

RECIPROCITY

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MOTION: MERE ATTRIBUTE OF MATTER?

Ronald W. Satz's paper, FURTHER MATHEMATICS OF THE RECIPROCAL SYSTEM, is published in this issue. The study of it should considerably aid advocates of the Reciprocal System to communicate more lucidly the truth that the physical universe essentially is a universe of MOTION.

In the light of the Reciprocal System motion is no mere attribute of matter, as traditionally assumed. Instead, motion essentially is an equivalent and inverse relation between time and space. From this relation all physical entities are elected. They include the physical entities both of the material sector (things) and of the cosmic ("anti-matter") sector. Thus, all physical existences, such as radiation, electricity, material and cosmic entities, etc. are only so many forms of the one physical entity, motion. Therefore, according to the Reciprocal System, the orthodox distinction between substance (matter, atoms, elementary particles, quarks) and properties (motion, space-time continuum, extension, figure, photons, energy) should be radically modified and overturned. It is predicated on the flawed "truth" that the physical universe is a universe of matter and energy and generates the fallacy of reification (making a thing of nothing).

What the Satz paper does is translate the discursive language of the new unified physics of D. B. Larson into appropriate mathematical language. The translation, for example, beautifully discloses that photons are the precursors of matter. It resolves the wave-particle paradox concerning radiation. It facilitates answering questions such as what is a photon? what is electricity? what is matter? what is a neutrino? The new analysis reveals that while the electron, neutron and proton each exists, surprisingly they do NOT exist as CONSTITUENTS of the atoms of matter.

The Larsonian concept that motion (space-time) is the common denominator of both energy and matter is not altogether new. Thoughtful philosophers of science, including Thomas Hobbes, Rene Descartes, Samuel Alexander and Arthur Eddington, have sought in the past, however unsuccessfully, to vindicate this view. In modern times the dialectical materialists, although advocating the erroneous view that the physical universe is nothing but a universe of matter, acknowledge that its objective reality is as inseparable from motion as space is from time and from motion.

Even things, a popular name for matter, particularly in the solid phase, are nothing but motional combinations, as Satz shows for the chemical elements in the solid phase. This is, of course, why no thing lasts forever. Every thing comes out of the flux of the space-time progress, eventually returning to it. A solid element lasts a more or less finite time, because, as Satz shows, it is a stable equilibrium of the two most fundamental physical motional entities: the space-time progression and gravitational motion. The atoms of an elemental solid cohere, because the attractive space-time progression force opposes and cancels the repulsive gravitational force inside a natural discrete unit of space. Thus, solid cohesion is the product of a force balance or stable equilibrium, in which the net internal force on the atoms of the solid amounts to zero.

Nothing lasts except the cosmos, as Carl Sagan remarked on a recent Donahue show. He defines the cosmos as all that is, ever was and will be. The cosmos presumably includes the physical universe of motion. Whether the latter constitutes all that is may be questioned. Also, in affirming that the cosmos lasts, does Professor Sagan here contradict his advocacy of the hypothesis about the Big Bang? The hypothesis assumes that the cosmos too has lasted only a finite time without disclosing what, if anything, went before. He believes that the cosmos began some billions of years ago, 15-20 more or less. Others have guessed it to be 5 billion years old and some believe it to be only a few thousand years old. The proposition that the physical universe lasts forever, the whole staying the same, while perpetually moving in its various sectors, has not been refuted. The existence of a Big Bang, hypothetically originating the physical universe some finite time ago is not nearly so well proven as is the existence of a physical universe of motion. The existence of a Big Bang is unnecessary to explain the recession of the galaxies, according to the Reciprocal System, which accounts for the expanding universe in terms of a space-time progression scalar motion, which, always acting away from unity, behaves as a repulsive force outside unit space, and a gravitational scalar motion, which always acting toward unity, behaves as an attractive force outside unit space. "In addition to defining the physical universe as infinite, the Fundamental Postulates (of the Reciprocal System) also define it as changeless, when considered as a whole" (D.B. Larson, SPU, p. 133)

The Fundamental Postulates also explicitly express the definition of space and time as quantized. The assertion that space and time structure includes equivalent discrete units, of course, is quite incompatible with the space-time continuum postulate of the relativity theory of Einstein. The Satz paper supports the Fundamental Postulates of the Reciprocal System, splendidly translating them into the mathematics of the Reciprocal System.

The British mathematician, Edmund Whittaker, in his book, FROM EUCLID TO EDDINGTON, indicates the discovery that space and time, like matter and energy, possess discontinuities as well as continuity may not be new but quite old, tracing it back to Pythagoras. "He proposed to regard the 'point' of geometry as an indivisible unit of space, analogous to the unit of arithmetic, and differing from it only in possessing the attribute of location..... It was accompanied by a similar explanation regarding time, namely that time was a succession of individual instants..."

The Satz paper is a superb contribution to the mathematics of space-time or MOTION.

DR. FRANK ANDERSON, OXFORD, MISSISSIPPI,
TO PROFESSOR FRANK MEYER

Dear Frank:

Heartiest congratulations on your election as President of New Science Advocates for 1980-81. I am very pleased that you have been elected to head NSA for the coming year and am confident that our organization will make a great deal of progress under your direction.

It was good to see you and Winnie at the Huntsville Conference but I regret very much that there seemed to be no time when we might sit down to discuss the future of NSA, and especially plans for the next five years or so. I believe that I am correct in saying that Dewey Larson is now in his 82nd year and that he appears to be going strong although his hearing seems to have decreased appreciably during the past year. What do you think of the idea of dedicating our 1981 Conference to him? Dewey has received very little recognition for his tremendous accomplishments. Designating the Sixth Annual NSA Conference as the Dewey B. Larson Conference might be one way of getting him a bit of the recognition that I think he deserves and should have.

I appreciate the privilege I have had of serving as NSA president for the past three years. Frankly, I am disappointed that I was not able to do more to promote the welfare of NSA and hope that you will be able to accomplish more than I did. You have my best wishes for a very successful presidency. Please do not hesitate to call on me if there is ever any way in which I can be of service to you or NSA.

Sincerely,

Frank A. Anderson

FURTHER MATHEMATICS OF THE RECIPROCAL SYSTEM

by

Ronald W. Satz

This paper will present in the most concrete, explicit manner the mathematics of space-time, radiation, and matter of the Reciprocal System. Readers without special knowledge of the Reciprocal System, are first urged to study Larson's books, such as Nothing But Motion, before undertaking the study of this paper.

I. Mathematics of Space-Time

A. Rectangular Coordinates

Starting from any reference point x_0, y_0, z_0, t_0 in the 0-system, the space-time progression is a spherical expansion. In rectangular coordinates the equation is

$$(x - x_0)^2 + (y - y_0)^2 + (z - z_0)^2 = c^2 t^2 \quad (1)$$

where c is the speed of light. If we choose the reference point to be $x_0 = 0, y_0 = 0, z_0 = 0, t_0 = 0$, then the equation is simply

$$x^2 + y^2 + z^2 = c^2 t^2$$

Now consider a second system, the 0'-system, moving translationally with respect to the 0-system in the x-direction. What is the equation for the progression in the 0'-system? From the inverse Lorentz transformations,

$$x^2 = \frac{[x' + vt']^2}{\left[\sqrt{1 - (v^2/c^2)}\right]^2} = \frac{1}{1 - (v^2/c^2)} (x'^2 + v^2 t'^2 + 2v x' t') \quad (2)$$

$$t^2 = \frac{[t' + (v/c^2) x']^2}{\left[\sqrt{1 - (v^2/c^2)}\right]^2} = \frac{1}{1 - (v^2/c^2)} \left(\frac{v^2}{c^4} x'^2 + t'^2 + \frac{2v}{c^2} x' t'\right) \quad (3)$$

$$y^2 = y'^2 \quad (4)$$

$$z^2 = z'^2 \quad (5)$$

Upon substitution, we obtain

$$x^2 + y^2 + z^2 - c^2 t^2 = x'^2 + y'^2 + z'^2 - c^2 t'^2 \quad (6)$$

But since the left side of the equation equals zero, so must the right side:

$$x'^2 + y'^2 + z'^2 = c^2 t'^2 \quad (7)$$

Thus the progression as determined by O' is also spherical. And so the equation for the progression is invariant under a Lorentz transformation.

B. Polar Coordinates

In polar coordinates the equation is simply

$$r - r_0 = c(t - t_0) \quad (8)$$

Or, letting $r_0 = 0$, $t_0 = 0$,

$$\frac{r}{t} = c \quad (9)$$

In the Reciprocal System the speed of light is the natural unit of velocity and so r and t must take equal natural values. The space-time progression is thus 1/1, 2/2, 3/3, etc. Thus one unit of space is equivalent to one unit of time. If there are an infinite number of space units, there must be an infinite number of time units; if there are a finite number of space units, there must be a finite number of time units.

II. Mathematics of Radiation

In the Reciprocal System radiation is the combined motion of a simple harmonic oscillation in one dimension and a uniform translation in a perpendicular direction.

A. Simple Harmonic Oscillation

The equation for a simple harmonic oscillation in one dimension (say the y direction) is

$$y = A \cdot \text{SIN} (-2\pi f_{os} t) \quad (10)$$

where A is the amplitude and f_{os} is the frequency. Since the oscillation takes place over one natural space unit, the amplitude must be one-half a natural space unit and thus is

$$A = .5 \cdot S_{nat} = .5 \times 4.558816 \times 10^{-8} \text{ m} = 2.279408 \times 10^{-8} \text{ m} \quad (11)$$

for all photons. In observation from the time-space region this value is reduced by the interregional ratio 156.4444 to $1.457 \times 10^{-10} \text{ m} = 1.457 \text{ \AA}$.

The other variable to be determined in eq. (10) is the frequency, f_{os} . In one cycle the oscillation travels one space unit up and one space unit down, for a total of two units. The average velocity of the oscillation is then

$$\bar{v}_{os} = \frac{2*s_{nat}}{cycle} * f_{os} \frac{cycles}{sec} \quad (12)$$

The natural unit of frequency must occur when the average velocity is c .

$$\bar{v} = c = 2*s_{nat} * f_{os nat} \quad (13)$$

But $c = s_{nat}/t_{nat}$, so $s_{nat}/t_{nat} = 2*s_{nat} * f_{os nat}$

Solving for $f_{os nat}$ we have

$$f_{os nat} = \frac{1}{2*t_{nat}} = \frac{1}{2*1.520655*10^{-16} sec} = 3.2880575 * 10^{15} \frac{cycles}{sec} \quad (14)$$

the Rydberg frequency, R (Actually Larson derived the natural unit of time from the Rydberg frequency but I think it was instructive to do the reverse, and this method will be used to calculate rotational and vibrational frequencies as well. (Of course, this method assumes that the natural unit of time can be found by some other means.) Because of the discrete nature of the Reciprocal System, it is only possible to have integer multiples or reciprocal integer multiples of the Rydberg frequency.)

Putting the values of A and f_{os} in eq. (10) we have

$$y = 1.457 * \sin(-2\pi_n * 3.2880575 * 10^{15} * t) \text{ \AA} \quad (15)$$

where

$$n = 1, 2, 3, \dots \text{ or}$$

$$n = 1/2, 1/3, 1/4, \dots \quad (16)$$

B. Perpendicular Translation

Perpendicular to the oscillation is a translation at unit velocity (the speed of light). Let x be perpendicular to y . Then

$$x = c * t \quad (17)$$

C. Combined Motion

From eq. (17) t can be found in terms of x and c and put in eq. (15). The result is

$$y = 1.457 * \text{SIN} (-2\pi * 3.2880575 * 10^{15} / 2.997930 * 10^8)$$

or

$$y = 1.457 * \text{SIN} (-6.8912465 * 10^7 * nx) \overset{\circ}{\text{A}} \quad (18)$$

if x is given in meters. This is the equation for a monochromatic wave of radiation in the Reciprocal System.

III. Mathematics of Matter

Particles of matter consist of rotating photons. Subatoms have one rotating photon; atoms have two rotating photons (both photons rotate about the same central point). The rotational motion has a translational effect, which will be discussed after the mathematics of the rotation has been worked out.

A. Rotation

1. single systems--particles

A photon can rotate around either of two horizontal axes passing through its midpoint, and also around itself. In the Reciprocal System the true physical zero is motion at unit speed. Anything physical must have a motion either greater than or less than unit speed. This deviation is called a speed displacement by Larson. The first particle has 1 speed displacement around one horizontal axis of the photon and is called the rotational base. Actually there are two rotational bases: one with one speed displacement above unity, the other with one speed displacement below unity. As will be discussed later, the one displacement unit neutralizes the translational motion of the photon in the original dimension, but the progression now continues in the remaining dimension, so the effective displacement is zero. In the ground state condition, the photon that is being rotated is one vibrational displacement away from unity (either $2R$ or $1/2R$). Here is a table giving the photon frequency, the rotational displacement, the effective rotational displacement, and rotational speed of the cosmic rotational base and the material rotational base:

	<u>Photon Freq.</u>	<u>Rot. Displ.</u>	<u>Eff. Rot. Displ.</u>	<u>Rot. Speed</u>
C-ROT. BASE	1/2 R	(1)-0-0	0-0-0	2-1-1
M-ROT. BASE	2 R	1-0-0	0-0-0	1/2-1-1

In the above table the speeds are calculated from the displacements as follows. For displacements of n_p , n_s , and n_E , the speeds are (n_p+1) , (n_s+1) , and (n_E+1) for a cosmic particle, and $(1/(n_p+1))$, $(1/(n_s+1))$, and $(1/(n_E+1))$ for a material particle. (Of course material particles could have high speed electric displacement, and cosmic particles could have low speed electric displacement).

These speeds can be converted to conventional units, such as revolutions per second, as follows. In one rotation of a photon about a horizontal axis the tip of the photon covers a distance of $\pi * s_{nat}$, a circumference. The speed of the rotation is then

$$v_{rot} = \frac{\pi * s_{nat}}{rev} * f_{rot} \frac{rev}{sec} \quad (19)$$

The natural frequency of rotation must occur when the speed is c .

$$c = \pi * s_{nat} * f_{rot nat}$$

But $c = s_{nat}/t_{nat}$, so solving for $f_{rot nat}$ I get

$$f_{rot nat} = \frac{1}{\pi t_{nat}}$$

But $t_{nat} = 1/2R$ so

$$f_{rot nat} = \frac{2R}{\pi} \quad (20)$$

where R is the Rydberg frequency, as before. In these terms, then, the cosmic rotational base is a photon that has a vibrational oscillation of 1.6440288×10^{15} cycles/sec and is rotating at 4.1864848×10^{15} revolutions/sec around one axis, and 2.0932424×10^{15} revolutions/sec around the other two axes. Likewise, the material rotational base is a photon that has a vibrational oscillation of 6.576115×10^{15} cycles/sec and is rotating at 1.0466212×10^{15} revolutions/sec around one axis, and 2.093242×10^{15} revolutions/sec around the other two axes.

All the other particles have photon vibrational frequencies, rotational displacements, effective rotational displacements, rotational speeds, and rotational frequencies. Here is a complete tabulation:

	<u>Photon Freq.</u>	<u>Rot. Displ.</u>	<u>Eff. Rot. Displ.</u>	<u>Rot. Speed</u>	<u>Rot. Freq.</u>
M-positron	2R	1-0-1	0-0-1	1/2-1-1/2	$\frac{R}{\pi} - \frac{2R}{\pi} - \frac{R}{\pi}$
C-positron	1/2R	(1)-0-(1)	0-0-(1)	2-1-2	$\frac{4R}{\pi} - \frac{2R}{\pi} - \frac{4R}{\pi}$
M-electron	2R	1-0-(1)	0-0-(1)	1/2-1-2	$\frac{R}{\pi} - \frac{2R}{\pi} - \frac{4R}{\pi}$
C-electron	1/2R	(1)-0-1	0-0-1	2-1-1/2	$\frac{4R}{\pi} - \frac{2R}{\pi} - \frac{R}{\pi}$
M-massless neutron	2R	1-1-0	1/2-1/2-0	1/2-1/2-1	$\frac{R}{\pi} - \frac{R}{\pi} - \frac{2R}{\pi}$
C-massless neutron	1/2R	(1)-(1)-0	(1/2)-(1/2)-0	2-2-1	$\frac{4R}{\pi} - \frac{4R}{\pi} - \frac{2R}{\pi}$
M-neutrino	2R	1-1-(1)	1/2-1/2-(1)	1/2-1/2-2	$\frac{R}{\pi} - \frac{R}{\pi} - \frac{4R}{\pi}$
C-neutrino	1/2R	(1)-(1)-1	(1/2)-(1/2)-1	2-2-1/2	$\frac{4R}{\pi} - \frac{4R}{\pi} - \frac{R}{\pi}$

Many more permutations appear to be possible, but the probability principles keep eccentricity to a minimum. Since none of the above particles has an effective displacement of 1 or more, they are all massless (aside from the mass contribution of an electric charge). The diameter of all the particles is one natural space unit, reduced by the interregional ratio, or 2.914 A. Of course since these particles don't exert any force (in the uncharged state), a particle measuring probe would be unable to detect any size of these particles at all.

2. Intermediate systems

Intermediate particles have two rotating photons, but one of the two sets has no effective displacement and thus contributes no primary mass. The two intermediate particles are the neutron and the mass one hydrogen isotope (and their cosmic analogs). There are only two kinds of rotations that can combine to form this kind of particle, the proton type and the neutrino type. We identify the combination of the material proton rotation and the material neutrino rotation as the mass one hydrogen atom; the combination of the material proton rotation and the cosmic neutrino rotation as the neutron; the combination of the cosmic proton rotation and the cosmic neutrino rotation as the mass one atom of cosmic hydrogen; and the combination of the cosmic proton rotation and the material neutrino rotation as the cosmic neutron. The proton is a single system with displacements 2-1-(1), effective displacements 1-1-(1), speeds 1/3-1/2-2, and rotational frequencies $\frac{2R}{3\pi} - \frac{R}{\pi} - \frac{4R}{\pi}$. Then we would have the following table for the neutron and hydrogen one.

	<u>Photon Freq.</u>	<u>Rot. Displ.</u>	<u>Eff. Rot. Displ.</u>	<u>Rot. Speed</u>	<u>Rot. Freq.</u>
Neutron	{ 2R 1/2 R	2-1-(1)	1-1-(1)	1/3-1/2-2	$\frac{2R}{3\pi} - \frac{R}{\pi} - \frac{4R}{\pi}$
		(1)-(1)-1	(1/2)-(1/2)-1	2-2-1/2	$\frac{4R}{\pi} - \frac{4R}{\pi} - \frac{R}{\pi}$
H ¹	{ 2R 2R	2-1 \ (1)	1-1 \ (1)	1/3-1/2 \ 2	$\frac{2R}{3\pi} - \frac{R}{\pi} \ \frac{4R}{\pi}$
		1-1 /	1/2-1/2 /	1/2-1/2 /	$\frac{R}{\pi} - \frac{R}{\pi} \ /$

The new notation makes clear the two photons involved and the five rotations (to be further discussed next).

3. atomic systems

Atoms have two rotating photons, but here both systems have effective displacements and both systems ordinarily have the same velocities. Let the first photon be called A and the second be called B. A and B are mutually perpendicular. We have the following 5 rotations: the rotation of A about B produces disk a; the rotation of B about A produces disk b; then disk a can be rotated about A; and disk b can be rotated about B; finally the whole structure can be rotated in the electric dimension (this last rotation is in the scalar direction opposite to that of the previous rotation). Cosmic atoms have speeds above unity for the first four types of rotations, whereas material atoms have speeds below unity for the first four types. The electric rotation may be above or below unity for both cosmic and material atoms.

The first particle with two effective rotating systems is deuterium, the second is helium, etc. A table similar to that for the intermediate particles can be made.

	<u>Photon Freq.</u>	<u>Rot. Displ.</u>	<u>Rot. Speed</u>	<u>Rot. Freq.</u>
Deuterium	{ 2R 2R	2-1 \ (1)	1/3-1/2 \ 2	$\frac{2R}{3\pi} - \frac{R}{\pi} \ \frac{4R}{\pi}$
		2-1 /	1/3-1/2 /	$\frac{2R}{3\pi} - \frac{R}{\pi} \ /$
Helium ⋮	{ 2R 2R	2-1 \ 0	1/3-1/2 \ 1	$\frac{2R}{3\pi} - \frac{R}{\pi} \ \frac{2R}{\pi}$
		2-1 /	1/3-1/2 /	$\frac{2R}{3\pi} - \frac{R}{\pi} \ /$

All other atoms can be given appropriate values in the same manner. In the solid state, however, the values that govern the physical properties are not the actual rotations, but the relative rotations, and the different values there are not due to inherent differences in the rotational speeds, but to differences in the orientations of the interacting atoms, and this will be discussed further later.

4. electric charges and magnetic charges

According to the Reciprocal System an electric charge is a rotational vibration about the electric axis, and the magnetic charge is a rotational vibration about one of the magnetic axes. Both charges have the same natural frequency, calculated as follows. In one cycle the motion covers a distance of $\pi * s_{nat}$ one way and $\pi * s_{nat}$ back, for a total of $2\pi * s_{nat}$. So we have

$$\bar{v}_{ch} = \frac{2\pi * s_{nat}}{\text{cycle}} * f_{ch} \frac{\text{cycles}}{\text{sec}} \quad (21)$$

At the unit level, $v_{ch} = c = s_{nat}/t_{nat}$, so

$$\frac{s_{nat}}{t_{nat}} = \frac{2\pi * s_{nat}}{\text{cycle}} * f_{ch \text{ nat}} \quad (22)$$

Solving for $f_{ch \text{ nat}}$ and recalling that $t_{nat} = 1/2R$,

$$f_{ch \text{ nat}} = \frac{R}{\pi} \quad (23)$$

This frequency is one-half that of a full rotation and can thus be considered to be effective in one direction only half the time. One negative electric charge is a rotational vibration of $R/2\pi = 5.233106 \times 10^{14}$ cycles/sec. One positive electric charge is a rotational vibration of $2R/\pi = 2.093242 \times 10^{15}$ cycles/sec. Similarly one unit of magnetic charge is a rotational vibration of $2R/\pi = 2.093242 \times 10^{15}$ cycles/sec, whereas one unit of isotopic charge is a rotational vibration of $R/2\pi = 5.233106 \times 10^{14}$ cycles/sec.

The isotopes of atoms result from the addition of isotopic charges.

B. Translation

The rotational motion of particles has a translational effect. The maximum inward translation is two full units, giving one net inward unit.

In terms of rotation we can have $2^3 = 8$ one-dimensional rotational electric displacements or 4 two-dimensional rotational magnetic displacements. Note that since $1^3 = 1$, the first magnetic rotational displacement, which is $1/2$ unit rotational speed, produces one unit of inward translation and thus neutralizes the original translational motion of the photon, but the progression still continues in the third dimension. Thus the rotational base and all the single system massless particles previously discussed move at the speed of light. Additional magnetic and electric displacements produces a net inward motion, and the inward motion of a group of atoms is termed gravitation.

For atoms with magnetic displacements of less than 4 and electric displacements of less than 8, the frequency of the rotating photons is normally one displacement above unity, or $2R$ (the frequency of photons in cosmic atoms is $1/2R$). When the magnetic displacement reaches 4 or the electric displacement reaches 8, the rotation must be extended to a second vibrational displacement unit--which means that the frequencies of the photons are now $3R$ (or $1/3 R$ for cosmic atoms). As Larson points out, though, it is possible to have these higher frequency photons even when the rotational displacements are less than 4 or 8, in which case we can say that the atom is "excited".

After the change to vibration two, two units of vibrational displacement exist to be rotated, and so each added unit of rotational displacement corresponds to only one-half unit of added specific speed. Thus the speeds corresponding to magnetic displacements can be listed as follows:

Mag. Displ.:	1	2	3		4	5	
Mag. Speeds:	$1/2$	$1/3$	$1/4$		$2/9$	$1/5$	or
	$1/2$		$2/5$	$1/3$	$2/7$	$1/4$	or
	$1/2$	$1/3$	$1/4$	$1/5$		-	in one displacement axis only

And the speeds corresponding to electric displacements can be listed as follows:

Displ.	1	2	3	4	5	6	7		8	9	10	11	12	13	14	15	16
Speeds	$1/2$	$1/3$	$1/4$	$1/5$	$1/6$	$1/7$	$1/8$		$2/17$	$1/9$	$2/19$	$1/10$	$2/21$	$1/11$	$2/23$	$1/12$	$2/25$
	$1/2$		$2/5$	$1/3$	$2/7$	$1/4$	$2/9$	$1/5$	$2/11$	$1/6$	$2/13$	$1/7$	$2/15$	$1/8$	$2/17$	$1/9$	$2/19$

In the solid state, the values for electric rotation can be further altered. Larson states that a combination of one atom with electric displacement x with another atom of electric displacement $8-x$ results in a neutral bond.

This bond gives rise to an electric speed of 1/10 for vibration one, and 1/5 for vibration two. Also there can be a combination of two 8-x atoms, which Larson calls a secondary positive bond. In this case the rotational speed comes to 1/(18-2x).

One final set of complications involves the lower group elements. Here there is just one subordinate magnetic displacement unit and thus these elements have less rotational force and thus are closer together in the solid state. The force is proportional to $\ln t$, where t is the inverse of the magnetic speed, and since $\ln 2$ is less than 1, atoms that have magnetic speed greater than 1/3 in any dimension have no effective force in that dimension. Note that the electric speeds given in the following Table:

LOWER GROUP ATOMIC TABLE IN SOLID STATE

<u>At. No.</u>	<u>El.</u>	<u>Os. Freq.</u>	<u>Rot. Displ.</u>	<u>Bond</u>	<u>Rot. Sp.</u>	<u>Rot. Freq.</u>	<u>Active Di</u>
1	H	{ 2R 2R	2-1 2-1 (1)	Neutral	1/3 - 1/2 1/3 - 1/2 1/10	$\frac{2R}{3\pi} - \frac{R}{\pi}$ $\frac{2R}{3\pi} - \frac{R}{\pi} \frac{R}{5\pi}$	1
2	He	{ 2R 2R	2-1 0 2-1	Zero	1/3 - 1/2 1 1/3 - 1/2	$\frac{2R}{3\pi} - \frac{R}{\pi}$ $\frac{2R}{3\pi} - \frac{R}{\pi} \frac{2R}{\pi}$	1
3	L1	{ 3R 3R	2-1 1 2-1	Pos.	2/5 - 2/5 1/2 2/5 - 2/5	$\frac{4R}{5\pi} - \frac{4R}{5\pi}$ $\frac{4R}{5\pi} - \frac{4R}{5\pi} \frac{R}{\pi}$	2
4	Be	{ 3R 3R	2-1 2 2-1	Pos.	1/3 - 1/2 2/5 1/3 - 1/2	$\frac{2R}{3\pi} - \frac{R}{\pi} \frac{4R}{5\pi}$ $\frac{2R}{3\pi} - \frac{R}{\pi}$	2
5	B	{ 3R 3R	2-1 3 2-1	Neutral	1/3 - 1/2 1/5 1/3 - 1/2	$\frac{2R}{3\pi} - \frac{R}{\pi} \frac{2R}{5\pi}$ $\frac{2R}{3\pi} - \frac{R}{\pi}$	2
or	B	{ 2R 2R	2-2 (5) 2-2	Neutral	1/3 - 1/3 1/10 1/3 - 1/3	$\frac{2R}{3\pi} - \frac{2R}{3\pi} \frac{R}{5\pi}$ $\frac{2R}{3\pi} - \frac{2R}{3\pi}$	3

LOWER GROUP ATOMIC TABLE IN SOLID STATE

<u>No.</u>	<u>El.</u>	<u>Os. Freq.</u>	<u>Rot. Displ.</u>	<u>Bond</u>	<u>Rot. Sp.</u>	<u>Rot. Freq.</u>	<u>Active Dim.</u>
5	C	{ 2R 2R	2-1 2-1	Neutral	1/3-1/2 1/3-1/2	$\frac{2R}{3\pi} - \frac{R}{\pi}$ $\frac{2R}{3\pi} - \frac{R}{\pi}$	2
			4		1/10	$\frac{R}{5\pi}$	
or	C	{ 2R 2R	2-2 2-2	Zero	1/3-1/3 1/3-1/3	$\frac{2R}{3\pi} - \frac{2R}{3\pi}$ $\frac{2R}{3\pi} - \frac{2R}{3\pi}$	3
			(4)		1	$\frac{2R}{\pi}$	
	N	{ 2R 2R	2-2 2-2	Neutral	1/3-1/3 1/3-1/3	$\frac{2R}{3\pi} - \frac{2R}{3\pi}$ $\frac{2R}{3\pi} - \frac{2R}{3\pi}$	1 1/2
			(3)		1/10	$\frac{R}{5\pi}$	
or	N	{ 2R 2R	2-2 2-2	Zero	1/3-1/3 1/3-1/3	$\frac{2R}{3\pi} - \frac{2R}{3\pi}$ $\frac{2R}{3\pi} - \frac{2R}{3\pi}$	3
			(3)		1	$\frac{2R}{\pi}$	
	O	{ 2R 2R	2-2 2-2	Neutral	1/3-1/3 1/3-1/3	$\frac{2R}{3\pi} - \frac{2R}{3\pi}$ $\frac{2R}{3\pi} - \frac{2R}{3\pi}$	1 1/2
			(2)		1/10	$\frac{R}{5\pi}$	
or	O	{ 2R 2R	2-2 2-2	Zero	1/3-1/3 1/3-1/3	$\frac{2R}{3\pi} - \frac{2R}{3\pi}$ $\frac{2R}{3\pi} - \frac{2R}{3\pi}$	3
			(2)		1	$\frac{2R}{\pi}$	
	F	{ 2R 2R	2-2 2-2	Neutral	1/3-1/3 1/3-1/3	$\frac{2R}{3\pi} - \frac{2R}{3\pi}$ $\frac{2R}{3\pi} - \frac{2R}{3\pi}$	2
			(1)		1/10	$\frac{R}{5\pi}$	

The reader can continue the table all the way to element 118. Again, one must first determine the kind of bond involved before the electric rotational speed can be determined.

Since different atoms have different rotational speeds and thus different rotational forces, a particle probe of equal energy shot at atoms of different elements would "penetrate" to different depths. Thus experimenters have concluded that "nuclear" size is proportional to atomic weight. Actually what they are measuring is atomic size, and according to the Reciprocal System this is constant (2.914 Å diameter)--but the force is proportional to the atomic weight of the atom. Also, where

Interatomic distances are less than 2.914 \AA , the atoms are partially merged; where the distances are greater than 2.914 \AA , the atoms are separate.

Surely this paper must be the most explicit, concrete formulation of the nature of space-time, radiation, and matter ever presented. Compared with the Reciprocal System, all other theories belong to the mystical dark ages.

Reference: 1. Dewey B. Larson, Nothing But Motion (Portland, Oregon: North Pacific Publishers, 1979).

LETTER TO THE EDITOR

December 7, 1979

Dear Prof. Meyer,

Hope my earlier letter dated 23rd Oct. 79 reached you. But we have not yet received the Bills for the \$23.18 we have to pay for the two books you sent for our Library. Kindly take the trouble to send them at your earliest to enable us to remit the dollars. Hope you are also sending us the copy of 'Quasars & Pulsars' as well as the Satz pamphlet on 'The Unmysterious Universe.' (Kindly enclose the Bills for those items also when you mail them.)

I have come to study 'The New Light on Space and Time' first time in March 79. Though the duration available to me to reorient the lines of my personal mind is short, it is sufficient to make me see the Reciprocal System's extraordinary truth. In the enclosed MSS I have set down some thoughts that occur to me. Please find time to clarify the points. Also can you inform if I can interact with any person here in India so that communications do not get so much time-lagged (as it is the case with the foreign mail), regarding any discussions on the Reciprocal System?

I am really interested and would like to know whatever that would help me understand and disseminate the understanding of the Theory. Please keep me informed of any relevant material the NSA keeps developing toward this end. May I know the activities of the NSA Inc.? If possible please send us a copy of RECIPROCITY. You may use any of the points of discussion in the enclosed MSS for publication in RECIPROCITY if you feel it helps.

Awaiting your reply.

With Warm Greetings,

K. V. K. Nehru, M.E., Ph.D.
Assistant Professor
Department of Mechanical Engineering
Officer in-charge, Library

LETTER TO EDITOR

Dear Frank,

First - CONGRATULATIONS on your new office with NSA!

And second, please keep New Science Advocates as a name intact!

There are several reasons why a change to "Unified Science Anything" would be detrimental to the organization.

First: the scope it implies is unnecessarily broad and overly ambitious.

For example, everyone would naturally ask if all the sciences were included? If not, they'd rightly wonder why their favorite had been left out. To many, the idea of "unified" science actually means science unified with areas outside it as well, e.g. religious and philosophical systems.

We would continually be pressed to explain why Larson omitted this or that from his "unified" science.

Many philosophers, notably von Bertalarfy (General System Theory, Braziler, N.Y., 1968) have clearly and convincingly argued that it is not possible nor desirable to achieve unity in sciences via reductionism.

"A unitary conception of the world may be based, not upon the possibly futile and far fetched hope to reduce all levels of reality to the levels of physics, but rather on the isomorphy of laws in different fields . . . The world is, as Aldous Huxley once put it, like a Neapolitan ice cream cake . . . We cannot reduce strawberry to chocolate . . . The unifying principle is that we find organization at all levels." (von Bertalarfy, 1968, pp. 48, 49)

Rather than get involved in this can of worms, we are best advised to use a name more descriptive of the writings of Larson. Another important aspect of the proposed name change:

The term "unified science" has developed an undeserved negative connotation. Thanks to Rev. Sun Myung Moon and his "Unification Church." Are you familiar with this, Frank? They're popularly known as the "Moonies." The Rev. has sponsored conferences on subjects like "Unification of Science" in New York and San Francisco - to name two. Professors from local universities have been invited, only to discover to their chagrin, that they are participating in a forum which is not objective in its orientation. Of course, I realize Moon's abuse of the concept of "unified science" has discredited only himself, and not the concept.

However, my point is simply that, as a result, the term raises associations which are negative in the minds of many - exactly the opposite of what we need!

The term "new science" on the other hand conveys to the newcomer as well as the old timer exactly what the RS is. It evokes the natural questions:

1. "What is the 'new science'?" and
2. "What is new about it?"

To "1": I'd answer: it's a new science of matter and energy including physics, chemistry, and astronomy based on a new theory of the physical universe in which space and time are theorized to be reciprocally related.

To "2": It's new in the sense that it is based on a new theory of the physical universe as discussed above. (How do you rate these answers Frank?)

And Frank, please tell me what you would answer to these questions if asked by a non-scientist, and how you'd answer if asked by a scientist?

Thanks for the articles. After I obtain the rest of the Asimov review and the letters section here, I'll comment.

I'm very glad to hear you are still open to switching the conference site. I have informally determined that the main auditorium at State (seating 1,000 about) is still available for reservations for August 81. It is a well-appointed hall with an arching, modern looking proscenium. This is the same hall in which the well-attended Centennial Einstein lecture series was held in late summer 79. It would make an ideal location for a meeting dedicated to Larson. There are conference room facilities available at the Student Union - just a few hundred feet away - and a large room suitable for a reception.

San Francisco, as you know, is just 500 miles north of LA - an hour's flight by PSA, our popular "commuter" type airline. People "love" San Francisco - they merely "put up" with LA - perhaps a generalization but not unduly so.

Dave W. Chance
San Francisco

PREDICTION. The Reciprocal System makes unnecessary and will replace much of nuclear physics, relativity theory, elementary particle theory, the gravitational collapse theory of astronomical compact bodies, quantum and wave mechanics.

Minutes of the Business Meeting of the
Fifth Annual Convention of the New Science Advocates
Saturday, August 23, 1980
University of Alabama at Huntsville

The business meeting of the New Science Advocates was called to order at 2:07 p.m. by Frank Anderson, president. Thirteen members were present.

1. The minutes of the Fourth Annual Convention, held at the University of Wisconsin at Superior, were read and approved.
2. The treasurer's report was then presented by Rainer Huck. Starting with a balance of \$1129.24 at the end of the last fiscal year, we had an income of \$891.14 and expenses of \$427.30 this year, so that the current balance is \$1593.08.
3. Frank Meyer reported on Reciprocity. He said that 1000 copies of Vol. X, No. 1 and 1500 copies of Vol. X, No. 2 have been circulated. With a 250% increase in printing expense, it now costs \$500 to print and to send out 1000 copies.
4. The president asked if there was any Old Business.
 - a. Rainer Huck stated that officers of NSA and members who presented papers could deduct the costs of their attending an NSA convention on their tax forms.
 - b. Since A. Studtmann and Flo Castner were not present, there was no report from the By-Law Committee. However, Rainer Huck moved that the board consider amending section 9d as follows: In the election of directors at the Annual Meeting of NSA, nominations from the floor shall be allowed. The motion was seconded by Frank Meyer and then it was passed.
5. The president then asked for New Business.
 - a. Satz, Wuenscher, Porter, Meyer, Berline, and Blackburn all had some say in formulating the motions to add standardized forms to Reciprocity, including the following:
 - 1) form for change of mailing address
 - 2) form for membership dues payment or subscription payment at end of fiscal year
 - 3) form for invitation of papers for Reciprocity and for the Annual Meeting
 - 4) form for all publications available
 All motions carried. These forms are hereafter to be included in each issue of Reciprocity.
 - b. In other new business, Porter and Wuenscher stated that NSA should make available for sale audio cassettes of Mr. Larson's talks if Mr. Larson concurs.
6. Next, elections of board members and officers were held. Porter moved and Huck seconded the motion by the By-Laws be suspended so that nominations from the floor could be made. The motion carried.

- a. Anderson, Huck, Satz, and Studtmann have two years remaining, and Brown, Mitchell, Long, Windolph, and Wuenscher have one year remaining on the board. Newly elected board members for three year terms were Porter, Halprin, Blackburn, Elkin, and Berline. (Each of the five had a majority of the votes cast, each member present casting five votes.)
 - b. Meyer and Studtmann were nominated for president, and Meyer was elected.
 - c. Studtmann, Wuenscher, and Blackburn were nominated for vice-president, and Wuenscher was elected.
 - d. Satz won reelection for secretary by acclaim, as did Huck for treasurer.
7. After discussion, members decided to present to the board two possible locations for next year's convention: Los Angeles, California, or Wichita, Kansas. Meyer will check to see if the time of the meeting can be moved up one week so that more members can attend.
 8. The meeting was adjourned at 5:34 p.m. so that the new president, Frank Meyer, could set up two committees.
 9. At 5:35 p.m. Frank Meyer called a short, second business meeting to order. He appointed Gilroy, Satz, and Elkin (chairman) to the Reciprocity Committee; he appointed Huck, Berline, and Porter (chairman) to the Name Change Committee. The meeting was adjourned at 5:44 p.m.

JOIN NSA

STUDY THE RECIPROCAL SYSTEM

Where something is found, there look again. The Reciprocal System already has provided the premises for finding straightforward answers to enough outstanding hitherto unanswered questions of physics and allied natural science. This is why we advocates think the Reciprocal System is the rational kernel, created by Dewey B. Larson and Ronald W. Satz, of unified physics that Albert Einstein and others were diligently seeking unsuccessfully. This is why we invite you, students of physics, astrophysics and the cosmos, to join the NSA to be among the pioneers having your own hard look at the Reciprocal System. You join NSA by applying and remitting \$10 annual dues to NSA Treasurer, Dr. Rainer Huck, address on RECIPROCITY masthead, for which you receive information about our continuing investigation of the Reciprocal System, including a year's subscription to RECIPROCITY. We invite you to read and study in particular the publications of D. B. Larson, R. W. Satz, Dr. Arnold Studtman, etc. about the Reciprocal System. If you seek truth, then inquire. For further information write to one of NSA officers whose address in on the RECIPROCITY masthead.

Frank H. Meyer
 Editor, RECIPROCITY