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Theory of Ageing of Physical Constant C and It's Effect On Planck's Constant 'h'.

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I. INTRODUCTION:

Over time and again a question has arisen whether the physical constant 'C' -the speed of light, is constant and the highest ever realised in physical world.

In the last decade it was observed that neutrinos passing through LHC at CERN were traveling at a speed faster than the speed of light.

Earlier in remote past too there were stray observations such as exploding quasars No.3C273 & 279 with a speed greater than 'C' ; then in recent past (2000/01) also there were couple of observations showing deviation in the constancy of 'C' (1.Radiation coming from very distant unidentified source.2. Rays passing through Ceacium).

MOTIVATION:
All the cited incidents here and there call for the review of this most fundamental Universal Constant. Is it age-stricken ? Whether ageing has affected the constancy ?

AIM:
To answer this in a general frame of natural laws , I herewith propound a theory of AGEING OF PHYSICAL CONSTANT 'C'.

DEFINITION:
Ageing is the rising graph of time. Time is constituted of pulses of happenings taking place at regular intervals in a system. The graph of time goes on and on as the happening at regular interval goes on repeating. This is 'AGEING' in physical sense.

Any system where 'ageing' is in progress, that is, where identical events are being regularly repeated nonstop, is defined as an ageing system - be it physical or non-physical.

With the non-physical i.e. living systems, it is observed that as the new event begins to repeat, the system begins to show adaptation to the happening of the event, that is, the reception of the happening would be easier; in the physical sense things happen more easily and readily than ordinarily they would. That follows that 'Adaptability' is inherent in nature.

'Nature' is sensitive to the conservation of energy and creative to maintain the equilibrium. Nature behaves such that conservation and thereby equilibrium of the system is retained. From this tendency of nature, adaptation and habit-forming arise which phenomena are very conspicuous in living systems. Now we are here to find whether such nature-induced behaviour is observed in physical (non-living) systems too ?
It is to be noted that :
As 'adaptation' is inherent character of nature, so is 'transmission'.

The transmitivity is the intrinsic property of nature which makes possible the propagation of electromagnetic waves at constant rate. Now when adaptation sets in a system, the transmission being the natural property, should also be affected by the adaptation therein. Owing to the adaptation, the transmission rate grows faster than usual as if the geometry therein is smoothed by the repeated events. With this axiom, I hereunder lay the following hypotheses to build the Theory of physical constant C.

HYPOTHESES:

[1] Natural laws apply to all the branches of science- may it be physical or non-physical.

[2] As the identical events begin to occur repeatedly and regularly in a system, the phenomenon of adaptation begins to play it's role in that system.

[3] At certain critical number N* of repeated events, the process of adaptation stops and begins to reverse, that is, begins to exhibit degeneration- devolution in general.

*The critical limit N , I set as 10^40 (i.e. N = 10^40) because this is the highest ever number that appears in physical world, also happens to be the estimated age of our universe. (It could be something else; after all, it is to be determined empirically.

[4] The most fundamental Universal constant C - the natural velocity of transmission in vacuuo, is affected as the adaptation sets in in an ageing system; and as a result it assumes faster rate than it's constant value .

Synthesizing 2, 3 and 4 hypotheses, the theory of ageing takes the shape as:

AS IDENTICAL EVENTS OCCUR IN A SYSTEM REPEATEDLY AT REGULAR PERIOD, THE NATURAL CONSTANT 'C' IN THAT SYSTEM ASSUMES IT'S FASTER RATE THAN USUAL AND AS THE NUMBER OF REPEATED EVENTS n REACHES IT'S CRITICAL VALUE N, THE VELOCITY OF LIGHT -C BECOMES INFINITE.

Cn= f (n). C Where C = Established value of Velocity of light in vacuum

Cn= Velocity of light in vacuum in an ageing system.

F(n)= function of number of
repeated identical events.

Now let us find F(n) to arrive at Cn.

Selection of the function of 'n' :

This is very identical situation to Mass- variance where mass increases as the velocity increases(there also is a critical limit as C).

Here according to the theory, as n- the no. of repeated identical events increases, C - the velocity of light increases and upon reaching the critical number N , the velocity of light becomes infinite.
I therefore, select the function* of n as:

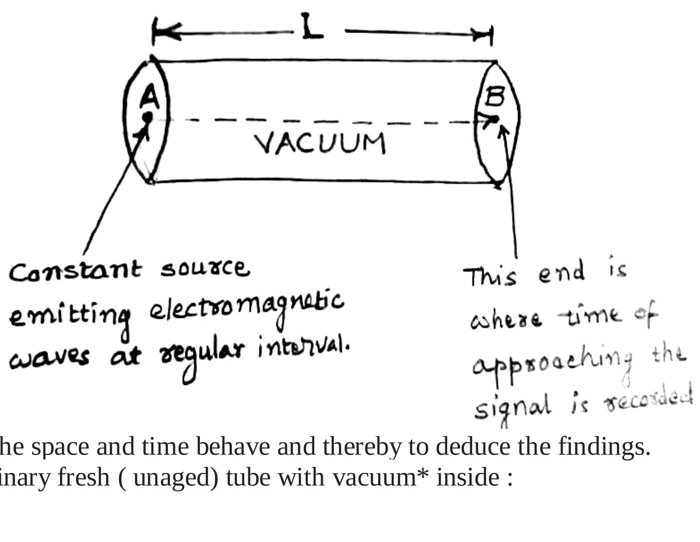
$1/\sqrt{(1-- n^2 /N^2)}$. Where n is no. of repeated like-events
and N is the critical number at which
the adaptation is reversed.

This fulfils the conditions of the Theory. (*This function of n chosen here arbitrarily is, in a sense, an Adaptation Factor which is yet to be proven empirically.)

Now introducing this function in the equation for the velocity of light in an ageing system, we get :

$$Cn= C/ \sqrt{(1--n^2/N^2)}$$

On the basis of this hypothetical value of Cn, I devise the following experiment to understand how fundamental



facets of Nature- the space and time behave and thereby to deduce the findings.

Let us take an ordinary fresh (unaged) tube with vacuum* inside :

* The hypothetical space inside the tube is totally vacuum- devoid of gravitational force of the earth. (To nullify the earthly gravitation , a counterbalance force is to be employed by a special device.) When the source of constant energy E is switched on to emit a signal from point A, the signal travels along in the vacuum tube and reaches the point B where time of approaching is recorded.

- In this first instance, the time taken by the signal in traversing the vacuum space L from pt. A to pt.B is found to be say: t1
- Thence, the experiment is carried on repeatedly at regular interval for over a very long period.

II. OBSERVATION:

(a) : After n times of repetition of the same event, the time taken by signal n in traveling the length L is say tn.
According to the hypothesis No.4, tn< t1.
The 'tn' is less than 't1' , that is, the signal 'n' propagating with the constant speed c had to travel shorter distance than L , after n times of repetition.

The signal has behaved as if the L is shortened to be Ln.
This is analogous to the Lorentz's contraction.
Using the same transformation as of Lorentz's, Ln reads as :
Ln =[√(1--n^2/N^2)] ×L
Now we have as per hypothesis,
Cn= C/√(1--n^2/N^2)
Therefore, tn here would be (1--n^2/N^2)t

Deduction (a):
As the number of repeated events increases, the vacuum space L is shrunk by √(1--n^2/N^2) and the time interval is shortened by 1--n^2/N^2

(b): Now with this finding we proceed further to evaluate the Planck's constant at repeated number of like events.
We have energy equation E = h.v where h is Planck's constant and v is frequency. It will take shape in the ageing system as:

$\boxed{E_n} = h_n \cdot \nu_n$, Now $\nu = C/\lambda$ (wave Length) $\therefore \nu_n = C_n/\lambda_n$

That is, $E_n = h_n \cdot \nu_n = h_n \cdot C_n/\lambda_n$

Now $\underline{C_n} = C/\sqrt{1-n^2/N^2}$, and Wavelength $\underline{\lambda_n} = (\sqrt{1-n^2/N^2})\cdot\lambda$

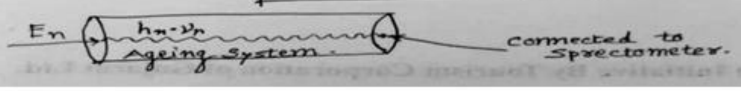
$$\therefore E_n = h_n \times \frac{C}{(\sqrt{1-n^2/N^2})} \times \frac{1}{(\sqrt{1-n^2/N^2})\,\lambda}$$

$$\therefore E_n = \frac{h_n}{(1-\frac{n^2}{N^2})} \times \frac{C}{\lambda} = \frac{h_n}{(1-n^2/N^2)} \times \nu$$

Now for the conservation of energy, E_n should be equal to E .

That follows : $\frac{h_n}{(1-n^2/N^2)} \cdot \nu = h \cdot \nu$

That is, $\boxed{h_n = (1-n^2/N^2)\cdot h}$



That follows : Frequency of the signal En at n number of repeated like events is increased as :

$vn = v/(1-n^2/N^2)$

That says that with the same energy, we may produce more frequency than usual after n repetitions of the same event in a system. This can be verified on the spectrometer.
Deduction (b) :
Nature behaves in the ageing system as if h were decreased.

(c): Now let us examine what would be mass of photon in the ageing system we are discussing.
We know $E= MC^2$, therefore, En would be $Mn.(Cn)^2$
For E=En we have : $MC^2=Mn\cdot[C/\sqrt{(1-n^2/N^2)}]^2$
That is, $Mn = (1-n^2/N^2)\cdot M$

Deduction (c):
Here after repetitions of the event, mass decreases by $(1-n^2/N^2)$. In case of moving bodies, inertia increases with the increased speed whereas here there is decrease in the inertia with the increased number of repeated events.
• For ' Mass-variance' in ageing system, the following relation is obtained : $Mvn=(1-n^2/N^2)\times Mo/\sqrt{(1-V^2/C^2)}$
If we set $(1-n^2/N^2) = \sqrt{(1-V^2/C^2)}$, we get, at that particular instant,
$Mvn = Mo$

(d) : As is seen above, in a system having repeated periodical events, we have decreased inertia to account for.
Deduction (d) :
We can deduce that the gravitational interaction gets weakened in an ageing system.

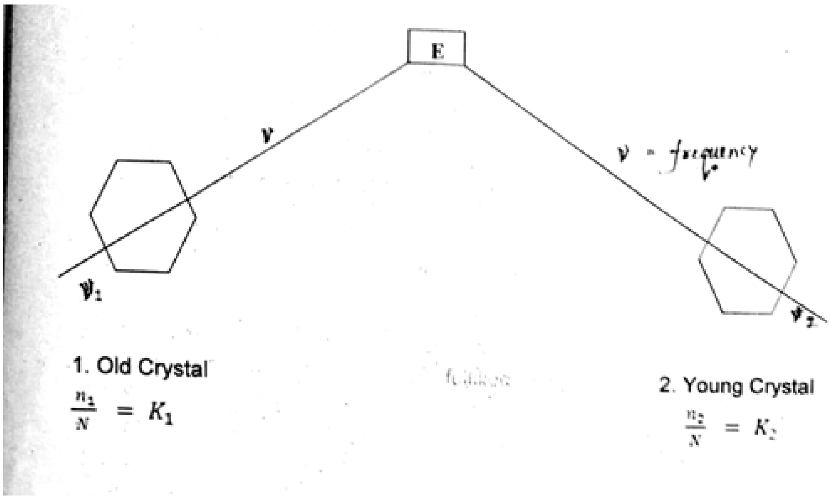
III. DISCUSSION AND CONCLUSION :

If the deductions made here are to be found true in reality , the theory holds good. The theory of ageing of fundamental constants propounded here is based on the assumption drawn from the natural phenomenon of Adaptation observed with living systems.

When adaptation is in making after recurrences of the same event in a system, the space of the system undergoes shrinking. It should be noted here that the hypothetical experiment shows the shrinking or contraction of the vacuum space, not of the physical body, that is ,it is of the space-in-itself that carries and transmits electromagnetic waves. The shortest distance 'ds' between A and B is shrunk by
$\sqrt{(1-n^2/N^2)}$,eventhough geometry* inside is simply flat, it being a vacuum devoid of gravitational field. This is the fundamental change* imposed by adaptation in the ageing system.
[*The flat geometry here is affected by the adaptation factor to take a new complexion where velocity of light is other than C and 'ds' equal to
$\sqrt{(1-n^2/N^2)}\cdot ds$].
There is also change in temporal dimension. Time here is shortened by second degree to take a shape as
$(1-n^2/N^2)\cdot t$.
These both the changes- spatial as well as temporal- inflicted upon by Nature owing to inherent adaptability, oblige the fundamental physical constant to change accordingly in an ageing system.
Should the change imposed be equal for the both space and time, the magnitude of C remains unchanged. But here, as the theory goes, since the temporal change is greater than the spatial change, the value of C is changed obeying the natural law of adaptation.
Should the astronomical observations confirm this reality, the theory holds good (however there could be variation in the quantitative finding to some degree because here the adaptation- factor i.e. function of number of repeated events is arbitrarily chosen.It can be set right after concluding quantitative findings) The hypothetical experiment suggested here is not impossible to devise, only that it should be run for a very very long period of time.(LHC at CERN may provide such opportunity.)
In place of a hypothetical experiment given here, the practical approach to the matter in question is to look for evidence found in nature around us.
Any stable molecular structure which persists in space- time, is a well-defined system* undergoing ageing.(*Again this system belongs to some larger system, that is, it is a system- in- system network. But that is not the point in question right here in this case. What we are concerned here is a fact that a stable molecular structure is a sort of ageing system we are looking for.)

Let us take two crystalline structures identical to each other which are formed at different stages during the evolving process of our earth planet and which are well stable since their inception without subject to any degeneration. They can be categorised as two identical aged systems having different span of ageing, that is, one is old and the other is young however both having the same molecular structure and hence the same field within the confined structure.

It should be noted that ageing here does not merely imply the length of its being since it's emergence as a defined structure but it relates to the number of repeated like events (such as orbital motion of electrons) taking place regularly and repeatedly within the field confined to the system of the defined structure. In order to avoid any complications arising from the interaction (or interpolation) with other fields, the said two like-crystals (say diamonds) are so selected and isolated for observation in laboratory that the necessary conditions for the experiment are fully fulfilled.



As shown in the diagram , from an energy source [E] two signals with requency v are simultaneously transmitted through the said two identical specimens (crystals 1& 2) and spectra are taken for the rays leaving the specimens.

Ideally both spectra ought to match each other because both specimens being identical, the frequency of the incident ray transmitted through, should remain the same.

But according to the proposed theory of Ageing (involving natural adaptation), both frequencies should differ in following manner :

(I) For old crystal:

$$\nu_1 = \frac{E}{h_1} = \frac{E}{\left[1-\left(\frac{n_1}{N}\right)^2\right]h} = \frac{E}{(1-K_1^2)h}$$

- As per the theory $h_n = \left[1-\left(\frac{n_n}{N}\right)^2\right]h$

(II) For Young crystal:

$$\nu_2 = \frac{E}{h_2} = \frac{E}{\left[1-\left(\frac{n_2}{N}\right)^2\right]h} = \frac{E}{(1-K_2^2)h}$$

∴ **Change in frequency:**

$$\nu_1 - \nu_2 = \frac{E}{h} \times \frac{N^2(n_1^2 - n_2^2)}{(N^2 - n_1^2)(N^2 - n_2^2)}$$

Considering the very large value of N (hypothetically N= 10^40), the difference between the two is going to be very minimal but with the ultramodern technology it can be detected.

And if so detected in the lab, it would be a confirmatory test of my theory and my claim that in an ageing system Natural Adaptability plays it's role to alter the constant value of Natural Constants, is not a farfetched hypothesis but a reality.
For conclusive finding, the said experiment is supposed to be furthered with more specimens of varied range of age groups.

If after a series of the said experiment carried out in the laboratory, the deviation in the frequency v, turns out exactly as my theory prescribes,I think, my theory of ' ageing of fundamental constants ' holds a good ground.

Now that when locally in a lab (CERN) we have extraordinary findings about neutrinos, I understand my theory can be verified to this date.

The theory can also be put to test in cases of astronomical unprecedented events. If it turns out to be in agreement with the theory , a wide range of application * of the theory is open.

AREA OF APPLICATION* :

- Preset- aged- system can be prepared to have enhanced output in telecommunication and teleportation.
- Unanswered genetic problems can be dealt with using this theory.

IV. SUMMARY:

- This can change the complexion of the present science because 'C' is involved in almost all cases.
- Cn has its noticeable differed value only where n- the number of repeated like- events is very very high.
- If we consider our universe as one whole system, there will be three categories of 'C' in general :
  - C at the beginning,
  - C in the grownup stage of the universe (now!!)
  - and C in the dying epoch .
- The theory further states that not only the velocity of light C but other physical fundamental constants like Planck's constant h and Gravitational constant G are also liable to be affected by the Natural Adaptability.

Nothing is constant (permanently) ! How interesting !

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