Field Effects Explaining and Proposed Experiments

2.1 The (e^- - e^+) Pairs Forming by Quantum Vacuum Energy

The possibility of vacuum energy extraction by an electric field was predicted by the physicist H. B. G. Casimir in 1940 and it has been observed experimentally in 1994. The Casimir effect predicts the symmetry breaking of the vacuum, i.e. the creation of a negative energy in the sense of the free electrons generating without simultaneously producing of positrons.

The fluctuations of the vacuum energy between the plates of a capacitor can be measured with a laser beam. The existence of "zeroth" energy was discovered in 1958 by M. I. Sparnaai who continued the Casimir's experiments made in 1948 and has proven the existence of forces between two unloaded capacitor plates, this force resulting from the vacuum energy. Sparnaai showed that this force appears not only from heat energy but also from another type of energy: the zeroth energy, being at zero Kelvin degrees.

According to the C. G. T., the formation of negatron-positron pairs results from "cold" (un-thermal) gamma-quanta: $\gamma^*(e^-e^+)$ existing as pairs of degenerate electrons – by theirs dividing into two electrons with opposite electric charge in a strong electric E-field by generating vexonic structures in the quantum volume of electronic constituents and corresponds to a quantum oscillation distance between gammonic centrols $A_v \leq A_v^e$ and to a critical frequency ω_v^e given by eq. (131), (132a), in accordance (also) with quantum mechanics which deduces a value for the critical E-field intensity for creating (e^-e^+) pairs: $E_s=m_e^2c^3/e\hbar=1.3x10^{18}$V/m, (Schwinger limit: $2.3x10^{29}$ W/cm^2 [1]), given by eq.: $\Delta E=m_ec^2=e\cdot E_s\cdot\Delta x \approx e\cdot E_s\cdot\hbar/m_ec$.

Another possibility for $\gamma^*(e^-e^+)$ pair transforming results by passing it through a magnetic field $B_s \geq E_s/c = 4{,}3x10^9$ T, applied intermittently with a frequency of about $(10^{21}\text{-}10^{22})$ Hz; (for example by the γ^*-gammon passing through the poles (N-S) of a linear arrangement of magnets, periodic and anti-parallel disposed. The required energy is approximate equal to the "rest" (intrinsic) energy of the hard-gamma quantum, i.e.: $e \cdot E_s \cdot a \approx 2m_e c^2$.

The conclusion corresponds to the relativistic quantum physics considerations regarding the hard-gamma quanta conversion in $(e^+ \div e^-)$ pairs.

The generalization of the fermion soliton model considered in the theory implies also the generalization of this particles genesis mechanism – by the polarized quantum vacuum energy conversion in particle-antiparticle pairs with an E_i-separating energy which may be given also by γ-quanta according to CGT.

This generalization was analyzed in the first chapter (schpt. 16.4) and it explains also some strong reactions of particle-antiparticle pairs forming by $(e^- + e^+)$ interactions, of the form [1]:

$$e^- + e^+ + E_i \rightarrow (q + \overline{q}) \{\text{or } (p + \overline{p})\}; \; E_i \geq 2m_q c^2 \; (2m_p c^2) \qquad (136)$$

2.2 The Superfluidity of Helium

A French-British team of specialists from Grenoble and from Lancaster used superfluid He 3 (cooled at 10^{-4} K) linearly irradiated with relativistic neutrons which heated the superfluid helium until to the normal (liquid and viscous) phase transition. After that, the cooled liquid mini-areas have become superfluid again, but are existed also some "islands" in the normal (liquid) phase surrounded by a H3 superfluid vortex. It is interesting the fact that the number

of H3 superfluid measured vortexes corresponds to the theoretical predictions based on the "cosmic strings" generation model.

The superfluidity of He3 was explained considering this state of He-which is diamagnetic in the basic state, of 0K, as being a Bose-Einstein superfluid state.

According to the proposed CGT, the phenomenon of H3 superfluid vortexes forming, evidences the vortexial nature of the magnetic moment and simulates the cold particles genesis in the Protoniverse period through the kinetic energy of the leptonic bosons and the energetic fluctuations of the "quantum vacuum".

The possibility of elementary particles cold genesis, formed as degenerated electron clusters, is sustained indirectly also by an experiment of the physicists from Berkeley (USA) which are obtained a cloud of electrons of 0,8mm diameter with 1012 charges in an ultrapure semiconductor at 2K degrees, [2, 3] The possibility of charge cluster forming at low temperatures was predicted also by a theory of some Russian scientists.

According to CGT, the phenomenon argues also the possibility of cold forming of stable solid clusters of Cooper pairs of electrons at→0K, i.e. in the quantum vacuum, as Bose-Einstein condensate.

2.3 The Einsteinian Relativity

The einsteinian theory of relativity was inspired by the Lorentz's relativist equations.

For verify the Lorentz's hypothesis of length contraction, some experiments were carried out, (Rayleigh 1902, Trouton and Ranking 1908 [4]), using a resistive Wheatstone bridge with moved wires with relativistic speed) but the hypothesis was not confirmed.

The objections of various theorists for the special relativity theory were not only for the postulation of the light constant speed but also for the interpretation the Michelson-Morley experiment. A ballistic analysis of this experiment (by the relativization of the photons speed to the light's source: Ritz's theory [5]) reveals as natural the lack of the light beams interference between a light beam parallel with the source speed and a perpendicular light beam. This result has a correct interpretation also for a density of etherons bigger than those of the "quantum vacuum" ($\rho_\Lambda^* \cong 1.2x10^{-26} kg/m^3$ in the interstellar space and higher in zones with mass concentrations – according to CGT).

This ballistic interpretation of the result of Michelson-Morley experiment, avoid the wrong conclusion -from philosophical point of view, of the time dilation, also in the papers of other theorists: Richard Price, Roland Gruber [6], O. Onicescu [7], Ioan Haş [8] and others.

Also, was made some experiments indicating the galilean addition of the light source speed to the light speed, (Harres 1912, Sagnac, Pogany, [9]). The experiment used two light beams emerging in opposed senses from a source placed in the center of a ring with mirrors, of r-radius. To an angular rotation speed ω of the ring, at an interferometer placed near the light source, the reflected light beams arrived with a time difference Δt between them, given by the equation:

$$\Delta t = 2\pi.r\left(\frac{1}{c - \omega.\mathrm{r}} - \frac{1}{\mathrm{c} + \omega.\mathrm{r}}\right) = \frac{4\pi\ \omega.r^2}{\mathrm{c}^2} \tag{137}$$

A variant of the "twins paradox" that could illustrate more clearly the formal interpretation of the einsteinian relativity, can be formulated in the form of the "three twin paradox" in the following way:

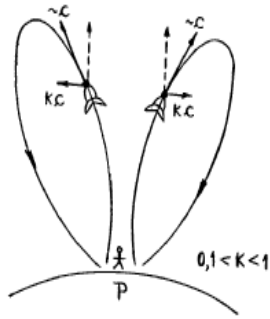

Fig. 16. *The "three twin paradoxe".*

Let us suppose that from three twins, one remains on the planet and the other two (1 and 2) are going in the space to trajectories simetrically oriented at 30-60^o relative to the vertical direction of the start place and with relativistic speed, $v_1(t) = v_2(t) \rightarrow c$, (figure 16). According to the einsteinian relativity, the travel duration, which has the same value: Δt, in the twins mobile system, O1 and O2, will appear "dilated" to the third brother remained on the planet (in the O3 system) at the same value:

$$\Delta T=\Delta t/\beta;\ (\beta=(1-v^2/c^2)^{1/2}) \tag{138}$$

If the trajectories of the two systems O1 and O2 have an angle of about 45^o between them, the reciprocal v_R speed of their movement in space is also relativistic (close to the speed of light), so that the twin 1 or 2 may calculate with the einsteinian relativity that his age becomes different, i.e – the age Δt_2 of one brother (2 or 1) result as increased for the other (1 or 2) to the relativistic value:

$$\Delta t'_2=\Delta t_2/\beta_r;\ \beta_r=(1-u^2/c^2)^{1/2};\ u=k.c;\ k<0,8 \tag{139}$$

(u -the relative speed between O1 and O2), but this conclusion is in contradiction with the fact that the third twin, remained on the Earth, must observe that the twins 1 and 2 returns to the Earth in the same-time with the same age:

$$\Delta T_1=\Delta T_2 =\Delta t_2/\beta'_r;\ \beta'_r = (1 - v^2/c^2)^{1/2};\ v=k'.c;\ k'<0,8 \qquad (140)$$

Some experiments which confirms the existence of tachyonic velocity were made also by researchers of the Köln University (1991-1992) and of Berkeley University (1993, [10]).

Another paradox of the eisteinian relativity is the paradox of "spin disappearance", resulted in the next way:

If we consider for fermions (also for vectorial photons) the existence of a spin in the classical sense (rotational angular momentum) arising as a result of a quantonic or also vexonic vortex: $\Gamma_S=2\pi r\cdot v_S$ with relativistic speeds ($\mathbf{v_S\rightarrow c}$) of the quanta, the material surface of a fermion with relativistic speed $\mathbf{v_f\rightarrow c,}$ has in its surface also quanta with a relative speed: $\mathbf{v_R = (v_f \pm v_S)}$ in a classical galillean relativity, but which in the einsteinian relativity has the value:

$$u_x = \frac{u'_x + v_p}{1 + \frac{u'_x \cdot v_p}{c^2}} = \frac{c + c}{1 + \frac{c \cdot c}{c^2}} = c \qquad (141)$$

so – the same relative value as the fermion center, in a stationary system (O), the fermion spin resulting of null relativistic value, in this case.

Concerning the total energy of particles with relativist or non-relativist speed, given as sum of the intrinsic (zeroth) energy: m_0c^2 and the kinetic energy, due to the mass/energy conservation law, for an un-disturbed particle results a classical expression of the total energy in the absence of the ether, in the form:

$$E_C= m_oc^2+m_o(u^2/2) =m_o\ c^2(1+u^2/2c^2) = m_xc^2 \qquad (142)$$

which is the same with the einsteinian relation for non-relativistic speeds and which corresponds to an apparent relativist mass in the absence of the ether, of the form:

$$m_x = m_o\,(1+u^2/2c^2) \tag{143}$$

In the presence of the ether, the expression of the apparent mass resulted from CGT:

$$m_y = m_o/(1 - v^2/2c^2) \tag{144}$$

is given by the fact that the resistance force of the sub-quantum etheronic medium acting over the moving particles, increase the energy necessary for accelerate the particle until the v-speed, with a value E_R, according to the equation:

$$E_A = E_C+E_R;\ \Rightarrow m_xc^2+E_R = m_yc^2 \tag{145a}$$

The value E_R given by the ether is obtained by eq. (145a) in the form:

$$E_R(v) = (m_y - m_x).c^2 = (m_0 \cdot \frac{v^2}{2}) \cdot \frac{v^2}{2c^2 - v^2} \tag{145b}$$

At the limit: $v \to c$, we have from (145b): $E_R = 0{,}5 \cdot m_o \cdot c^2$. In this way, the paradox of mass increasing to a infinite value at $v \approx c$, is avoided.

For a photon, for example, we have: $E_A = m_yc^2 = 2m_0c^2 = E_C+E_R$

So, also the tachyonic neutrinos evidenced in the OPERA experiment are well explained in a classical etheronic theory, without paradoxes.

The previous theoretical considerations are sustained also by the experiments made by Fizeau in 1853 [11] with flowing water, which may be explained only by the conclusion of the aether entrainment by the flowing water. Another similar experiment made in 1958 using a maser, showed that the entrainment velocity of the aether is under 30 m/s.

Also, in 1987, E. Silvertooth determined experimentally, by laser interferometry, that the wavelength of light varies with the direction of light propaga-

tion, resulting that the Earth moves through the ether toward Leo constellation with a speed of about 378 km/s, result confirmed by some astronomers which have found that the solar system is moving toward the southern part of Leo constellation with a speed of about 365 km/s relative to the surrounding 3K microwave background.

This result sustain also the conclusion looking the existence of a pseudo-stationary component of quantum and sub-quantum medium.

2.4 Magneto-Electric and Magneto-Mechanic Effects

An argument in favour of the CGT concerning the quantum-vortexial nature of the magnetic field and of the magnetic potential **A**, could be considered the arrowheads formed on the surface of a magnetic liquid placed in a magnetic field perpendicular on it, (figure 17b)

Also, a group of physicists led by Akira Tonomura has measured and visualized the fluxons, i.e.: the flux quanta h/2e, through the electronic holography, using superconductors with many magnetic holes in which the magnetic field penetrates in the forms of filaments (fluxons) distributed in the entire material, (figure 17a, [12]).

Fig. 17. *a, b-Micro – and macro-effects of magnetic field lines.*

These phenomena are explained in the CGT by the highly dynamic quantum pressure of the magnetic field vortex $\Gamma_B + \Gamma_A$, that determines the attraction of

magnetized particles of a magnetic liquid over the level of its surface in the vortex tubes of the external magnetic field.

2.4.1 The Einstein – De Haas Effect and the Barnett Effect

In 1915, was realized the Einstein-De Haas experiment [13], consisting of the rotation around its axis of a ferromagnetic bar suspended by a quartz thread with a mirror and placed inside a coil that produces a magnetic field parallel with the bar axis. When the sense of the magnetic field is changed (reversing the direction of the electric current through the coil), the rotation sense of the ferromagnetic bar is inversed too. The connection between the magnetic momentum and the work momentum is given by:

$$\mathbf{P_M} = -(e/m_o)\cdot\mathbf{S} \tag{146}$$

(P – magnetic momentum, S – spin momentum, m_e-the electron mass).

The effect was explained by the conclusion that the magnetization of the bar is given by the spinorial magnetic moment and not by the orbital motion of the electron inside the atom.

It is known also the Barnett effect [14], which is the inverse of the Einstein – De Haas effect. In the Barnett effect, a ferromagnetic bar is rotated around its axis with the angular speed ω, the atomic magnetic momentum being rotated by a couple of forces:

$$C = M_F\,\omega \sin\theta;\ \mathbf{C}=\boldsymbol{\mu}\times\mathbf{H} \tag{147}$$

According to the theory, [44], the effect of these couple of forces is the same as those of a magnetic field $H \| \omega$ that magnetizes the ferromagnetic bar.

For ω=3000 rot./min., it results $H=10^{-5}$ Oe.

Because the fact that the Einstein – De Haas effect and the Barnett effect use a ferromagnetic bar, it seems that these effects has a causality of magnetic nature.

But it is known also the Gallimore effect [15] which shows that when a crystal is rotated around its axis of symmetry or around the optical axis, an axial magnetic field is generated.

In this case we may suppose that the microphysical force that produces the Einstein-De Haas effect and the Barnett effect may be of gravito-electric or of gravitomagnetic nature.

According to CGT, we may consider that in the Einstein-De Haas effect, the basic cause that produces the rotation of the ferromagnetic bar is a force F_A which acts on the mass of the atomic particles by a pseudo-electric field: $\mathbf{E}_A = (dA/dt) \approx \delta\mathbf{A}/\tau$ of the sinergonic vortex Γ_A of the magnetic potential **A** in the form:

$$F_A = \frac{\delta S}{\delta t} = q_G \cdot E_A = q_G \frac{\delta A}{\delta t};\ \delta A = A_f;\ \ \delta t = \tau;\ \ \delta S = S = q_G A_f = (e/m_e) M \cdot A_f \quad (148)$$

where: q_G is the gravito-electric charge of the M-mass of ferromagnetic bar and τ is the time of the A-field increasing until the value A_f.

We observe that the eq. (148) correspond to an impulse variation of an electron mass, m_e, of value: $\delta p = e \cdot \delta A = e \cdot A_f$. This conclusion correspond to the correction made mathematically by the quantum mechanics to the impulse of a charged particle moved in a magnetic potential vector **A**, by defining the Lagrange canonic impulse, i.e.:

$$hk = p = m\mathbf{v} + e \cdot \mathbf{A} \quad (149)$$

correction necessary for explain also the Aharonov-Böhm effect which evidenced a physical nature of the magnetic potential, **A**.

According to CGT, the pseudoelectric field $\mathbf{E}_A \| \mathbf{A}$ of the sinergono-quantonic vortex explains also the dependence of the ferromagnetic bar rotation sense on the sense of the solenoid's magnetic field in the Einstein-De Haas effect.

The question is if the effect is given by the magnetic potential variation: $\delta A = A_f$ of the external magnetic field generated by the solenoid or by the ferromagnetic bar magnetic moment, $\mathbf{P_M}$. The eq. (147) indicates as plausible the second possibility, but the Gallimore effect – the obtaining of a weak magnetic field with a rotated crystal, indicates as plausible the both possibilities.

According to CGT, the Barnett effect is produced by the relativistic sinergono-quantonic pseudovortex of the (sub) quantum medium resulted relative to the atoms of the rotated ferromagnetic bar.

According to CGT, this pseudovortex is equivalent to a **H** magnetic field acting over the rotated bar atoms through the sinergono-quantonic vortex-tubes induced around the atom's nucleus and around the atomic electrons, which tends to magnetize the ferromagnetic bar by atomic magnetic moments orientation:

$$B(r) = k_1 \rho_c (\omega \cdot r) \tag{150}$$

where ρ_c is the mean density of the quantonic medium in the bar's volume of r-radius and ω is the angular rotation speed.

This field may magnetize the ferromagnetic bar which can interacts magnetically with the terrestrial magnetic field, for example, generating a magnetic force which is dependent on the rotation sense of the bar.

The explanation given by the CGT for the Barnett effect may be generalized also for the Gallimore effect [15].

It is known also an experience made by the Russian scientist Kozirev, who revealed that the weight of a gyroscope of 90g is increased with 4mg by the gyroscope rotation with high speed in the gravitic field of the Earth for a given rotation sense, the effect being inversed by the inversing of the rotation sense, [16].

2.4.2 The Joffe-Kapitza Effect

Another effect which may be explained by the previous conclusions of CGT, is the Joffe-Kapitza effect [17], obtained by a ferrous cylindrical bar vertically suspended by a wire with mirror, which was previously magnetized and thereafter was heated. It was observed that the bar's demagnetization corresponds with the appearance of a rotation around its axis. According to CGT, the bar magnetization produces a rotation force given by a pseudo-electric field E_A, which determines its rotation with a given θ angle, by the vortexial nature of the magnetic potential, **A**, of the bar's magnetic field, as in the case of the Einstein-De Haas effect. Because that in the suspending wire is induced a tortion force by the pseudo-electric field E_A, the cancellation of the bar's sinergono-quantonic vortex of its magnetic moment through demagnetization cancels also the torsion force given by E_A, applied initially to the suspending wire, the demagnetized bar being rotated in an inverse sense with the same θ-angle.

2.4.3 The Aharonov-Böhm Effect

In 1959, Aharonov and Böhm [18], [19], [20] are analyzed the wave function of an electron in the presence of a magnetic potential, A, but with a null magnetic induction **B** = **rot A**.

They observed that the wave function of electron is modified by the magnetic potential A, the phenomenon suggesting a physical nature of the magnetic potential.

The effect was explained by the conclusion that for the Lagrangean of a charged particle in the presence of a magnetic potential A, must be used the canonic impulse, specific to the quantum mechanics, obtained by the expression of de Broglie in the form:

$$\hbar \cdot k = p_l = mv_e + e \cdot A \tag{151}$$

For experiment, the idea was to introduce between the electronic trajectories coming from two virtual coherent sources, a magnetic string or a thin solenoid, orthogonal to the trajectories and long enough so that the magnetic field emanating from the extremities cannot modify the electron trajectories, (fig. 18).

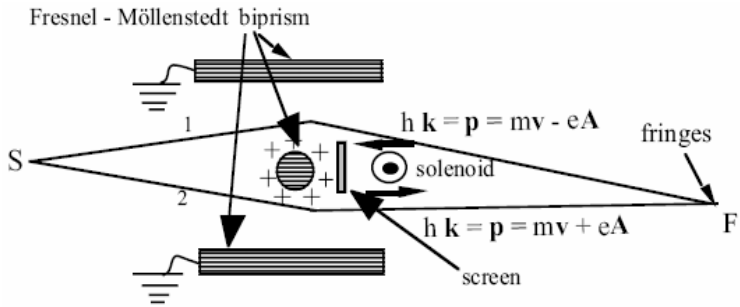

Fig. 18. *The Aharonov-Bohm effect.*

According to eq. (148); (151), for two electrons which enters with the same initial impulse p_i in a field of magnetic potential ±A (of opposed senses) and null magnetic induction B, we have the canonic (final) impulse:

$$\hbar k_1 = p_l = mv + eA; \hbar k_2 = p_l' = mv - eA \quad (152)$$

Therefore, it is *a priori* obvious that interference and diffraction phenomena will be influenced by the presence of a magnetic potential, independently of the presence or not of a magnetic field of non-null induction B, by a simple change of wavelength and thus a change of phase, as may be done in optics by introducing a plate of glass into a Michelson interferometer. So, it seems that the electron interferences are not gauge invariant, because that in the case of the Aharonov-Böhm experiment, there are additive phases $\delta\lambda = h/\delta p_l$ with $\delta p_l = \pm eA$, on both interfering waves, which doubles the shift of interference fringes, considering the same lenght for the electrons trajectories.

The interpretation of these additive phases was the subject of different interpretations [21] of the Aharonov-Böhm effect.

By CGT, we may suppose that the A-B effect is done by a speed/impulse modification by a (quasi) electric field: $E_q = \delta A/\delta t$ considered as being generated by the electron entering in the field $\delta A = \pm A$ in a time δt in which this E_q field, acting over the electron, determines an impulse variation according to eq. (148):

$$\delta p_e = m_e(v_f - v_i) = m_e a \cdot \delta t = e \cdot E_q \cdot \delta t = e \cdot \delta A = e A_f; A_f = \pm A \quad (153)$$

giving a final impulse of the electron:

$$p_f = m_e v_i + \delta p_e = m_e v_i \pm e \cdot A \quad (154)$$

For a circular B-field, generated-for example, by a magnetic wire, we have by eq. (16) of CGT:

$$A= ½\ B\cdot r = ½\ k_1\rho_B(r)\cdot c\cdot r = ½\ k_1\rho_c(r)\cdot v_c(r)\cdot r = ½\ k_1\rho_s(r)\cdot r_\mu c \qquad (155a)$$

$$B_k= rot.A_j =½\ k_1 r_\mu\cdot\partial_i(\rho_s(r)\cdot c)_j;\ (\cdot\partial_i=\partial/\partial x_i;\ x_i \,||\, r) \qquad (155b)$$

Also, because that-according to the theory (eq. (30)) we have:

$\rho_c(r) = \rho_s(r)$ and: $k_1 = (m_e/e)\cdot k_h$, it results also that:

$$\delta p_e= ½\ k_1\rho_s(r)\cdot er_\mu c = (1/c^2)\cdot\mu_B\cdot E_{GE} = (1/c^2)\cdot\mu_B\cdot(m_e/e)\cdot a_G;\ m_e a_G = \delta p_e/\delta t \quad (156)$$

The eq. (156) shows that the electron impulse variation: δp_e is determined by the impulse density of the sinergono-quantonic vortex Γ_μ which generates the magnetic moment μ_B and implicitly – also the tangential gravitoelectric field $E_{GE.}$

The value: $p_f = m_e v_f$ correspond to a value of dynamic equilibrium between the accelerating and the decelerating force-given by a density ρ_R of the pseudostationary (brownian) sinergono-quantonic medium.

Because that the gravitoelectric charge of electron is considered also in CGT of equal value with the positron electric charge: $e_g \approx e$, the hypothesis of the gravitoelectric nature of the (quasi) electric field E_q is sustained by the eq. (155-156). An experiment necessary for verify if the considered E_q-field is of electric or of gravitoelectric nature may be made replacing in the Aharonov-Bohm's experiment (or in another similar experiment) the negatrons with a positrons or with photons.

Also, it may be made an auxiliary experiment by using of three thin magnets axially polarised and antiparallel disposed at equal inter-distance and by passing two electron beams between the magnets, pseudo-orthogonal on the plane of

theirs axis and through a point P_1, P_2 equally distanced of two adjacent magnets, (figure 19), in which we have:

$$A_{t1} = +2A;\ A_{t2} = -2A \tag{157}$$

Comparing the interference figure of the two electron beams with the interference figure obtained only with the second magnet, as in the A.-B. effect, it must be obtained a double value of δp_e and of $\delta\lambda = h/\delta p_l$.

It is important to observe also if the electrons of this experiment, with the spin oriented orthogonal to the impulse by an additional weak B_G magnetic field (as the geomagnetic field), are influenced in the points P_1, P_2 by a Lorentz force of different value than those given by the weak field B_G, ($\mathbf{F_L}' \neq \mathbf{F_L} = -e \cdot \mathbf{v} \times \mathbf{B_G}$). According to CGT, the experiment must have a positive result because the Magnus effect produced by the quantons of the quantonic Γ_B vortexes of the magnets, which generates an impulse density $p_c = \pm\rho_c \cdot c$ of non-null value and of opposed senses in the points P_1 and P_2.

Also, if we use in the previous proposed experiment two coherent laser or gamma beam, If the field intensity $E_A = \partial A/\partial t$ has a gravito-electric nature, it must modify the photons impulse in P_1 and P_2 with the value:

$\Delta p_f = \delta m_f c = h/\delta\lambda = q_g \cdot A = (e/m_e) \cdot m_f \cdot A$, according to TGC, (eq. 26b).

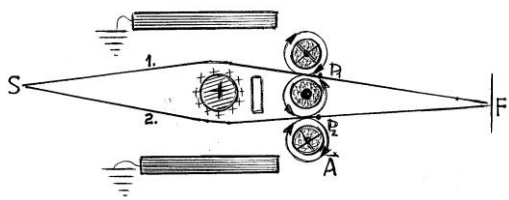

Fig. 19. *New proposed experiment.*

2.4.4 The Hooper – Monstein Effect

The Hooper-Monstein experiment [22] consists in the rotation of two identical magnets disposed mutually antiparallel with the pole axis N-S. With a sample with Hall effect was measured the B magnetic induction along the line which is perpendicular to the plane that contains the axis of magnets and passes through the P-point of equidistance, (fig.20).

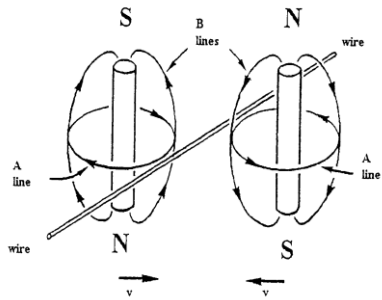

Fig. 20. *The Monstein effect.*

At this line, the total B_T magnetic induction resulted by adding the values B_1 and B_2 of the two identical magnets is null, ($B_1+B_2 = B_T = 0$).

In the first experiment, one of the two magnets is periodically distanced with the same speed from P point, generating an electric tension:

$$U = B \cdot l \cdot v \tag{158}$$

that for B=0.8 mT, l=15 cm, v=2.64 mm/s, has the value: U= 0.3 μV.

But the measured values were of 1.2 μV ÷ 1.6 μV at approaching and of 1.3 μV ÷ 1.8 μV at distancing, with a precision of ±0.12 μV.

In the second experiment, the two magnets were rotated with the same tangential speed v=2.64mm/s, in opposed senses (figure 8), for induce a total electric voltage U_T of null value: $U_T = B_T \cdot l \cdot v$, ($B_T$=B+B'=0), in the P point.

In reality, the induced tension resulted in this way was of double value than those resulted in the case of the rotation with the same tangential speed of only one magnet, in contradiction with the law of the electric field induction by a magnetic field.

The experiment shows in this case that – in reality, the electric potential and the electric current are induced by the magnetic potential **A** and not by the magnetic induction **B**=rot **A**, the **A** vector being circulary oriented around the magnet axis and of mutually opposed circular sense for the two magnets, the total magnetic potential in the P-point being of value: $A_T = A_1 + A_2 = 2A$, also when the magnets are rotated in the same sense, so-the electro-magnetic induced effect in the P-point is of double value, in this case, [3].

The same value of U_T is obtained even if the rotation speed of the left magnet is of double value and the test-line is moved with the speed v=2.64mm/s toward the left magnet.

The Monstein effect is explained physically and mathematically by adding to the intensity of the induced $\mathbf{E_B}$ electric field, vectorially induced by the **B** magnetic induction:

$$\mathbf{E_B} = \mathbf{v} \times \mathrm{rot}\mathbf{A} = \mathbf{v} \times (\nabla \times \mathbf{A}) \tag{159}$$

of a component generated by the time-depending variation of the **A** magnetic potential, which for a "v" linear constant speed of magnetic movement has the expression:

$$E_A = -(v \cdot \nabla)A \tag{160}$$

that gives the total intensity of the induced electric field, in the form:

$$\mathbf{E_T} = \mathbf{E_B} + \mathbf{E_A} = \mathbf{v} \times (\nabla \times \mathbf{A}) - (\mathbf{v} \cdot \nabla)\mathbf{A}; \ (\nabla\text{-the Nabla operator}) \tag{161}$$

The experiment show that the **A** magnetic potential is real (also physical, not only mathematical) and confirm the conclusion of CGT that the magnetic potential **A** is given by a pseudovortex $\mathbf{\Gamma_A}$ of s-etherons (sinergons) generated by the magnetic moment of the electric charge and that the $\mathbf{\xi_B}$ -field lines of the **B** magnetic induction are materialized as secondary quantonic vortexes gradientally induced in the $\mathbf{\Gamma_A}$ pseudovortex, the induction **B** = **rot.A** being of null value also in the case of a non-null total potential vector $\mathbf{A_T}$ but a null gradient: $\partial_i A_j$, (i.e null gradient $\partial_i p_j$; $p_j=\rho_s w_{sj}$),

Because that the eq. (160) may be written in the form: $E_A = -\partial A_j/\partial t = E_{GE}$, it results that the variation in time of A-potential induce an electrogravitic field E_{GE} (explaining also the canonic impulse) also if the two magnets has null rotation but are moved toward the test-line with the same velocity, (maintaining a null B_T).

2.4.5 The Faraday Paradoxe

In 1831, M. Faraday showed the possibility to obtain an electric current between the rotation axis and the periphery of a copper disk rotated with a v-speed in a magnetic H-field perpendicular on its plane, produced by a cylindrical magnet. Trying to see if the magnetic lines are rotated at the same time with the magnet, Faraday compared two experiments: -the rotation of the magnet in report with the disk and the simultaneously rotation of the disk and of the magnet (the disk being solidary with the magnet), and are resulted that in the first case is not generated electric current but in the second case is obtained the same difference of potential as in the case of the copper disk rotation in the field of a stationary magnet.

The experiment was interpreted later by the Lorentz force by the conclusion that the field lines are not rotated at the same time with the magnet, so are produced outside it. New researches confirmed the conclusion [23].

This experimental result corresponds also to the conclusion of the CGT that deduce the physical nature of the $\boldsymbol{\xi_B}$ – field lines of the magnetic induction **B** as being quantonic vortex-tubes formed around some oriented pseudo-stationary vectons accumulated from the quantum vacuum by the quantonic vortex $\boldsymbol{\Gamma_B}$ of the **B**-field, (eq. 155b). The fact that only at the copper disk rotation in a magnetic field is generated electric current, correspond also to the CGT explanation of the Lorentz force, as being a quantum Magnus type force generated at the electron (or proton) moving through a quantonic ρ_B-mean density of magnetic ξ_B vortex-tubes, generated similarly in the case of a rotating magnet as in the case of a stationary magnet, in the sense that the μ-magnetic moment generates-by the ξ_B-vortex tubes, only a rotation movement of quantons, not also the ρ_B – density translation.

Also, the magneto-optical effect Cotton-Mouton, of light polarization plane rotating in a constant magnetic field, correspond to the Munera's model of photon and to the conclusion of vortexial nature of the $\boldsymbol{\xi_B}$ – field lines which may orientate also the pseudo-magnetic moments of vectorial photons, according to CGT.

2.4.6 The Superconductivity; The London Equations

In the theory of superconductivity, it shown that the change in velocity of an electron in the superconductor body surface, when the magnetic field is increased from zero to its finite value, is:

$$\Delta \mathbf{v}_e = -(e/m_e)\cdot \mathbf{A} \tag{162}$$

according to a London's postulated relation [24], explained in QM by the relation between velocity and the canonical momentum **p** in the presence of a magnetic vector potential **A,** i.e.:

$$\mathbf{v} = (1/m_e)\cdot(\mathbf{p} - e\cdot\mathbf{A}), \text{ (with } p = m\cdot v_i \text{ - in the ground state)} \tag{163}$$

It is supposed that this value $\Delta\mathbf{v}$ is given by the Lorentz force acting over electrons which are expelled to superconductor surface [25], i.e.

$$\Delta v_k = \int a_L\cdot dt = -(e/m_e)\cdot\int v_r x B_j\cdot dt = (e/m_e)\int dr\cdot(dA_k/dr) = -(e/m_e)\cdot A \tag{164}$$

According to CGT, the magnetic potential A is generated also physically, by a sinergonic pseudo-vortex Γ_A having the impulse density according to eq. (155) which gives a (quasi) electric field $E_q = dA/dt \approx \delta A/\delta t$. In the case of a superconductor, when a magnetic field is applied orthogonal to the superconductor plane, the magnetic potential A is increased with the value $\delta A = A_f$ in a time $\delta t \approx \tau$ in which this E_q field, acting over the electron, determines an impulse variation according to eq. (162):

$$\delta p_e = m_e\delta v = m_e v_f = m_e a\cdot\delta t = e\cdot E_q\cdot\delta t = e\cdot\delta A = e\cdot A_f \tag{165}$$

For a density n_o of electrons forming the electric current, j_e of Cooper pairs, we obtain the London equation [24]:

$$\mathbf{j_e} = n_o e\cdot v_f = \rho_e\cdot(e/m_e)\cdot\mathbf{A_f} \tag{166}$$

for which we may use the Nabla operator, obtaining another London equation:

$$\nabla x\, \mathbf{j_e} = \rho_e\cdot(e/m_e)\cdot\nabla x\, \mathbf{A_f} = \rho_e\cdot(e/m_e)\cdot\mathbf{B_f} \tag{167}$$

which permitted the explaining of the Meissner effect.

We observe also that the eq. (166) may be obtained also by the equation of the electrons drift speed, v_D:

$$j_e \approx \rho_e \cdot v_D = \rho_e \cdot (e \cdot E_q / m_e) \cdot \tau_r = \rho_e \cdot (e/m_e) \cdot (\delta A / \delta t) \cdot \tau_r;\ \delta A = A_f;\ \delta t \approx \tau_r;\ v_f \approx v_D \quad (168)$$

if: $\delta t \approx \tau = \tau_r$, (i.e if the time of magnetic potential A increasing until the final value A_f is approximate equal with the relaxation time of the electron Cooper pairs).

The time $\tau = \tau_r$ may be considered – in consequence, as the time necessary for give to the electron Cooper pairs the final speed, $v_f \approx v_D$ of dynamic equilibrium between the accelerating force: $2e \cdot E_q$ and the decelerating force: $F_R = (\tau_r)^{-1} \cdot m v_f$, given by a density ρ_R of the pseudo-stationary (brownian) sinergono-quantonic medium. The existence of this decelerating force is evidenced indirectly by the fact that the electric current j_e is maintained by the superconductor only few days or few hours-depending on superconductor, in the absence of the (quasi) electric field E_q.

In a simply connected superconductor rotating with angular velocity, ω, a magnetic field exists throughout its interior given by:

$$B_i = - (2m_e/e) \cdot \omega \quad (169)$$

(conventionally called "London field", [26]). This has been verified experimentally for both conventional [27, 28, 29] and high T_c superconductors, [30]. The existence of the field conform to eq. (5) also follows from London's equation[4], and hence is predicted to exist also when a rotating normal metal is cooled below its superconducting transition temperature, and indeed is so found experimentally [29]. If in a rotating metal the electrons become "free" as the metal enters in the superconducting state, the centrifugal force would push the electrons out, towards the superconductor surface. The London moment effect is understood as arising because that – near the surface, the electrons "lag behind" when the body is put into rotation, and a surface current is generated. But was considered also a correspondent gravitomagnetic effect, given by the mass

rotation, (Tajmar, [31]) which corresponds to the Gallimore effect, well explained phenomenologically by CGT and which sustains the microphysical explanations given to these effects by CGT.

2.4.7 The Ball Lightning

The vortexial nature of ξ_B-field lines may explain also the fibrillar structure of some photographed black ball-lightning, (figure 21).

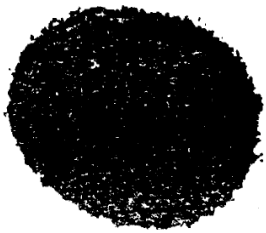

Fig. 21. *Black ball-lightning.*

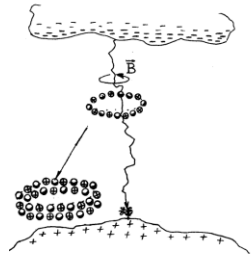

Fig. 22. *The ball-lightning genesis.*

According to the resulted explicative model, because that the ball lightning is produced by an electrical discharge lightning of a thunderstorm, we may suppose that the genesic lightning ($I=3\div5x10^4A$), induces a strong circular magnetic field $B = \mu_0 I/2\pi r$, in the form of vortexial rings-according to CGT, which aligns locally attractively the atomic magnetic moments of N and O of the air, forming in this way positively ionized ozone molecules, i.e. O^--O^+-O and nitrogen monoxide molecules: NO^+, and quasi-annular chains of N-O^+ linked by neutral atoms of oxygen, which attracts thereafter neutral molecules of O_2, N_2 and H_2O-particularly, forming in this way fibers, as bunches of atomic fibrils (fig.22) with the central chain in the form: O^--O^+-O=O^--O^+-O or/and -N-ONO$^+$ONO$^+$O--, so-with covalent and ionic links, which are resistant to usual temperatures until at least 100 $^\circ$C, explaining the time life of ball lightning.

This theoretical conclusion is based on the fact that the ozone and the nitric oxide are produced naturally during the electrical discharges of lightning in thunderstorms and is also in accordance with the used speculation that the nitrogen dioxide is formed as occurring via the ONOONO intermediate, [www]. The positive charge considered for the central chain of ball lightning fibrils is explained by the charge separation made after the lightning by the thunderstorm negative charge and may explain the destructive effect of the BL which can disintegrate biologic structures and other non-metallic structures, by the effect of electrons adsorption and the BL auto-destroying by explosion, in some cases. Also, the vibration of BL fibers may explain-according to the model, the sound emission (whistlins) of some BL cases, (Habarovsk, 1978, [32]) and the vibration of some ions and neutral atoms between BL fibrils may explain the microwaves emission and the infrared or visible light emission of BL.

It is plausible also the conclusion that the plasmatic sphere forming the BL is enveloped by a layer of neutral molecules generating a superficial tension σ, as in the Stahanov's model of BL, (plasma sphere with layer of water molecules, [32]), the stability equation of BL being:

$$p_i^e \approx \frac{2.\sigma_e}{R_e}; \quad P_i \, x \frac{4.\pi}{3}.R_e^3 = \frac{M}{m_o} R \cdot T_e \; ; \quad (\frac{4.\pi}{3}.R_e^3 = V_e) \qquad (170)$$

with: p_i^e – the stability pressure; m_0-molecule mean mass; M; V_e – the BL mass and volume; $R= k_B N_A$ (the gas constant), σ being as of an ionic liquid: $\sigma= u/2d_i^2$ with: $u =\Sigma u_i = 6x10^{-2}(1-c)\ (e^2/4\pi\varepsilon_0 d_i)$; $d_i \approx 3Å$; $c \approx 0.545$, (repulsion coefficient)

It may be argued that the ball lightning phenomenon may explain also the phenomenon of "Holy Light arrival" at the God Jessus tomb, by the electrization of the church metallic roof and of the mass of aerosols formed above the tomb after 20-30 minutes of "hot" prayers of believers (which favor the electric discharge).

2.4.8 Conclusions

By the previous theoretical explanations of the analyzed magneto-electric and magneto-mechanic effects, it results that the correspondence of these phenomenological explanations resulted in a microphysical sense with specific equations of these effects, sustains the resulted vortexial model of the magnetic field proposed in CGT, with distinct but correlated vortex of the magnetic induction **B**given by quantons and of the magnetic potential **A**, given by s-etherons. Also, it results in consequence, the possibility to make some new proposed experiments for verify the microphysical characteristic: electrical or gravito-electrical, of the field $E_A = \partial A/\partial t$ generated by the Γ_A – vortex of s-etherons which explain the magnetic potential A and the relation **B**=rot.**A,** conform to CGT.

A consequence of the CGT predicts that in a very strong magnetic field, of more than 10T, the part of $\mathbf{\Gamma_B}$-vortex which is not converted into $\mathbf{\xi_B}$-vortex tubes, generates also a magneto-gravitic field, $V_{MG} = -½\upsilon_i\cdot(\rho_c c^2)_j$, acting by quantons over the volume $\upsilon_i(a_i) = 0.9fm^3$ of nucleons:

$$V_{GM} = -\frac{1}{2}\upsilon_i(\rho_{ct}c^2)_j \; ; \; \nabla_r(\rho_{ct}c^2) = k_\Gamma \cdot 2\frac{B_{kc}c}{k_1 r_\mu}; \quad B_k(r) = B_k^0\left(\frac{r_\mu}{r}\right)^3 \; ; \; k_\Gamma < 1 \qquad (171)$$

with k_Γ-conversion coefficient ($(1 - k_\Gamma)$-coefficient of $\mathbf{\Gamma_B}$-vortex conversion into $\mathbf{\xi_B}$-vortex tubes).

For example, for $B_k = B_k^0 \approx 10^6$T and $r = r_\mu \approx 10$km; $k_\Gamma = 10^{-2}$, it results: $a_{MG} = \nabla(V_{MG})/m_n \approx 1$ m/s^2, i.e equal with those generated by a gravitational force of a mass $M_B = 1.5x10^{18}$kg and density: $\rho_b \approx 4x10^5$ kg/m^3 and for a magnetar-

type star with R= $r_\mu \approx 30$km, $M_B = 10^{32}$kg, $\rho_b \approx 4x10^5$ kg/m^3 and $B_k^0 \approx 10^{12}$T, it results:

$a_{MG} \approx 3.3x10^5$ m/s^2, (comparing to $a_G = GM/r_\mu^2 \approx 2.2x10^{17}$ m/s^2).

Also, the expression (26a) for the gravito-electric field corresponds to the Schiff-Barnhill effect which states that in presence of a gravitational field and in stationary conditions, there is a small electric field generated in a conductor or superconductor: $E = -(m/e)\cdot g$.

2.5 Biophysical Fenomena

2.5.1 The Kervran Effect

An unexplained phenomenon by the usual physics was evidenced in 1962 by Louis Kervran and it refers to the phenomenon of atomic transmutations at low un-radiative energy, produced for stable isotopes by a biological organism. Her assumption is based on previous observations of french chemist Vauquelin, who observed that a hen nourished with oats and water, produced of five times more calcium than the consumed quantity. Prout observed also that an egg of one day has of four times more calcium than the fecundated egg.

Researches concerning the variation of calcium indicated similar disproportions during the germination of the oats seeds (Von Herzeele, 1875-1883) and barley, (Long, 1970).

During 1875 and 1883, von Herzeele conducted 500 analytical experiments which checked the growing of plants in controlled medium and he concluded that the plants can produce nuclear transmutations of some chemical elements.

Similar researches were done by Baranger from the Polytechnic School in Paris, 1947, who analyzed the content of Ca, K, and P in plants. His researches showed that the un-germinated seeds or germinated in distilled water doesn't reveal a variable content of K, but the seeds treated with $CaCl_2$ has an increased quantity of P, unexplained by the plants biology, and a grow of 10% of K, [33].

After Kervran, the living organisms can produce, in certain conditions, by bio-geochemical reactions, also nuclear reactions of elements as: C, N, O, Si, Na, K, Ca, P, S, Kl, by specific enzimes (transmutant enzimes) located intra-mitochondrial, [34].

For explain the effect of biological transmutations of chemical elements, L. Kervran considered a new nuclear model, as cluster of alpha particles with two types of links: hard and weak, considering that the weak links can be split enzymatically, so that an atomic nucleus can be divided in two nuclei by biological way, with the mitochondrial energy, the produced energy being a part of the total energy of the body.

Kervran considered that Si is a "bio-consumed" element and Ca is a bio-produced element, being known that it is possible to reduce the lack of Ca in the human body and in the animal body (cow, pig) through the administration of Mg and Si (under different forms-organic or anorganic). According to Kervran, the specific reactions are:

(172) $$^{24}Mg+^{16}O\rightarrow^{40}Ca;\ ^{28}Si+^{12}C\rightarrow^{40}Ca \qquad (172')$$

It is considered also that in the process of thermolysis and of ATP modification, in the human body, by electric excitations are produced the following reactions:

(173) $$^{39}K+^{1}H\rightarrow^{40}Ca';\ ^{23}Na+^{16}O\rightarrow^{39}K, \qquad (173')$$

De Beauregard proposed to explain the biological transmutation of potassium by the known reaction:

$$^{39}K \rightarrow {}^{39}Ca + e^{-} + \bar{\nu}_e;\ (\nu_e \text{ - antineutrino}) \qquad (174)$$

G. Oshava and M. Torii showed in 1964 [35] that after an electrical discharge of 60W and 30 minutes, in a vacuum tube of 20 cm containing 2, 3 mg of Na, by introducing of O in the tube, after the stopping of electrical discharges is produced a cold fusion between nuclei of Na and O, producing K as in (172') reaction which explains the adjustment of Na/K balance to cell level, according to the Kervran effect.

L. Kervran and Komaki showed after many years of observations that the human and the animal bodies consumes continuously Na and eliminates continuously K [34], but the Na/K balance remains constant, with or without K consuming.

Experimental researches in the field of biological nuclear transmutations producing, have been realized by Panos T. Pappas from the Physics Department of Pirraeus Technological Institute, which evidenced the role of the cell membrane potential [36], sustaining the phenomenon of S transmutation in potassium inside the biological cell, during the processes of active (Na-K) pump of ions in the presence of oxygen, according to the reaction:

$$_{11}Na^{23} + (\text{electric excitation}) + {}_{8}O^{16} \rightarrow {}_{19}K^{39} + \text{Energy} \qquad (175)$$

which was considered in the base of G. Oshava and M. Torii researches (1964) and those of Hodkin and Keynes (1955).

During 1989-1999 the researches made by P. Pappas showed that the concentration of K increases in the blood of the bodies subjected to magnetic pulses of short time, which generates induced electricity representing a fraction

from the value of transmembranar potential gradient which is of about 10MV/m, to a power level corresponding to the thermal level of electrotherapy, [37].

It is considered that a great number of functional biological and medical mechanisms could be better understood through the known mechanisms of osmosis correlated with the reaction (175) of biological nuclear transmutation, implying also the energy of ATP transforming, at the cell level, according to the reaction:

$$_{11}Na^{23}+_{8}O^{16}+(\text{electric excitation})+(\text{ATP-aze' energy})\rightarrow_{19}K^{39}+\text{BioEnergy} \quad (176)$$

and with its reverse:

$$_{19}K^{39} = _{11}Na^{23}+_{8}O^{16} - \text{with the energy of an electric current} \quad (177)$$

There are also other serious studies concerning the Kervran effect and some patented inventions, for example-based on researches of Vladimir I. Vysotsky, Alla A. Kornilova and Igor I. Samajlenko (patent: RU2052223/10 January 2006).

The explaining of these nuclear reactions of cold transmutations through the quasi-crystall nuclear model, of nuclear molecule type, and through the vortexial model of atom, proposed in CGT, supposes the hypothesis that the energy of intra-mithocondrial transformations (of some specific transmutant enzimes) or some electrical impulses delivered in shocks, increases the vibrating state of the atomic components (electrons and nuclei) and favours nuclear fusion or fission**,** the nuclear fusion reactions of Kervran effect resulting as a result of electronic transition on sub-fundamental energetic level (of $n=^{1}/_{2}$), [38], induced by the sinergono-quantonic vortex of the nuclear magnetic moment and by the energy of the ATP transformation or/and by electric impulses or by nuclear magnetic resonance, because that the nuclear charge screening, produced by this induced electronic level of $n=^{1}/_{2}$, favors the nuclear

fusion as those conform to reaction (176) by the atoms coupling with collinear magnetic momenta.

The previous hypothesis is in accordance with the Kervran's conclusions looking the role of intra-mithocondrialenergy resulting by the ATP transformation and with the Pappas explicative model based on the role of the cell membrane potential in the phenomenon producing. Also, there are some experiments of cold nuclear fusion, obtained with relative low electric potential, such as: O+H→N; (Th. Moray, 1927);

Light→Be8 ;(Cockcroft is Walton, 1932, 125V).

Looking the nuclear transmutation produced by nuclear fission biologically induced, considered by the Kervran effect, we may suppose that the increasing of nucleus vibration energy by chemo-biological reactions, determines the reducing of the quantonic vortex Γ_{μ}^{N} of the nuclear magnetic moment and the increasing vibration energy of some weakly linked nucleons, determining – according to the quasi-crystal nuclear model of CGT, the local decreasing of the bonding energy of vibrated nucleons, conform to eq. (70) and thereafter – the nuclear fission of the nucleus in two stable nuclei, by nucleonic self-resonance.

The previous explanation is relative equivalent with those of Kervran, considering a nuclear model of alpha particles with two types of links: hard links and weak links.

According to the previous explanations, It is plausible also the conclusion that the electronic induced transition on sub-fundamental energetic level ($n=^{1}/_{2}$), favors nuclear transmutation by electronic capture, according to a nuclear reaction in the form:

$$ {}_{Z}N^{A} + e^{-} \rightarrow {}_{(Z-1)}M^{A} \qquad (178) $$

For verify this possibility, an proposed experience may be made by placing a small amount of substance with Z > 50, for example-Bi (or a combination of it: Bi_2S_3), in a paralelipipedic open cavity of copper with only few millimeters between two adjacent surfaces, which is connected to a high negative potential (of more than 30kV) and is heated to more than 300^o C and by irradiating the substance with a coherent (laser) radiation with the energy of photons equal with the K-electron transition on under-fundamental level, for stimulated electronic transition:

$$h\nu = E(n=1) - E(n={}^1/_2) \tag{179}$$

If this stimulated electron transition is obtained, it is possible the electron capture by the atomic nucleus or/and the reaction (174) under the electrostatic pressure of the charged cavity and the thermal vibration of the atoms.

In particular, the reaction (178) corresponds to the alchemists wish, of the gold obtaining from mercury. Also, the possibility of inducing electronic transition to sub-fundamental level in atoms corresponds to the possibility of the "mascons" obtaining, (i.e. the possibility of "concentrated mass" obtaining by the atom radius decreasing and by the interatomic attractive force increasing).

2.5.2 The Biotherapy

It is known that exists persons with biotherapeutic property of hands, (bioenergy healing), explained by a more intense electric potential of hand's bio-field, (10-100V). Apparently, the bio-field component which may produce healing effect is the microwaves component. But for the human body, the intensity of this component of bio-field is low, of ~10μW/cm^2, [39] under 20μW/cm^2, generally. In this case it may be supposed that the bioenergetic effect is given by another penetrant radiation which may be emitted by the

human body, i.e. scalar radiation, generated according to the eq. (46) of the theory, by energical excitations of atomic charges by enzimatic reactions, for examples-by mitochondrial enzimes and by ATP transforming.

The explaining of the biotherapeutic effect of this considered component of the bio-field, may be made by a "thermal pump" model of cell's membrane ionic pump, which explains the active transport of Na and K ions by cell membrane.

The actual accepted model of Na-K-ionic pump supposes the Na+/K+-ATP-ase conformation modifying by changing the relative position of its α and βunits, forming channels for Na+-ions releasing and K+ions entering, with the osmotic pressure of cytoplasm, generated by ATP (adenosine triphosphate) transformation: ATP$\rightarrow$ADP+P+Energy, in a cycle of phosphorylation/ dephosphorylation, with En.~9 Kcal/ATPmol. for~130mV membrane potential difference. It is not very clear how the generated osmotic pressure moves 3 sodium ions out and 2 potassium ions in during a phosphorylation cycle.

By the endoplasmatic reticulate structure, having microtubes with diameter D≈20÷25nm, it may be considered also – in our opinion, a model of "thermic pump" of Na+/K+ions [40], based on the cytoplasm property of ionic liquid, considering a funnel form of the end of a small proportion of reticulate network microtubes (MT), with the diameter D ≈ 3÷5d, which is fixed to the cell membrane in positions with ATP-aze protein, having also a free "blocking molecule" (BM) which may be also an ATP molecule, (figure 23).

At the ATP transforming, because the property of ionic liquid, with f=5÷20% holes, of the cytoplasm, the released dephosphorylation energy increases the proportion of cytoplasm holes by the local temperature and pressure increasing and determines the cytoplasm dilation, phenomenon which determines the

obstruction of the reticulate network microtubes by the B-molecule and the expulsion of Na^+-ions from the inside of MT funnel to the cell exterior through the central channel of ATP-aze α-unit, (fig. 23).

By mass loosing and the temperature lowering of the inner cytoplasm, the ionic pump cycle is continued by an inverse process – of exterior liquid and K^+-ions absorption by the open channels of ATP-aze β-units, these K^+-ions being thereafter introduced into the cell's interior by the reticulate network microtube re-opening, generated by the difference pressure acting over the B-molecule.

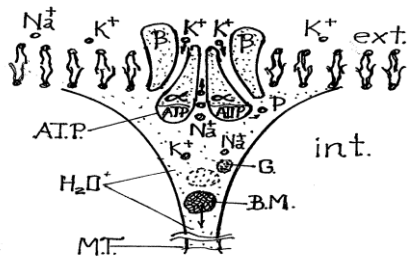

Fig. 23. *The cell's ionic pump functioning.*

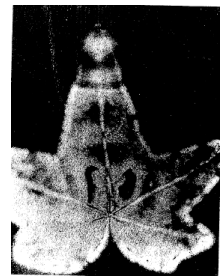

Fig. 24. *The "Phantom limb" effect.*

For example, if ~70% of ATP energy ($4{,}35x10^{-20}$ j/ATP molecule) is converted into mechanic work for $3Na^+$-ions expulsion against a potential difference: 90 mV, (the rest being loosed energy), is necessary only $\sim{}^1/_3$ of this energy for Na^+-ions displacement, $\sim{}^2/_3$ of this energy ($\sim 3\ x10^{-20}$ j/ATP molecule) being used for cytoplasm expulsion. Considering also that the osmotic pressure necessary for Na^+-ions expulsion is approximate equal with the blood osmotic pressure ($p_s \approx 8$ atm), the expulsed cytoplasm volume has-in isobar conditions, the value:

$$\Delta V = L / p_s = 2.9x10^{-20}\,j / 8.1x10^5 N = 35x10^{-27}\ m^3 = V_f - V_i \approx V_l^o(\Delta f) \quad (180)$$

$$(V_l = V^o_l(1+f);\ f = 0.10...0.25)$$

and corresponds to a cytoplasm mass difference: $\Delta m_L=35x10^{-24}$ kg and to: $V_i \approx 25x10^{-26}$ m^3/ATP molecule for $\Delta f \approx 10\%$. The obtained value of mass difference: Δm_L correspond to 614 water molecules and 3 Na^+-ions. So, the model correspond with approximation to the conclusion of a research which show that the cell's osmotic pressure equilibration is made by the active transport of 300…400 water molecules for every ion species which is expulsed from the cell and to the researches showing a direct thermodynamic dependence of ionic activity in ionic solutions as the cytoplasm [41].

In the bio-field therapy, in the case of relative deficit of ATP, the bio-field component which is enough penetrant and intense for replace the effect of ATP-molecule energy in the process of cytoplasm holes generating, is the scalar field component, which may have an ionizing effect, according to eq. (46) of CGT.

The bio-field therapy practice using alternative hands approaching (bioenergetic passes), is explained with the proposed model by the necessity to produce alternatively atomic holes within cytoplasm for the Na^+/K^+ionic pump functioning. The previous explanation may be correlated also with the therapeutic effect of decimetric microwaves.

The ionizing scalar radiation, as possible component of the biofield, may explain also the ectoplasm forming as cold and weak ionizing state, produced by parts of human body, according to some controversial but scientific observations. It may be argued also [40] that the ectoplasm producing is essential for generate some proved telekinetic effects, as the biological "magnetism", i.e metallic objects attraction or plastic ball attraction by the subject's hands, for example, (Nina Kulaghina case, [42]), phenomenon which may be explained (only) by air pressure difference produced by the ectoplasm formed between the object and the biologic organ, (by ectoplasm ions mutually repulsion).

For example, for sustain a body of S =50cm^2 surface and M =1 kg, "attracted" by a hand, is necessary an atmospheric pressure difference: Δp_a=2x10^{2}N/m^2=0,002p^o, (p^o-the atmospheric pressure), which may be obtained with a cold plasma with $n^i_o \approx 10^{20}$ positive ions/m^{3}generated between the M-body and hand by bio-field.

An effect which suggests the bio-field's existence also to plants is the "phantom limb effect" observed by the Kirlian photography which evidenced an almost integer aura to a leaf with cutted tip, (usually – to a cissus leaf, fig. 24, [46]) but the Kirlian apparatus generates also emission of ionizing scalar radiation. However, it is known also a plant: phytologica electrica, (from Nicaragua), with an electric field which action by a discharge of 100-200V, with measurable effect until 2 -2.5 m from it, but only under the sunlight, phenomenon which indicates an ionizing component of its bio-field dependent of the light intensity (also – of IR rays).

Mathematically, the scalar wave corresponds to the term: divE from the

$$\text{wave equation: } \Delta E = \text{grad.div } E - \text{rot.rot } E = (1/c^2)\partial^2 E/\partial t^2 \qquad (181)$$

2.6 Particles Negentropy and the Functioning of the "Free Energy" Devices

According to D. Böhm and J. P. Vigier, the wave-function Ψ of quantum mechanics, in enough general conditions approximate the real density ρ of a sub-quantum fluid which determine also the de Broglie associated wave of a particle. Also, the "hidden thermodynamics" of particles (de Broglie) states that the elementary particles are ergodic systems, which change mass, energy and entropy with the sub/quantum medium, in accordance with a specific equation of the open systems, (I. Prigogine):

$$\frac{dS}{dt} = \frac{dS_e}{dt} + \frac{dS_i}{dt} \tag{182}$$

in which: S – the total entropy of the particle; S_e (+,0,-) – the entropy changed with the quantum/sub-quantum medium; S_i (+) – the initial internal entropy.

The negative entropy: $S_e(-) = -S_e(+)$, represent a "negentropy", which show the organizing degree of the system, particularly-of the particle structure. When all entropy of the system is eliminated, dS/dt =0, i.e the entropy variation is null.

It results – according to Böhm-Vigier interpretation of the wave-function and to the vortexial (chiral soliton) model of particle, that the internal vorticity of the particle is a measure of its negentropy, linked to the quantum and sub-quantum internal dynamic pressure: $S_e^- \sim P_d = \frac{1}{2}\rho \cdot c^2$, so – the static quantum/sub-quantum pressure is a measure of the particle entropy: $S^+ \sim P_s$.

For example, for the electron, changing the notation, ($S \equiv \varepsilon_e$), by eq. (31) of CGT:

$$\varepsilon_e(r) = n_h \cdot \varepsilon_h(r) = \gamma \cdot (k_B/\hbar) \cdot n_h S_h(r) = \gamma \cdot (k_B/\hbar) \cdot S_e(r); \tag{183}$$

with:

$$S_h(r) = \oint m_h c \cdot dl_r = 2\pi r \cdot m_h c;\ dl_r \perp r;\ e^{-\varepsilon/k} = |\Psi_e|^2 = [\rho_e(r)/\rho_e{}^0],$$

($n_h = m_e/m_h$; m_h -the quanton' mass), it results that – according to de Broglie's equation: $\varepsilon/k_B \approx S/\hbar$, the internal entropy $\varepsilon_e^+(r) \sim S_h(r)$ increase with the distance 'r' from the particle kernel because that:

$$\varepsilon_e^+(r) + \varepsilon_e^-(r) = \varepsilon_e^+{}_M(r_M) = \text{const.} \tag{184}$$

in accordance with the simplified form of Bernoulli law applied to the quantum/sub-quantum fluid: $P_d(r) + P_s(r) = P_{sM}(r_M)$ and by the dependency:

$\varepsilon_e^-(r) \sim P_d(r)$; $\varepsilon_e^+(r) \sim P_s(r)$. So, the negentropy: $\varepsilon_e^-(r) \sim P_d(r)$ decrease with r.

For the particle magnetic moment: μ_e, we must take:

$$r_M = r_\mu = \hbar/m_e c; \varepsilon_e^+{}_M(r_M) = \varepsilon_e^+{}_\mu(r_\mu). \quad (185)$$

It result that – at the electron surface, the negentropy is:

$$\varepsilon_e^-(a) = \varepsilon_e^+{}_\mu(r_\mu) - \varepsilon_e^+(a) = k_\varepsilon \cdot (S_h(r_\mu) - S_h(a)), \quad (186)$$

with: $k_\varepsilon = \gamma \cdot (k_B/\hbar) \cdot n_h = 1.03 \times 10^{33}$ [$(K \cdot s)^{-1}$], (eq. (31) of CGT).

If the B_e-field (giving the magnetic potential energy of electron) is converted in mechanic work L_μ, by magnetic interaction with another particle or with another B-field, by reciprocal interaction and by ξ_B-vortex-tubes partial destruction inside the magnetic moment of r_μ radius, the $\varepsilon_e^+(r)$ entropy must be normally increased with a value $\delta\varepsilon_e^+(r)$, while the $\varepsilon_e^-(r)$-negentropy is quasi-instantaneously decreased at the value:

$$\varepsilon_e^{-`}(r) \approx \varepsilon_e^+{}_\mu(r_\mu) - (\varepsilon_e^+(a) + \delta\varepsilon_e^+(r)) = \varepsilon_e^-(r) - \delta\varepsilon_e^+(r), \quad (187)$$

(even if the $\varepsilon_e^+(a)$ and $\varepsilon_e^-(a)$ remains constant), by the decreasing of $\varepsilon_e^+{}_M(r_M)$, i.e by the de $r_M = r_\mu$ (the Compton radius) decreasing – according to CGT. This imply – by the dependence: $\mu_e \sim r_\mu$, a short decrease of μ_e with the value: $\delta\mu_e \sim \delta\varepsilon_e^+(r)$.

The fact that a decreasing of μ_e – magnetic moment is not observed during the magnetic interaction, is explained by the particle' "hidden" thermodynamic, i.e by "negentropy importing", according to eq. (182) of ergodic systems – phenomenon explained in the CGT by the negentropic property of quantum and sub-quantum winds to regenerate quantum/sub-quantum vortexes, like in the very similar phenomenon of tornade forming at macro scale, (in atmosphere).

In conclusion, the constancy of the magnetic moment value of the magnetically interacted particles cannot be explained without the negentropic property of the quantum and sub-quantum winds and the Universe cannot be explained phenomenologically without the "dark energy" existence.

At the same time, by the dependence: $\varepsilon_{e^-}(r) \sim P_d(r)$, the previous explanation of the magnetic moment constancy in the magnetic interactions of particles, explains the possibility to, "extract" quantum/sub-quantum energy from quantum vacuum by magnets and by magnetic fields, i.e – the functioning of the "free energy" devices, for example – the functioning of some magnetic motors [45] realized only with magnets (without electromagnets), with long-life magnets, (of NdFeB), by the conversion in mechanic work of the potential magnetic energy of repulsive magnetic interactions between rotoric and statoric magnets, realized disymmetrically by disymmetrical orientation or/and magnetic screening.

A such device, explained also by the Sachs theory of electrodynamics, of the quantum and sub-quantum medium – in accordance with an old opinion [43], is not a "perpetuum mobile" in the sense of a contradiction with the energy conservation law – in consequence, because that the energy of the magnetic field is generated with the essential contribution of the quantum and subquantum winds of the quantum vacuum, i.e. by the negentropy of the great Nikola Tesla.

The conclusion may be extrapolated for the case of the electric charge value constancy, which is explained in a similar way.

An example of a "free energy" device which use the electric field energy and not use magnetic energy, is the Karpen's voltaic pile [46] which may give continuously an electric tension without material consumption of electrodes-

which are of Au and Pt, or of electrolyte, (which is usually the sulfuric acid). The inventor (V. Karpen, 1956) explained its functioning by the conclusion of a quantum IR energy consumption, but the device need not a caloric source for generate electric energy.

To the biological level, there are known some telekinetic effects of objects displacing by the bio-field of hands (the Kulaghina case) which cannot be explained only by the energetic contribution of bio-field and which has an experimentally correspondent in the case of so-named ‚Hutchison effect' consisting in the levitation of metallic and non-metallic objects under the simultaneous action of a high electrostatic field and of an electromagnetic field with a specific frequency. This phenomenon was explained in CGT by a mechanism of electromagnetic→scalar radiation conversion generated by electrons vibrated in shocks, (eq. 42).

2.7 The Auto-Organizing Tendency of Complex Systems at Macro Scale

An important conclusion of CGT is that the auto-organizing tendency of the matter at low temperatures, determined by fields, is not possible without the mentioned negentropy property of the quantum vacuum energy, i.e without quantum and sub-quantum vortexes generation.

This tendency is evidenced also to higher, atomic scale, as in the case of oscillant chemical reactions Belousov – Zhabotinski,

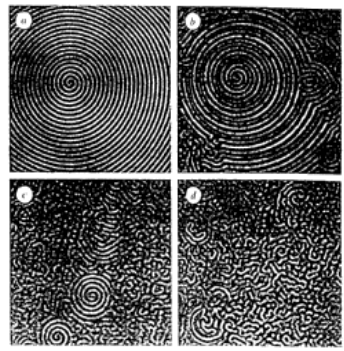

Fig. 25. *Spirals in B-Z reactions.*

(oxidation in solution of mallonic acid in the presence of cerium sulphate) in which from a homogenous solution are formed alternances of solution concentrations in the form of concentric circles or spirals, (figure 25).

According to the theory, a strong magnetic field perpendicular on the solution may influence the density of the formed circles.

At the biological level, even the life is a consequence of the matter tendency to auto-organizing, to negentropy.

In this sense, it is possible to generalize the conclusion of I. Prigogine (1979), that in case of dissipative systems, the sum of the system entropy S_S and the medium entropy S_M is a constant value, i.e:

$$S_{SM} = S_S + S_M \tag{188}$$

The processes in which the entropy disappearing occurs are named “coupled processes” and the systems with capacity of adaptation to environment are named “adaptive systems”. L. Brillouin defined the negative entropy as a negentropy generating organization and Hartley, (1928) defined the informational entropy which – according to Claude Shannon, has the expression:

$$H = -\sum_{1}^{n} p_i \log_2 p_i \; ; \quad H = H_{MAX} \Rightarrow p_i = \frac{1}{n} \; ; \tag{189}$$

deducted by similitude with the Boltzmann's expression of entropy, by the Stirling relation:

$$S = k_B \ln w = -N \sum p_i \ln p_i \tag{190}$$

in which: $N = \sum N_i$ – total number of status; $p_i = N_i/N$ – the probability of founding the particle in the energetic state k = i. According to Brillouin, the final entropy of a system, S_p, has the expression:

$$S_F = S_o - I = -kNH \tag{191}$$

with: S_o – the initial entropy; I – the information quantity introduced in system.

A solution in the sense of an unitary description of the systems organizing is offered by the fiability theory of the technical domain which describe the functioning probability after a time periodτ: $p_F(\tau)$, of a system with $N=\Sigma n_i$ components in which n_1-n_k components has the "lifetime" T_1... T_k, depending by the failure danger,λ, λ_i and defined as the system fiability:

$$p(\tau) = e^{-\Sigma(\lambda_i \cdot \tau)}; \; \lambda_i = \frac{\Delta n_i}{\tau \cdot n_i} = \frac{1}{T_i} \tag{192}$$

in which: $\Delta n_i(\tau)/n_i(\tau)$-the rate of damages in τ-time, in the "i" sub-system with n_i total components; T_i -the average lifetime of the "i" sub-system.

Comparing to the wave function amplitude of a chiral particle-like soliton: $R^2=e^{-\Sigma/k}$, we may reconsider the fiability expression in the form of a functioning potential:

$$Q_S(\tau) = e^{(1-\Lambda_S \cdot \tau)};\ \Lambda_s = l\sum_{i=1}^{k}\lambda_i = \frac{1}{T_s}\ ;\ l \le 1;\ Q_{SM} = e;\ Q_{Sm} = 1; \qquad (193)$$

in which Λ, λ_i is the failure danger, $l \le 1$ characterize the links between the $N=\Sigma n_i$ components of the system and T_s represent the average lifetime of the system.

The defined Q_S functioning potential (FP) is in a Boltzmann type relation with the functioning negentropy (the functional organizing), O_τ, i.e:

$$O_\tau = -S_M \ln Q = -S_M (1 - \Lambda_s\tau) = - (S_M - S_\tau) = O_M + S_F(\tau) \qquad (194)$$

the maximal organizing having the value: $O_M = -S_M$. The functional entropy is:

$$S_F(\tau) = +S_M \cdot \Lambda \cdot \tau + S_e = S_M \cdot \tau \cdot l \cdot \sum_{i=1}^{k}\lambda_i \cdot \frac{n_i}{N} + S_e \qquad (195)$$

S_M representing the maximal entropy of the totally disorganized system and S_e representing the entropy introduced by the environment, $S_e = \pm|S_e|$, depending on the "i" components endurance, which may be written in the form: $S_e = S_M \cdot l \cdot \tau \cdot \Sigma f_i$, in which $f_i(\tau) = \pm|f_i|$ has the meaning of an entropy flux introduced by the environment, (as in case of a rain which oxidizes some metallic components of a motor).

The form of the functioning potential results – in this case, in a general form:

$$Q_G(\tau) = e^{S_M(1-l\cdot\sum_{i=1}^{k}(\lambda_i + f_i)\cdot\tau)} = Q_{Gi}\cdot Q_{Es},\ with:\ Q_{Es}(\tau) = e^{-S_M\cdot\tau\cdot l\cdot\sum_{i=1}^{k}(f_i)} \qquad (196)$$

the size: $a_i = -f_i = -\Delta S/S_M \cdot \tau$ having the meaning of an negentropic flux (which gives the organizing speed) introduced by an exterior cause, as in case of a lubricant introduced in a thermo-mechanic engine, S_M being equivalent with an

complexity coefficient, S_M = C, (adimensional). In this case, Q_{Es} represents a "harmonizing potential" of the environment or of an external source (cause).

If $a_i = 0$, $Q_{Es}=1$ and $Q_S = Q_{Si}$, (the own functioning potential).

So, generally, the harmonizing potential of an cause acting by a negentropic flux a $=\Sigma a_k$ produced by m negentropizing sources, has the form:

$$Q_{ms} = Q_{Es}(\tau) = e^{S_M \cdot \tau \cdot l \cdot \sum_{l=1}^{m}(a_k)} = \prod Q_k \quad ; \quad a_k = -f_k \tag{197}$$

If $Q_E>1$, that means a harmonizing potential and if $Q_E< 1$, that means an entropizing potential. So, a harmonizing potential may grow the functioning potential of a system, (as in case of a lubricant), the system becoming in this case a "harmonized" system, i.e. "perfected" system.

Because that many other systems: psychological, psycho-social, are open systems, the eqn. (193) -(197) may be generalized for every "hollonic" (collective) systems. For example, for a productive system with two sub-systems, the interaction between them (1 actioning over 2 and 2 actioning over 1) may gives the next results;

a) $Q_{E(1-2)}< 1$; $Q_{E(2-1)}< 1$; $Q_{E(1-2)}$x $Q_{E(2-1)} = H_s< 1$; – entropized hollons;

b) $Q_{E(1-2)}< 1$; $Q_{E(2-1)}> 1$ $Q_{E(1-2)}$x $Q_{E(2-1)} = H_s\approx 1$ – non-harmonized hollons;

c) $Q_{E(1-2)}> 1$; $Q_{E(2-1)}>1$ $Q_{E(1-2)}$x $Q_{E(2-1)} = H_s> 1$ – harmonized hollons.

For a system with N sub-hollons, the "harmony" of the system may be written in the form:

$$H_S = \prod\left[A_n^2(Q_E)\right]; \text{ (A_n^2 – arrangements of n parts taken by 2)} \tag{198}$$

Also, the efficiency criterion may be written by Q_E in the form:

$$e^{R-E} = e^{\Delta O_p - \Delta O_c} = Q_{Es}(\tau) \tag{199}$$

in which: R – the result, (produced organizing, ΔO_p), and E – the effort, (consumed organizing, ΔO_c) with $E/R = \Delta O_p/\Delta O_c = \varepsilon$ (the efficiency), resulting:

1. For $\varepsilon = R/E = \Delta O_p/\Delta O_c < 1$; $(E > R)$; $\Rightarrow Q_E < 1$, – inefficiency;
2. For $\varepsilon = 1$; $(E = R)$; $\Rightarrow Q_E = 1$, – simple reproduction;
3. For $\varepsilon > 1$; $(E < R)$; $\Rightarrow Q_E > 1$, – efficiency (enlarged reproduction);

(a produced and a consumed product bearing negentropy).

For technical systems, the previous (199) criterion may be used for estimate the efficiency of an energy conversion system, for example: replacing ΔO_p with E_i (the input energy) and ΔO_c with E_o (the output energy), the case $Q_E > 1$ corresponding to a free energy device case.

For a psycho-social system, the harmonizing potential $Q_{Es}(\tau)$ express also the psycho-social value of the system,(even for a person ora society) in domains with k_i –importance coefficient, ($k_i = 5$ for political d. and $k_i = 1$ for technical d.):

$$V_{Es}(\tau) \approx \sum[k_i \cdot Q_{Es}(\tau)];\ (k_i = 1 \div 5 - \text{importance coefficient}) \tag{200}$$

where $Q_{Es}(\tau)$ may be either latent (given by knowledges and technical production capacity, etc.) or active harmonizing potential (evidenced by action).

2.8 New Proposed Experiments

1. A first experiment for the theory verifying may be an experiment with monochromatic photons of a very thin laser fascicle projected to non-thermal electrons maintained with the μ_e-magnetic moment perpendicular

to the laser fascicle, by an external magnetic field. According to the vortexial model of electron, the photons with **c**-speed antiparallel to the **c**-speed of the $\mathbf{\Gamma}_{\mu}$-vortex quantons will lose a (very) small quantity of energy pentrating the $\mathbf{\Gamma}_{\mu}$-vortex.

2. Because the difficulties implied by the previous proposed experiment, may be proposed a similar experiment replacing in the previous proposed experiment the electron with a magnetic wire or bar axially polarized. If the field intensity $E_A=\partial A/\partial t$ has a gravito-electric nature, it must modify the photons impulse tangent to the magnetic wire surface but antiparallel with A, with the value:

$\Delta p_f= \delta m_f c = h/\delta\lambda = q_g \cdot A = (e/m_e)\cdot m_f A$, according to eq. (26b) of TGC.

3. Another experiment which may be proposed consists in the screening of a linear conductor charge placed in a very strong magnetic field parallel with the charged conductor.

According also to Ouantum Electrodynamics, the M_b-bosons of polarized quantum vacuum produces the electric charge screening. According to CGT, the quantum-vortexial nature of the magnetic field generates-by the gradient of A_j - magnetic potential, a gravito-magnetic force, of value:

$$F_{GM} = \tfrac{1}{2}(M/\rho_M)\cdot\nabla_r(\rho_s c^2)_j \tag{201}$$

If the field: B=rot.A has the variation: $B_k(r) =B_0\cdot(r_\mu /r)^3$, results by eq. (40, 41) of CGT, that:

$$\nabla_r(\rho_s c^2) = -\frac{2B_k c}{k_1 \cdot r_\mu};\quad F_{GM}(r) = -\frac{M}{\rho_M}\cdot\frac{c}{k_1 r}\cdot\sqrt[3]{\frac{B_k^2(r)}{B_0}} \tag{202}$$

with: $r_\mu=2P_m/Q_m \cdot c$; (Q_m-the electric charge which produces the magnetic moment P_m which generates the B_k – field;$\rho_M=8.8x10^{23}kg/m^3$.

This gravitomagnetic F_{GM} – force accumulates M_b-bosons of quantum vaquum in the region with $B_k=B_0$ with the charged conductor producing the screening of the conductor charge with a value which depends on the value of B_0 and of r_μ. Also, a non-magnetic ball, for example-a quartz ball, will be attracted toward the center of a strong magnet or a strong magetic field according to eq. (200), (201). For example, for $B_k^0(r_\mu)=10T$ and $r_\mu=1m$, a crystal ball of 100g will be attracted with a gravitomagnetic force: $F_{GM}(r_\mu) \approx 2.2x10^{-6}$ N, i.e measurable by a torsion balance, for example.

1. From the "dynamide" model of neutron of CGT, it result also the possibility to induce β – disintegration with electromagnetic (γ, X)-rays of $7.9x10^{20}/n$ Hz (n=1÷10) of resonance with the rotation of the neutronic negatron, in nuclei with low binding energy and with odd number of neutrons and/or nuclear self-resonance.

2. From the vortexial model of particle, a real particle mass growing is possible only by the increasing of Γ_μ quantonic vortex of the μ-magnetic moment. So, it is possible an experiment for verify if the μ-magnetic moment ofa β-electron ($v_e \rightarrow c$) is bigger than those of a "frozen" electron.

3. From the model of deuteronic self-resonance of CGT, it result that may be realized a weight decreasing for a metallic sandwich of 1-5 mm with an upper strong magnetic layer, a median thin layer and an inferior layer of lead strongly dopped with nuclei with giant resonance: U, Zr, Pb excited with gamma rays or electrons energy of at least 14MeV, which-by the induced deuteronic resonance, will increase the local static quantonic

pressure which will generate a quantic pressure gradient corresponding to a quantic pseudo-antigravitic (levitation) force, according to CGT.

2.9 Philosophical Conclusions

The Schwinger's hypothesis which consider that the quantum vacuum is non-linear, [26], implying non-linear solutions to the Maxwell's equations of the electromagnetism, of soliton-particle type, generated as "zero point" disturbations in quantum vacuum sustain the CGT' vortexial models of particles, arguing that the Fred Hoyle's theory of a continuous matter creation may be fundamented by a vortex cascade model of particles creation from the quantum/subquantum "vacuum energy", in accordance with experimental observations such as the phenomenon of pair production of particles and antiparticles in a high electric field, particularly-in the electric field of a nucleus.

The same phenomenon justify –at the same time, also the use of the classic galileian-like relativity, which imply the conclusion of the rest-mass existence for all particles and for all quanta, conclusion which explain also the fact that even if the hard-gamma quantum has the light speed c, (for which the einsteinian relativity imply a null rest-mass), it may be transformed in electrons with non-null rest-mass. At the same time, the phenomenon justify also the model of degenerate electrons cluster of mesonic and baryonic particles, resulted as chiral soliton and Bose-Einstein condensate of gammons and the possibility of particles forming from quantum energy, in accordance also with the acceptions of quantum mechanics and of einsteinian relativity. It is known also, from quantum chemistry, the fact that two electrons with opposed spins may form a linked state of quasi-particle (Animalu, Santilli şi Ningazin) which has an autonomous existence in vacuum, evidenced also by the Cooper pairs in semiconductors.

For the philosophy, the pre-quantum cold genesis theory re-find some conclusions of the metapysics which states that:

1. every event has a determinist cause;
2. the knowledge may be – in principle, complete, conclusions revised by the probabilistic philosophy (the "positivism") which – by some adepts (Patrick Suppex et al.), consider that:

   a) the fundamental laws of physical phenomena are – essentially, probabilistic, by their character;

   b) the causality is, by their nature, probabilistic;

   c) the certitude is not accessible in our knowledge.

By CGT, which evidenced the possibility to describe the fundamental quantum state (of $T \rightarrow 0K$) of elementary particles and of atoms by determinist pre-quantum models, may be argued that the laws of Nature are deterministic for simple systems, with very small number of particles and determinis-probabilistic for systems with great number of particles or other component parts, because the determinist-probabilistic character of theirs interactions, i.e:

1. the fundamental laws of natural phenomena are determinist-probabilistic;
2. every event in a multi-component system has determinist – probabilistic causes;
3. the scientific knowledge may be complete in a necessary-sufficient relative way.
4. These conclusions may be generalized for more complex systems such as biological or psycho-social systems and for the evolution of the society, indicating as preferable the scientific ideology, also for the religion, i.e:

scientific Orthodoxy, scientific Catholicism, and so on, based in this case on human principles (purification, illumination, unification with the divinity, fight against evil, reciprocity) but also on necessary-sufficient complete knowledge about the world's reality.

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