

SPIN & TEMPORANCE IN THE RECIPROCAL SYSTEM OF THEORY (RST)**A SUBSTANTIALLY-EXTENDED SEQUEL TO BOTH 'CHE SARA SARA' & 'S.V.M.' OF 1988****CONTENTS**

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PRELIMINARY ABSTRACT

Among the members of I.S.U.S. and the contributors to the ISUS-Discuss group, there is a certain undercurrent of questioning of the postulates of the RST as to whether they can produce precisely all the deductions, that are expected of them, and therefore be suitable for presentation to the scientific diaspora to overcome its close-minded resistance and also to arouse some genuine interest thereamongst. Also there are some ambiguities arising from time to time. As a consequence, the very paradigm itself seems to be floundering in a '*rigourless sea of indistinctions*'.

There is a new methodology being used in an attempt to clarify, if possible, some of the concepts of RST as defined/subsumed by the postulates, and, hopefully, to put it into a form, that can be modelled on a computer, and hence be convincing to all serious-minded searchers for the ultimate paradigm for the physical universe.

This new method is based on the Cellular Automata (CAs) methodology, using Progression Algorithms (PAs), that Stephen Wolfram used in his book, *"A New Kind of Science"*, in his attempt to explain the physical universe from his perspective. Since I have not seen the book and know in advance that it is far beyond my comprehension, I shall not try to embarrass myself by borrowing it from the library or whatever.

However, like any form of mathematics, CAs and/or PAs are only tools, and great care must be taken by their proponents to see that these CAs & PAs do not taint the analysis by their own impediments, **if any**.

As I see it, we have an automata theory and/or discipline, that its proponents want to use to explain the very basis of RST when in fact there may be an incipient problem, that limits its applicability, I believe. I am sure that it can complement much of our researches in RST, but there are some areas of mathematics that it cannot supplant.

Whether this idea is vital for RST, it's up to the readers and members of ISUS-Discuss to assess.

ANALOGY

One knows that Differential Calculus deals with continuous functions, and therefore will not be a suitable tool for all areas of one's investigation, such as discrete matters (say).

Similarly, Discrete Mathematics is limited in its applicability.

In the RST paradigm, there are areas of investigation, that require discrete mathematics. Similarly, there are areas of investigation, that require continuum mathematics. Great care must be exercised not to mix the two disciplines, since so doing is fraught with incongruities and cognitive dissonances.

SECONDARY ABSTRACT

This paper contains an alternative explanation/interpretation of some of the fundamental findings of the Reciprocal System of Theory, **(without assumption(s))**, with the overt intention of:-

- 1) making RST more understandable, and
- 2) announcing some new findings and concomitant crucial experiments.

The question arises:- Are the postulates, (whether we consider the original presentation or the reformulated form), both **necessary and sufficient** for the RST paradigm, or are they merely **necessary**?

I humbly suggest that they are **insufficient**, due to certain apparent assumptions made in the texts, upon which one comes from time to time. e.g. The two concentric photons for all the chemical elements except hydrogen. (See more later and in *"Che Sara Sara"*)

Larson alleged that the single photon would be unstable if it was the only photon in the rotational base for all elements. Surely he

could have concluded that if that were the case, then why not look for a rotational base, that would satisfy all the elements and not have any drawbacks? For instance, he conjectured the two concentric photons, but did not appear to consider them for the spin triplets of hydrogen and all the subatoms. Why not??

From the postulates, we start with the transcendental, (objective), viewpoint of a universe of motion existing in three dimensions, and all motions are 'locations' moving outwards from each other at the rate of one space unit per time unit, which we identify as the speed of light. We can call this outward movement "*Scalar Spherical Expansion*" (S.S.E.), analogous to a Xmas pudding swelling up in a hot oven and all raisins receding from each other.

"The secrets of the Universe lie in things that spin."

Eric Laithwaite 1980

POETIC LICENTIOUSNESS-1

CONTEMPLATION HAIKU

Along came Larson
And his theory
Let's write a Haiku; ker!
Plus two lines more for Tanka:
Empty like space; must hanker.

DEVELOPMENT

This is how I see RST in its stages of theoretical development, which does not necessarily impute and/or affirm that the actual act of creation took place exactly so, or if, indeed, there ever was an 'Act of Creation'; it is merely a **deconstruction** of Larson's paradigm.

This deconstruction is not intended to have a parallel with the Biblical six days of creation and one day of rest, however if it's a reader's predilection to think so, then "*so mote it be*". There follows a seven stage deconstruction, where stages 6 & 7 are grouped together for the sixth day to allow for the deity's sabbath. (Dayenu)

PRELIMINARY CLARIFICATION

In the English language, the words "*Inward*" and "*Outward*" are antonyms of each other, but in RST there are two distinct categories of meaning, that, (if one relied on the dictionary alone), would give birth to ambiguity and therefore a high chance of a false conclusion re RST.

When the paradigm is being built up step by step by deduction from the postulates, eventually we have gravitating matter, and only then, (**never before**), do we consider the scalar concepts of *inward* and *outward* applying to such matter, hence the scalar spherical expansion, (S.S.E.), and gravity are seen to be opposing 'forces' away from or towards the **unit boundary** resp..

However, in the previous steps of the paradigm, prior to matter, we only have outward considerations, despite the counter-intuitive

thought applied to direction reversal when delineating the nascency of a vibration. Remember that S.S.E. is **outwards from a unit boundary** or **inwards within a unit boundary**, but before matter is to be considered, there is **no unit boundary**. Read on, bearing that in mind.

The intention of this paper is to study/analyse a particle, (atom or subatom), using the RST postulates literally, (if not pedantically), as a basis for investigating its spin, moment of inertia, angular momentum, etc., with the fervent hope, that this new derivation and alternative perspective will inspire the 'gurus' amongst us to apply this to work function, ionisation energy and magnetic resonance frequencies of the atoms and subatoms, with at least the same success as formerly by the other methods of our primary pedagogues, (Larson, Satz and Nehru), and thence to as-yet-undiscovered RST revelations.

Euclidean geometry will abound, as expected from the postulates of RST. Whether we consider our physical sector, or we consider the so-called "Cosmic Sector", each has Euclidean geometry as its own internal geometry.

STAGE 1

We start with Larson's primeval objective transcendental universe, as defined by the postulates and within which there are neither observable existents nor observers. There is not even a humanly-conceivable type of observer, however metaphysical, hypothetical, spiritual or religious we humans may be.

The three dimensions of motion are the Natural Reference System (NRS), (and are **NOT** a container concept, but just a reference framework), but, at this **first stage**, RST **seems** to have nothing to offer as a viable paradigm, on which to model the physical universe.

POETIC LICENTIOUSNESS-2

DEMONSTRATING HOW A LAY PERSON REALISES INTEGRATED NOTIONS

THEORY-POSTULATES

At last came Dewey, yet with a 'newey'.
S and T in a reciprocal relation
Gives us velocity or speed,
And it follows, (without consternation),
A Theory, for which this is the seed.
Space and Time have units discrete,
And Space-Time is continuous, (to complete).

ACHIEVEMENTS

- 1) Achievements are many, starting with the **PHOTON**,
Keeping within the postulates,
All else is 'verboten'.
- 2) **RADIATION** without an ether,
(You don't need one neither).
- 3) **GRAVITY** is an inherent property of **MATTER**,

- (Certainly no idle chatter).
- 4) How **GALAXIES** recede, with increasing speed,
 - 5) And **STRUCTURE, (ATOMIC)**, to the core,
Certainly doesn't agree with Bohr,
(Please, dear reader, make no fuss,
Because of the absence of **NUCLE-US**).
 - 6) Velocity of **LIGHT**, is rather trite,
 - 7) And **SOLID-COHESION** is simple to reason.
 - 8) While **MATTER** and its **STATES**, is one of the greats,
 - 9) **EXPLOSIONS**, galactically, are predicted didactically.
 - 10) **ELECTRICITY** is simplicity,
 - 11) As is *'to enlarge on a CHARGE'*.
 - 12) So too:- There's a good rendition
Of **RADIOACTIVE FISSION**.
 - 13) The **TIME-SPACE SECTOR** is the Universe's bisector.
 - 14) His version of **COSMIC RAYS**,
is worthwhile to appraise;
 - 15) And the **PERIODIC TABLE**
Separates fact from fable.

SUMMARY

The above may be succinct,
Yet it serves to *'distinct'*:-
CONTINUUM from **VACUUM**,
INFINITY from *'DEFINITY'*,
CREATION from **FLUCTUATION**,
GRAVITY from **DEPRAVITY**
And **PHYSICAL UNIFICATION** from **LEGACY BOVINE DEFECATION**.

STAGE 2 ONE OSCILLATION

Larson envisaged the concept of a **non-vectorial** setting, which he called a *"scalar"* setting. (This could be a bad choice of names, since *"non-vectorial"* seems to have more RST meaning than does *"scalar"*.)

He did not intend that we only consider scalar in the usual magnitude sense. He intended that we must realise that *"there is no preferred vectorial consideration"*. However, he maintained that *"there is a Euclidean geometry"*, therefore we always have to remember that very geometry as well as the concomitant magnitude considerations as they arise.

So the only option, that he could consider for the next stage of evolution of the RST paradigm, was to consider a periodic reversal of direction of the outward-going *'locations'*. This neither conflicts with the postulates nor adds any assumption. However there is no particular centre from which they recede, since wherever one chooses to focus on a given *'location'*, then all others recede linearly therefrom.

At this second stage, there is no concept of *inward* to be considered, despite the reversal of direction, since that arises only in the seventh stage of development.

We now have a vibration, [oscillating space unit, (photon)], with constant speed along the Y axis, say. This, I believe, precludes the PA methodology for the first six stages, since that PA, as portrayed in the current diagrams, depends on **inward and outward from the unit boundary**, which boundary only comes into existence in the seventh stage.

Firstly, we must define clearly what constitutes the on-going creation process of every particle in the RST paradigm. Neither matter nor waves exist per se; they are always in a state of perpetual creation.

We have a photon, [vibrating, (oscillating), space unit], which can be analysed one step at a time from the postulates until we build up its composite construction. Whereas the space unit travels in a line, it does **NOT** *"generate a line"*, as Nehru would have us believe in one of his papers.

The line along the Y axis is merely the path of the oscillation and we need only consider one dimension of Euclidean 3-space and one dimension of time for this vibration.

POETIC LICENTIOUSNESS-3

A SHORT MACARONIC ABOUT A TEUTONIC, FOLLOWED BY A SEQUEL WITHOUT EQUAL

Einstein hat gesagt, dass ein Light-Beam ist *'ausfliessig'*,
Ganz along a path in space, heisst ein Geodesic,
But Dewey, being cluey,
Opined Riemann no *'he-man'*,
(More *'perfidian'* and simian),
And amid **EUCLID**, declared:-
*"A straight line is fine, for thee and thine,
Be it for rays in phase, or beams in streams"*.

STAGE 3 (WITHOUT ROTATIONS)

ELECTROMAGNETIC WAVES

Now that we have a vibration, we can deem it to be an entity, and then, and only then, do we consider that it may recede from other vibrations, but there is still no inward motion to be considered. These natural vibrations may recede (radiate) in a planar scattering, (in the 2π radians of the XY plane), due to the Euclidean consideration, that the vibration is along one axis of a Cartesian rectangular trihedral, whose origin is the centre of the vibration receding outwards in the NRS and therefore there are no actual specific vectorial considerations. So this is identified as an electromagnetic wave. Of course, it is only when considering a photon-generating source producing a stream of photons, that we can admit the overall radiation to be spread over 2π steradians. Hence, we have explained electromagnetic waves and insodoing have anticipated the concept of polarising these waves to be all planar.

Still no room for PA methodology.

STAGE 4

Now we consider at least two more possibilities and their relative probabilities. What else may happen to contribute to evolution of a physical universe, or are we stymied and cannot go any further?

(WITH ROTATIONS)

SUBATOMIC PARTICLES

Precluding further oscillations, we consider rotation for the first time. We can consider that the vibrating unit may be rotated about its centre at a given spin, (spin = 1, about the X axis, say), in like manner to a pair of collinear spokes on a wheel, and the path of the vibration seems to create a disk-like area when rotated thuswise, (not "create an area" as stated by Nehru in above-cited paper). We are, in fact, speaking of the rotation of the vibration, (in a linear path), within a planar disk-like boundary, defined by a circle, but **NOT** tracing a circle. [Therefore I believe that, maybe there is no need to bring in a second time dimension for the area consideration, (as Nehru did in above-cited paper), only a second (and orthogonal) spatial dimension is utilised, apropos of Euclidean geometry, as per the postulates.]

Actually, the mid-point of the vibration, which traces the linear path in the interval of one time unit, when rotated then, traces out a plane curve, which is contained within a circular boundary.

So, at this stage, we have a planar curve being traced by the oscillating space unit within a circular boundary, suggesting a type of circular-like lamina.

This is the Rotational Base [1-0-0] named by Larson, and is a precursor to subatomic particles and hydrogen. It is a massless entity, and it does not exist as such, as far as we know.

POETIC LICENTIOUSNESS-4

ODE TO SPATIAL TEMPORANCE

MARGINAL CWITICISMS

At playing cards, Albert was a disgrace,

RAMBLER-GAMBLER

His thoughts wandered off in directions of Space,

He wrested these thoughts from morning till night,

SCHEMER-DREAMER

How would he ever surmount his plight?

He thought and thought, then shook his head,

HE SLEEPS LIKE PEPYS

" 'Twere better, by far, I'd gone to bed".

It made him furious

BOMBASTIC ICONOCLAST

To deem Newton spurious.

or

ICONOCLASTIC BOMBAST?

In spare time he conjectured a new `ether capacious',

Seizing hold of each moment, in a manner rapacious,

And with tenacity, sagacity

HONEST-MODEST

And an added touch of perspicacity,

BEHOLD, its veracity!

Then like friend Archimedes, "*EUREKA*", said he,

OPTIMIST-ALCHEMIST

"I've got it, I've got it, how simple it be",

THEORIST-PHARMACIST

"The prescription, I have", he noted with zeal,

"Take Space and Time, mixed, real and unreal,

SPACIST-ANALYST

Three parts to one is just what you need,

I believe I have it, yes indeed".

This arbitrary ratio of three to one,

May, unfortunately, be where he came undone,

SYMMETRIST-PHYSICIST

Since three to three is more isotropic,

And may yet prove Al. had been myopic.

When signature is two,

With tensors you stew,

REVOLUTIONIST-TRANSCENDENTALIST

But make it zero

And become a hero.

Isomorphism in Time and Space

RECIPROCITY-GENUOSITY

Puts a new theory in the race.

Hence ergodicity

Creates felicity

And one has solved the case,

Showing vigour and rigour

ENOUGH TO MAKE OGDEN GNASH

Make Science healthier, than '*sickour*'.

STAGE 5 (TWO ROTATIONS)

Then, the next step is when this laminar-like rotational base is deemed to be constantly rotated about its diameter, (the Y axis), to give it a particular spin = 1. We are actually envisaging the plane curve transmogrifying into a space curve within Euclidean 3-space, entirely contained within a spherical, (or ellipsoidal), shell, depending on the values of the numbers in the triplets, which define the particular subatom, (Neutron [1-1-0] or Neutrino precursor).

It is also a massless entity, and it does not exist as such, as far as we know. This spin number is the second number in Larson's triplet of numbers.

So, further, (as previously, where we did **NOT** create an area), this time we are **NOT** creating an entity with volume, that requires another dimension of time. I believe that there is no "*Nehruvian volumeness*" to consider, as claimed in his paper, "*On the Nature of Rotation and Birotation (Reciprocity, Vol XX No.1 1991)*", just the usual Euclidean geometry.

STAGES 6 & 7 SUBATOMS & ATOMS

There are four alternative generic scenarios, based on Euclidean geometry, to consider:-

1) After it is given the second spin about the orthogonal diameter, [the Y (magnetic) axis], we have a space curve with a longer path, still contained within a spherical shell-like boundary, and then this shell-like entity is given a third spin about the Z axis, (the electric axis), and we have, in total, the rotational base with a triplet of spins. This is a particle of matter, whose resultant spin is equivalent to an inward scalar motion in opposition to the S.S.E., and is a gyroscopic entity with concomitant mass and weight.
e.g. Neutrino [1-1-(1)]

OR

2) If it is not given that second spin (around Y axis), it is a precursor to the Electron [1-0-(1)] or Positron [1-0-1]

OR

3) There is an increase in its initial spin about the X axis from 1 to 2 and then it is given a spin = 1 about its diameter as a precursor to Hydrogen. [2-1-(1)]

OR

TWO OSCILLATIONS WITH ROTATIONS

4) Larson describes the atoms as having two concentric photons vibrating orthogonally, which are then rotated. Despite the ultimate apparent success of this description, it disallows for the highly improbable scenario of two photons becoming concentric in the first place, based on the original derivation from the transcendental primeval objective universe, subsumed by the postulates.

There are two concentric orthogonal vibrations with the triplets of numbers for atoms as above representing all atoms except hydrogen.

Then spin = -1, 0 or 1 about the Z axis, (the electric axis), is taken into account to make up the number triplet, and so we have a space curve with a longer path, still contained within a spherical shell-like boundary.

Now, at last, I believe that there may be some gain by using PA methodology, since its incipient baggage is no longer disadvantageous.

EUCLIDEAN GEOMETRY (AS DELINEATED BY THE POSTULATES)

In the derivation of subatoms and atoms, we can reject totally all reference to complex numbers, and/or quaternions and their ilk, despite their mathematical beauty and frequent usage in many other areas of natural philosophy & the sciences. I opine that:-

1. Nehru completely overlooked the simplicity of Ockham's Razor.
2. Nehru contradicted his former thesis, that, when theorising on the three spatial dimensions, the three temporal dimensions must be paired off with them accordingly.

FURTHER POLEMIC COMMENT

Quaternions are well-known to have three spatial dimensions and one time dimension; one cannot use the quaternion algebra if one increases them to be '*sexternions*' so as to incorporate 3 temporal and 3 spatial dimensions; one would be '*swamped in the mire*' of a very messy new algebra. So, if quaternions are used, then only one dimension of time can be used, which '*flies in the face*' of Nehru et al, who seem to think that each spatial dimension must be paired off with a different temporal dimension; another cognitive dissonance, nicht wahr?

All the foregoing is predicated on the Larsonian interpretation of the number triplets for the atoms and subatoms representing constant rotations. (see Appendix)

POETIC LICENTIOUSNESS-5

THOUGHTS, INORDINATE, ON MATTERS, COORDINATE

DESCARTES was gracious in things large and spacious;

ARGAND was grand, '*the pick of the band*',

Yet with curvilinear familiar,

Your horizons expand.

POETIC LICENTIOUSNESS-6

MATHEMATICAL REFERENCE TO BE A PREFERENCE

Equations:- Polar, Cartesian and other
Aren't taught in the crib by everyone's Mother,
Yet this information
On space connotation
Is what many young students should '*rather*'.

POETIC LICENTIOUSNESS-7

MATHEMATICAL TRICKS, OR VICKS?? - SCALARS & VECTORS

-THE AFTERMATH OF A MISOMATH

SCALARS have size,
VECTORS, direction
This implies
Careful selection.

TENSORS are trying,
In 'scripts, super- and sub-,
There's no denying,
Yea, "*there's the rub*".

But everyone knows, fo'sure
That **QUATERNIONS** have closure.

Viva `QUATERNITY'
Until eternity.

MATHEMATISATION OF THE POSTULATES

So, the prominent initial aim for the mathematisation of the Larsonian postulates is to come up with a mathematical model for the definitive and incontrovertible vibrating space unit(s). Once we have that, we can achieve two spin-offs:- (pun intended)

Electromagnetic Waves and Matter (subatoms & atoms).

The definition of this vibrating space unit is that it travels at a constant speed, merely reversing its direction at each end of the path.

(See extract from Larson's book and my pertinent comments at end of this paper in the Bibliography.)

The vibration is the locus of the centre-point of a space unit. There is no point-mass involved, therefore no constraint on the point, such as one would find in SHM. Here we have constant speed and instantaneous direction reversal at each end of the path of vibration. Let us suppose that we give it a constant speed '1/u' in the positive Y direction.

Hence $dy/dt = 1/u$ where u is 1,2,3,4,... and $1/u$ represents a fraction of unit speed, which is the ratio of a space unit to a time unit and is the speed of light.

Hence $y = t/u$ is a simplistic description of the path of the vibration, but when one considers its bi-directionality and periodicity one must use a Fourier series to subsume all this.

Consider the path to be along the Y axis, and we place the centre of the vibrating space unit at the origin of the Cartesian axes at $t = 0$ and it travels half a space unit above the X axis and also below it, meaning the amplitude is half a space unit.

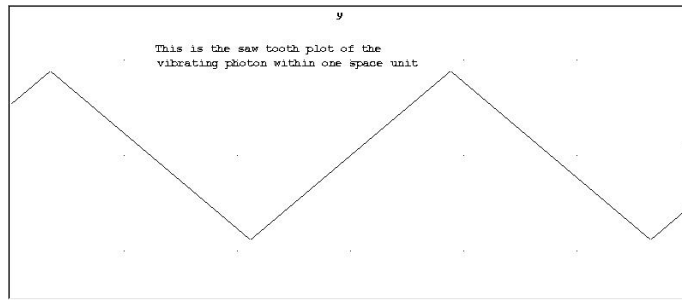
$$\frac{dy}{dt} = \pm \frac{1}{u} \therefore y = \pm \frac{t}{u}$$

The path, traced by the centre-point is along the Y axis to the point (0,a/2) then down to the point (0,-a/2). If, now, we translate this vibrating unit, (V.U.), along the positive direction, we have given it an X coordinate.

In order to create periodicity by having the centre-point travel to and fro along the Y axis, we have to resort to a Fourier Series and there are at least two suitable expressions, that serve this purpose.

$$\sum_{n=1}^{\infty} \left[\left(\frac{3 \cos \frac{3\pi n}{2}}{2\pi n} - \frac{\sin \frac{3\pi n}{2}}{\pi^2 n^2} - \frac{3 \cos \frac{\pi n}{2}}{2\pi n} + \frac{3 \sin \frac{\pi n}{2}}{\pi^2 n^2} \right) \cdot \sin n\pi t \right]$$

$$\text{or } \sum_{n=1}^{\infty} \frac{4 \cos [(2n - 1)\pi (t - \frac{1}{2})]}{(2n - 1)^2 \pi^2}$$



Electromagnetic Wave

It is sufficient to take $n = 100$ to see a 'good saw-tooth curve' when one plots y against t . It follows that in the case of the electromagnetic wave travelling at the speed of light ($u = 1$) along the X axis such that $x = t$ then the same saw-tooth curve represents the path of the light wave.

In the case of the photon, $u = 1$, then at time ' t ', the position of the centre-point is given by the pair of parametric equations:-

$$x = t$$

$$y = \sum_{n=1}^{\infty} \left[\left(\frac{3 \cos \frac{3\pi n}{2}}{2\pi n} - \frac{\sin \frac{3\pi n}{2}}{\pi^2 n^2} - \frac{3 \cos \frac{\pi n}{2}}{2\pi n} + \frac{3 \sin \frac{\pi n}{2}}{\pi^2 n^2} \right) \cdot \sin n\pi t \right]$$

$$\text{or } x = t, \quad y = \sum_{n=1}^{\infty} \frac{4 \cos [(2n - 1)\pi (t - \frac{1}{2})]}{(2n - 1)^2 \pi^2}$$

This is hardly astounding, but it paves the way for the new curves. As an overview, they are the projections onto the three coordinate planes, XY, YZ and ZX, of the three-dimensional space curve, generated by taking the V.U. above and placing its original vibration along the Y axis, as before, then rotating it, firstly, about the X axis to form the fundamental rotational base at a constant rotational speed of 1.