Dewey B. Larson died May 25, 1990 in Portland, Oregon. Dewey B. Larson will continue to live in ISUS, Inc. so long as it takes us to convince the human species that his search for truth about the structure of the physical universe as a whole and in all its parts achieved its purpose as early as 1959 A.D.

Our leader and dear friend introduced two new concepts into physical science, the concept of physical location and the concept of scalar motion.

With the aid of these and previously established concepts, including his faith that the universe is rational, D. B. Larson also has been able to explain that the cause of the expansion of the universe assumed by the astronomers is the steady outward progression of three-dimensional space with three-dimensional progression of time rather than a "Big Bang."

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Reciprocity

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How Accurate Can An Incorrect Theory Be?

I was surprised to find a letter in the November, 1989 issue of Physics Today. It was the lead letter in the Letters column and was titled “Copernicus, Ptolemy, and Particle Theory”. It was written by Martin Machacek from the Institute of Astronomy in Ondrejov, Czechoslovakia. The letter begins,

“The following text pretends to be written by a second-century Alexandrian astronomer. But it is not.

“The standard model of planetary motions -- the epicycle theory -- has enjoyed an enormous amount of success. Indeed, it appears to be consistent with all established astronomical observations. This being the case, the first question one should ask is why one should even be looking for something better. Most criticisms of the standard model are based on the fact that it requires a number of arbitrary choices and fine-tuning adjustments of parameters. These features do not prove that it is wrong or even incomplete. However, given the history of successes in mathematical astronomy, it is natural to seek a deeper underlying theory that can account for many of the arbitrary choices of parameters. These include the choice of equans, the number of epicycle generations, and the specific values of various parameters.’

“In fact, this is the second paragraph of a recent essay by a particle physicist, in which I substituted the italicized passages for ‘electroweak and strong forces,’ ‘particle physics experiments,’ ‘elementary-particle physics,’ and ‘gauge groups and representations, the number of families of quarks and leptons, the origins of the Higgs symmetry-breaking mechanism’, respectively.”

Machacek goes on to discuss how Ptolemy’s epicycle theory was a great success in reproducing and predicting the results of observations. In fact as data became more accurate, it was only necessary to postulate an additional epicycle to bring the theory in line with observations. The problem with the epicycle theory was not the accuracy of the theory, but in fact that it would have been impossible for Newton and Kepler to have formulated their fundamental laws of motion based on Ptolemy’s theory. In other words, the accuracy and long years of acceptance of his theory actually stood in the way of progress towards discovering the more fundamental laws of the physical universe.

In light of this, Machacek then looks at the standard model of modern physics and finds a theory that is extremely accurate in certain areas, but one that is also extremely complex and contains a great number of necessary ad hoc parameters. He concludes,

“The point I want to make is that more experiments with lots of accurate data do not necessarily mean progress in physics. They could, instead, perpetuate old theories, just refining their free parameters and adding new generations of something new and then. This danger is even greater today, when the data are screened by computers; these are looking for what we want to find and tend to mask the rest.”

Actually, the correlation between modern physics, especially quantum mechanics, and the epicycle theory is even greater than Machacek suggests. If one looks closely at Feynman diagrams and the S-Matrix theory, what you will see are diagrams of particle theory epicles, Since the diagrams are arranged from the strongest contribution to the weakest and the number of interactions are often infinite, one only needs to evaluate more diagrams to bring the accuracy of the theory to any desired level. This does not indicate in any way that the diagrams are true representations of physical reality, but that they do constitute a means of obtaining accurate mathematical results.

Another example from the quantum mechanics can be found in hydrogen spectra. As the accuracy of spectral measurements increased in the early part of this century, it became clear that the simple picture of the electron orbiting a proton would not be sufficient to explain the fine structure. As spectral measurements continued to become more accurate, it was worked out that the interaction of the spin of the electron and the spin of the proton contributed to these new spectral lines. Finally physicists used the precession of the spin of the electron and the new proton to reach the current accuracy of the observed hydrogen spectrum.

Now consider again the correlation between the epicycle theory and the hydrogen spectra. In order to explain mathematically the
observations of light spectra generated by excited hydrogen atoms, physicists have concluded that the atom is composed of two bodies, one in orbit around the other. Each body is spinning and precessing around its axis and the magnetic fields generated by this spinning also interact with each other. Amazingly then when the leading physicists are asked if this is an accurate picture of the atom, they will say the atom is really composed of interactions of probability waves.

One can carry this line of reasoning on indefinitely. As we move from observing light spectra to observing the spectra of particles scattered in high powered accelerators, we must then continue to find more epicycles to explain these new spectra. The results are quarks, gluons, strange particles, and the “fundamental” strong and electro-weak forces. It is not surprising then that attempts to produce unifying theories that encompass these epicycles have been failures. With Grand Unified Theories (GUTs), Supersymmetry, Superstrings, and more, all attempts to date have been unable to gather in all of these disparate elements. The problem is exactly the same problem that would have faced Newton and Kepler had they been only willing to believe in Ptolemy’s theory.

Clearly what is needed is a new Copernican revolution in physical theory. The Reciprocal Theory developed by Dewey Larson offers the possibility of such a revolution. The theory offers fundamental principles from which it should be possible to derive all physical phenomena. The basic theory is simple. Though requiring changes in conceptual thinking, very little mathematics is required to produce essential results. And how accurate is the Reciprocal Theory? In many areas the theory is not nearly as accurate as quantum theory. But one must keep in mind that over 2,000 PhD degrees in physics are granted each year. The majority of these physicists spend most of their time minutely extending the accuracy of current theory. In contrast there have been at most 2 or 3 individuals at any one time doing research of any sort with the Reciprocal Theory. So it is meaningless to claim that the Reciprocal Theory falls short because it is not as accurate as current theory in some areas.

The criteria that should be used to compare the standard theory and the Reciprocal Theory are the same criteria that were used to compare the epicycle theory and the Copernican Theory. Does the theory offer simple, fundamental principles from which all the known phenomena within the scope of the theory can be deduced without the introduction of arbitrary constants and parameters? Given these criteria we must conclude that based on the work done so far, the Reciprocal Theory wins hands down.

It is also interesting to note that with the Reciprocal Theory having been in publication for over 30 years that not a single well-known physicist has taken the time to learn the theory sufficiently well to offer a serious critique. I do not believe that this is due to any fundamental difficulty with understanding the theory, but instead with an intellectual prejudice that prevents radically new ideas from being heard. I believe that the Reciprocal Theory will in time stand on its own merits as both as profoundly accurate and a profoundly correct physical theory.

-Edwin Navarro

***

A Growing Controversy?

“Since the idea that the galaxies are at rest in an expanding space is now quite widespread, I would like to put my request for an experiment to a wider audience. Can any theoretician researcher, cosmology book author, astronomy teacher, student, or laymen think of an experiment to differentiate between the two possibilities?” (Galaxies expanding or space between them moving apart)

-Lewis Epstein

Is Space Extending or are the Galaxies Moving Apart?
Letter to the Editor, Am J. Physics, Vol. 55 No. 11, page 970 November 1987

“...a fairly well established answer to this query already does exist thanks to a substantial body of astronomical observational evidence. This body of data indicates very strongly that the space is expanding rather than that the galaxies are moving apart.”

-Alex Harvey

Space is Extending
Letter to the Editor, Am J. Physics, Vol. 56 No. 6, page 487 June 1988

***
The Photon: Displacement in a Second Scalar Dimension

The simplest displacement to the natural progression is a unit reversal in one scalar dimension of the outward motion of a unit of space associated with a unit of time. This displacement is the simplest physical object and being an object it necessarily occupies a location. This location is moving with the natural progression in the other two scalar dimensions and therefore moves outward at unit speed in reference to the spatial reference system.

The motion which is the photon must continue in one of the other scalar dimensions because its energy is of course conserved. It is also at the lowest energy state possible for a space displacement. It follows that it can not change form readily either. The inward unit motion which is the photon can not continue over a second unit of time, because that would require an additional unit of energy. The single displacement is one unit greater than the natural progression of 1/1, that is 1/2. To carry over to a second sequential unit of time would require one more unit of energy for a total speed of 1/3. So the inward motion inevitably lapses and is replaced by the natural progression for one unit of time at the end of which it can assume its form of a unit displacement again.

The mechanism for the lapse is an energy limitation at the end of the units of time associated with the inward motion. The mechanism for reversal again to the inward direction after completion of the mandatory outward unit is the unrelenting tendency of the inward motion to manifest itself due to its energy conservation.

This 1/n motion is similar to translational motion but it does not involve motion of an object, just the inherent motion of the displacement. Without an object to move, the subject motion does not have any representation in extension space. The photon motion which manifests itself in extension space is the motion of the photon as an object. This is the outward translation of the location which is occupied by the photon. This outward motion is in 2 scalar dimensions one of which is represented in the spatial reference system. The motions in the other scalar dimensions, though real, have no influence on the motion represented in the spatial reference system, except where this motion interacts with matter. This will be investigated further on.

The inherent motion which is the photon is in one of the other scalar dimensions. The motion 1/n which is the photon itself could not be represented in extension space even if it was the motion of the object, if that object were also moving in another scalar dimension at unit speed (see Page 209 of Universe of Motion). This would constitute motion greater than unity when the two motions are added vectorially.

Therefore the motion which is the photon is a pure displacement in a second scalar dimensions. The second dimensional motion is carried along with the object photon in its translation in extension space.

A photon of course can not be viewed because directing light at a photon would accomplish nothing, even if the speed of the photon could be overcome in this task. Another photon would not reflect from another photon. All of the supposed properties of a photon have been induced from the photons interaction with matter.

However, based on the above deductive development the nature of the photon can be further deduced. The simplest photon is a one unit displacement of the natural progression. As such it cancels the motion of the outward progression with a unit of inward motion. This creates a packet of zero motion of unit size within the continuity of the natural progression. When this packet of zero motion impinges on a material object, it acts similarly to a pulse at point of contact.

The pulse varies in intensity depending on the energy of the photon. The intensity is therefore the duration of the pulse, because each unit of energy simply increases the number of consecutive units of time over which constant motion inward, that is the pulse, is effective. This is related to the wave length by the expression n+1, where n is the pulse duration, or units of energy, with the additional unit of time for the inevitable reversal to the outward direction. The frequency is of course forward unit speed divided by the wave length, the duration of the pulse plus one unit of time for reversal. This frequency is therefore 1/n+1. Looking at this another way, the frequency and the wavelength are the inverse of each other when the speed is at unity, one unit of space per one unit of time. The frequency is cycles per unit time and the wavelength is units of time per cycle.
Being similar to a pulse does not mean the photon is just like a wave. It is actually motion of translation without an object of translation. The motion, being in a second scalar dimension is not manifested in extension space. However its motion is real nonetheless. It follows that the displacement which is the photon object is completely distributed in the two vectorial dimensions other than the direction of of the photon object translation. Naturally this distributed motion will be centered on the line of translation as there is no preference for any one direction. This scalar motion becomes apparent when it contacts a physical object.

An example is the phenomenon of diffraction. When light passes through a slit about the size of the wavelength, the light is affected by the slit. This corresponds very well with the concept that the photon motion is distributed and centered on the line of travel about one wavelength in total width. This is as opposed to conventional theory which puts the wavelength along the line of travel with the hypothetical amplitude extended laterally. As such the diffraction should take effect based on the amplitude not the wavelength.

The next consideration is motion of the photon through a physical medium. Any medium constitutes a concentration of time displacement and space displacement in a localized volume in extension space. The clock time of transition of the location of the photon relative to the reference system in extension space is necessarily longer through the medium due to more net units of space to be traversed.

However, this is offset to some extent by the additional motion which is the photon in a second scalar dimension. This is a motion inward in space which is equivalent to a motion outward in time. Time has no relation to the dimensions of space, therefore this motion in time can have some effect on the forwards speed of the photon in extension space. Since the physical medium is composed of net time displacement, any additional motion outward in time will shorten the clock time required for the outward progression of the photon’s location to traverse the concentrated time in the medium.

It follows that the photon with the greatest displacement or longest wave-length, will have the greatest additional outward motion in time. Therefore the longer the wavelength, the greater the speed in the reference frame of extension space. This corresponds to measurements of the speeds of light.

A more complex phenomenon of light is its refraction at the interface of two mediums or a medium and a vacuum. This is a result of the change in speed from one medium to the other as the photon crosses the interface at angle to the surface less than perpendicular. The speed of the photon in a medium is, as previously discussed, retarded in relation to extension space. If follows that since the photon has distributed motion in a second scalar dimension centered on the line of travel, it begins to retard on the side of the photon which contacts the interface first.

Naturally the greater the angle from the perpendicular, the longer does this differential effect act on the photon motion. This bends the photon line of travel as a function of the angle of approach. The side of the photon furthest from the surface continues at the original speed longer while the other side of the photon changes speed in extension space. Thus the photon twists around to a different line of travel.

As discussed above, the greater the wavelength, the greater the neutralization of the speed reduction in a physical medium. Therefore photons of larger wavelength have less differential in speed between the side in one medium to the side in the other and so less refraction at a given angle of approach than a photon of smaller wavelength.

A more complex phenomenon of interaction between light and matter is what has been called interference. This is the result of diffraction at two slits located parallel and a short distance from each other. In diffraction the slit is about the size of the wavelength. Therefore any photon passing through the center of the slit passes through without hinderance. If offset from center the edge of the slit will impede the forward translation of the distributed motion in the second scalar dimension. The remainder of the photon will continue at unit speed causing the photon to twist similar to refraction.

The motion in the second scalar dimension exists in discrete units. When the outer most unit is impeded, a certain angle of twist occurs. If the photon is offset from slit center one more unit, an additional angle is added to the total twist, and so forth for each additional unit. As a result the photons leaving the slit are redirected on radial lines at
different angles. Both slits have the same action.

This combination of the radial lines of photons and the spaces between the lines create points of intersection of radially projected lines from the two slits with empty spaces between. When a screen is placed within a certain range of the slits, the light bands will appear at each radial line with dark bands between. These will be much more pronounced if the screen is placed at such a distance from the slits that it's plane passes through intersections of two radial lines, one from each slit.

The conventional explanation for this light pattern on the screen is based on a major leap of inference. Longitudinal waves, such as water waves which are visible, create a similar pattern after passing through two slits. The diffraction in this case is due to a discontinuity in a longitudinal wave which allows the end of the wave after passing the slit to move laterally. The hump of the wave when cut off vertically at the end will redistribute laterally such that the top of the wave at the end will taper off on a slope. This slope supports the remainder of the wave. The slope extends a substantial distance inward towards the center of the wave segment created by the slit.

This lateral movement of wave energy causes the ends of the wave segment to move out radially. This causes further loss of support to the central wave and more lateral motion occurs with more radial effect. At the slit size of one wavelength, the effect is a nearly complete radial wave.

These radial waves form a new pattern with waves from one slit crossing waves from the other slit. This sets up the true interference pattern with peaks of double amplitude and points of net zero wave where crest meets trough.

A photon in conventional theory is not a longitudinal wave. The radial arcing of the photon as in the case of the water wave is clearly not possible. The action of the slit would be to clip off the top of the postulated wave amplitude peak. However this would only happen to photons within one half amplitude of the slit edge. However the phenomenon occurs when the slit is about one wavelength in size. The appearance of multiple bands of intensity with multiple dark bands is not explained by this.

There would be perhaps a somewhat diffused band on the outer ends of the pattern with one very bright band in front of each strip. There would be little in the way of concentration of photons. In fact the concept that photons can occupy the same location and cancel each others energy is pure assumption. There is no real evidence that this effect ever occurs.

Now after this review of the nature of the photon, it would be appropriate to link this theoretical photon with the remainder of the physical universe. We original established a one unit reversal of the natural progression as the simplest displacement. This one unit displacement occupies one unit of space. It is essentially a disk of distributed scalar motion in the 3-dimensional reference system. This disk of one unit diameter would seem to have some propensity to spin around the axis through its center.

Rotation of a disk of pure motion, a disk without any material inertia and constituting the simplest possible displacement confined to a single unit of space, would seem a very reasonable incremental next step towards more complex displacements of the natural progression. The simplest rotational progression displacement would of course be one unit of motion. Thus there would be a disk of distributed inward scalar motion occupying one unit of space occupying one unit of space spinning with one unit of motion around its central axis. This hypothetical compound motion can be shown to posses the qualities of a physical electron with one unit displacement of the photon being its base for rotation.

-Thomas Kirk

Status of 'Big Bang' Hypothesis about Cause of Expanding Universe

“No one acquainted with the contortions of theoretical astrophysics in the attempt to interpret the successive observations of the past few decades would exhibit great confidence that the solution in favour of the hot big bang would be the final pronouncement in cosmology.”

-Bernard Lovell

COSMOLOGY NOW pg 8

“I have little hesitation in saying that a sickly pall now hangs over the big bang theory.”

-Fred Hoyle

Science Digest

May 1984

** **
Is Ferromagnetism a Co-Magnetic Phenomenon?

Introduction

According to the Reciprocal System, magnetism is the manifestation of two-dimensional scalar motion of the rotational vibration type with space displacement. Since the stationary three-dimensional spatial frame of reference is capable of representing not more than one dimension of a scalar motion, only one dimension of the motion of a magnetic charge, which is two (scalar) - dimensional, is observable while the scalar motion in the second dimension is unobservable.

In the phenomenon of the ferromagnetism the material exhibits large spontaneous magnetization in the absence of any externally applied magnetic field, below a characteristic temperature called the Curie point. Relatively few elements are ferromagnetic. This is because "a magnetic charge, as a distinct entity, can exist only where an atom is so constituted that there is a portion of the atomic structure that can vibrate two-dimensionally independently of the main body of the atom." This precludes many elements from being ferromagnetic.

Another important point that we need to note is that "Ferromagnetism is a phenomenon of the time region, and its natural zero point (the Curie temperature) is therefore a boundary between two dissimilar regions ..." The rotational vibration which is the magnetic charge is not a basic motion; it is a modification of a specific portion of the basic rotation of the atom. In a solid state the atomic motion is already in equilibrium in the time region. The magnetic charge, therefore, effectively crosses a regional boundary when the motion falls below the time region unit of space, which is a compound unit and is smaller than the natural unit of space by the interregional ratio, 156.444.

Into the Time Region

The conventional theory tries to explain the spontaneous magnetization of the ferromagnetism by the mutual magnetic interaction of the atomic dipoles. The initial attempts at this explanation ran into trouble when it was found that the strength of this interaction which is needed to explain the observed high intensity of magnetization had to be nearly $10^4$ times that of the postulated dipole-dipole interaction. When all rational attempts to account for the origin of this high interaction strength have failed, quantum mechanics was invoked to interpret it as a purely hypothetical 'exchange interaction.'

In the Reciprocal System, however, the explanation comes out naturally; it stems from the second power relation between the corresponding quantities of the inside and the outside regions. Explaining cohesion in solids Larson points out: "As we found in Chapter 12, Vol. I, the equivalent of distance s in the time region is $s^2$, and the ... force in this region therefore varies as the fourth power of the distance rather than the square." The interatomic distance in solids is, on the average, of the order of the compound unit of space applicable to the time region, namely, the natural unit of space divided by the interregional ratio, 156.444. Therefore, the dipole-dipole interaction strength worked out on the basis of the inverse fourth power law would turn out to be $(156.44)^2$ or nearly $2.5 \times 10^4$ times stronger than that calculated on the basis of the inverse square law. This is precisely what is needed to account for the observed state of affairs.

Co-Magnetism

In an earlier paper we have shown that when the magnetic motion enters the time region, the apparent direction of the motion reverse, resulting in an attraction of like poles and a repulsion of unlike poles. The phenomenon has been referred to as 'co-magnetism.' This is illustrated in Fig.1, which is reproduced from the above referred paper.

Figure 1

Magnetism vs. Co-Magnetism

(a) magnetic lines (b) co-magnetic lines

N S M N S N S

(c) magnetic poles (d) co-magnetic poles

C 19.1-6
It can be gathered from Fig. 1(c) that the minimum energy configuration for two magnetic dipoles when located adjacent to each other is when the respective dipole directions are antiparallel, and if placed collinearly is when the dipole directions are parallel. On the other hand, in the case of co-magnetism, as could be seen from Fig. 1(d), the minimum energy configuration of two dipoles which are adjacent is when their directions are parallel and if they are collinear when their directions are antiparallel. The scheme of orientations is illustrated in Fig. 2.

**Figure 2**

**Dipole Orientations for Least Energy**

<table>
<thead>
<tr>
<th></th>
<th>magnetism</th>
<th>co-magnetism</th>
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</table>

We shall presently show how co-magnetism is responsible for the domain structure characteristic of the ferromagnetic order. The point that is of significance here is that the magnetic charge (motion) is two dimensional. If p and q are respectively the effective speeds in the two scalar dimensions concerned of the magnetic charge, the motion of the charge crosses the regional boundary effectively when the product, pq, or more correctly, their geometric mean, falls below the value of the compound unit of space. This could happen in either of the three ways (see also the Appendix):

**case (i) when the component motion p, pertaining to the dimension parallel to the dimension of the conventional spatial reference frame, is still outside the compound unit, while the component q, pertaining to the second scalar dimension (which we shall refer to as the ‘transverse dimension’ for the purposes of this paper) crosses the regional boundary and enters the inside region;**

**case (ii) when the component p crosses the regional boundary which the component q is still outside it; and**

**case (iii) when both the components cross the boundary and enter the inside of the compound unit.**

Though "the motion components in the second dimension are not capable of direct representation in the conventional spatial reference system, ... they have indirect effects that are observable, particularly on the effective magnitudes."6. Further, quoting Larson: "... a two dimensional (magnetic) charge consists of a rotational vibration in the dimension of the reference system and another in a second scalar dimension independent of the first, and therefore perpendicular to it in a geometrical representation."7 Following our notation, we can conclude that the motion component q

**Figure 3**

**Magnetic/Co-magnetic Orderings**

- **(a) Ferromagnetic Ordering**
- **(b) Antiferromagnetic Ordering**
- **(c) Antiferromagnetic Ordering**

pertaining to the transverse (scalar) dimension, though not observable directly in the conventional reference frame, nonetheless, has indirect effects that do manifest in the geometric representations, in directions that are perpendicular to the dipole direction.

Coupling this conclusion with the
Theoretically there could be seven types of the dipole orderings. Let p be the component of the magnetic charge in the collinear direction, and q be the one in the traverse direction, of the geometric representations. Splitting q into q1 and q2 to represent each of the two transverse directions and adopting brackets to indicate that the component is inside the compound unit of space, we have the following seven possibilities, all of which exemplify the magnetic charge crossing the interregional boundary:

(i) \[ p - [q1] - [q2] \]
(ii) \[ [p] - q1 - q2 \]
(iii) \[ [p] - [q1] - [q2] \]
(iv) \[ p - [q1] - q2 \]
(v) \[ p - q1 - [q2] \]
(vi) \[ [p] - [q1] - q2 \]
(vii) \[ [p] - q1 - [q2] \]

Of these, combinations (iv) and (v) are geometrically identical. So are combinations (vi) and (vii). Only the first combination gives rise to ferromagnetism. All the remaining lead to antiferromagnetism. The characteristic common to all the antiferromagnetic combinations is the occurrence of parallel crystal planes such that while the dipoles in any plane are all mutually parallel, the dipoles in neighboring planes are antiparallel. The matter in which these combinations differ from each other is in the orientation of these planes and in the inclination of the dipole direction with respect to these planes.

** Corrigendum to ‘The Law of Conservation of Direction’ **

Reciprocity, XVIII (3), p. 6

The following paragraph was missing entirely. It should be added immediately after the Table I in page 6, first column:

It may be seen that in the case of the translation situation the vectorial direction reverses in unison with the scalar direction. But in the case of the vectorial vibrations it is not so: it is perplexing why the scalar and vectorial directions do not maintain a constant relationship in the case of the vibrational motion (cp., for example, the third and the fourth units in the tabulation).
Here we have a limited parallel between:

1) the laws of Northern America and the role that they play in the administration of the life of the inhabitants, living therein

AND

2) The laws of physics, pertaining to all the states of matter, that exist, or may exist, within the Physical Universe.

In other words, a comparison between the Supreme Law of the Land and the Supreme Law of the Physical Universe.

Both the parallels and the differences will be highlighted, where deemed appropriate.

Essentially, ipso facto, there can be no amendments, (appended assumptions), to the laws of physics, but there will be a surfeit of by-laws, all of which are deducible from the laws of the constitution, so, a priori, there will be many instances of overlap in the field of by-laws; and occasionally there will appear to be a contradiction, but, since cognitive dissonance has no place in physics, (despite many current practices), they will be resolved by an in-depth analysis of the fundamental laws of the constitution, and the concomitant deductive processes applied to them. If such alternatives still persist, then we have to consider that:

1) There may be an inherent fault in the constitution, which, although unlikely, will be considered if one or both of the following two reasons cannot obtain.

2) There may be a fault in the deductive processes, which brought about this apparent dissonance.

3) There may be only an apparent dissonance, when, in fact, both alternatives may coexist, under appropriate circumstances, perhaps based on balance of probabilities.

Relevant to this possible point of contention, it may be solely due to semantic interpretations, for the following reason(s):

When one gives serious consideration to an alternative paradigm, that, by its very nature, must be grossly at variance with the original paradigm(s), one must expect that there appear new (and/or extended) meanings to current terminology, and/or new terminology, such that some differences will be only apparent due to arguing at cross-purposes.

In essence, we have to examine the Laws of the Physical Universe, in the same probing manner, that an attorney-at-law will examining the Laws of the Land, wherein he looks for legal loop-holes, that will help him exonerate his client, when accused of some misdemeanor. In this instance, he knows that there are such loop-holes to be found, since the Laws were formulated and promulgated by humans, for humans, who, by definition, are imperfect.

On the other hand, the Laws of the Universe are there, to be discovered by Man, and exist independently of Man, since the Universe existed before the Birth of Mankind and will continue long after its disappearance, so if Man, in the person of a Philosopher of Science, does indeed discover these immutable Laws, then the search for the loop-holes rather than discovering faults, (which, by definition, cannot exist in a perfect Universe), in fact uncovers all the possibilities, that may be, and then it is only a matter of probabilities, as to whether the entities/existents are there to be discovered.

So now to state the Laws, as discovered by D.B. Larson, which he lists as four basic premises, as hereunder:

Basic Premises

"The basic premises of the theory consist of certain preliminary assumptions, a postulate and a definition.

A. In order to make science possible, some preliminary assumptions of a philosophical nature must be made. We assume that the Universe is rational, that the results of experiments are reproducible, etc. These assumptions are accepted by scientists as a condition of becoming scientists, and are not usually mentioned in purely scientific discourse.

B. We assume that the generally accepted principles of mathematics, to the extent that they will be used in this development, are valid.

C. We postulate that the Universe is composed entirely of one component, motion, existing in three dimensions and in discrete units.
D. We define motion as the relation between two uniformly progressing reciprocal quantities, space and time."

We can analyze the above four statements in various ways, for instance:

As they stand, prima facie, they represent the definition of the Primal Universe of Motion, wherein the motions are solely primal, themselves, and therefore are not considered to be an activity of the six-dimensional Universe, but merely, the setting, background, or datum, within which we shall interpolate, and from which we shall extrapolate, in an attempt to investigate whether there can be secondary motions and/or entities, which complement the premises, but in no way need assumptions to justify them.

We note that there is no mention of vectors or energy, let alone matter, so let us investigate any opening (loop-hole) for possible variations.

We acknowledge the discreteness of time and space, hence we must imagine (as best we can) these miniscule ‘units’, all progressing, (the space units), away from each other, with no inherent directions, but those determined by chance, or in other words, obeying a probability distribution, and are purely scalar quantities.

The same description applies to the temporal units, but cannot be imagined quite so easily, because there is no spatial connotation, other than by analogy with the space units. The Primal Universe is indeterminate, and Heisenberg’s description may well obtain.

So we see that this Primal Universe is expanding at a speed, determined by the ratio of one space unit per temporal unit, sine qua non. This speed can be called unit speed, and can be identified by our observations, as being the speed of light, although at this stage of the investigation this can be put aside, awaiting further developments.

Looking once again, in overview, at the primal six-dimensional universe, we have one unit of space progressing per unit of time, showing that both are progressing. There are two mutually exclusive ways of observing this, the first being the way that humans observe, which is by taking a spatial approach, and using a reference frame, whereby we envisage the spatial locations moving outwards, distributed over all the possible radii of an expanding sphere, whose center is the origin of the reference frame. The other type of observer, about whom we can only conjecture, would have the capability of observing this expansion in a temporal framework, and would see it in the same way, BUT what we call space and see evidence of in our framework, would not be observed in the same way by the other observer, who would only look upon it as a one-dimensional continuum as we look upon time. Similarly, by reciprocal argument, our knowledge, by our experience, of time, is as a one-dimensional continuum, (see next paragraph), when in fact, vice versa, it is the three-dimensional space of the other type of observer, which Larson calls a cosmic observer.

I shall now quote Larson on the topic of the two classes of observers:

"Re the existence of the two classes of observers. That is one of the reasons for distinguishing between the ‘material’ and ‘cosmic’ sectors. Human observers ‘exist’ only in the material sector. The hypothetical cosmic observers ‘exist’ only in the cosmic sector. The material sector can be regarded as a three-dimensional frame of reference moving ‘linearly’ through a three dimensional temporal frame of reference. The material observer, therefore, has access to the entire spatial reference frame, but cannot observe the high speed physical entities moving in the temporal reference frame, except during the brief ‘interval’, during which they happen to be on the ‘linear’ path of the time progression. To the cosmic observer, these relations would be reversed, (interchanged)."

We note that the outward expansion of the universe is a primal motion, and any secondary motions that will be introduced must, of necessity, involve a different ratio of time units to space units. than 1:1. Having realized this, then a broader concept of motion obtains, since, for instance, 2:1 or 1:2 have equal probability. The former representing a spatial speed, which is half unit speed, a normal motion, to our observations, while the latter represents its counterpart, from the point of view of the cosmic observer, but which will manifest itself to us, not as a motion at twice unit speed, but in some other way. We can label it motion in time, but not to be confused with the science-fiction concept of time-travel.

This speed of the recession is fixed, so the only variation open to us is a directional variation, of which there are several types:-

Linear vibration, rotation, and rotational vibration.

Imagine that a space unit reverses its outward motion at the end of a unit of time, and moves for one time unit back along the line of progression, when it reverses again, so we have to consider whether this conflicts with any part of the basic premises. It seems not, so to develop the consequence of this vibrating unit,
If, then, we consider the vibrating unit as being within a space unit and having a period of $2n$ units of time, we would have a vibration not only at less than unit speed, but in fact that fraction of unit speed denoted by $1/2n$.

It should be noted here that the vibratory motion is not the simple harmonic motion that we learn at school, since in that case we have a mass, which oscillates to and fro, which is at rest at both ends of the motion and is at its maximum speed halfway along the path of oscillation. The oscillation of the photon, however, is at $1/2n$ of unit speed each way, and there is no mass to be considered as coming to rest and accelerating to a maximum speed etc.

eetc..reductio ad absurdum.

We need to formulate a mathematical expression to represent this type of motion, which must have a name, so let us call it simple vibratory motion, (S.V.M), but we cannot expect it necessarily to have a simple mathematical expression. In fact in a separate paper, I have written the Fourier series, that describes it, and also the shape of the electromagnetic wave with its equation.

Material matter, according to the Reciprocal System of Theory, is predicated on the material rotational base, which has a vibratory unit, whose speed of vibration, is that fraction of unit speed, denoted by $1/2n$ or $1/(2n+1)$, where $n$ takes integral values 1,2,3,4,... but the actual value, or preferable choice, appears not to have been elucidated, to date.

The texts refer to a destructive limit where material disappears from observation, said to go into the cosmic sector, but more accurately described as becoming observable by the cosmic observer, and no longer observable by the material observer or in other words, there is an interchange of its components, where time and space interchange, hence the vibratory rotational base of the matter becomes the vibratory unit of electromagnetic waves where, say, the vibration of $2n$ becomes a vibration of $1/2n$, or perhaps some other value???

To quote and comment on James Jeans evaluation in 'The New Background of Science':-

"Space-time is not the framework of the world of nature, but of the world of our sense-perceptions, and when we represent objects beyond our senses in space-time, their apparent absence of determinism may be merely the price we pay for trying to force the real world of nature into too cramped a framework.... Materialistic philosophy runs counter to the teachings of present-day physics.
in its assumption that everything can be fully represented in space and time; it fails to distinguish between the surface and the depths beneath. It takes the spatial qualities of objects to be their primary qualities, although science shews that, the spatial qualities are merely those with which our senses can establish direct contact—the ripples on the surface, which meet our eyes."

Considering the foregoing premises and arguments of Larson, James Jeans was closer than he could have ever imagined himself to be, with actually ‘hitting the right button’.

To transmogrify Jeans by appropriate paraphrasing, and yet couching it in his terms:-

Space-time IS the framework of the world of nature, (the physical universe). When we want to represent objects objectively, which means in the space-time reference frame, which in itself and of itself is beyond our sense-perceptions, their apparent absence of determinism is the price we must pay for trying to force the real world of nature into too cramped a framework, of merely three spatial dimensions and a one-dimensional time continuum…. Materialistic philosophy and its successors up till 1988, (other than the Reciprocal System of Theory), all have assumed that everything within the physical universe, whether it be matter, energy, or other entities, still awaiting proof of existence, can be fully represented in space and/or time and/or a 4-dimensional space-time, which is commonly regarded as non-expanding by most paradigms, and what is more, both space and time are considered to be independent continua. Effectively, this lack of understanding of the true nature of space-time, implies that the spatial qualities of entities are their primary qualities, while at the same time it is recognized that the spatial qualities are merely those with which our sense and measuring instruments can establish direct contact.

Summarily, all existents in this physical universe, whether material particles or electromagnetic waves are six-dimensional and capable of being observed, wholly or in part, directly or indirectly, by both mutually exclusive classes of observers, each according to his perspective, which is always four dimensional.

To put it yet another way:-

We humans, are composed of aggregates of atoms, which are contiguous in space, and we emanate infra-red waves of energy, which are subject to scalar motions, that distribute them in all directions of space, based on probability laws, yet they are all six-dimensional entities, and would be observable, wholly or in part, by cosmic observers, the vibratory units of our atoms would be the vibratory units of electro-magnetic waves and the vibratory units of our infra-red waves would be the vibratory units of c-atoms and c-particles.

The basic premises not only define a theoretical universe, but they also describe accurately, both explicitly and implicitly what can be and what cannot be in the universe. (see article, ‘Que sera sera’; to appear later) For instance, there have to be indefinable concepts, which by their very nature do not fit anywhere in the universe, therefore are irrelevant to an meaningful discussion, and should be dismissed as a waste of time, in the elucidation of the facts.

It can be argued, from a different standpoint, that one may bring any topic not a conversation for some other purpose, than the purported matter under discussion, but in a serious attempt to develop all the consequences of the basic premises, some items should be summarily dismissed.

e.g.1) Theology, theosophy, zen, mysticism, supernatural, and such concepts as ‘beyond space and time’, ‘the beginning of time’, ‘the big bang’, ‘time travel’, neutron stars, magnetic monopoles, black-holes, super-strings, super-gravity, gravitons, gluons, quarks and anti-gravity.


e.g.2) The possibility of there being such an observer, that can observe all six dimensions. This has no more meaning, than the age-old paradox of the coming together of the irresistible force and the immovable object, or the sound of one hand clapping, or dividing by zero. This is all zen, and whereas it may have a purpose of clouding a mind with sufficient confusion in the hope of bringing about an eventual enlightenment, it is not, in essence, meaningful or relevant.

P.S. Notwithstanding all the correct results obtained by R.S. in the domain of the atom, could there be another factor, that to date has not been investigated, but which may have the potential to answer some of the problems that have arisen, where some inconsistencies are awaiting explanation? I humbly suggest the vibrational frequency of the rotational base. This does not appear to have had any in depth analysis. Whereas reference has been made to the variations possible in electro-magnetic waves, depending on the generating source, but here is part of my analysis, to date.
It is impossible to have a vibrational frequency that is exactly unit speed, (as perceived in our four-dimensional sector). Unit speed only occurs in the outward expansion, where there is a 1:1 relationship between space and time units. The moment we have a direction reversal, to set up this simple vibrational motion, we have either 1:2 or 2:1 as mentioned in above paper, giving the speed as 1/2 or 2, and by analogy the only speeds possible are 2n or 1/2n of unit speed.

This then raises the question, could some elements have more than one representation, depending on the frequency of the rotational base, or alternatively, could certain groups of elements use one value of this frequency only, while other groups used another value? Or can this frequency be changed by extreme conditions, such as in excited atoms, in lasers and in some galactic examples too???

**View From A Point**

Take thou a photon, and vibrate it freely,
Then may-be you-all have a straight line, nearly.
This vibration, (in time), is forever eternal,
It's as obvious as night and day are diurnal.
Each photon merely describes its own locus,
to aver it a line is a Hocus-Pocus.
So when we rotate it, to build up a particle,
This is done in space, (as you'll see by my article).
The successive rotations may be called revolution,
And all of these revs. determine the Atom's Evolution.
The Atom, thereby formed, has properties, Intrinsic,
Brought about by these combined vibes and revs.,
Extrinsic.
The triplets, that described this photon's dance do suffice
To identify WHICH atom, in a manner, precise.
However, for completeness, we may need one more:-
The vibration's frequency comes to the fore.
Now remember, the kernel is 2 or 1 photon;
To deny this foundation is strictly 'verboten'.

-David Halprin

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**Lump of Matter Exploding or Steady Progression of Space with Time**

"many people (including some scientists) think of the recession of the galaxies as due to the explosion of a lump of matter into a pre-existing void, with the galaxies as fragments rushing through space. This is quite wrong ... the expanding universe is not the motion of the galaxies through space away from some center, but the steady expansion of space."

Paul Davies
Edge of Infinity
Simon and Schuster
New York, 1981, pg 137

**Publication Policy**

The editors of Reciprocity welcome papers, especially from new contributors. The requirements that a contributed paper must meet in order to qualify for publication are clarified below. Editorial assistance is available in those cases where a limited amount of revision will enable a paper to meet the requirements.

As stated in the by-laws of the International Society of Unified Science, the objective of the Society is the advancement of the Reciprocal System of physical theory. This theory, as it is defined, consists of two fundamental postulates, together with everything that can be derived from those postulates by logical or mathematical processes, without introduction from any other source.

The unitary character of the theory, resulting from the derivation of all of its conclusions from the same set of premises, is its most essential feature. It is this status of the theory as a general physical theory - the only thing of its kind - that enables proof of its validity by the probability method, and enables extension of the theory into areas inaccessible to observation.

The purpose of Reciprocity is to contribute toward the accomplishment of the objective of the organization. Acceptance of items for publication shall therefore be determined by the following criteria:

1. All items must have relevance to the stated objective of the International Society of Unified Science.
2. Original technical articles must deal with the Reciprocal System, of theory, as defined above, or aspects thereof; that is, the propositions supported must purport to be derived from the postulates of the Reciprocal System, or from previously published conclusions reached on that basis, without introducing further assumptions.
3. Arguments advanced against previously published material must be similarly based.

Papers should be sent to one of the editors. All published papers become property of ISUS, Inc.

**New Policy**

You may now, if you wish, submit your papers on 3.5 inch disks for the Macintosh computer, in Word 4.0 or MacWrite (version 2, 4.5, and 5.0) formats. This helps to eliminate the errors that may occur in transcription and reduces the amount of time it takes us to put the journal together.
Absolute Magnitudes of Physics

Frank H. Meyer, ISUS, Inc.

(Only the gist of this paper was presented to the 58th Annual Spring Meeting, Section A, of the Minnesota Academy of Science at the Mayo Clinic, Rochester, May 5, 1990)

ABSTRACT: Absolute Magnitudes of Physics.
Frank H. Meyer, ISUS, Inc.

A universe of motion composes the physical universe, in which motion is a reciprocal relation between space and time. All motion consists of discrete units. Each individual unit of motion is a relation between one unit of space and one unit of time, a motion at unit speed. This unit speed and its constituents, clock time and clock space, are absolute magnitudes. Unit speed is identified with the speed of the physical locations of photons. Absolute magnitudes do not exclude relative magnitudes, such as material speed, coordinate space and coordinate time. Mass, invariant with speed, as reported by I. Newton, L. Oken and D.B. Larson, is another fundamental absolute physical magnitude. The contention of some teachers of the theories of relativity that mass near unit speed is a relative magnitude, not an absolute magnitude, results from the misinterpretation of the equation, \( E=mc^2 \). \( E \) does not denote the total energy of a moving mass, but rather only the rest energy of the mass.

Introduction:

Many of us know what time and space are, when we do not think about them. When we start thinking about them, we are not so sure. Most of us believe that time passes, time progresses, time does not stand still, time has no stop, time does not stop.

Does anyone know the finite speed of time, say with relation to space; when is this speed uniform, when non-uniform; when absolute, when relative; when both absolute and relative?

Newton\(^1\) believed that absolute space is immovable. This implies that, if we further suppose with Newton that absolute space remains always the same, the speed of space with relation to time is and remains zero.

When, like Aristotle, Newton, Einstein and/or Larson, we spend a life time wondering and learning about these fundamentals of physics, space and time, we are likely to find that we learn more about them only by making and repeating old mistakes, correcting old mistakes and making and repeating new mistakes. “We are reminded to appreciate Will Roger’s sage observation: “We all are ignorant except about different things.” Truth is by no means manifest, is hard to come by, but what science is about.

Absolute Motion of the Expanding Universe

Nothing has shaken established view about space and time more than the Hubble discovery that the physical universe includes an expanding universe of galaxies. “The expanding universe is not motion of the galaxies through space, ..but is the steady expansion of space.”\(^2\) Expansion clearly implies that the well known three dimensional scalar gravitational motion, which is always INWARD toward absolute unit speed, is opposed by the less-known three-dimensional disembodied space-time scalar motion at unit speed. Space-time progressions are the primary motion, which is always OUTWARD from unit speed (unity, the true physical ZERO).

Unit speed, including an absolute unit of space and an absolute unit of time, is an absolute magnitude, equal in measured value to the speed of light in vacuo. The purpose of this talk is to submit data and evidence for the existence of these magnitudes as absolute throughout the physical universe.

Absolute and Relative Motion in the Reciprocal System

In the Reciprocal System of physics absolute motion (unit speed), absolute space (clock space) and absolute time (clock time) refer only to the primary motions, defined as those motions which can exist independently of the existence of motions of other types. Relative motions (the motion of matter, electricity, light, etc.), relative space (coordinate space), relative time (coordinate time) refer to independent motions, other scalar motions of physical locations that the primary motions open the way for.

In Newtonian mechanics and in Einsteinian physics absolute motion and relative motion are distinguished, but Einstein and Newton agreed neither about their distinction nor their relation.
Newton guessed space to be absolute, because he believed space to be permanently immovable. He was aware that absolutely immovable space can not be sensibly verified. Therefore, he had to introduce a relative space, that is, a stationary spatial reference frame. Such a frame of reference is not any physical entity and is always relative to the human mind that conjures it. Newton correctly guessed that absolute time progresses uniformly ("flow equably"), but was unaware of relative time (coordinate time). Einstein identified relative time with all of time and incorrectly defined time operationally as what you measure with a clock. A clock is useful in physics only to measure absolute time, not relative time (coordinate time) and also to measure absolute space (clock space).

In the end Einstein supposed both space and time and all motion except the speed of light to be relative space, relative time and relative motion.

I think that the reason Einstein and modern physics came to conclude that all motion is necessarily relative has not been sufficiently examined and understood. The reason I suggest: Einstein was less interested in the intrinsic nature and objective reality of physical space, physical-time and physical motion than in their appearance to and through the imagination and inventive skill of the human species to represent them.

A story perhaps best illustrates what then Einstein means when representing time as relative: A graduate student of the Woodrow Wilson School of Political Science wandered over to the Institute of Advanced Study, when Einstein was taking a coffee break. The student approached Einstein and requested the physicist to brief him about the theory of relativity. Einstein responded jokingly and truthfully, "Young man, it's like this: When you sit with a nice girl for two hours, you think it is only a minute, but when you sit on a red hot stove for a minute, you think it is two hours. That's relativity."

In the Reciprocal System the two hours of interlude with the nice girl is clock time, which is a moment of absolute uniform time progression, while the seeming one minute is a moment of relative time, related to the savor of the young man's joy. Another name for relative time in the R.S. is coordinate time since its estimation requires setting up a reference frame in the young man's mind. Another moment of absolute time, as measured by a clock, or clock time, is the one minute of his encounter with a red hot stove. Another moment of coordinate time or relative time is the seeming two hours, related to the apprehension of his pain.

Relative time dilation during the coward's fear of death also is aptly expressed by Shakespeare: "Cowards die many times before their death; the valiant never taste death but once."

In the new Reciprocal System of physics, absolute motion, absolute space, and absolute time refer only to the primary motions, defined as those which can exist independently of the existence of motions of other types. Primary motions are absolutely uniform motions at unit speed. Relative motion, relative space and relative time in the R.S. are not relative only in the relativistic sense of Einstein, but also refers in the R.S. to independent non-uniform (accelerated motions), which the primary motions open the way for.

**Primary Motion and Independent Motions in the Reciprocal System of Physics**

Members of ISUS, Inc. and other supporters of the Reciprocal System of physical science assume that the universe is rational, that the same physical laws apply throughout the universe, that the results of experiment are reproducible, etc. These assumptions are accepted by scientists as a condition of becoming scientists, and are not usually mentioned in purely scientific discourse.

We assume that the generally accepted principles of mathematics, to the extent that they will be used in this development are valid.

'Reciprocal System' is the name D.B. Larson3 has given to his revaluation and unification of theoretical physics and engineering practice. The name derives from the mathematical relation Larson has discovered exists universally between time and space. Entities that are multiplicatively inverse in their physical relation to each other are referred to as each other's reciprocal. D.B. Larson has discovered that there is NO way in which the physical entities, space and time, can be distinguished other than that AS MOTION they are reciprocally related to each other.

Larson rejects as inadequate and grossly misleading the current definition of motion prevailing in physics as "change of spatial
relations among bodies”. The obvious inadequacy: this definition makes no mention of time. However, motion is as impossible without time as without space. At best this definition is grossly misleading, because it pertains at all only to one of the two reciprocally related sectors of the physical universe -- the material sector. It is only in this sector, the material sector, that physical entities, i.e., material objects, move in space. This kind of motion is properly referred to a three-dimensional spatial coordinate and scalar clock time reference system. The only speeds involved here are less than unit speed. This scheme leaves entirely out of the account, however, representation of those inverse material objects, physical entities of the cosmic sector, the reciprocal of the material sector, that move in time. Since these entities move in time with finite inverse speeds in excess of unit speed, their investigation is not properly referred to a stationary spatial reference frame, but must instead be referred to a three-dimensional temporal coordinate and scalar clock space reference system.

We postulate that the universe is composed entirely of one component, only MOTION, existing in three dimensions and in discrete units.

Larson redefines motion as “the relation between two uniformly progressing reciprocal quantities, space and time.”

Motion, as defined, is measured IN TERMS OF SPEED, the scalar magnitude of the relation between space and time. By the reason of the postulated reciprocal relation between space and time, each individual unit of motion is a relation between one unit of space and one unit of time, a motion at unit speed. This speed is the unvarying absolute speed of all the equal discrete units of motion composing the primary motions of the three dimensional universe of motion.

According to our definition, motion involves the uniform progression of both space and time. We define a point, or segment of the line of the space progression at a given time as a physical location in space. (We define a point or line of the time progression at a given space as a physical location in time.)

The initial point of the progression of an individual unit of motion is zero. As the distance between two points cannot be less than zero, it follows that the primary motions are necessarily OUTWARD, increasing their distances relative to the initial points.

Any two physical locations are progressing outward from each other at unit speed, that is, their separation is increasing at the rate of one unit of space per unit of time.

The natural system of reference FOR THE Reciprocal System, by definition, is that system in which the primary motions do not cause any change in the positions of physical locations.

The natural system of reference evidently is progressing outward at unit speed relative to the stationary spatial system of reference.

The R.S. identifies unit speed as the speed of light. Thus, the speed of light is not the speed of photons through space, but is the speed of their physical locations, whether or not occupied by photons (or galaxies). A corollary is that each photon remains in the physical location in which it originates.

Since the postulate of the R.S specifies that nothing exists other than discrete units of motion and the natural reference system is a direct consequence of the existence of the primary units, this reference system is the framework, or background OF THE UNIVERSE OF MOTION, and does NOT represent ANY activity IN that universe. This is why the natural reference system, as defined, is the physical zero, or datum level, from which all physical activity extends.

The outward progression of the natural reference system relative to the stationary system of reference CAUSES the “expansion of the universe”, reported by the astronomers.

The Reciprocal System explanation of the general background of the physical universe is essentially in agreement with the astronomer’s assumption. The R.S. account leads to an absolute uniform unit speed, rather than a speed that varies with the distance, as produced by the kind of an expansion assumed by the astronomers. This difference, however, is easily accounted for, because there is a known force, gravitation, that acts against the outward motion, with a magnitude varying as an inverse function of the distance.

The R.S. explanation of the universal background, it is well to notice, is developed from a set of general premises. The advantage of deducing the background rather than assuming its existence lies in the fact that further deductions can be made from the same
premises. Instead of a single process involving the universe as a whole, this explanation identifies the expansion as the result of outward scalar motion of individual physical locations. This opens the way for the existence of other scalar motions of the same physical locations. These other motions Larson calls independent motions.

Different Roles of Primary Motions and Independent Motions

The distinction in the R.S between primary motions and independent motions is essentially a difference between absolute motions and relative motions.

Independent motions are manifested by all observable physical phenomena, including photons (light), electrons and positrons (electricity), positive and negative magnetrons (magnetism), material and cosmic atoms (matter).

Independent motions are relative motions. Independent motions are NOT, however, relative to a state of absolute rest. They are relative to the state of absolute motion at unit speed.

Do not use mathematical zero, therefore, to express the origin of your spatial coordinate system, unless you can find more evidence that a state of absolute rest exists in practice, as Newton does.

Use rather the space-time ratio of unity to express the datum from which all physical phenomena extend, the initial level of all physical activity, as Larson does. Think of unity as the true physical zero.

Absolute motions and relative motions ensue as diverse expressions of one and the same fundamental CAUSE: that space and time are reciprocally related as motion. This same cause also results in space & time being completely and/or perfectly SYMMETRICAL and beautiful, leading Benjamin Franklin to comment that, if you love life, then don't squander time, for it is the STUFF life is made of.

The reciprocal character of the relation between space and time leads to each individual unit of space being EQUIVALENT to an individual unit of time. This equivalence, this one to one correspondence, leads to the absolute unit speed of space time progression.

Until now physicists have found only one absolute finite speed in the physical universe. This is called the speed of light. It is the translational speed of the physical location of each photon in vacuo. It is also the translational speed of physical locations, whether or not occupied by photon or other massless particle.

What constitutes this absolute finite speed? The speed consists of two absolute finitely divisible quantities, the smallest length of space, which Larson has shown is measurable by the reciprocal of the Rydberg wave number constant, and the shortest duration of time unit that is measurable by the value ratio of unit speed to the length of the natural unit of space. The length of the natural unit of space amounts to \(4.55 \times 10^{-6}\) cm, while the natural unit of time is \(1.52 \times 10^{-16}\) sec.

But reciprocal means much more than equivalence of these two units. Physical phenomena, as we know them, and we ourselves would not exist here and now or at all, if the only reciprocal relation between space and time were this relation of equivalence. Although reciprocal implies equivalence, equivalence is not identical with reciprocal.

Physical phenomena, independent motions, come in to existence from a quite different implication of the reciprocity between space and time. Larson's reciprocal postulate requires that in addition to the one to one correspondence or equivalence between space and time, under certain conditions association of \(n\) units of space must exist and under these conditions the \(n\) units of space are equivalent to \(1/n\) units of time and/or under certain other conditions associations of \(n\) units of time must exist and under these conditions the \(n\) units of time are equivalent to \(1/n\) units of space.

Expanding Universe of Outward Progression and Inward Gravitational Motion

The outward motion due to the progression of the natural reference system always takes place at unit speed, regardless of the size of the aggregate or the distance that is involved. The net relative motion of any two gravitating objects with no additional motions is the algebraic sum of the unit outward motion and the inward gravitational motion.

At relatively short distances gravitation predominates and the net motion is inward. Since the gravitational motion decreases with
Distance, while the outward progression remains constant, the opposing motions will eventually reach equality at some greater distance, which we will call the gravitational limit. Beyond this distance the net motion is outward, increasing with distance and approaching unity (the speed of light) at extreme distances.

This theoretical pattern of net speeds is verified observationally by measurements of the Doppler shift in the radiation from the distant galaxies.

**Is Absolute Speed Meaningless and Relative Mass Meaningful?**

Some physicists assert that absolute speed is a meaningless motion and that mass is a relative magnitude.

In the light of the R.S. they are wrong on both counts.

Even the relativists maintain that light speed in vacuo is an absolute speed. Is light speed then not an absolute speed? Einstein was unable to explain the absolute motion of electromagnetic waves (light) in vacuo, but he assumed that the event exists:

“Our only way out......seems to be to take for granted the fact that space has the physical property of transmitting electromagnetic waves, and not to bother too much about the meaning of this statement.”

Space does not do this job by itself; space requires the aid of time. Light speed is the scalar motion of physical locations at unit speed, whether or not occupied by photons or galaxies. Physical locations translate; they are not at absolute rest, the traditional stationary reference frame from which absolute motion and speed are estimated.

I. Newton, who introduced mass into physics, discovered it to be another absolute magnitude of motion, gravitational motion. The notion of relative mass is a modern mistake, reported 31 years ago by D.B. Larson and more recently by L. Oken. The mistake stems from a prevalent current misinterpretation of a true result of the theory of special relativity. This is Einstein’s mass-energy equivalence equation, $E = mc^2$. The error consists of misinterpreting $E$ to be the total energy of a mass, $m$, moving with velocity, $v = \text{non-zero}$ magnitude. $E =$ instead only the rest energy of $m$, when $v = 0$.

References


Possible Logo?

Dr. K.V.K. Nehru has submitted this idea for a logo which, in part, represents the intertwining of the material and the cosmic sectors.
(1) The ability to move away from established patterns of thinking and strike a new avenue of approach is a rare characteristic but most desirable for research. In this paper Satz comes up with such a fresh approach. He suggests that "frequency in the natural sense is the number of cycles per space-time unit." This is at variance with Larson's view that "the so-called "frequency" is actually a speed. It can be expressed as a frequency only because the space that is involved is always a unit magnitude." (Nothing But Motion, P. 152) I am not in the least maintaining that concurrence with Larson's views is the criterion of truth. But in this instance, the recognition that frequency is really speed seems nearer the truth, since in the context of the Theory of the universe of motion the criterion that decides the truth of a concept is whether it is explainable in terms of the basic component of that universe, namely, speed.

Satz supports his conclusion by the statement: "Photons of all frequencies can be observed in both sectors, and the only way that this could be possible is if the denominator of the natural definition contains both a space unit and a time unit." In order to see the falsity of this statement it is necessary to remember that a photon has two speeds: the speed of propagation in the forward direction, and the speed of oscillation in the lateral direction. The fact that the speed of propagation is of constant magnitude and unit value (in the natural units) is what makes the photon observable in both sectors, since unit speed is the boundary between these sectors. The frequency, which is the speed in the lateral direction and which is the measure of its energy, is not relevant to its observability from both sectors.

(2) Satz gives in space-time terms the equation \( E = h \star v \) as:

\[
\frac{t}{s} = \left[ \frac{t^2}{(t/s)} \right] \frac{1}{s \ast t} \tag{2}
\]

and in the cgs system of units

\[
\text{erg} = \left[ \frac{\text{sec}^2}{(\text{sec/cm})} \right] \frac{1}{\text{cm} \ast \text{sec}} \tag{3}
\]

It is to be noted that in this the dimensions of frequency are taken to be cycles/(cm-sec). On this basis only he continues and arrives at the value of \( h \) in Eq. (5). At this juncture \( h \) has the dimensions erg-sec-cm and frequency cycles/(cm-sec). He now adopts the following procedure: he detaches the cm dimension from the frequency and attaches it to \( h \), rendering its dimensions erg-sec. Let us call this procedure of his the 'swap' for later reference. This procedure has the effect of insulating this cm term from the effects of any operations that are uniformly carried out on all the terms comprising \( h \), because he 'swaps' this cm term into \( h \) only after performing those operations on the terms comprising \( h \).

(3) After incorporating the inter-regional factor into the terms contained in the square brackets of Eq. (3) he arrives at the Planck's constant \( h \) as

\[
\frac{1}{156.4444} \ast \left( \frac{t^2}{(\text{sec/cm})} \right) \tag{4}
\]

If one compares the terms comprising \( h \) respectively in Eq. (3) and Eq. (4), it becomes apparent that the author unwarrantedly introduces in Eq. (4) the term \( (t_0)^2 \), replacing the term \( \text{sec}^2 \). I will call this procedure of his the 'switch.' All the terms in Eq. (3) are in the cgs system of units. The rationale for making this 'switch' is not given: only the numerator term is 'switched,' retaining the other terms in the cgs units. Further, if the 'swap' is not carried out, the cm term we wish to avoid finally in the frequency would find place in \( h \) right from the beginning, making it:

\[
\frac{1}{156.4444} \ast \left( \frac{\text{sec}^2}{(\text{sec/cm})} \right) \tag{4}
\]

As such, if he has reasons to 'switch' the sec term in the numerator to the natural unit of time, the same reasons would compel the 'switching' of this cm term also to the natural unit of space. This, of course, produces the wrong result. The 'swap' serves to avoid just this.

(4) At two places Satz comments on my attempt to calculate the Planck's constant.
equals 1, this factor turns out to be \((1+s)^{1/3}\). It may be noted that this factor is non-dimensional, being a ratio, and its application (my Eq. (7)) does not vitiate the dimensions of \(h\) as Satz contends.

Further, Satz remarks that "secondary mass varies between the subatoms and the atoms and so cannot be a part of the conversion factor." But this is not relevant to the situation, since I was concerned with the effect the secondary mass included in the definition of the gravitational mass unit on the size of the natural unit of energy, insofar as the latter is derived from the unit of gravitational mass. I was not speaking of the secondary mass component included in the mass composition of the material particles at all since that has no bearing on the present issue, as Satz correctly points out. I was, however, uncertain as to which items make up the secondary mass—like the magnetic mass, the electric mass etc.—in the situation I was discussing.

(6) And a final comment:
In Satz' Eq. (4)

\[
h = \frac{1}{156.4444} \cdot \frac{t_0^2}{\text{sec/cm}} \cdot \frac{e_0}{\text{erg}}
\]

replacing all the terms with the corresponding natural units we get:

\[
h = \frac{1}{156.4444} \cdot \frac{t_0^2}{t_0/s_0} = \frac{1}{156.4444} \cdot (e_0 \cdot t_0 \cdot s_0).
\]

If we now bring in the cm term that has been staying in the denominator of the frequency term, we get

\[
h = (e_0 \cdot t_0 \cdot s_0)(156.4444 \cdot 1 \text{ cm})
\]

This is identical to my Eq. (6) (seeing that I there used suffix n instead of suffix 0 and the upper case letters instead of the lower case) and therefore, there is nothing essentially new in Satz' derivation excepting the introduction of the 'swap' and the 'switch.'

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-K.V.K. Nehru
Open Letter to ISUS News

Editor:

By the letterhead on this page it can be deduced my profession is neither Academic nor Scientific Research oriented. I do, however, practice the methods of investigation into natural phenomena, as much because of curiosity as by hopes of rewards for my efforts. When, during my college career, the last of a series of chemistry courses (organic chem. & qualitative analysis) failed to clarify for me the nature of the atom, but rather clarified for me the confusion and disagreement within the professional community as to the Correct Model of the atom, I left the chemistry course certain I did not wish to pursue any further classroom study of such an apparently misunderstood phenomena. I took up engineering, in the lower ranks, as I had not yet earned a degree. I did not stop my search for better explanations and representations of the Physical Universe.

Now, seventeen years later, I find one aspect of myself has not been dulled by the work-a-day world of my life, and this is my joy at discovering some solution to an existing problem of immediate import, or questing on my own to find out just why some intermittent causes produced just this result, whether the result be related to my occupation or some activity simply associated with daily life.

This quality of curiosity led me to a set of lectures given by a professor at the Junior College which I was attending seventeen years ago, and the subject of these lectures was the Reciprocal System. I have not stopped studying, to my own capacity, the Reciprocal System.

In response to Professor Denslows’ statement regarding reaching out to young students with the ideas of the Reciprocal System, I can reply with one case, mine. When he presented the material in the series of lectures I attended, I wonder if he ever expected to discover positive results of his efforts this much later in time.

My Thanks,

Martin Thomas