

This atom already has a variety of forms of its "electronic orbitals " .

Let's stop at them.

Let us construct the route of movement of each particle of an independent Oxygen atom , which rotates in the image of the result of the action of its resulting "activity" .

The "creeping snake" they form - {λ} will pass along this route, determining their electron orbitals .

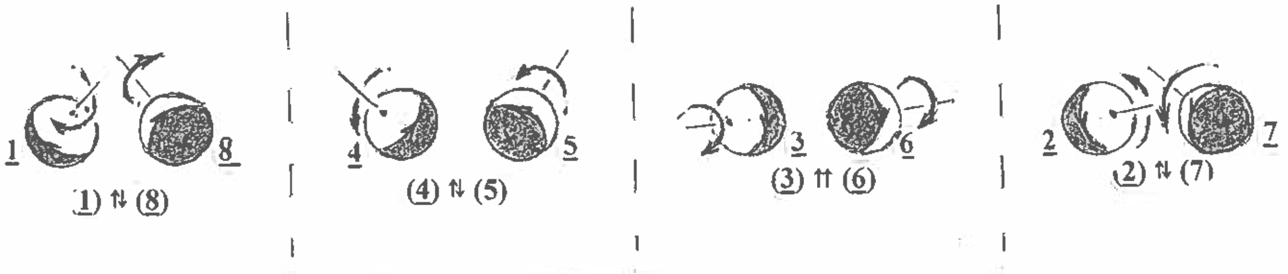
The image of an atom **O** will always look like this : two of its particles directed "inward" of its image, their opposite two - "outward", and the remaining ones - in pairs in "opposite" directions .

This arrangement of particles leads to the own rotation of the image ( **O** ) along a conical surface with the top from the "internal" direction of the particles, and the base from their "external" direction .

As a result, we obtain the following routes of atom particles ( **O** ) with the types of their "electron orbitals " :

- located at the apex of the cone – "small" circular shapes related to : **s1**( ⇅ ) ; **s1**( ⇅ ) ;
- located at the base of the cone – "large" circular shapes related to : **s2**( ⇅ ) ; **s2**( ⇅ ) ;
- located on the lateral of the cone – "loop" forms related to : **2p1**( ⇈ ) ; **2p2** ( ⇅ ) .

One opposite pair with **2p1**( ⇈ ) , in a "lateral" arrangement ( **O** ) of greater tilt with the same "electron orbital ", does not differ in mutual rotation, and therefore will have a "spin" - ⇈ :

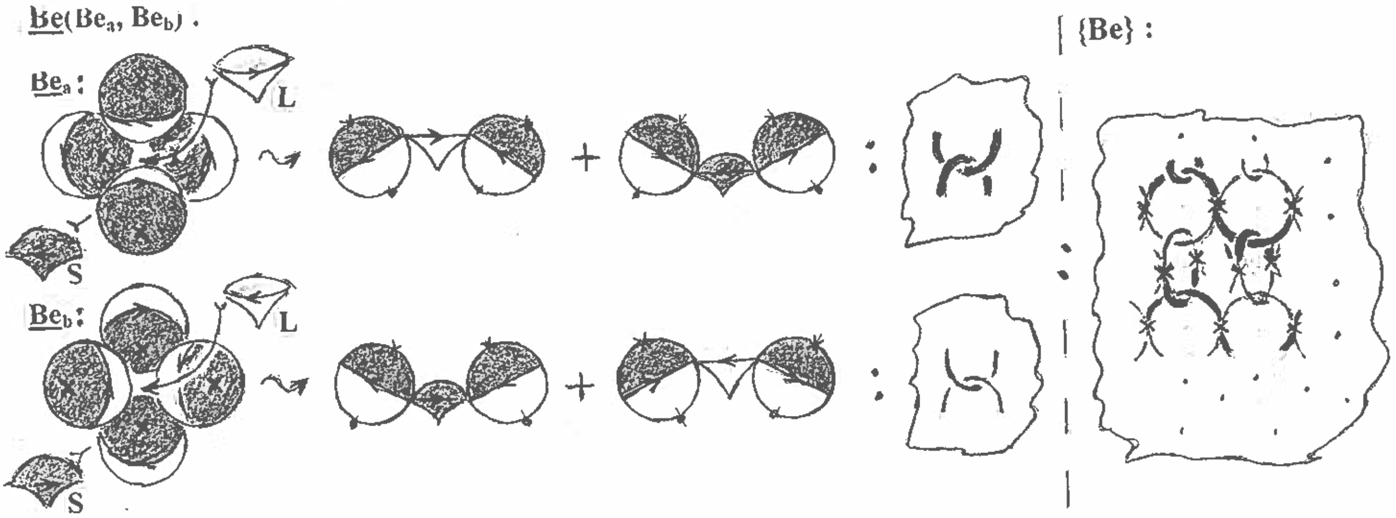



This is a figurative representation of "spins": ⇈ ; ⇅ , in identical "electron orbitals ", is used in all atomic designs .

**c** . Beryllium ( **Be** ).

By adding to the structural compound of an atom, from particles **L^S**, individual elements **S** and **L** give this atom "excess" mass .

An example of this is the Beryllium atom **Be**, which consists of four particles **L^S** with an additional compound of the elements **S** and **L** , which determine the "excess" in its relative mass – " 9 " :




The substance {**Be**} has a "hard" form – a solid state .

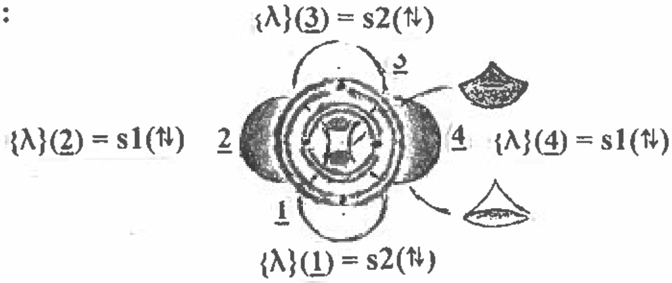
Directivity: ↘ , its constituent particles will be :

- two **L^S** are directed "inward" of the form **Be** ;

- two **L^S** are directed "outward" of the form **Be** .

And the "crawling snakes" they form from the freely rotating, resulting "activity". **Be** , will cover, respectively, "smaller" and "larger" circular regions of their passage, representing with them their "electronic orbitals " : **2s1( ⇅ )** and **2s2( ⇅ )** :

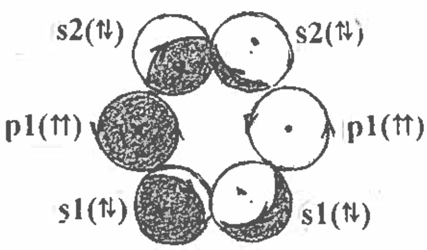
**Be** :




**d .** Carbon( **C** ).

Carbon atom ( **C** ) is built in the similarity of the Oxygen atom ( **O** ), and therefore we present only its form with the characteristics of its particles:

C(6L^S) :




{u2} =∠60°

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