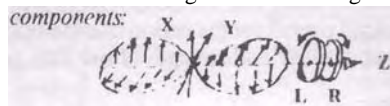# Unified Particle Theory

This paper was condensed nine years ago from one small, though important, aspect of the unified particle theory which I began an entanglement with (in September or October of 1954) due, first, to my doubts on the explanation offered by special relativity on the constancy of the velocity of light for all observers (regardless of states of motions, etc.); and, secondly, to my further skepticism on the gravitational explanation of general relativity, i.e., on the so-called curvature of space-time. How much better an attenuation shadow works! For thirty years I was laughed to scorn.

But now — during the last year and a half — most particle physicists are screaming that, at least, general relativity will have to be drastically revised if their new "superstring theories" are to work. Friends and acquaintances are now pointing out that 1 have had a "superstring theory" for thirty years. Even so, I have never called the UPT a "superstring theory." Nevertheless "superstringers " have copied many aspects of my theory, including non-pointlike properties of elementary particles. They now say that charge is smeared out, while with our basics this has always been a requirement. And behold! They now say that "curvature of space-time" must be drastically changed If one could only cry! And they have even copied the torus for the internal constituents of nucleii — but not of the electron, they suppose. I'll be so bold as to say it again: These internal constituents are electrons (±). It is no fault of my own that they are groping in the dark yet, for I sent extracts of the UPT to the theoretical physics departments of all major universities in the United Stales twenty-five years ago (I have some of these returned, unopened). And at many other times I gave excerpts of the UPT to renowned physicists and astronomers in academia.

Many places in the enclosed paper I use the terms "basics of space," "basic photon flux, " "magneticflux, "and "flux wind, "etc. They are all the same. On page two I call these "photons." This is also true, but a further explanation should be given: These basics are photons which have split up or which have never joined to an oppositely spinning partner.

Now that I have said this, I must say further that the electromagnetic radiation which we can sense or measure: light, whistlers, gamma radiation, etc., is made up of nutating, oppositely spinning pairs of our basics of space which sense and affect the basic flux. This spinning double basic photon gives a perfect picture of Maxwell's sine-waved orthogonal electromagnetic *components:*

The spinning photons trace out "waves." Also see FN 10. Moreover, this double spinning photon concept explains refraction, defraction (without "waves"), polarization without ad hoc assumptions (e.g., here, "spheroidal waves" — as if there could be any such thing), and all the other known properties of electromagnetic radiation fit beautifully. This is explained in the unified particle theory, from which this paper is extracted.

But it is not proper that I should bring in all the ramifications of the statements made or ideas touched upon, or this explanatory note must be much bigger than the paper. The paper is on "elementary"particles.
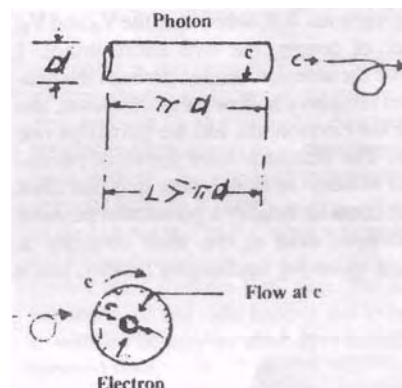
A Two Component Particle Hypothesis
(Taken from the Unified Particle Theory)

If particles are assumed to be composite structures whose components were at one time photons one can build up a two component particle hypothesis which not only fits the phenomena of charge, spin, etc., including a new conserved quantity in all particle reactions, but also he can, by assigning a mass (when bound) to each of these two components, have a pretty near fit with the masses which are known from experiment. Others are predicted. This hypothesis is much simpler than the quark ones. And its predictions are more exact.

I make these assumptions about a photon: (1) it is cylindrical and perhaps hollow (or, depending on spin diameter, disc like or annular) in shape. (2) It spins always at c while moving linearly at c, and these two movements are retained once the photon becomes part of a particle (any point on surface traces a helix of 45°, so the trace speed is 1.4142c).

To become a particle of mass this photon must curl upon itself forming a torus. There are two generic types: closed and open. The effectiveness of the former spin(the spin 1 of the photon) is now "cancelled", though the spin is retained; the tori of charged leptons are closed:

The four arrows symbolize the annulcd spin of the former photon; the single outside arrow, the new particle spin. The spin shown by the 4 arrows is critically necessary for encrgy-to-mass formation; I call this movement the "flow" of the torus. If a photon describing left hand helicity curls and forms into a particle it remains forever distinct from a torus which is formed from a photon of right hand helicity because of the two movements (one cannot be changed to the other). These are truly elementary. One is an e^-; the other an e^+. Either might now, in translatory motion, show left or right helicity (have spins parallel or antiparallel); however, one helicity would be preferred, as will be shown directly.

Charge is assumed — in this scheme — not to inhere, per se, in the torus, but rather to be a manifestation of the electro-magnetic radiation of space[1] (flowing through the hole of the doughnut.
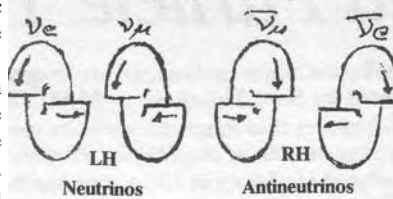
I assume that space is permeated with photons of various "wavelengths". These ordinarily do not mutually interact while traversing space together any more than, say, two searchlight beams interact or, a microwave beam and photons from the sun interact. These photons collectively I call the basics of space (since they are the basic stuff from which not only matter, but charge, as well, is made).[2]

Although the photon may possibly be hollow, have a cylindrical shell structure, as a charged particle I presume that, in any case, it squeezes down to a structure filled (with the "fire fluid" of the photon).[3] Electrons should be very small (and no photon less energetic or shorter than P times its diameter can ever become an electron).

The torus contributes a mass of about 68.6 meV when bound in nucleii. When free, 0.5 MeV, the e+.

There has to be a second particle constructed from photons with no charge capabilities, or mass while free. It must come in two versions. It is, when free, the V_e and V_r; also, of course, the two antineutrinos. I make the assumption that perhaps the neutrino remains a hollow torus. However, unlike the electron, the tori are parted on one side. The neutrinos form spirals of permanent helicity. In sketch note that one must here consider helicity a permanent physical parameter even as one must consider a screw as having unchanging helicity; this is

aside from the usual vector definition, of "parallel" or "antiparallel" spin.

LH   RH

Neutrinos   Antineutrinos

One can have four distinct particles, two of left helicity, and two of right, fitting the requirements of V_e, V_r, V_e, V_r. This quadrality obtains because, with the permanent helicity, we have also the locked in photon spin, analagous to flow in the electron's torus. We have no V_r.

Further, since some force must hold the helices unchanging I assume this is the disturbance in the basics (an electro-magnetic 'field') caused by the two spins, and the two (hollow) faces. The V is electromagnetically neutral overall for the reason that the magnetic polarity and strength of one face (at

where the tori are split) would just oppose that of the other, neutralizing the V as a whole.

This uncharged, apparently massless (when free) lepton contributes a mass of 18.53 MeV when bound inside the composite particle.

Using multiples of the two energies and adding them together we come near the experimentally determined values.[4] Stable and metastable particles.

All 1/2 integer spin particles have odd numbers of components when summed; even integer spin ones have even numbers of components.

Note that the above scheme works reasonably well in calculating the masses of composite particles irregardless of whether they are leptons, mesons, or baryons.

The masses derived are not exact; there is an error of about 1 MeV out of 500 MeV in some. Binding energies are not uniform; and are unexplained. It is noteworthy that no other scheme comes nearly so close.

Particle	Spin	Mass MeV	n(68.6)	+	n_2(18.53)	Calculated Mass MeV
$\mu^{\pm}$	1/2	105.66	68.6	+	2(18.53)	105.66
π^o	0	134.96	2(68.6)	+	0	137.2
K^o	0	497.67	4(68.6)	+	12(18.53)	496.96
η^o	0	548.8	8(68.6)	+	0	548.8
$p^{\pm}$	1/2	938.279	11(68.6)	+	10(18.53)	939.9
Λ^o	1/2	1115.6	16(68.6)	+	18.53	1116.9
Σ^o	1/2	1192.46	16(68.6)	+	5(18.53)	1190.25
Ξ	1/2	1314.9	17(68.6)	+	8(18.53)	1314.44
Ω^-	3/2	1672.2	19(68.6)	+	20(18.53)	1674

If all particles are composed of these two types of tori then there should be some conserved quantity — akin to the tori — common to all composites (other than charge).[7] Call this quantity 2-toriness (2- -ness); then:

2- -ness) = Q - A, where Q is charge and A the baryon no.

Add algebraically. In *evvery* reaction 2- -ness is conserved. The e+ and its Ve are *together* given a 2- -ness of +; the e-Ve, -1, except in inverse beta-decay, where the electron alone has 2- -ness of -1 (+1).

Examples:

Now, above I said one helicity of the e-, e+ would be preferred. If we section one of these tori and make flow lines

E_L — Sectioned   basics of space

in the fire fluid around a *center* we may see why. We assume that the tori can have a maximum velocity relative to the basics of space of 2c (in the same sense that accelerated electrons encounter the $2°7$ blackbody radiation at near 2c). But now we must differ, for I assume that not only is this important but that it is all that is important to inertia and mass: As the electron's velocity increases into the basic flux the fluid stuff near outside of torus must meet the basics at an increasingly higher rate than does the fluid near the hole. I am assuming a torus which flies forward face on. So the center of the flow must move ever inward to keep the fluid flowing at c. If enough energy were available (an infinite amount?) this center

would reach the "skin" (at which time the torus would lose all mass and likely reverse directions). I assume mass is this movement about the center; the assymetry of the flow as seen in section is a measure of the mass. If the flow center is moved, say 90% of the distance to inside edge, this represents a certain inertia of mass, as when we throw a ball (fast ball!), and until an opposite "force" acts upon the ball — and so changes *the center of movement* — it will continue on.[5] The mass of, say, a proton at "rest" on the earth is about 938 MeV due to the repression of the flow centers of the three component particles within the proton. Inertia and mass are the same.

Accelerated mass is added on, therefore, without permanently changing the particle.

Basics

The tori would prefer one helicity for the reason that, in sectional view the hatched, the outer portion contains a greater volumn. And least action would prefer that the greater and slower flow impact the basics; the lesser flow makes up for this in speed up to near 2c[6].

A final question should be this: do large multiples of these components exist inside the more massive elementary particles as separate entities?

It appears unnecessary in all cases since the repression of the center flow in the *closed* tori -- by accelerating into the basic flux -- and the increase in D, decrease in d, of the *broken* tori is the equivalent of having mass added on, where D and d are the two diameters of a torus as used conventionally. By this the scattering cross section of neutrino interactions should increase as energy goes up, that of the electron, decrease.

I have said above that one could construct "elementary" particles with only "two" torus-like components, of specified internal spins and flows.

Therein I made statements to effect that one could see the experimentally-confirmed properties of the particles by picturing these as made of the tori components. I mentioned a few.[7],[8],[9]

Now I should like to show that parity violation was no violation at all, but a misinterpretation, a confused view. The confusion was partially, at least, caused by one's having pictured the particle's spin as either "pointing forward," right hand, or, "backward," left hand. Arrows pointing opposite to the direction of the particle's linear movement are not only misleading but are one

dimensional affairs; whereas, we need arrows showing *movement* in *three* dimensions (arrows pointing with the direction tell little more). It is small wonder that in viewing the beta decay of Co^{60} in terms of the conventional arrows we should ascribe to the mirror an impossible event.[10],[11] Convenient mathematical fictions can cause trouble. In terms of the traced movements and helices of our tori there are not only no "impossible" mirrored events but the events as mirrored are the requisite antiparticles. (When we have no translatory movement we must yet picture spin and flow — but not helicity.)

Let us use mirrors.

Sectioned Components

Consider the unbroken tori, which I assume are the electrons: If a torus of one flow and spin (with a preferred direction of translation) constitutes an e- then its mirror view with all the opposed movement, of opposite helicity, is the e+. The mirror view of the e- is not still an e- ("since we can have left and right electrons," as it is usually said), for we must consider flow also. The torus can show left and right helicity, *but* to be an e- with *left* helicity we must have outside to forward flow,

and an eR^- must show opposite, i.e., inside to forward flow.

The mirror views of these two are the two helices of the e+. The flow center configuration should prohibit the e- from remaining right handed. If it is started out from a composite as right handed it should flip immediately, reacting against the basics of space, and conversely, the e+.

Images of the above

e_L^-, e_R^- become $e_R^=$, $e_L^=$
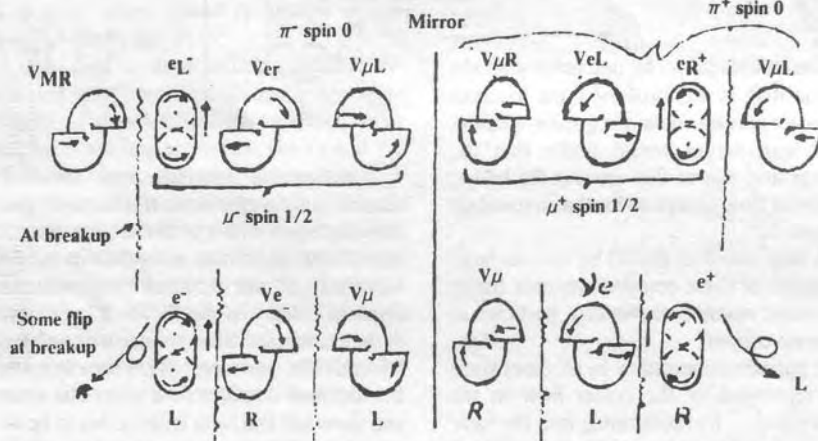
113

Real   Mirror   Images

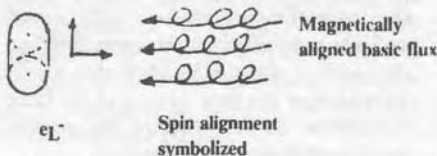If we show the more complex proton, its mirror-image will likewise be its anti-particle.

Because of the flow — and impingement of basics of space against this flow (maximum relative of 2c) — there is a preferred helicity of the electron. If, therefore the electron is treated with a magnetic field[10],[11] the electrons will assume orientations which will preferentially, at unstable particle decay, fly off in predetermined directions. consider a mirror view of π^- and μ^- decays:

All internal movements are reversed by the mirror; therefore the images are the antiparticles. Since π^- has spin 0 and the μ^- has spin 1/2 we must assume that when the π^- breaks up into a μ^- and an $V\mu$ the e^- flips over from a state of left spin to one of right spin; this allows the $V\mu$ and μ^- to fly apart with the right hand helicity. The flip takes time, slowing the reaction. Nevertheless, except to preserve angular momentum when the need arises, the flow pattern of the e^- should make it left handed.

Finally, if we align a composite particle by using an electro-magnetic "field" (our helically aligned space basics) as Mrs. Wu and associates did with the Co^{60} nucleii[12] we thereby align the composite in a preferential way since the *individual* components are all that offers a resistance to our spin aligned basics, indeed, all that there is to any particle. All should pretty much agree with that. Now, the important thing is this: the mag-

netic basic flux hitting the components of Co^{60} will tend to cause the outside flow of the unbroken tori (within the Co^{60}) to face into a helically aligned flux "wind" (electromagnetic field) — exactly as when the tori are accelerated. This aligning of the tori (since they do not flip except under special conditions of breakup of composite) is that which aligns the whole:[10]

Magnetically aligned basic flux

Spin alignment symbolized

When these electrons are "shot" out they are shot out so that the outside flow heads into the flux. This repression of the flow center *is* inertia; when any weak spot (or hole) in the impinging flux passes by, the component,

the e^-, must shoot out — the steam is up, and throttle is open. The chuck is removed.[13]

What of charge, of the so-called TCP theorem? We have treated it above, already; for when we treat spin, flow, and helicity (through the basics) we have simultaneously treated charge. Charge is the twist given the basics by spin and flow. It is then small wonder that "weak interactions always obey charge-conjugation invariance and parity invariance taken together". They are inseparable. The parity (true parity) determines the charge.[14]

And we treat not just charge-conjugation invariance and space-inversion invariance, or parity, but, at once, time-reversal invariance. For when we allow that any parity experiment must see all internal constituents and their several movements — and without this allowance we are hobbled, have blinders on — we at once see that no experiment, including "thought" experiments, can

claim that the principle of time reversal is anything but invalid: we can start at the macro level, using the illustration of a swimmer moving backward in time (a favorite of the time-reversal-*in principle*-crowd). As the swimmer moves forward in time we see, by close scrutiny, that there is a reaction between the water and the swimmer's feet and hands. But in the backwards view — and we must see all — the water molecules rush up against the swimmer's hands and feet, stop dead, causing no reaction; instead the swimmer moves back along the path from which the water came. Action-reaction is violated, Newton's third law of motion.

Let's go to the very small: we have a π^+ moving through a magnetic field, the magnet has poles, and marked N and S; the magnetic field is of such a direction, say, that from our vantage point the π^+ curves to the left (a π^- will curve to the right). If we run a film of the event backwards the π^+ will be seen to curve right, an impossible π^+ in our magnetic field. Ah! but let the camera reverse left for right. Now our π^+ curves left again. But perversity has us, for when our camera changed left for right it also changed all the internal spins and flows of the π^+. And this changed particle is a π^-. A π^- should curve to the right, not left. But wait! did our camera not also interchange the north and south poles by reversing the spin of spin-aligned basics traversing the space between poles (despite the now phony fact that the south is imprinted N, the north, S), reversing our field? Indeed. Now we have the π^+ curving left, well enough, but since our magnetic field is reversed, it should now curve right, not left. Therefore time reversal is impossible. When we have allowed ourselves the abilties to see the spin and substructures of all components of a particle we see that we have changed a particle into its antiparticle, we now have a π^- curving correctly in a reversed field, but we have not run the π^+ backward in time. All such experiments with micro (as with macro) constituents fail if we are allowed analytical instruments, e.g., magnets in determining all parameters. Only if we disallow instruments showing charge (the curve), ionization, spin, momentum, etc., may we say: The most elementary particles can travel backwards in time — unfortunately we are hiding behind our ignorance. For when we allow total analysis, showing the known properties of particles, no example of time reversal is seen. Indeed since one can show that time reversal is impossible in the four simple basic particles (by our hypothesis), the electrons and neutrinos, due to its violating one or more of the known laws of nature and

since (in our view, above) all matter is composed of these can we not conclude that time ~versal is disallowed in all more complex ~ructures by existing laws of nature?[15]

FOOTNOTES

1. Besides the $2°.7$ blackbody of Penzias and Wilson and the other known electro-magnetic radiation of space I assume there to be much other. More than 90% of the substance of the world is unaccounted for; it is needed to account for the formation of the gravitational systems. If this missing mass is in the form of photons we should have enough.

2. The elementary particle aspect of the UPT with which this paper is concerned was first conceived in about 1957, excerpts of which were printed in pamphlet form (on three occasions in the early 1960's). New data was added as it became available. I call the overall scheme the unified particle theory, and intend publishing the concept in book form. As far as I can determine the French-Swiss LeSage was the first to propose a particle shadowing effect gravity.

3. Though a filled in cylinder is not apparently a prequisite here, it might give us a clue as to why the Bohr energy orbits contain the numbers: $1, 4, 9 \ldots 36$ (Balmer and other series). If R, r are the lii (in usual sense) of the torus; then in maintaining a constant volumn as r assumes values $1, 1/2, 1/3 \ldots$; R assumes the values $1, 4, 9 \ldots$

4. I apologize if due credit has not been given anywhere. I have little access to the literature.

5. I assume that both the broken and unbroken tori have the ability to replicate themselves, given enough energy through acceleration. The new material is from the basics of space. But no torus can replicate unless it has basics on both sides (and acceleration sees to this) thereby producing pairs of components of opposite spins and flows — all the intrinsic properties there are (all other properties are seen as caused by these spins, and flows, and, their interactions with basics).

7. The electron charge remains constant due to constant volumn, spin, and flow of the torus.

8. Although the numbers and kinds of particles and resonances are, by this hypothesis, restricted in the lower mass range there are nearly unlimited possibilities at higher and higher masses, given sufficient energy of acceleration and some degree of stability.

9. Since I have made the assumption that nothing exists except the basic photons of space the two tori, broken and unbroken ones, then all "forces" of nature, gravity, weak, electromagnetic, and strong must ensue from these. It is not difficult to envision that tori in proper juxtaposition would be difficult to break apart because of helicity of basics (charge) flowing through the holes of tori whereas at some distance we might

Over Unity Motors??

have repulsion. Further, certain positionings can be seen as readily breaking apart, i.e., being pushed apart; others only slowly, only after having flipped over — recall, if you will, that we have a preference of helicity for the closed tori; and a permanent helicity for the broken ones. And gravity can be seen as a push shadowing gravity, much like the one LeSage envisioned. The total interactions (weakening) of the basic flux is the important criterion here. We need no "field" — the weakened flux density *is* the field.
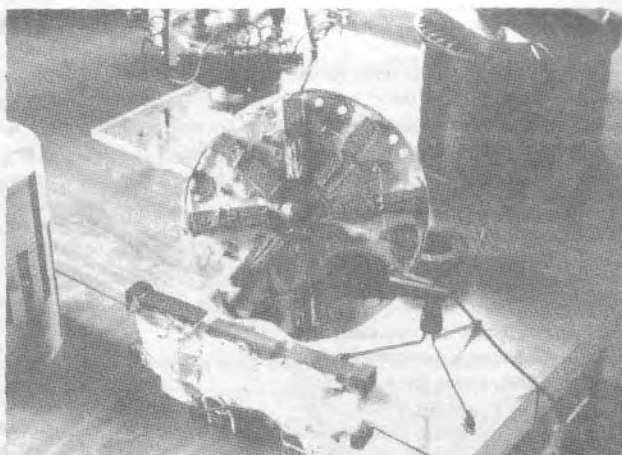
10. In our view an electric "field" is the alignment of spins of basics *caused* by the flow of electrons through the basic stuff of space; a magnetic field is the spin allignment of basics caused by the flow of the basic stuff through electrons (which are alligned and usually "stationary"). In both cases the basics go through the hole of the torus, i.e., when the tori move past the basics we have the electrical, and when the basics move past the tori we have the magnetic one.

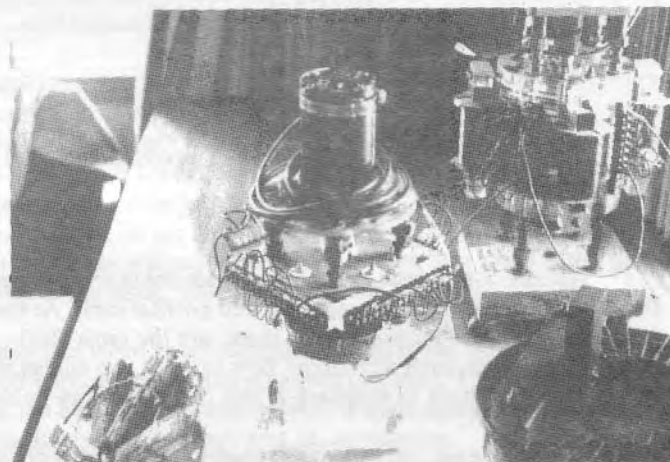11. In the famous parity overthrow experiment suggested by Lee and Yang.

12. See page

13. Radioactivity, its randomness, and tunnelling are naturally explainable by slight inhomogeneities in the basic flux. One should not stop here. Both the high energy production and superluminal velocities of QSO's can be seen as caused by matter (galaxies) having reached near the edge of a bounded, steady — more or less — ball of basic flux. The nearer one comes to the edge the more particles that become unstable. Out of the flux *all* are unstable. Total internal reflection will keep the size of the world constant. At edge of basic flux, matter all across a galaxie, without regard to extent, could simultaneously break up to radiation — hence the "superluminal" velocities.

14. If this view (from the unified particle theory) is correct then the ν, while possibly massless, should not of necessity have a linear velocity of c. By producing short bursts of neutrinos one should be able to time the flight of the bunches. A test. An alternative to this view of the v, and one which I once considered, was this: It is a mold pattern molded in the basic flux by reactions against that flux by the tori — a pattern molded by kick-back at time of break up of composites, so it would be a dimple in the flux of specified energy and spin angular momentum. At least this

allows it go off at c always. And what of the preferred flow pattern of the tori, the e⁻, which I have suggested? If outside flow is away from the flux (instead of into) and consistently used thusly will it not answer? Yes, but both cannot be right. I discount this latter (mold pattern) view.

15. The unified particle theory, if proven true, has, of course, fantastic implications. Much of present day physics will need revision. Several branches (some cosmology, particle physics, relativity, quantum mechanics are out, discarded crutches). Perhaps this is why the many workers to whom, over the years, I have given extracts of the upt have reacted very violently, usually negatively, before they see the whole picture. New ideas out of context always seem ridiculous, violating all that we have been taught. One must try to keep an open mind on the questions this necessarily limited extract will raise. In five years I had finished 225 pages from which most of this extract is taken.

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SYSTEMS TECHNOLOGY: GRAVITY NOTES VI (CEFITS)

Richard LeFors Clark, Ph.D
December 7, 1984