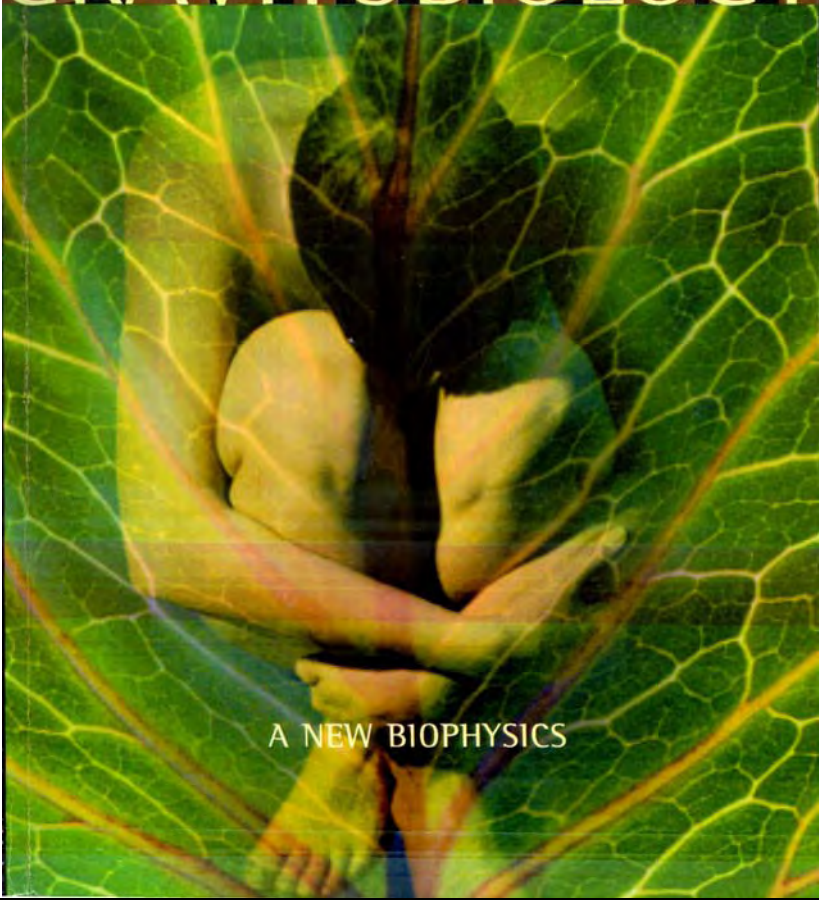
BEARDEN

GRAVITOBIOLOGY



A NEW BIOPHYSICS

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Introduction

This may be the most important and far-reaching paper **that** this researcher has ever written. The knowledge and utilization of gravitobiology will profoundly alter the entire future of mankind.

The paper has been very difficult to write. It advances what — to the West — is an astounding breakthrough in understanding the mechanisms for the direct biological effects of Maxwellian electromagnetics.[1] However, one is given great pause at the sobering implications for both good and evil.

Although secretly well-known and highly developed in the Soviet Union for decades, this new technology ushers in a completely new area to the West: electrogravitobiology, or shortened, *gravitobiology* — which infolds and drastically extends present photobiology.[2]

Gravitobiology is the application of a unified field theory conception of electromagnetics (EM) and gravitation (G) to the total energetics exchanges (1) between a living organism and its external environment (interexchanges) and (2) inside the living organism and between, within, and among its parts and its whole (intra-exchanges).

Gravitobiology drastically changes the present reductionist view of photobiology, where *the whole is simply the sum of its parts*, and the superposition principle rigorously holds. In photobiology (and, in general, in ordinary physics), one specifies the externalized field/matter exchange on, between, and amongst the parts. Then it is assumed that one has specified the total action of the whole. On the other hand, in gravitobiology reductionism and superposition are only pale shadows of the total biological truth. Now one approaches a completely holographic situation: The part exchanges with and conditions the whole, and the whole exchanges with and conditions the part[3]

In gravitobiology, fundamental changes are made to two "untouchable" primary sciences: general relativity and quantum mechanics. In so doing, one unites and extends both of them into a common unified approach, and drastically enriches the present conception of the physical exchanges in, of, between, among, and within physical systems. The foundations changes to general relativity allow the incorporation of a hidden variable theory (the Whittaker internalized EM energy structure of the potential) without violation of Bell's theorem.

So First one must change general relativity. One must unite EM and G on the most fundamental level possible: that of the quantum particles of the fields.[4] The clue to the procedure is the fact that, in quantum field theory, the graviton has spin-2 and the photon has spin-1. This strongly suggests that two photons ought to couple together to produce a graviton, if the resultants of the E- and B-fields of the coupled photons are reduced to zero. In fact, such a bound (coupled, as in a standing wave) photon/antiphoton pair makes a basic spin-2 *graviton.*

However, in the vacuum, virtual photons are appearing (creation) and disappearing (annihilation) all the time, at incredible rates. Further, from the standpoint of GB we state that these virtual photons are also coupling (modulating each other) and decoupling (demodulating) all the time, again at an incredible rate. The virtual photons are coupling and decoupling (modulating and demodulating) with each other at such intense rapidity that to speak of a *fixed spin-2 coupling* ignores the fact that it is really only an averaged coupling that stably exists. Any number of photons can simultaneously modulate — and they do. And just as quickly, they decouple. Hence the number of instantaneously coupled photons at a point in the vacuum is

always dynamically changing over a very great range of values. Further, continual decoupling of these coupled photons also occurs with intense rapidity. The coupled-photon *ghost form* structures in the vacuum are always continually being annihilated, as well as created. In his fastest observation, of course, the macroscopic observer delects/observes the sum of a vast number of these virtual photon coupling/decouplings. He will thus detect *only the average coupling.*

The upshot is that *on the average,* the number of photons in each graviton may appear to the macroscopic observer to be stabilized at some value between zero and infinity, including *fractional* values. Further, one can now speak of the *distribution* of the coupled-photon ghost forms, and hence of graviton spin-value in local observer spacetime. One can also speak of the *relative density* of any particular local ghost form in the vacuum, seemingly the *instantaneous local density* of that ghost form with respect to the macroscopic observer.

One also can speak of the *reality density* of each ghost form in the local vacuum, with respect to its relative density vis a vis all the local coupled-photon ghost forms, during a unit time interval. For that particular form, one can also speak of its "Q" or *reality stability* — that is, how *sharply* (and hence how stably) something is real. As can be seen, this approach immediately affects our entire conception of virtual and observable physical realities and their relationships and interactions with each other. When a ghost form reaches a sharpness of one or more, it has reached/breached the threshold of observable quantum change, and is no longer just a virtual-state form. Further, we will shortly find that we can structure and engineer these virtual state coupled-photon ghost forms at will. In gravitobiology, *physical reality itself becomes deterministically tuneable, changeable, engineerable, and not fixed at all.* Physical reality is not like a stone, but rather it is like a stabilized bubble lightly floating on a rushing torrent of water. An *observably real* form is an equilibrium in the violent flux of the creation and annihilation of virtual state vacuum ghost forms of all kinds, such that it has sufficiently stable density to consistently breach the quantum threshold.

To show the basis for this graviton concept, several figures are required. Figure 1 shows the two kinds of EM energy: (1) translation (externally acting) EM energy and (2) stress (internally acting) EM energy. To first order, Figure 2 shows how we consider the photon as a single oscillation of a minimum observable monochromatic EM wave.

Figure 3 shows the coupled photon/antiphoton pair that comprises the basic graviton. On the average, uncurved spacetime is nominally composed of such spin-2 gravitons. To the first order, a spacetime composed of spin-2 gravitons is said to be *a flat* spacetime.

However, spacetime in a sense may be regarded as a conglomerate of potentials — including the scalar EM potentials. Therefore the simplest structure of *EM scalar potentials* (trapped EM energy) is also nominally composed of such spin-2 gravitons. Note that each of the coupled photons in the graviton may be constantly circling the other at nominal light speed tangentially, but the *graviton system itself* may be essentially stationary. In other words, the two trapped photons in a simple graviton are like whirling dervishes, spinning and running at top speed in non-translating circles.

Of course, the graviton system can also translate *as a system.*[5] Figure 4 shows this dynamic graviton system concept and Table 1 summarizes it.

In addition to spatial linkage of their hidden EM Whittaker wave contents, gravitons link or exchange contents via harmonic and subharmonic EM frequency chains. Thus one has photon communication (translation) between gravitons in two fashions: (1) *horizontally* (along spatial wavelength chains), and (2) *vertically* (via harmonic frequencies). Note that horizontal (wavelength) communication is linear, while harmonic (frequency) communication is nonlinear.

For that reason, linear media translate horizontally, passing a frequency without changing it; while nonlinear media translate vertically, changing a frequency that is passed.

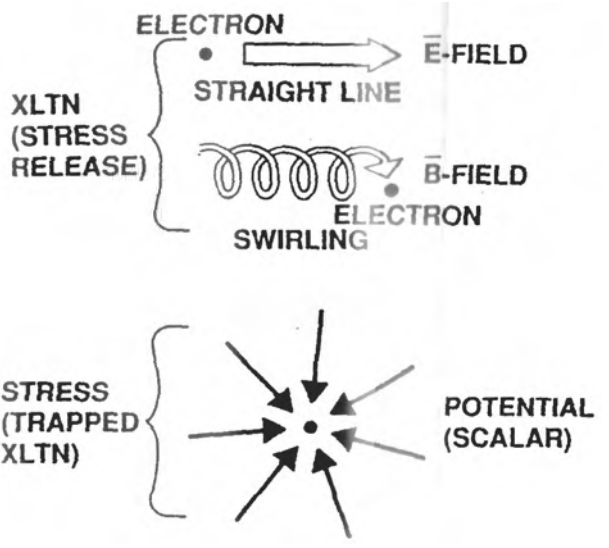

Figure 1. Two kinds of EM energy: Stress and translation. EM translation energy does external work. EM *stress* energy does internal work on the medium.

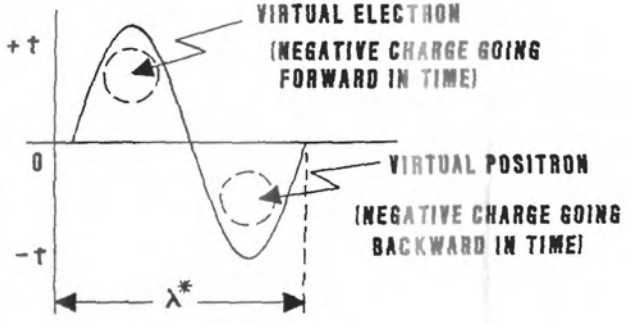

Figure 2. **The** photon as a single oscillation of a minimal carrier wave.

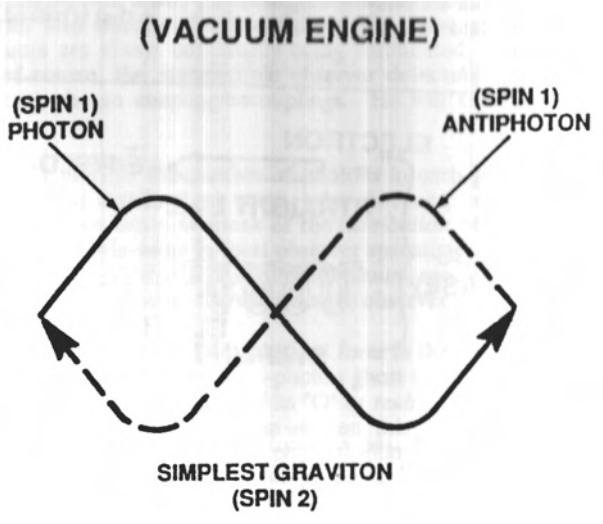

Figure 3. Coupled photon/antiphoton pair (simplest graviton).

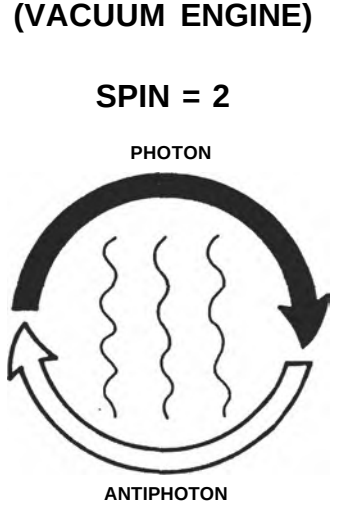

Figure 4. The potential is composed of gravitons, whose structures consist of bound photons and antiphotons.

Table 1. The graviton vacuum potential.

- **PHOTON TRANSLATES AT C**
- **SCALAR POTENTIAL IS STATIC**
  - **TRAPPED "CHARGE"**
  - **TRAPPED PHOTONS (VIRTUAL)**
- **HOW DO YOU TRAP A PHOTON?**
  - **MAKE A GRAVITON**
- **EM SCALAR POTENTIAL IS MADE OF GRAVITONS**
- **VACUUM/SPACETIME MEDIUM IS MADE OF GRAVITONS**
- **GRAVITON IS A PIECE OF VACUUM MEDIUM**

The scalar EM potential may be regarded as an infinite set of pairs of bidirectional EM planar waves, where the two members of each pair are multiplied together, totally *modulating* each other.[6] Figures 5,6, and 7 show this effect.

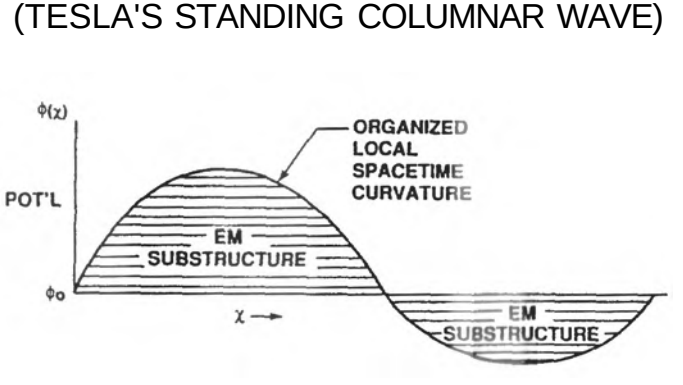

Figure 5. The Whittaker standing potential wave.

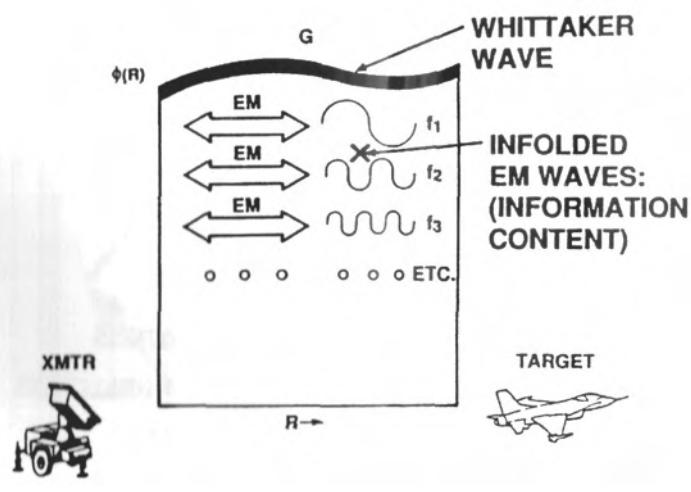

Figure 6. Infolded EM structure of the Whittaker beam.

(VACUUM ENGINE)

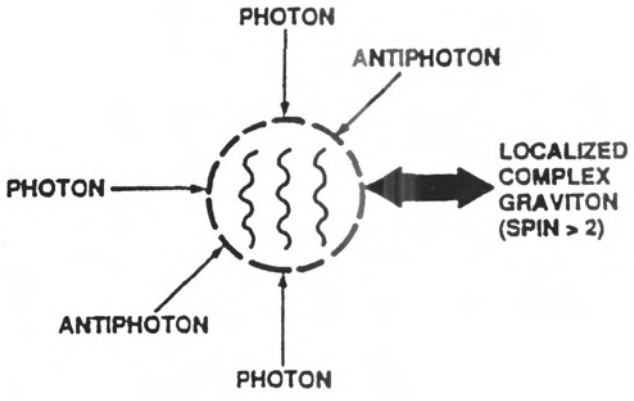

Figure 7. Destructive and constructive interference. Destructive interference of photons infolds them as EM structures inside gravitons; i.e., it constructs gravitons. Destructive interference of gravitons outfolds the internal EM structures; i.e., it constructs ordinary EM.

In a scalar EM potential the EM energy communicates vertically, which is harmonic translation of frequency energies, or time-wise. The time-wise two-wave EM energy communication represents a *stress upon the rate of flow of local observer time;* hence it represents *gravitational s*tress. Further, the local rate of flow of time is determined by this local time-stress of vacuum potential. *One can easily engineer the harmonic bidirectional wave structure of the vacuum potential When one does so, then one also (1) curves local spacetime, (2) deterministically structures that local curvature with selected hidden-variable EM engines, (3) changes the local rate of flow of time, (4) gravitationally affects local systems, and (5) dynamically structures that local gravitational change to affect different system structures at will.*

Immediately this graviton concept focuses intensive attention to the nonlinear aspects of the problem, and hence to modulation and demodulation. Nonlinear materials, after all, are materials which directly exhibit the production of harmonics from a fundamental, as shown in Figure 8. However, as previously pointed out, production of harmonics affects the time-stress and the local rate of flow of time in an area. This is a gravitational effect, and hence nonlinear EM actions contain gravitational action components. *Nonlinear materials can and do void the mutual exclusivity of the classical EM and G fields, and interact in a unified-field manner.*

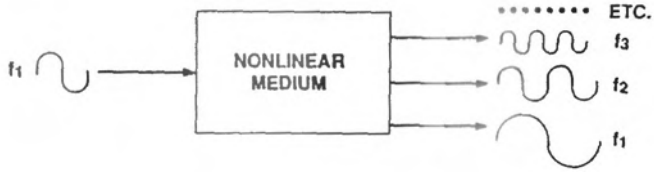

Figure 8. Nonlinear materials produce harmonics.

Also, in a true time-reversed situation, nonlinear materials can exhibit the production of a stronger fundamental from a combination of the fundamental and its harmonics, as shown in Figure 9. Thus there is a very clear difference between a true time-reversed EM wave and an ordinary EM wave with the same envelope and directional characteristics, contrary to most of the present treatments in physics.[7] The latter *case, pseudo-conjugation,* is not all true conjugation.

Figure 10 shows a comparison of phase conjugate mirror reflection and standard mirror reflection. Figure 11 shows the four-wave mixing concept by means of which the energy in pump waves A_1 and A_2 is utilized to produce an amplified phase conjugate replica wave A_3 in response to the weak input signal wave A_4. This gives a powerful means for producing and amplifying the time-reversed wave.

So a graviton is regarded as *a particle (cell) of the vacuum and of the spacetime medium.* It is in fact any one of the *ghost forms* we previously referred to. But it is not a sternly fixed, quantized fundamental particle, in the sense presently used in physics. Instead, the graviton is like a

quivering balloon or jelly-like cell in the vacuum medium, with many input and output pipes (coupling and decoupling waves) in and out.[8] The instantaneous size and composition of the balloon (the *graviton cell)* depends upon a multiplicity of internal states and their exchanges. A relatively stable graviton cell — such as the nominal spin-2 graviton — represents only an envelope of the average equilibrium state of multi-photon coupling in a dynamic coupling and decoupling photon flux.

(A NEW KIND OF INTERFEROMETRY)
[STOKES' PRINCIPLE OF TIME REVERSIBILITY]

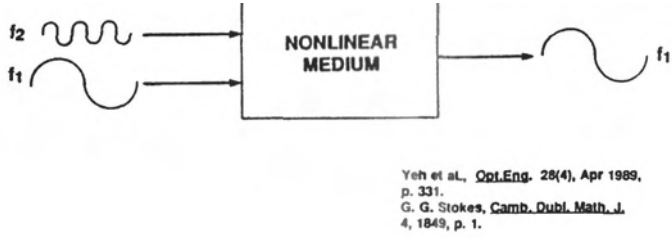

Figure 9. Time reversal of a fundamental plus harmonics can produce a stronger fundamental.

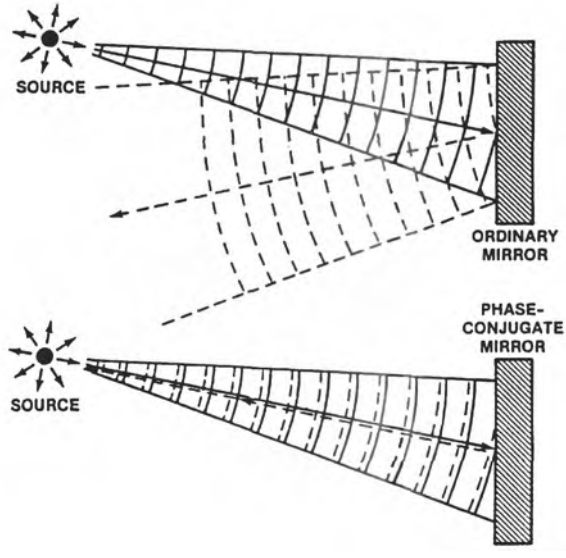

Figure 10. Ordinary mirror reflection versus phase conjugate mirror reflection.

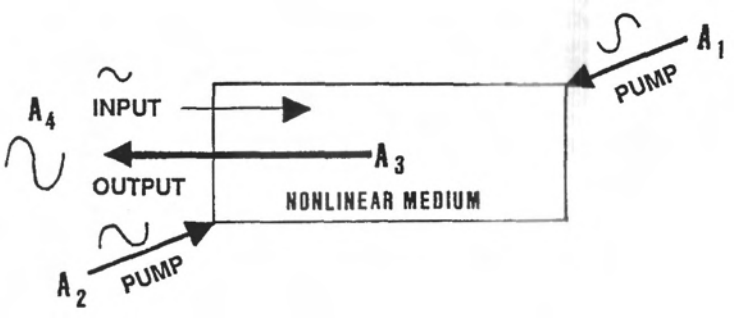

Figure 11. **Pumped** phase conjugate **mirror (PPCM).** The PPCM material acts as a triode **amplifier. Pumping and four-wave mixing allows strong amplification.** The phase conjugate **replica A_3 of signal input** A_4 **may contain up to all the energy in** A_1 **and** A_2.

Thus the graviton is the average coupled-photon structured cell of the local vacuum EM potential. When the graviton (average) spin is two, the local spacetime is flat and uncurved. *All that the concept of "flat spacetime" means is that the predominant average activity of the virtual photons of the local vacuum flux is simply the coupling and decoupling of pairs of single photons and single antiphotons.* When the graviton (average) spin is less than or greater than two, the local spacetime is curved, and EM and G are no longer mutually exclusive. Spin less than two gives curvature in one manner, and spin greater than two gives curvature in the opposite manner.[9] *All that the concept of "curved spacetime" means is that the predominant average activity of the virtual photons of the local vacuum flux involves either (1) increased decoupling and decreased coupling of photon/antiphoton pairs (negative curvature; graviton spin less than two), or (2) decreased decoupling and increased coupling of photonlantiphoton pairs (positive curvature; graviton spin more than two.)*

In quantum mechanics (QM), any EM frequency — even in a single quantum — now must be regarded as continually having internal dynamic exchanges subharmonically and harmonically. Indeed, each photon wavelength (single oscillation) must be considered as a graviton cell having **its** own spectral content. At the same time, it is also a part of the spectral content of many other **graviton** cells. Note that this describes a holographic connection and interaction. It also accounts for the fact that the photon stubbornly refuses to act solely as a simple, localized particle. One therefore regards photons as single-wavelengths of waves, to the first order. One regards the vacuum as composed of harmonic bidirectional wave structures, always marvelously and dynamically varying at incredible rapidity. This photon-structured vacuum permits the inclusion of internalized ordered-photon structure in spacetime, *in quantum change itself.*

Accordingly, the fundamental QM postulate that quantum change is random must be changed. Since there now may exist hidden subquantal and quantal orders within the randomness, the altered postulate must state that quantum change is *chaotic.* This produces an *already chaotic* quantum mechanics, and resolves one of its most pressing foundations difficulties: that of the missing chaos.[10]

It turns out that these changes to GR and QM unite them into a single unified conceptual approach. However, they also implement to the hilt a vital hidden variable theory and a graviton-

structured potential, to include the *quantum potential* (see Table 2 and Table 3), which can yield action at a distance. Now nonlocal effects arc also subject to deterministic engineering.[11]

Table 2. Quuntum Potential (QP) Characteristics.

- NO POINT SOURCE
- NOT RADIATED
- QP BETWEEN TWO PARTICLES
  - INTERACTION DOES NOT VANISH AS SPATIAL SEPARATION BECOMES VERY LARGE
  - INSTANTANEOUS CONNECTION
- DEPENDS ON QUANTUM STATE OF SYSTEM AS A WHOLE
- SYSTEM PARTS CAN BE GREATLY SEPARATED

Table 3. Hidden Variable Theory Quantum Potential.

- $V_{quantum} = (\hbar^2/2\,m)\,\frac{\nabla^2\sqrt{\rho}}{\sqrt{\rho}}$
- "A QUANTUM PARTICLE MOVES AS IF IT WERE SUBJECT, IN ADDITION TO EXTERNAL POTENTIALS, TO A POTENTIAL WHICH IS A FUNCTION OF ITS OWN PROBABILITY DISTRIBUTION.
- BOHM'S H.V.T. ASSUMES
  - PARTICLE AND WAVE FUNCTION REAL AND SEPARATE
  - WAVE FUNCTION OBEYS SHROEDINGER'S EQUATION
  - PARTICLE OBEYS CLASSICAL MECHANICS
  - PARTICLE COUPLES TO WAVE FUNCTION THROUGH A QUANTUM POTENTIAL

LEE SMOLIN, "STOCHASTIC MECHANICS, HIDDEN VARIABLES, AND GRAVITY," QUANTUM CONCEPTS IN SPACE AND TIME. PENROSE/ISHAM, EDS. CLARENDON PRESS, OXFORD, 1986, PG. 165-166.

By far the most significant EM biological effects occurring in and on a biological system are due to its gravitobiological (internalized multi-photonic) exchanges. There are great differences between single-photon (monochromatic) interactions and multi-photon interactions. A priori the very notion — and the physical selection — of a monochromatic single photon interaction assumes that the multiphoton coupling of the graviton has already been destroyed. This discards any notion of a consistent and persistent graviton structure, since a monochromatic photon does not independently exist until its *coupling shell* graviton is destroyed or excluded. Spectral (harmonics) interactions, on the other hand, may well involve substantial and profound multiphoton, infolding, and outfolding effects that do not appear at all in monochromatic interactions. *A dramatic extension of photobiology is involved in gravitobiology.*

In the new model, permissibly the linked internal structure of spacetime may be partially ordered deterministically. This internally structured spacetime[12] underlies quantum change itself and is available for dynamic utilization and manipulation by living systems. This is particularly significant since the living system, its cells, and all its subcellular and multicellular parts deliberately utilize deterministic *internal* communication (Whittaker photon exchange) through the medium of the *hidden* internal EM photon structures of stabilized gravitons comprising scalar potentials. In short, for its living communication and control of both mental and physical processes, the biological system utilizes *internalized EM energy* in hidden harmonic Whittaker photon channels inside scalar potentials.[13]

Of course, externally one can also directly engineer a harmonic photon/wave structure and infold it as a hidden stress pattern structuring of Whittaker potentials. Such externally engineered Whittaker/Devyatkov signals provide a totally new and startling capability to directly and deterministically enter into all the biological organism's hidden internal control and communications systems — both physical and mental. With this approach, all internal living biophysical and biomental processes are now open to external engineering, manipulation, and control. Further, this is already well-known to the Soviets as evidenced by the work of Devyatkov,[14] Kaznacheyev,[15] and others.[16]

We strongly point out that gravitobiology deals with the dynamic structuring, tailoring, and engineering of the vacuum state itself — including the virtual state, spacetime, and subquantal and quantal change. Since all physical observables may be regarded as *collections* or *integrations* of subquantal and quantal changes, *we are now dealing with the ability to directly structure, tailor, manipulate, and engineer physical reality itself.* Also note particularly that the *living* aspects of a biosystem — mind, thoughts, memories, lives, emotions, personality, etc. — themselves may be regarded as equilibria and dynamic structures in the deeper nested levels of the virtual particle flux of vacuum/spacetime.[17] We have long pointed out that mind and matter share one "real" dimension in common: that of *time.* In structuring the vacuum and the curvature of spacetime, one is also producing a substructure in *time itself* — in both mind and matter. Accordingly, vacuum engineering (gravitobiology) implies that *we are also dealing with the ability to directly structure, tailor, manipulate, and engineer mind, emotions, personality, deeper mental reality, and life itself.*

The implications for technology development — and consequently for humanity itself — are awesome, both for good and for evil. For the good, we now see a breathtaking vista where a simple, cheap, and ready "cure" for almost any disease or health disorder will eventually become available. We see eventually the direct capability to access such heretofore excluded areas as all conscious and unconscious mental functioning, emotions, intelligence, memory (both short term and long term), and personality itself. *Eventually education will be by direct loading of the proper "software".* Even a severe personality disorder will be directly and quickly correctable. Even more astounding, it should be possible to reverse the aging process itself. Also note that, quantum mechanically, mechanics is electromagnetic at its basis, since exchange of virtual photons generates all mechanical **forces.** Thus even the mechanical aspects of disease —

crippling, twisted spines, shortened and gnarled limbs, physical malfunctions, physical defects, etc. — all will be directly treatable and curable.

For the bad, we see a mind-numbing vista where men can (the Soviets already have done so) utilize electrogravitobiology (EGB) for terrible new mass weapons of *electromagnetic biological warfare (EMBW).* The means for ultimate human enslavement — absolute mental manipulation and control from external means — can be developed, and this will certainly be noticed by would-be dictators and meglomaniacs.

The ability to develop and utilize EM disease-inducing and immediate death-inducing scalar EM weapons has already been developed by the Soviet Union in secret KGB laboratories. We will not dwell extensively on the potential horrors of such EM BW warfare. With the new weapons any nation on earth can be devastated — physically, mentally, or both — relatively simply and in short order, with tens and even hundreds of millions of prompt casualties. We point out that small tactical EM BW "death ray" weapons have already been clandestinely tested by the Soviets in Afghanistan, accounting for the *smerch* or instant-kill "nerve gas attacks" — so called.[18] When a body was struck by this weapon, not a single twitch or movement resulted in it thereafter, ever again. Not a single nerve impulse firing occurred, ever again, in the struck body. Every cell, bacterium, virus, paramecium, etc. in the entire body was instantly dead. The body simply fell like a limp dishrag and lay crumpled and still where it fell. A decisive signature of this weapon was that, with every cell and bacterium dead, the dead bodies did not decay for a very extended period (even 30 days) — precisely as if they had been deeply irradiated with cobalt-60 nuclear (gamma) radiation. No gas or chemical attack can do that.

The weapons vista for this entire area — which the Soviet refer to overall as *energetics,* is sobering. Khrushchev himself stated to the Presidium in 1960 that these new, fantastic weapons then in Soviet development could wipe out all life on earth if unrestrainedly used.[19] One strongly suspects that Khrushchev was referring to the EM BW directed energy weapon (DEW) aspects of energetics.

In the 1975 SALT Talks, Leonid Brezhnev even tried to get an agreement for banning the development of such new mass weapons. He personally met with visiting Senators and other Congressional leaders to point out the pressing and urgent need for limitations on these new weapons.[20] In fact, he called them weapons *"...more frightful than the mind of man has ever imagined."* That same year, Gromyko introduced to the United Nations General Assembly a draft treaty for the ban of these mass destruction weapons, and urged the nations of the world to sign it as a most urgent matter.[21]

Unfortunately, the rest of the world simply did not understand what the Russians were talking about

Thus one has great qualms — and much personal anguish — when even approaching this gruesome area. Certainly that is true for this analyst. Were it not for the fact that the Soviets have already discovered and highly weaponized these EM BW effects, I most certainly would turn my attention firmly away from this entire area.

However, such frightful EM BW DEW weapons *have* already been secretly developed and deployed by the Soviets. For over three decades they have used our reaction or nonreaction to the weak EM BW against personnel in the U.S. Embassy in Moscow[22] to gauge our knowledge — or *lack* of it — of unified EM/G biological warfare. In the nearly unthinkable event that war should break out between the Soviet Union and the West, the West will simply be immediately devastated by these eerie, mind-numbing EM BW weapons before it even knows what hit it. *When we have absolutely no counters, such attack becomes a preferred Soviet option and very likely.* A wide range of options is available to the Soviet Union in utilization of both EM BW DEWs and conventional BW agents. Clandestine, slow BW attacks can be so insidiously hidden and

cleverly employed that the Western nations — because of their present scientific and intelligence shortfalls and biases — will not even comprehend that the BW "slow strike" — on several fronts and employing differing agents and methodologies — was deliberate, until it is far too late to do anything about it

I firmly believe that, one way or another, such a clandestine "slow biological warfare strike", using viral and bacteriological agents and EM BW DEW augmentation as well — is already well underway against us. Further, it is still totally unrecognized as such by the West.[23]

Nonetheless, there is still great hope. If this nation wakes from its lethargy and puts its mind to it, gravitobiology can be quickly developed. Slow (and even prompt) BW attack can then easily be countered. *Unless gravitobiology is developed, we do not have now, and we shall not have in the foreseeable future, any effective defenses whatsoever to a BW attack, whether clandestine or open, and whether by conventional BW agents orEM BWDEWs.*

The scientific and engineering mindset and the need for a little highly unorthodox EM/G effort is all that presently blocks us from quickly achieving sufficient defensive capabilities for parity in this absolutely vital area.

Leaving the weapons aside for a moment, the new technology's positive benefits to mankind can be enormous — *"far more beneficial than the mind of man has ever imagined,"* to paraphrase Brezhnev. The control and vanquishing of all the ravaging illnesses and diseases is there, available for us to develop and employ for the benefit of everyone on earth, and for our children yet to come.[24] The vista of complete and thorough education for everyone — economically and universally available — is also something that has never existed but will now become possible, since eventually the necessary software and operating systems for any human skill or field can be directly loaded, so to speak.

With a developed knowledge of the external and internal energy balances of our biosphere, we can clean up the biosphere, permanently rid ourselves and our children of poisonous chemical and nuclear wastes, and restore the vitality of the planet for our living health and enjoyment

But make no mistake: This technology will give us the capability to engineer reality itself—both physical reality, life, and mind. *And we will be able to engineer it to be either a heaven or a hell; the choice is strictly up to us.*

Faced with the looming advent of this new science, certain of my associates and I have striven over the last four years to obtain funding for a major research institute, to develop scalar EM, gravitobiology, and novel energy and antigravity devices for the betterment of mankind. However, all our efforts have been thwarted. It has become increasingly apparent that the present scientific and control mindsets are so strongly entrenched, and so dedicated to suppressing any such attempt to break the economic and technological stranglehold on our citizenry, that the vision of such an institute is just a dream and not to be taken seriously.

Consequently, I have reluctantly concluded that this information must be openly released, for that is the only remaining way to overcome the solid barrier against the new technology and its benevolent use for humankind. I believe that a well-informed, concerned citizen is also a good thing for democracy and our free way of government. At least if there are frightful dangers facing us and terrible reefs to be avoided, *let us know what the dangers are and where the reefs are.*

In that vein, this paper is reluctantly written and circulated. This technology — of which only a tiny glimpse is provided here — is truly *a force amplifier* of vast gain. It is a massive amplifier for both good and evil, for any knife cuts both ways. How any tool is *utilized* depends upon the hand

and intent of the user, not upon the tool itself. Every tool is amoral, and only humans apply it morally or immorally.

Gravitobiology conceptually points the way to unleashing some of the most formidable tools ever conceived. Let us fervently pray that wisdom will prevail and these new tools will be utilized for Man's good, to heal him and not to kill him.

Man is upon the threshold of a crisis between the good and evil sides of his nature that is unparalleled in all human history. Whatever the reader's faith, I ask for your prayers. Most assuredly they will be sorely needed in the days to come.

Tom Bearden

January 1991

Woodpeckers; A Soviet Bicentennial Present to the U.S.

On July 4, 1976 the Soviet Union presented the United States of America with a most unusual bicentennial present: On that date, extremely powerful Soviet transmitters were energized in the communications band (3-30 MHz), causing interference with communications all over the world. The "chirped" signals of the new transmitters gave them a most peculiar sound, very much like that of a woodpecker's beak striking a flat block of wood. HAM operators immediately dubbed these new monster transmitters *"Woodpeckers."* Official protests by the various nations did little good. The Soviets insisted that the Woodpecker transmitters were "experimental" and necessary. The Woodpecker transmitters continued to pour out their bothersome worldwide interference, and they do so to this day.

Misidentification as an OTH Radar

The U.S. Department of Defense (DOD) scientists and engineers proclaimed the new monster Soviet transmitters to be simply *over-the-horizon (OTH) radar transmitters.* Of course, signals in the communication band will reflect off the earth's ionosphere, so that the signals can be transmitted beyond the radio horizon, reflecting around the earth in multiple bounces within the earth-ionospheric wave guide. For that reason, OTH radars commonly utilize one or more such frequencies. However, there are certain fairly stringent limitations on an OTH radar that are evidenced in its signals. While the Woodpeckers usually exhibit those characteristics, often they also exhibit a great many other characteristics that would be useless or even detrimental to purely OTH radar functioning. Therefore the consensus among many analysts — including, for example, one or more of our most knowledgeable OTH radar experts — is that the Woodpeckers *can* function as OTH radars if need be, but their primary purpose appears to be far more complicated than OTH radar sensing and ranging.[25] Officially, however, the U.S. Department of Defense and the U.S. intelligence communities still label the Soviet Woodpeckers as OTH radars.

Immediate Weather Engineering Over North America

For the next decade after the initial operational capability (IOC) advent of the Soviet Woodpeckers in 1976, the weather over North America was highly anomalous. In fact, the prestigious journal *Science* eventually pointed out that such an anomalous weather decade could be expected only once in 1200 years.[26] During this anomalous decade, of course, the Woodpecker transmitters were very active. Indeed, their beams regularly intersected over the United States in an interference "grid."[27] Finer interferometry patterns within this overall interference "grid" were used to create and move high pressure and low pressure areas over desired areas in the U.S., steering and controlling the giant jetstreams over the U.S. and directing the course of U.S. weather. The present author has fully documented and explained the use of the Woodpeckers in the weather control mode.[28] Further, we have long documented the use of the Woodpeckers as highly unusual directed energy weapons.[29] In addition, we have pointed out the Soviet capability to utilize the Woodpecker weapon systems to produce biological effects,[30,31] but have not heretofore given a full explanation of the exact EM mechanism for that capability. In this paper we present a more technical explanation of the biological effects of scalar electromagnetics — including as utilized by Soviet weapon systems such as the 14-year-old Woodpeckers, and the decades-long Soviet microwave radiation of personnel in the U.S. Embassy in Moscow. For details of the Embassy radiation, see Brodeur,[32] Johns Hopkins

University's study of the **health status of Embassy penonnel,**[33] The U.S. Commerce Department's funded study of **the** radiation,[34] **and other references.**[35]

Given a Dose of Their Own Medicine

After some time, the aggravated HAM operators banded together and formed a group action. Many of them recorded the Woodpecker's signals on tape and, at a prearranged time, suddenly turned **all** their transmitters on with the tapes playing, transmitting back to the Woodpecker receivers the taped replicas of their own jamming signals. The woodpecker transmitters were observed to become confused. They frantically changed channels and desperately tried to avoid the HAM operators' transmitted replica signals. Unable to do so, finally the Woodpeckers went off the air completely. Thereafter a modicum of caution began to be utilized by the Woodpeckers. They changed channels frequently so as not to "jam" one HAM channel continually, and substantially decreased their degree of interference with other communications equipments. Also, electronic filters to add on to one's receiver and filter out the Woodpecker's annoying "chirps" were produced in the West and made available to HAM operators and other communications groups. An uneasy truce resulted, and there the matter rests today, insofar as communications is concerned. The Woodpeckers have continued to operate at will.

Launch-Phase Antibomber and Antimissile Weapons

In latter 1985 and early 1986, the Soviet Union employed the internalized EM energy capabilities of the Woodpecker weapon systems to directly attack, disable, and destroy a series of U.S. aircraft and missiles. (We shall address internalized EM energy shortly.). We have previously documented these overt Soviet acts of war[36] and will not repeat that documentation here. We have also pointed out that 1985 was the specific Soviet target year to have all these weapons online and ready to go, as specifically stated by Leonid Brezhnev at a secret meeting of European Communist Party Leaders in Prague in 1972.[37] Indeed, at that time Brezhnev actually confirmed that detente was part of a deliberate Soviet deception plan.[38]

How This Paper Came About

Recently a frequent correspondent who is knowledgeable in HAM radio — and well familiar with the annoyance of interfering signals from the powerful Soviet Woodpecker transmitters in the communications band (3-30 MHz) — sent me a Federal Communications Commission (FCC) compilation of Soviet Woodpecker signal radiations and requested my comments. The editor of an important journal in England also urgently requested more definitive information on the Woodpecker's biological warfare capabilities. I quickly dashed off short responses to these two correspondents, but I realized that the biological capabilities of EM transmitters, including the Woodpeckers, required a more lengthy paper to provide an adequate explanation.

This paper is a much-expanded version of my responses to those two correspondents. Its purpose is to more fully reveal precisely how the Soviets can utilize EM transmitters such as the Woodpeckers to transmit biological effects — including *any kind of cellular death or disease whatsoever*— and induce and create these effects in a targeted distant population. In this paper we will detail some of the powerful electromagnetic (EM) biological warfare (BW) capabilities of electromagnetic transmitters, including the Woodpecker weapons systems. This will complete our expose of the unsuspected capabilities of the Woodpeckers.

Start With These References

First the concerned U.S. scientist should recognize that Soviet scientists — particularly those who work on highly secret Soviet EM biological warfare weapons projects — do not utilize the type of biophysics known to Western scientists. Instead, they have applied a unified EM/G field theory, called *energetics,* to photobiology and created a new, highly classified Soviet biophysics which this author refers to as *gravitobiology.* Accordingly, to understand the real, classified Soviet biophysics, the concerned U.S. scientist must be prepared to (1) acquire extensive new knowledge and a drastically different technical viewpoint, (2) search Western orthodox and unorthodox scientific literature in photobiology and unified quantum field theory physics, to discover potential candidate areas that the Soviets may have developed and applied, and (3) look behind the deliberate deception involved in most openly published Soviet biophysics papers and search for possible significant clues.

First, he or she should read and digest the two Whittaker papers,[39,40] ponder what is meant by Devyatkov's *information content of the field*[41,42] in light of Whittaker's infolded EM structuring of the scalar potential, and Kaznacheyev's extensive cytopathogenic work in EM induction of cellular death and disease at a distance.[43,44] Next he or she should study the implications of time-reversal in physics,[45] and the potential implications of utilizing in biology the time-reversed (phase conjugated) EM waves[46] which the U.S. discovered in the open Soviet scientific literature in the late 1960s and early 1970s. Finally, he or she should study the photobiology work of West German scientists such as Popp.[47,48] Those references should be studied first. Then he or she should study in detail the difference between Heaviside's/Gibb's vector EM curtailment of Maxwell's theory[49,50] and the original quaternion Maxwell theory,[51] because the Heaviside/Gibbs theory (the present classical EM theory) is only a subset of Maxwell's actual *unified EM/G field theory.*[52] Finally, by combining all this information and reiterating the study of the reference material until it can be successfully integrated in one's understanding, one has the basis of the "*whole banana"* of Soviet gravitobiology, so to speak.

One then has the basis of unified EM/G theory (energetics) with which the Soviets started some 40 years ago — and the beginning of which Maxwell had already published in 1873. From that foundation, it's not too terribly difficult for a good laboratory team to piece together the theory — and gradually develop practical, working hardware on the laboratory bench.

Technical Basis for Soviet EM Biological Warfare

Our scientists in the State Department, DoD, CIA, DIA, FCC and other U.S. governmental agencies are never going to understand the full biological warfare (BW) capabilities of electromagnetic transmitters such as the Woodpeckers — or develop new instruments to measure what specific biological information their signals really contain — until they understand s*calar electromagnetics.* Ordinary (classical) electromagnetics was produced by Heaviside and Gibbs in a s*ubstantially truncated* version of Maxwell's true quaternion EM theory, as previously pointed out[53] by this author.[54]

Ordinary EM (and its *externalized* energy) cannot exhibit the capabilities we are referring to, or produce such "biological death and disease ray" results as are possible with specialized scalar EM transmitters. Instead, one must recover and utilize the scalar part of Maxwell's quaternion EM **theory** — the portion that was discarded by Heaviside and Gibbs.

Maxwell's original theory was a unified theory of EM and gravity (G), with the electrogravitational aspects being captured by infolding functions of the vector E and B force

fields inside the scalar component of the quaternion.[55] Thus Maxwell's quaternion theory, for example, also prescribed scalar waves of pure potential (trapped) EM energy, where this potential energy contained hidden, deterministically structured, *internal* bidirectional EM wave patterns — yet no external E- and B-field force resultants appeared in the overall vector summation envelope.[56] This can readily be seen by simple examination of the scalar component of the quaternion.[57] This pure *scalar potential (wave)* with a hidden deterministic EM wave substructure aspect was completely discarded by Heaviside and Gibbs. It is still discarded by classical vector electromagnetics theory today, even though it is experimentally verifiable and testable — and *engineerable.*

Scalar EM,[58] however, is a unified field theory of electromagnetics and gravitation, since it recaptures the scalar wave portion of electromagnetics that was erroneously discarded by Heaviside and Gibbs. In short, scalar EM captures, infolds, and hides deterministic EM waves inside EM scalar potentials — and also then interferes the structured scalar potentials to outfold the EM energy and recover it at a distance. That distant interference recovery, however, can be in the form of either negative (time-reversed) or positive EM energy, merely by how one biases the ground potential of the scalar interferometer relative to the ambient potential in the distant interference region.

Since it is known that potentials are gravitational (they are composed of trapped energy and energy is gravitational), then scalar EM is a unified field theory of electromagnetics and gravitation. Obviously these unified scalar fields with their hidden internal structures[59] have a great many more capabilities and uses than do the far more restricted classical EM force fields.

For four decades the Soviets have secretly developed this scalar EM/G theory and technology — which they call *energetics* — and have used it to develop and deploy secret unified field theory (UFT) superweapons of enormous power and startling capabilities.[60,61]

Biological Implications

The infolded, deterministic, hidden EM wave structure inside the scalar EM potential is called the *information content of the field* by Soviet scientists.[62,63] The Soviets know that it is this infolded and hidden EM structure — the *internalized* or *covert* EM energy of the potential field — that is deterministically utilized by living biological systems in all their cellular control and regulatory functions. Thus by deliberately manipulating this internalized EM energy structure of the scalar EM potential, the Soviets have found it possible to accomplish astounding EM biological effects — both for healing and for biological warfare — that are entirely undreamed of in the West.[64] The Soviet energetics technology can manipulate, change, control, or destroy literally any of the key biological functions of the living system — including *mental* and *behavioral* functions.

Internal and External EM Energy

In his 1903 Mathematische Annalen paper,[65] Whittaker demonstrates a standing, spatially-fixed wave of pure potential, but one with an infolded, highly dynamic, hidden EM forcefield substructure containing *hidden* bidirectional pairs of EM waves/energy. Again, see Figure 6 for a diagrammatic portrayal of this Whittaker wave (scalar EM wave).

In the diagram, in each pair of infolded EM waves, the two coupled waves flow in opposite directions *inside the standing potential wave.* Further, their speed is not limited to the normal

speed of light in vacuum.[66] In each pair, the two waves are multiplied together. Hence they *modulate* each other, locking together into graviton waves rather than photon waves.[67] *Each paired EM planar wave couplet is a hidden EM stress energy channel in vacuum spacetime, and in this channel EM energy flows in either direction — in fact, in both directions at once.* Further, there is continual constructive and destructive interference of these two waves, yielding continual coupling into pairs of photons and decoupling into photon/antiphoton pairs. In short, continual creation and annihilation of spin-2 gravitons is occurring. *A scalar potential, then, is composed of this dynamic structure.* Taking the Whittaker approach to the lowest level possible, this author has previously presented a unified field development of photon/antiphoton structures inside gravitons, unifying gravitation and electromagnetics at the most fundamental level — that of the quantum particles of the fields.[68] Figures 1,2,3, and 4 developed this *unified particles* approach.

The bottom line is this: There are two fundamental kinds of electromagnetic energy: (1) First, there is *externalized* EM energy. This is the normal "wave envelope" EM force field translation energy that acts externally upon each charged particle, to translate the particle as a single unit. The resulting unitary changes (translations) of charged particles *as wholes* produce the normal EM interactions upon things and objects, as seen by the external observer. Indeed, this process is external observation, and external observation is this process. (2) Second, there is also *internalized* EM energy, where EM forces act in antiparallel pairs. This *EM stress energy pattern acts* internally upon a charged particle or medium, specifically structuring the virtual particle flux exchange of the particle with the vacuum, or of the medium with the vacuum. This vacuum exchange with the particle, of course, constitutes the *charge* of the particle. The electric charge of a particle is due to the exchange of virtual photons between the vacuum and the mass of the particle. Note that the Whittaker structure represents deterministic structuring of this vacuum exchange with the mass of the charged particle. *It represents deterministic structuring of massless electric flux itself, in electromagnetic terms, and this does not presently appear in electrical physics theory.* Instead, orthodox theory *assumes* that the structuring is random, when in fact it is not — from Whittaker's work.

Western scientists do not normally even detect or recognize this internalized EM energy. Our instruments normally see only the gross static EM potential energy by actualizing it into gradients (force-fields) that translate charged particles.

External EM energy is the face that the scalar EM potential exhibits in its outer bulk interactions with gross matter. Internal EM energy is the face that the scalar EM potential exhibits in its inner interactions with the virtual particle flux of the vacuum — and with every charged particle in the universe, *most especially with the charged particles in the nuclei of atoms.*

Internal EM energy is the infolded EM stress energy inside the vacuum potential. Note that all scalar EM potentials are vacuum potentials. Deterministically structuring the infolded EM planar waves in the Whittaker structure of the vacuum potential is *vacuum engineering.*[69] It is also structuring the local spacetime, and curving it whenever the Whittaker potential differs from **the** potential of ambient vacuum/spacetime.

In our present engineering, at best we see only the gross envelope or bulk translation energy (overall charging or draining energy) of the EM potential (trapped EM energy) that was exhibited by translating charged particles. We never detect the dynamic, hidden, bidirectional-wave EM substructure content and interactions of the EM vacuum potential. This undetected internalized EM energy that is infolded inside the scalar potential is electrogravitational energy, **since** all EM potentials are gravitational in nature, as is well-known.[70]

Vacuum Engineering **and Activation**

Note that the vacuum/spacetime consists *only* of internalized (infolded) (virtual) energy. Everything — every particle, wave, etc. — that exists or moves in the vacuum continually *internally* exchanges with the vacuum flux, since in fact every entity itself is only a special kind of equilibrium state in this vacuum flux. Everything, so to speak, is simply a special kind of fragile balloon in a many-pipe flow situation.

If the vacuum that an entity exists or moves in is deterministically structured, the vacuum exchange with the internal energy of the entity is structured. Just as changing the colors of the flows into and out of the balloon will gradually change the color of the balloon, the entity, will gradually "charge up" its internal energy to any persistent change in the vacuum's virtual particle flux. This charging process is called *activation.* If the vacuum exchange then changes back to normal, the structure of the internal EM energy of the entity will gradually return to normal. The entity then is said to have *discharged* (with respect to the new pattern or structure it had charged up with previously.) Discharge is also called *deactivation.*

The mass of an observable entity is a direct indication of its degree of total exchange with the vacuum. Since most of the mass of an atom is in its nucleus, then one is particularly interested in the activation and deactivation of the nucleus, for that is where the process largely occurs. The deterministically structured potential reaches directly to the nucleus of the atom, and the interaction between internal structuring is far greater in the nucleus than in the electron shells of the atom.

The Nuclear Charge Spreads

As the nucleus charges up with a new vacuum potential pattern, its EM coupling with the electron shells gradually is changed also, producing electron changes (of a wide variety) as well. *Activated* masses — atoms, nuclei, ions, neutrons, and electrons, for example — can then exhibit quite abnormal external chemical, electrical, and gravitational interactions as compared to unactivated (normal) "inert" masses.[71] If there is any sort of deterministic pattern in the activation, the activated nuclei can act very differently in their electrical, chemical, *and nuclear* interactions.[72]

Thus the internal energy structure of everything that exists or moves through the vacuum — every particle, wave, etc. — interacts with the internal structure of the potential (spacetime).[71] Everything is continually charging and discharging internally. Any change in the infolded Whittaker structuring of the local vacuum potential will gradually activate everything — virtual or observable — existing or moving locally through that region.

Activation of Photons

If one wishes to produce strongly activated photons that have a selected internal energy structure, one first produces a scalar EM potential with that structure and charges/activates matter (atomic nuclei) with it. Then one uses four-wave mixing in that material to evoke a highly amplified phase conjugate replica wave in response to a weak signal wave. The highly amplified replica will internally contain a strong replica of the selected structure.

EM waves whose potentials[74] are comprised of such activated photons can be produced and transmitted. When this activated wave is absorbed in a distant target, its internalized EM interaction will deposit this selected structure in the target mass. Gradually that internal activation structure will diffuse through the mass — particularly its atomic nuclei, then its lattice structure — so that the target becomes activated as well, with the desired pattern. Continued Irradiation of the target will result in a certain equilibrium "charge level" for that selected activation structure (partial potential) being present in equilibrium in the atomic nuclei of the target EM coupling to the electron shells and further interatomic interaction gradually activates the material lattice of the target with that Whittaker structure.

When external photon interactions now occur with the activated target material, kindling of the hidden virtual-state order may produce sufficient coherent integration to breach the quantum threshold and produce observable physical change. This will produce an "anomalous" change with respect to normal macroscopic interactions. Physical reality itself has been directly engineered and altered.

For specialized applications, extremely intense pulses with selected internal energy substructures can be generated. When these strike a target, immediate and intense effects can be obtained, particularly in the atomic nuclei. Fissioning of a nuclear material, for example, can be directly accomplished by this process. With slightly less intense application, specific cellular diseases or behavioral patterns can be promptly induced in biological systems.

Western Physicists Missed It

In experimental physics, Western scientists have been preoccupied with ever more subtle detection of charged particles translated by the *externalized* envelope energy of EM waves and potential gradients. They have not recognized that (1) gravitational potential stress always has a hidden electromagnetics substructure,[75] (2) the greatest portion of this substructure is electromagnetic, and (3) that hidden EM substructure can be deliberately controlled and utilized to manipulate particles, atomic nuclei, and gross matter (both living and nonliving) in ways that arc completely impossible with the present *envelope* translation electromagnetics.

The hidden EM stress substructure can be deliberately engineered by composing it of a proper deterministic set of EM waves and signals, and infolding these together with their equal phase conjugates into a modulation and standing wave resonance process.[76] This produces an "artificial" or internally patterned/activated potential with the desired Whittaker bidirectional EM wave structure hidden inside. Since earliest times, living systems have utilized these internal EM energy channels and performed such "vacuum engineering" by infolding. Because we have not recognized or measured this internalized EM energy in biology and physics, we have heretofore completely failed to penetrate to the active infolded EM signals and hidden EM control mechanisms of living biological systems — literally because our present instruments cannot detect and measure their functioning nor the hidden EM energy they utilize.

Chaos: Hidden Order Underlying Randomness

Because we have been preoccupied with *externalized* EM interactions, we have been reductionist in our outlook upon physical reality. Accordingly we have built a present physical science and biology that is almost completely *reductionist* (i.e., we believe that the whole is just the sum of the parts, and that is all there is to it.). However, the interactions of *internalized* EM stress energy transcends reductionism. Then the whole is no longer just the sum of its parts, but also is

changed and affected by the overall nonlinear internal interactions of its parts — both with each other and with the whole itself. Then we indeed have a new holographic science whose true ordered nature does not presently appear to us through our crude "externalized energy" detectors except as *chaos* — the mysterious presence of hidden order in apparent randomness. When such "randomness with hidden order" — chaos — is integrated and collected, surprising and unsuspected order emerges macroscopically.[77]

Special Implications **for Quantum Mechanics**

However, quantum mechanically this implies that there exists hidden order even inside a single quantum of change. That is, the hidden order is *subquantal,* hence *virtual.*[78] This tells us that the virtual state itself is ordered by Whittaker structured-potential methods.

But this changes the interpretation of one of the postulates (fundamental assumptions) of present quantum mechanics itself. Now one must postulate that quantum change is *chaotic,* rather than purely *random.*[79] For large collections/integrations of quantum changes, the hidden internal order emerges and stabilizes. Thus quantum change is statistical, but it is not the Gibbs statistics of a random variable; rather, it is *chaotic* statistics. Since the macroscopic implies large collections/integrations of the virtual, the chaotic statistics of quantum change yields an ordered macroscopic universe that emerges from *seemingly* random (but actually, already chaotic) microscopic changes.[80]

It also resolves one of the burning issues in quantum mechanics today: the problem of the missing chaos.[81] One simply alters the fundamental interpretation of the QM postulate — that quantum change is statistical — to mean that quantum change is *chaotic.* This places quantum mechanics upon an *already chaotic* basis, resolving the QM foundations difficulty of the missing chaos.

It Was **Already Implicit Within** the Theory

Actually, from still another viewpoint, the whole thing should have been apparent long ago. Numerous physicists have struggled with the embarrassing fact that the energy in the G-field is *negative* energy. For the G-field, like "charges" — that is, all masses, so to speak — *attract* each other. Their unrestrained attraction does work on the G-field between them and increases the energy of the field (potential) at the same time that the kinetic energy of the masses is increased. But conservation of energy states that the energy of the system (kinetic energy of the particles plus the potential energy of the field) must remain constant if there are no other sources or sinks. Hence the increased energy of the G-field must be negative, since the increased kinetic energy of the particles is positive. To drive these "like G-charges or masses" apart, one has to input additional positive energy to the field to cancel some of its negative energy. Therefore one has to expend additional positive energy to separate two masses against the G-field attraction.

In electromagnetics, of course, like "charges" — either electrical or magnetic — repel each other, and their unrestrained repulsion weakens the EM field (potential) energy at the same time that the kinetic energy of the charges is increasing. Conservation of energy of the system thus requires that positive energy "goes out of the weakening EM potential, driving the repelling electrical charges apart and increasing their kinetic energy. This means that the energy of the electric field (potential) is positive.

So we now speak of positive *(externalized)* field energy and negative *(internalized)* field energy. What we call *normal EM energy* is *externalized (outfolded)* EM energy. What we call *normal*

gravitational potential is in fact *internalized (infolded)* EM energy. This of course is completely consistent with Sakharov's seminal 1968 hypothesis that the gravitational field is not a primary field of nature, but is generated by — and composed of— other ordinary fields.[82] In fact, to the first order it is generated by, and composed of, infolded electromagnetic fields. Sakharov's hypothesis has led to an explosive development of stochastic gravitation,[83] culminating in the very important papers of Harold Puthoff.[84] Indeed, the modern vacuum is anything but empty, but is filled with Whittaker order and structure, incredible density of disintegrated EM energy, and violent virtual particle flux of an intensity and density that boggles the imagination.[85]

The Case of Opposite Charges

In passing, for the purist we briefly point out the case of opposite charges. First, let us look at equal but opposite *electrical* charges. Electrically, two unlike charges are seen by the external observer to attract each other, and increase the strength of the field. However, *charge-wise only (not mass),* each charge is now the antimatter partner (time reversal) of the other. In quantum mechanics, time is not an observable, but only a parameter. Since we never *see* time but only infer it from observed spatial changes, we will just see the *spatial* track of the time-reversed forces and the energy situation. Thus we will see mutual "time-reversed repulsion" — which corresponds to *mutual attraction* as seen by the time-forward observer. The electric field now seems to add negative energy. That is, additional positive energy is seen to be extracted from the electric field, to increase the kinetic energy of the attracting particles, which means that the negative energy of the field is increased. However, the external observer does not see this energy as negative but as positive. He sees the positive energy of the electrical field increased.

When unrestrained, two unlike *gravitational* charges (i.e., a positive mass and a negative mass) act in similar time-reversed fashion. The situation is exactly opposite to the case of the electrical charges and fields. To the forward-time external observer, the two unlike gravitational masses will be seen to repel (i.e., to "time-reversed attract) each other and decrease the negative energy of the gravitational field between them.

We also examine another case: the coherent integration of photons. We choose to regard a photon as a coupled electron-positron pair, in the virtual state. There are now two ways of ordering collections of photons.

First, if we parallel-order the positrons and parallel-order the electrons, this is coherent integration of photons, which is involved in a single EM sine wave, for example. In this case, we still have all the positive charges opposed to all the negative charges, so the situation remains *photons* and electromagnetic. In an EM sine wave, the electric charges are collected in the positive E-field portion of the wave, and the positrons are collected in the negative E-field portion of the EM wave. This wave will always interact with a charged particle, regardless of its phase, at all but its beginning, ending, and middle "zero E-field" points.

The second way to order collections of photons is to equally collect electrons and positrons. That is, for each electron/positron photon, its antiparticle (its antiphoton, which in this case is a positron/electron photon) is collected with it. Voila! The vertically parallel electrons and positrons attract each other, so that *all resultant E-fields of this collection are zeroed, vectorially.* Further, each photon/antiphoton pair now has spin-2, which does not constitute a photon with non-zero E-fields, but a *graviton* with zeroed E-fields. That is, we have created a pure electrostatic scalar potential, with a hidden *internal* EM wave/photon coupling and decoupling structure. In this coupling, which we have very crudely described, photons/antiphotons are continually coupling and uncoupling. From Whittaker's work, the coupling and uncoupling are phasing, both vertically and horizontally, so that harmonic sets of paired bidirectional EM waves

are seen to be internally moving (photons coherently coupling in one direction and antiphotons coherently coupling in the other, then decoupling, then recoupling, etc.) inside the potential.

What we have done, in short, is turn electromagnetic energy into gravitational energy. What emerges from all this is a clear principle (which can be demonstrated in the laboratory, with only medium difficulty): The one-to-one addition of an electromagnetic wave and its phase conjugate replica of equal magnitude, results in a gravitational envelope wave of pure scalar potential. In Bohm's terms, it infolds the electromagnetics into a hidden, ordered EM structure of a standing gravitational wave. Note that this gives a new view of negative energy vs. positive energy. We may state now that positive energy is ordinary, time-forward, outfolded EM energy; and negative energy is nonordinary, time-reversed, infolded EM energy.

But if that is true, then one of the cornerstone physics assumptions is false: that is the assumption that a photon and an antiphoton are identical. Indeed, this is false, as this writer has protested for years. Further, it is easily proven that it is false. We do so as follows: First, take a phase conjugate mirror material. We now wish this material to sometimes emit ordinary photons (which it will do, for example, by simply heating it). We also wish it to sometimes emit antiphotons, or time-reversed photons (which it will do when stimulated by absorbing another photon, and emitting a phase conjugate replica. Now we measure the recoil of the mirror material *when it emits a photon or antiphoton.* That's fairly readily done; a little tricky, but not too difficult Any decent university lab can do it easily. An interesting thing now emerges: *The mirror material measurably recoils as required by conventional theory when it emits an ordinary photon. It does not recoil as required by conventional theory when it emits an antiphoton.* We therefore have shown that, in some very fundamental fashion, *a photon and an antiphoton are very different, and their emission is very different from the fundamental criterion of Newton's third law.* Q.E.D.

Whittaker Rediscovered Tesla's Standing Columnar Wave

Actually the standing Whittaker 1903 wave is the same strange new wave that Nikola Tesla experimentally discovered emanating from Colorado thunderstorms four years earlier — on the night of July 3-4, 1899.[86] This was Tesla's famous *standing columnar wave.* Let us give credit where credit is due: in later years the Great Electrician repeatedly stated that he was not using transverse EM waves, but rather he was using *longitudinal EM "sound" waves* — waves of compression and rarefaction of the etheric medium (of the virtual particle flux of vacuum) itself.[87] In other words, he was using *stress waves of the vacuum ether* — pure potential waves, precisely the same as those for which Whittaker wrote the theory in 1903.

In fact, then, Tesla was using Whittaker standing potential waves with deterministic bidirectional EM transverse wave hidden substructures. He had discovered and was utilizing the *internalized* EM energy (i.e., the information content) of the field as well as its *externalized* EM energy the field. Generations of Western physicists and electrical engineers — brought up on an exclusive diet of the Heaviside/Gibbs vector truncation of Maxwell's unified electrogravitation — have condescendingly believed that Tesla was mistaken.[88] They have haughtily proclaimed that no one could produce and utilize longitudinal EM waves — because *they themselves* could not do so! Those same physicists and engineers have not had the slightest understanding of what Tesla really discovered and used. And they have not had the slightest knowledge of the Whittaker papers, which have been there in the literature all these years, neglected in the West. Unfortunately, Whittaker's work and Tesla's work were uncovered, thoroughly investigated, extended, applied, and intensively utilized long ago by Soviet scientists to produce powerful new secret superweapons and frightful EM biological warfare weapons.[89]

Soviet Weaponization

The Soviets simply took the internalized EM energy theory directly from the Whittaker papers in the open literature and weaponized it. Taking the Whittaker viewpoint, the most important and insidious thing about the Woodpecker transmissions is the *infolded* EM content inside their standing (persistent) potential waves — *not* the "external envelope" E- and B- translation fields that constitute the "normal" electromagnetics familiar to our own scientists and engineers. It is the infolded paired bidirectional EM waves and energy — the hidden *internalized* EM energy that has been added within and to the normal envelope E- and B-field translation energy — that allows the Soviets to utilize two quite different kinds of EM energy, and conceal the most important kind from prying Western investigators.[90]

What this means is that if one just measures the *externalized* E- and B-fields transmitted by the Woodpecker transmitters — as Western scientists and engineers do — then one misses the most important thing. Oh, one will believe the Woodpecker is an over-the-horizon (OTH) radar, alright, for it obviously can perform that function by the highly restricted *envelope* (outfolded, externalized) EM that we Westerners already know about, measure, and use. But one will not see or know anything about what the Whittaker standing potential waves of the Woodpeckers can do and are doing — both energetically and biologically — with their hidden internalized EM information content/structures.

Detection and the Aharonov-Bohm Effect

To get at the infolded EM structure of the Whittaker potential, one must make a two-stage detecting instrument. The instrument must contain a *shielded interference first stage,* where two or more Whittaker potentials interfere, a la the Aharonov-Bohm effect.[91] [An overview of the Aharonov-Bohm effect is given by Olariu and Popescu.[92] For confirmation of its proof and begrudging acceptance, see Schwarzschild.[93] For weapons potential, see Bearden.[94]] By that initial interference in the first stage, Whittaker's second paper[95] shows that you will "outfold" the hidden EM contents of the interfering potentials, even if the interference is accomplished at a great distance. Voila! "Normal" (externalized) EM energy magically appears at the output of the first stage interference. The first stage was shielded, of course, to prevent any other spurious ordinary EM radiation to reach the region of the output of the first stage and contaminate our subsequent measurement of the first stage output. The second stage consists of a suitable *normal EM* instrument, spectrum analyzer, etc. to measure the outfolded EM spectrum, power density, distribution, timing, phasing, etc., allowing one to "track backwards" and characterize the *hidden EM information content* that was infolded inside the Whittaker potential.

Note that, taken together, the two Whittaker papers prescribe a means for producing a macroscopic Aharonov-Bohm effect at an appreciable distance — something which is eminently weaponizable.[96] It appears, of course, that the Soviet Union has done just that very thing.[97]

Distant Heating or Cooling: Hot or Cold Explosions

In the macroscopic world, interference of two OTH Whittaker beams of widely separated Woodpecker OTH transmitters produces EM energy at a distance (in the distant interference zone). However, this *outfolded-at-a-distance* energy can either be *negative* EM energy or *positive EM* energy.[98] Negative (timc-reversed) EM energy will do negative (negentropic) work: It

represents the reordering of scattered/disordered EM energy in the interference zone. This of course directly corresponds to *electrostatic cooling* in that zone.

On the other hand, positive (time-forward) EM energy will do positive (entropic) work: it represents the further disordering/scattering of the EM energy in the interference zone. This in turn corresponds to *electrical heating* in that zone. Whether heating or cooling is produced by Whittaker/Aharonov/Bohm (WAB) interference in the distant target zone depends simply upon how the electrical grounding of the Soviet Woodpecker transmitters is potentially biased vis a vis the local ambient vacuum potential in the interference zone. If the Woodpecker ground potential is higher, positive energy (and concomitant heating) will be produced in the distant interference zone. If the Woodpecker ground potential is lower, negative energy (and concomitant cooling) will be produced in the distant interference zone. The Whittaker scalar interferometer can produce the heating or cooling in the distant interference zone very slowly, gradually, or explosively." Indeed, incorporation of Whittaker's hidden EM structure inside the scalar potential requires a revision of all our present energy concepts.[100]

Artificial Highs and Lows to Steer the Jet Streams

One can now see that, by simply changing the biasing of the Woodpecker transmitters, in a distant region the Soviets can produce atmospheric heating (and consequent lower pressure from the lowered density of the expanded air) or atmospheric cooling (and consequent higher pressure from the increased density of the contracted air.). Thus the Soviets can easily make high pressure areas or low pressure areas in the Woodpecker interference zones over the U.S. (and elsewhere) as desired. By deliberately placing and moving these artificially created high and low pressure areas, the jet streams over North America can be deviated and steered at will. This is the major means by which the Soviets engineer the weather over the United States today. Recall again that the Woodpecker transmitters really were a Bicentennial gift to us from the Russians, for they were cranked full-up on July 4,1976. Since that time the weather over the U.S. has been far, far more anomalous than could even remotely be expected statistically. Note also that July 4, 1976 was the 77th anniversary of Nikola Tesla's discovery of his "standing columnar wave" — the Whittaker standing potential wave that the Soviet Woodpeckers utilize to engineer America's weather.

Soviet/German Discovery of TR Radar Waves

One should also realize that the Soviets discovered time-reversed (TR) EM waves right after World War II. In the latter 60's and early 70's, to their astonishment, Western scientists found time-reversed EM waves emerging in the open Soviet nonlinear optics literature. In 1972, two Soviet scientists briefed U.S. scientists at Lawrence Livermore National Laboratory on nonlinear optical phase conjugate waves.[101]

At the end of World War II, the Soviets discovered four-wave mixing and pumped phase conjugate mirror effects in the German radar team's anomalous radar experiments with multibeam illumination of radar absorbing material (RAM). Specifically, in multibeam illumination of RAM materials, one gets four-wave mixing and amplified phase conjugate replica effects. The phase conjugate replica, of course, is a time-reversed EM wave. Further, in four-wave mixing, this time-reversed EM wave can be amplified. Thus anomalous, amplified, time-reversed radar waves would have been encountered in the radar team's experiments. The Soviets obtained the entire German radar team — RAM materials, multibeam illumination anomalies and all — at the end of the war. In deciphering these anomalies, the Soviets and their German

protegees discovered time-reversed EM waves, phase conjugate replicas, pumped phase conjugate mirrors, and multiwave mixing effects. And they first discovered them in *radar* waves — microwaves — not in *optical* waves.[102]

Targeting U.S. Embassy Personnel in Moscow

Accordingly, the Soviets began to apply TR EM waves to *radar* (microwave) prototype directed energy weapons (DEWs) by about 1950 or so. And in the early 1950s they promptly started the weak microwave radiation of the U.S. Embassy in Moscow, targeting the U.S. Ambassador and guaranteeing highest-level U.S. attention. The purpose was to stimulate the U.S. with the new technology, to see what reactions and responses we produced on site at the Embassy. In other wnrds, by watching our *technical* reaction at the site, the "Embassy stimulus" allowed the Soviets to find out whether or not we knew about Whittaker potentials and their infolded EM substructures, Kaznacheyev EM induction of diseases, etc. By our total lack of any scalar EM reaction, we conclusively showed the Soviets that we still only knew of ordinary *externalized* (envelope) electromagnetics.[103] Specifically, we were totally unaware of the infolded-EM Whittaker potential wave whose deterministic internal structure constituted *specific cellular biological information.* This hidden *information content of the field* was utilized to generate specific diseases in U.S. Embassy personnel, including three U.S. Ambassadors.[104]

A Reinterpretation of the Johns Hopkins Investigation

Some years later, Johns Hopkins scientists investigated the Soviet microwave radiation of our Moscow Embassy and found that *no diseases were induced in personnel in Embassy locations where E- and B-fields from the radiation existed.*[105] The patterns of the non-zero force-field radiation areas inside the Embassy were carefully modeled by the Johns Hopkins team.[106]

Predictably, Johns Hopkins scientists ignored the potentials and concluded that, since no diseases occurred in personnel located where the E- and H-fields were, it could not have been the microwave radiation causing the effects. This conclusion, of course, follows the classical EM assumption that *only* the nonzero E- and B-fields are causative agents. Note, however, that the *persistence of the potentials* is inversely proportional to the strength of the EM force fields (Figure 12). After all, a force field is just a gradient in a potential, which means a *bleedoff* or escape of that potential by translation of charged particles. Potentials *persist* where there is no bleed-off (i.e., where there are no force fields). Whittaker potentials, which in the absence of interferometry do not produce external gradients, normally do not produce force fields and move electrons to measure. Normal instruments will therefore usually fail to detect the presence of persistent potentials — for exactly the same reason they fail to detect the ambient vacuum potential in which they are immersed.

The *Johns Hopkins scientists reached a totally wrong conclusion.* Since 1959 and the Aharonov-Bohm paper,[107] physicists have known that the EM force fields are not even primary; the potentials are primary, and the force fields are *effects* created directly in the system itself by interference of the potentials. However, as yet this has not widely filtered down into conventional electrical engineering as a major consideration! Precisely stated, what the Johns Hopkins investigation actually showed was that it was not the E- and B-fields — the force fields - that were inducing the diseases. However, the microwave radiation was definitely involved, or else there would not have been such total anticorrelation to the force fields. That is, if the microwave radiation was not a factor, then some of the diseases should have occurred in the absence of the force fields, and some should have occurred in the presence of the force fields.

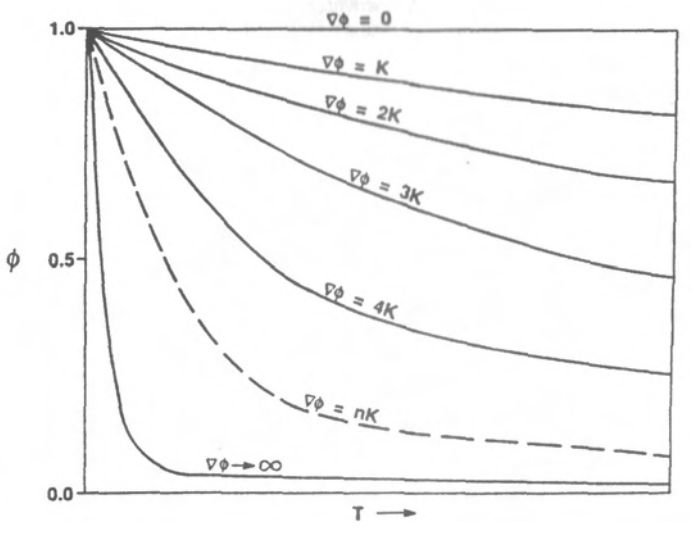

Figure 12. Potential persistence vs. gradient discharge. The curves are adapted to show typical declining exponential variation of the discharge.

Note that, other things being equal, total correlation to the absence of one of a pair of canonical variables may be very high correlation to the presence of the other canonical variable. From Whittaker's 1904 paper, we know that we can discard the notion of the E- and B-fields in the microwave radiation pattern in the Embassy, and replace these force fields with interfering, dynamic (changing) and *interfering* scalar EM Gelds. Indeed, as Whittaker showed, two source of interfering scalar potential fields/beams are sufficient to produce the EM force fields. *Twin-beam transmitters, and therefore the presence of interference — was in fact present in the microwave transmissions*, as verified later. Where Whittaker standing potential waves are not in interference, the waves remain as force-Geld-free potentials. In those regions, the E- and B-fields are zero.

The point is, the stable presence of EM force fields and the stable presence of EM scalar potentials are canonical. The hidden EM bidirectional wave structure of these stabilized potentials is still there and stabilized, even when the external force fields are zero.

That is, in the presence of the Whittaker potentials where scalar interferometry does not occur, the externalized EM force-field waves are zero. However, the internalized bidirectional EM wave structure of the Whittaker potentials is very much present. If the harmonics of the enfolded EM Whittaker structure have been deliberated created to possess a disease pattern signature, then that disease pattern is present in the persistent potentials. A body exposed to that activated potential will gradually "charge up" its master cellular communication system with the disease pattern. Thus that body will activate its defenses, try to throw off the disease, but be unable to rid its cellular control system of the cytopathogenic pattern that is affecting all its cells That body will thus gradually develop the disease, with sufficiently prolonged exposure to the cytopathogenic pattern on the internalized EM of the persistent potentials.

What Johns Hopkins researchers actually found is that the *changing* EM microwave potentials were not inducing the health changes in Embassy personnel. Ergo, if it was the electromagnetic radiation, it had to be the persisting (unchanging) potentials — the standing potential waves a la Whittaker. And there was essentially 100 percent correlation between induction of the diseases and the possibility of the presence of the persistent microwave EM potentials. From there, the induction of the diseases can be explained via Kaznacheyev's *cytopathogenic effect,*[108] Devyatkov's *information content of the field,*[109] and a deterministic infolded internal energy structure of the Whittaker potentials.[110]

The Johns Hopkins study actually showed a high correlation between the presence of persisting microwave potentials and the locations of the induced health problems in Embassy personnel Since it showed total lack of correlation to the force fields, it eliminated any other causative agent *except* the structured Whittaker potentials. If the microwave radiation had not been inducing the illnesses, then some health changes should have occurred in personnel in locations where the E- and B-fields were present, as well as in some locations where they were absent.

The Johns Hopkins team members were highly capable scientists and very good electrical engineers — but completely lacking in knowledge of structured Whittaker potentials, the Devyatkov/Whittaker infolded EM bidirectional wave-pairs that constitute a hidden deterministic Information content of the field, and the Kaznacheyev EM induction of disease at a distance (cytopathogenic effect). Of course, the twin-beam part of the microwave radiation gives a clue to the Whittaker/Aharonov/Bohm interferometry involved, and how to get the graviton (Whittaker potential) radiation back into EM photon radiation structures inside the Embassy interference zone.[111]

Advanced Photobiology Aspects

It should be pointed out that apparently the U.S. did not even bother to translate Kaznacheyev's important 1981 book on the EM induction of cellular death and disease.[112] Figure 13 shows a diagrammatic illustration of the cytopathogenic effect, as demonstrated in thousands of military experiments by Kaznacheyev's team. And apparently U.S. researchers still have not translated Devyatkov's book on the information content of the field.[113] The overwhelming importance of the most crucial photobiological work in the world simply has not been recognized to date by Western scientists and intelligence analysts.

If one checks Devyatkov's work, one finds that (1) the Russians obviously know all about the coded EM potential — they refer to the infolded EM waves in the Whittaker potential as the *information content of the field.* Devyatkov also points out the incredible medical implications, and strongly stresses that this is *not* normal communications theory! He gives a part of the theory in his paper — all the while carefully keeping from revealing that the "field" being structured with information content consists of the *structured scalar Whittaker potentials.* He is not referring to modulations on the carriers or to wave-front shaping of the EM forcefield waves. Of course he refers to healing and diagnosis; the effect can be used either for direct healing of diseases[114] or for the *direct electromagnetic induction of the desired diseases themselves.*[115]

Electromagnetic healing works this way: (1) The Kaznacheyev cytopathogenic signals for a specific cellular disease is time-reversed (phase conjugated). This produces a specific healing signal complex. The complex signal may also be powerfully amplified by pumped four-wave mixing techniques, using a pumped phase conjugate mirror. (2) The healing signal complex is infolded into a structured Whittaker standing potential wave. By Whittaker's 1904 paper, this infolds the signal complex into one or both of the two scalar potentials that are involved in the production of a normal EM wave. This process yields, for example, a normal EM wave which has

been internally altered with the hidden information content of that healing signal. Or, if one wishes, one may simply utilize a single Whittaker standing potential wave directly, and infold the healing signal complex in it. (3) The wave with its healing information content/structure is broadcast into a targeted living body, where it gradually charges up *(activates)* the body's master cellular control system with the desired healing signal complex. In turn, the cellular control system carries this complex to every cell of the body, gradually activating all of them with the healing signal. At the same time, the immune system is conditioned and charged (activated) for the specific healing process. Table 4 summarizes this EM healing methodology.

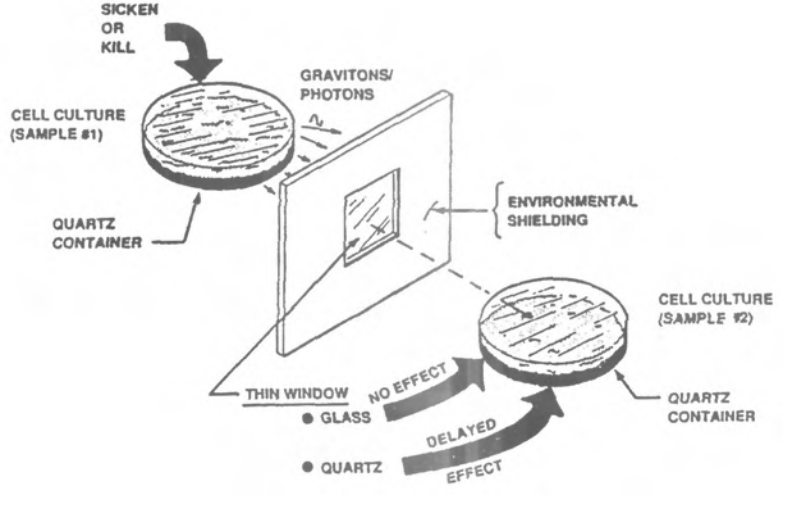

Figure 13. The Kaznacheyev cytopathogenic (CPG) effect. Death and disease transmission by deterministically structured gravitons. The gravitons contain disease-specific infolded photon patterns that represent specific disease information. The destruction of the harmonics of the Whittaker pattern destroys the time-sync of the photons, freeing them and destroying the gravitons.

Table 4. Countering EM Biological Warfare.

- **PER QUANTUM MECHANICS:**
  - **MECHANICS IS EM AT BASE**
  - **CHEMISTRY IS EM AT BASE**
  - **BIOTOXINS ARE EM AT BASE**
- **ALL BW IS EM BW AT BASE**
- **PREPARE WHITTAKER EM ANTIDOTE AS FOR AN UNKNOWN DISEASE**
- **IRRADIATE PERSONNEL WITH WHITTAKER EM ANTIDOTE**
- **DISEASE IS REVERSED IN SYSTEM TESTED**

The Soviets have long since developed this capability, and they continue to hold it highly secret. Techniques similar to this give the Soviet Union a perfect defense against surreptitious biological warfare.

The Soviet Union is in a position to be able to successfully defend against any sort of biological warfare attack, by any kind of biological agent. It is presently the only nation on earth that possesses such a capability, or that has the ability to employ biological warfare to the hilt without fearing retaliation in kind. Thus, *for at least three decades biological warfare has been a preferred Soviet option since no other country has such anti-BW defenses and the Soviet Union does.* And their decades-long microwave radiation of personnel in the U.S. Embassy in Moscow, to induce mysterious health problems and diseases, has continued to show them that the U.S. knows nothing of this technology, and is unprepared to defend against it.

Inducing Diseases in U.S. Embassy Personnel

In the microwave radiation of the U.S. Embassy in Moscow and the deliberated induction of diseases and health problems in Embassy personnel, Table 5 summarizes how the diseases and health problems are induced. All that is necessary is just to use and infold the Kaznacheyev cytopathogenic EM signal complex (the K-signal) directly into a Whittaker potential, without first time-reversing it. If only the optical spectrum for the specific cytopathogenic effect is available, it can readily be translated to the microwave spectrum by using the principle of subharmonic oscillation.[116] Such "specifically activated" potentials (signals) can be broadcast by transmitters as standing Whittaker potential waves, and used (with or without scalar Whittaker interferometry) to directly produce the disease pattern in targeted personnel. To produce efficient charging or activation of the targets with the disease pattern, the potentials must be persistent and stable, producing a steady "trickle current" of structured scalar potential pattern into the atomic nuclei of the bodies of the targets. There it gradually charges the nuclei and the master cellular control system.

Table 5. Electromagnetic Biological Warfare (EM BW)

- **DETERMINE KAZNACHEYEV OPTICAL DISEASE PATTERN**
- **TRANSLATE TO MICROWAVE FREQUENCY REGION**
  - **SUBHARMONIC OSCILLATION**
  - **RETAIN PRECISE HARMONIC RELATIONSHIPS**
- **EXPRESS MICROWAVE PATTERN AS A WHITTAKER/ DEVYATKOV STRUCTURE**
- **INFOLD SIGNAL COMPLEX INTO CARRIER(S)**
- **INCLUDE BIOSYNC MECHANISM OR OVER-RIDE**
- **TRANSMIT INTO TARGETED POPULATION**
- **ACTIVATION/KINDLING OCCURS, INDUCING DISEASE**

Real transmitters and equipments are imperfect. When these internally structured Whittaker waves are utilized in real transmisions, some interference of the infolded waves usually may

occur. Thus small, normal EM signal frequencies — similar to EM "splatter" or noise, but consisting of small, outfolded complex EM frequency spectra (according to Whittaker's 1904 paper) — may still be produced. U.S. investigators will detect *that* spectrum of normal EM waves, using their normal EM detectors. They will then puzzle over what the detected spectrum and its changes and content mean. Again, this is one more refinement of the stimulus to see if the U.S. recognizes the Kaznacheyev/Devyatkov content, and whether it knows how it was infolded and outfolded. For this reason, the Soviets often used twin-beam microwave radiation, to provide the necessary Whittaker scalar interferometry for outfolding to guarantee our detection of E- and B-fields inside the Embassy.[117] This deception plan, for example, seems to have completely fooled the Johns Hopkins researchers.

Thus the Soviets can intentionally induce desired disease(s) in human or animal bodies at a distance — such as in personnel inside the U.S. Embassy, in a targeted population halfway round the world, or in a targeted mammalian population such as porpoises in the ocean.[118] Sea lions or seals would also provide excellent test specimens for such clandestine testing.[119]

However, note that in the target zone the diseases will be induced only where the potentials persist — that is, where there are little or no E- and B-fields formed to "bleed-off" the structured or *activated* potential that contains the infolded disease signal complex. *Note again that this sort of thing is precisely what the Johns Hopkins study really showed, but the study scientists did not consider the potentials and their persistence as a possible inducing agent, since they had no knowledge of Whittaker-structuring of potentials.*

Pieces of the Vacuum Medium

We have previously detailed some of the things that can be done with this approach — and some of what *has* been done with it by the Soviets. Some of this documentation has been with respect to Soviet biological warfare,[120] some has been with respect to Soviet scalar EM weapons,[121] phase conjugation in Soviet superweapons has been accented,[122] and Soviet prowess in weather engineering and steering of the jetstreams over North America has been documented.[123] The reader is also strongly referred to my July 1989 update[124] delivered to the USPA Annual Symposium, Sacramento, California. There the reader will find how to directly unify gravitation and EM in the most fundamental manner: by letting the simplest graviton (spin 2) be composed of a coupled photon/antiphoton (each of spin 1) Whittaker substructure wave pair.

Potentials are composed of gravitons, not just photons. Per Devyatkov and Whittaker, gravitons can be deliberately structured internally so that they contain any desired photonic pattern/structure of spacetime whatsoever — including specific structures for a specific disease information content.

The graviton is a flexible, dynamic *piece of the local vacuum medium.* The exact photon coupling of the photons and antiphotons is statistical; that is, they are always coupling and uncoupling at a tremendous rate, at any point. The average coupling gives the average value of graviton spin The graviton is the photon-coupled aspect; coupling is statistical, and so the graviton is just the statistical average of the photon/antiphoton coupling. Spin-two gravitons constitute an uncurved local spacetime. Gravitons which *on the average* are substructured with less than or more that two photons, so that each total graviton spin is less than or greater than two, constitute a locally curved spacetime. That condition violates Einstein's general relativity assumption (postulate) that the local spacetime is always flat.

This piece *of the vacuum medium* — the photon-structured statistical graviton — is considered high state secret by the Soviet Union.[125]

The Quantum Potential

The present author's 1989 USPA *Scalar EM Update* paper also developed a specific mechanism by means of which a *quantum potential (QP)* is generated, either accidentally or deliberately.[126] Formation of a quantum potential leads to *nonlocal* effects being produced instantaneously between participating components and equipments, even though they may be widely separated. When the equipments start being connected by a common quantum potential, these widely separated equipments and/or materials start partially acting as if they were all part of the same *local* system, and not separated at all! The effect (self-ordering of the potentials into a quantum potential) increases as the signal density of the environment increases.

Note that a local observer at one of the pieces of affected equipment will see anomalous and spurious internal EM signals apparently "generated" internally in, and appearing in, his electronic equipment, with no apparent cause or logical explanation. Indeed, since we do not design and build electronic equipment to operate in a quantum-potential connected manner, the extra signals cause serious interference in the electronics functioning, often even damaging or destroying the circuits themselves. Every signal produced in any one of the QP-participating equipments is at least partially and instantly input to all the rest of the participants as well. Thus each local observer sees anomalous and spurious internal "jamming" signals that interfere with the electronics functioning, and that may even disable or destroy it Again, he sees no logical explanation for these mysterious internal jamming signals, which seem to spontaneously arise out of nowhere. When subjected to the QP effect, electronic equipments throughout an area exhibit massive and shocking aberrations, bizarre malfunctioning, and spurious failures. Every circuit, equipment, generator, warm source (IR), etc. in the area contributes to the effect. It is purely a function of the signal density, and has only very little to do with the power of the individual signals.

A startling example of the formation of a quantum potential, and an unexpected severe effect from these nonlocal effects, was experienced in the April 1986 U.S. air attack on Libya. The QP formed as a result of the increased signal density (and the concomitant increased occurrence of multiwave mixing phenomena) of the EM environment.[127] Figure 14 and Table 6 illustrate these anomalies experienced in the attack. Table 7 summarizes recent Pentagon studies of electromagnetic interference (EMI). It appears that, unless EMI shielding is universally incorporated in U.S. equipments, U.S. military forces may encounter catastrophic electronic equipment failures in the *really* dense signal environment expected in the European theater.

Even with EMI shielding, however, there is another effect, presently unknown to U.S. analysts, that may well predominate: that is, the formation of a quantum potential can still occur. If a QP forms, the subsequent wholesale failure of electronic equipments on the battlefield due to nonlocal self-ordering of the atomic nuclei in the radiating circuits and equipments may prove catastrophic. Further, both enemy and friendly radiations and circuit signals will contribute to increasing the effect. Figure 15 shows the mechanism for generating a QP.

The Soviets, for example, are fully aware of this QP effect, including how to deliberately generate a quantum potential in a given area. They also can be expected to know how to shield their own electronic equipments against these nonlocal QP effects, so they can operate in a QP environment — at least in one that is not too strong, but which would still be strong enough to disable and destroy electronic equipments not shielded against quantum potential self-ordering Of the nuclei. The West does not yet even know of the QP effect, much less how to shield against it. The U.S. shields against ordinary EMI, but knows nothing of the quantum potential and does not shield against it. EMI shielding will increase the signal density required for QP formation by about two or three orders of magnitude, but will not eliminate the effect. It will just move the QP effect to a higher threshold of formation.

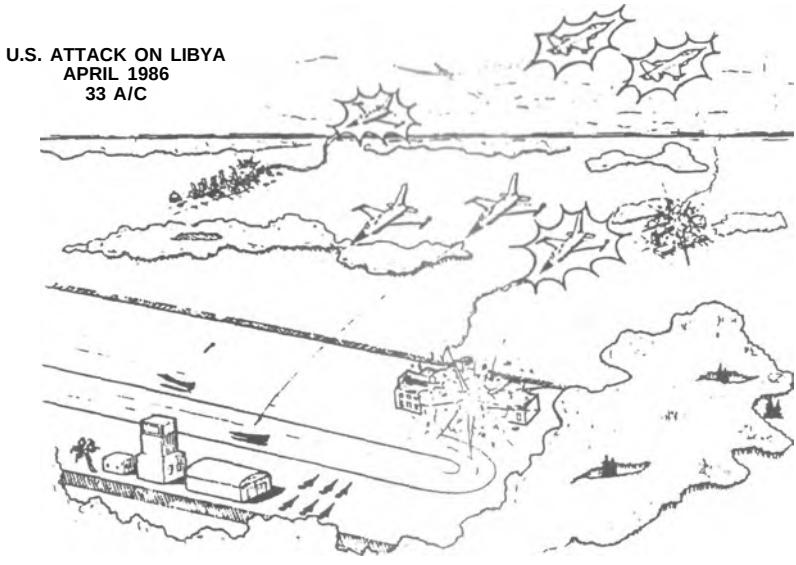

Figure 14. The quantum potential EMI "fireflies" effect.

Table 6. Real-Time Anomalous EMI Interference Via Quantum Potential. U.S. Airstrike on Libya in April, 1986.

[WASHINGTON POST, 22 JANUARY 1989, p.A4]

- **33 U.S. AIRCRAFT IN STRIKE**
- **MANY HIGH-POWERED TRANSMITTERS**
  - **COMMUNICATIONS JAMMERS**
  - **RADARS**
- **SEVERE, UNEXPECTED EMI ENCOUNTERED**
  - **ONE F-111 DOWNED**
  - **NUMEROUS WEAPONS WENT ASTRAY**
  - **THREE FOREIGN EMBASSIES DAMAGED**
  - **SEVEN AIRCRAFT ABORTED**
- **STRIKE COMPLETED, BUT WITH DIFFICULTY**
- **IRATE COMMANDERS AFTER STRIKE: "US OR THEM?"**

Table 7. Recent Pentagon EMI Studies.

- **U.S. TRANSMISSION COMBINATIONS CAN**
  - **AFFECT AIRCRAFT FLIGHT CONTROL**
  - **TURN OFF FUEL SUPPLY**
  - **CAUSE UNCOMMANDED DIVE/TURN**
  - **BRING DOWN U.S. WARPLANES**
- **SEVERE EMI EFFECTS IN STRIKE ON LIBYA**
- **UH-60 BLACKHAWK HELICOPTER PROBLEMS**
  - **UNCOMMANDED TURNS**
  - **FIVE EMI CRASHES SINCE 1982**
  - **$175 MILLION PROGRAM LAUNCHED TO SHIELD IT**
- **7-MONTH PRELIMINARY AIR FORCE STUDY OF LIBYA EMI**
  - **SEVERE EMI PROBLEM EXISTS**
  - **EMI SHIELDING IN HI-TECH WEAPONS OFTEN WAIVED**
  - **THOUSANDS OF CONFLICTS POSSIBLE**
- **MAJOR 3-YEAR, $35 MILLION, 66-MAN STUDY PERFORMED**

SELF-TARGETING **ALL COMPONENTS ACTIVATED**

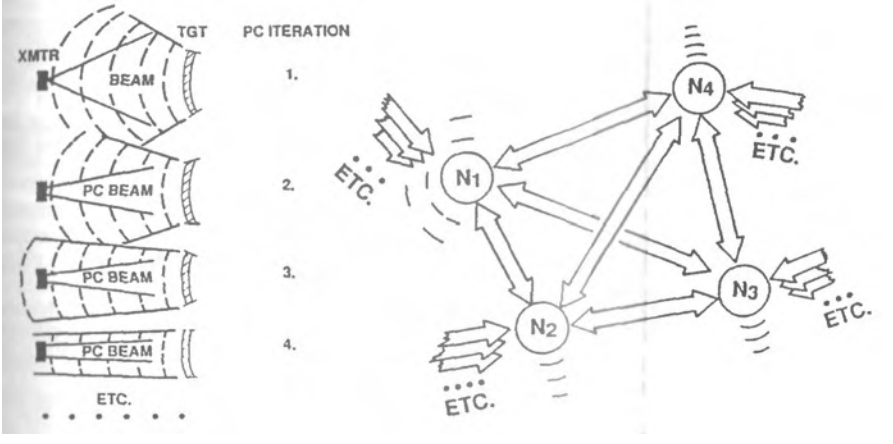

Figure 15. Mechanism for forming a quantum potential. Self-targeting exchange in infolded Whittaker channels between nuclei leads *to* nuclei pumped four-wave mixing, amplification, and consequent growth of time-sync'd potentia (the quantum potential) in widely separated nuclei and signal-interacted equipments.

Variations of the Woodpecker transmitters, for example, and of ultra-wideband transmitters could be adapted for the purpose of creating such an EM signal density in the environment that a quantum potential would begin to form.

Thus on a future battlefield, we may still get the shock of our lives when a great deal of our high-tech equipment — which is very good equipment — suddenly begins to malfunction and fail. Systems such as surface-to-air missile systems, radar systems including AWACS, power generators, tank fire control systems, aircraft avionics and fire control systems, missile guidance and control systems, and communications systems may fail us at the most intense part of the battle, when the need is the greatest, if a quantum potential forms on the battlefield.[128]

What I did not mention in my 1989 Sacramento paper is that the quantum potential can also be internally structured with a deterministic, enfolded EM content. The QP is also constructed of photon-structured gravitons, just as is the normal potential. The QP therefore has a Whittaker bidirectional transverse wave substructure. Note particularly Ignatovich's mention of just such a structure in the potential for the Schroedinger equation (see reference 16 above). Transmission of the graviton envelope is essentially a phase wave transmission and is instantaneous. We accent that, when QP weapons are utilized and a deliberate Whittaker structure is introduced in it, very powerful effects can be generated that cannot be resisted or opposed by ordinary means. A QP, for example, can conceivably be tailored so that it nullifies or destroys only a single, particular type of weapon or system, or mix of them. *It can be used to generate any desired effect in equipment or personnel at a distance.*

In this manner, the biological cytopathogenic effects — cellular death and disease — can also be produced *at a distance* and throughout a very wide area, without any *apparent* direct EM transmission of them in the ordinary sense. (Of course a *healing* signal can also be implanted in a QP, as an antidote.) It is conceivable that, using the Woodpecker transmitters, the Soviets may be able to induce in a targeted population the eerie situation where, the more persons that become infected with a particular disease, the more infectious the disease becomes *by noncontact means, directly through a specifically structured bio-quantum-potential linking that population.* Further discussion of this quantum mechanical action-at-a-distance EM biological warfare effect is beyond the scope of this paper. The reader is referred to cogent references on the quantum potential[129], on the Aharonov-Bohm effect,[130] and on the inconsistencies between quantum mechanics and general relativity.[131,132,133] The reader may combine the information in those quantum potential references with the information in this paper and draw his or her own conclusions.

Detection of Scalar EM in Woodpecker Signals

In August 1989, a close colleague/inventor friend positively detected scalar EM radiation directly connected with several giant radial clouds in the sky just off the California coast. Each of these clouds was "stabilized" against winds and did not move; other normal clouds in the sky moved right along in the winds blowing inland from the ocean. Further, on several occasions the scalar EM radiation was observed by my colleague to suddenly be cut off, and in each case thai associated radial cloud dissipated within seconds. Such giant patterned clouds, with radial cloud streamers radiating from the center, have been widely observed across North America, connected with Soviet weather engineering.[134] Speculation on this scalar beam weather engineering has been published in a national medium.[135] Several types of radial clouds — the single radial, the connected twin, and multiple separate singles and twins — have been observed.[136]

Whittaker Waves. Aharonov-Bohm Effect, and Hidden Variables

Note that Whittaker's 1903 paper[137] predates the modern (Bohm's) hidden variable theory (HVT) of quantum mechanics.[138] Whittaker's 1904 paper[139] — producing EM forces from interfering scalar EM potentials, even at a distance — also predates Aharonov and Bohm's seminal 1959 paper[140] on the primacy of the EM potentials rather than the force fields, and their prediction of just such a Whittaker scalar interferometer effect in the total absence of the electromagnetic force fields.[141]

Recently modern researchers, working on acoustic missiles and with the scalar acoustic wave equation, have "rediscovered" Whittaker's 1903 infolded bidirectional planar waves inside the scalar wave[142]; however, apparently they have not yet realized the application of this to scalar E*M* potentials, for use in their work on *electromagnetic* missiles. Thus it appears that our directed energy researchers are still not fully aware of the scalar extent of the Russian microwave directed energy techniques and capabilities.

More on Kaznachevev and Priore

In the U.S. neither the intelligence community nor the scientific community at large seems to have become aware of Whittaker's infolded intermodulating pairs of bidirectional EM transverse waves inside a standing potential wave,[143] and of their importance. Obviously our scientists and analysts therefore have not connected Whittaker structuring of the potential with Devyatkov's information content of the field, or with Kaznacheyev's cytopathogenic effect — the induction of cellular death and disease electromagnetically at a distance. As briefly covered in this paper, this Whittaker internalized EM energy mechanism *is* the mechanism that has been used by the Soviets in the microwave radiation of personnel in the U.S. Embassy in Moscow for over three decades, to generate health problems and diseases. Two U.S. Ambassadors were stricken with leukemia-like disease and died.[144] A third Ambassador (Stoessel) sickened during his tenure and even bled from the ears. Some years later, Stoessel also died of a leukemia-like disease.[145]

While the U.S. officially held steadfast to its pronouncement that the microwave radiation was harmless and not the cause of the personnel sicknesses and health problems, the Moscow Embassy was declared a hazardous duty post and government personnel were given a 20 percent differential in pay. Obviously the radiation was important to the Soviets, because they ignored requests from several U.S. Presidents to stop the radiation. The Johns Hopkins study[146,147] actually provides very strong correlation of the induction of health problems in Embassy personnel to the presence of persisting (unbled) potentials rather than forcefields (bleeding-off potentials).[148] Note that Kaznacheyev — the world's greatest expert in the electromagnetic induction of death and disease at a distance — now works with two secret Soviet agencies near Moscow which develop high-powered microwave directed energy weapons.[149] The obvious conclusion is that the Soviets are also developing, or have already developed, a range of powerful photogravitational EM BW weapons of mind-numbing power.[150]

Further, the U.S. has obviously not connected Whittaker's fundamental work with Antoine Priore's phase conjugating and multi-signal-infolding RF/rotating plasma device for curing cancer and leukemia with just such potential fields with infolded EM information content.[151,152,153] This means that U.S. analysts have not realized that phase conjugating a Kaznacheyev cytopathogenic signal pattern for a particular disease generates a specific healing (Priore/Devyatkov) signal for that disease. Consequently Western scientists have not realized that this mechanism can quickly provide a specific antidote signal for any biologically-induced disease, either known or unknown. Translation of the antidote signal to microwaves, etc. then readily yields a specific and effective

treatment signal. Tables 8 and 9 summarize the effective gravitobiological countermeasure to biological warfare.

Table 8. Countering EM BW (Cytopathogenic Signal Available)

- DETERMINE INFOLDED EM BW SIGNAL STRUCTURE
- TRANSLATE TO MICROWAVES
- PHASE CONJUGATE TO PRODUCE EM ANTIDOTE STRUCTURE
- INFOLD EM PHASE CONJUGATE STRUCTURE INTO CARRIER POTENTIAL
- IRRADIATE AFFECTED PERSON/POPULATION
- ACTIVATION/KINDLING OCCURS, REVERSING THE DISEASE

Table 9. Countering EM BW (Cytopathogenic Signal Unavailable)

- TREAT AS IF FOR UNKNOWN DISEASE
- CONSTRUCT EM BW SIGNAL STRUCTURE FROM DISEASED CELL CULTURES
- TRANSLATE SIGNAL COMPLEX TO MICROWAVES
- PHASE CONJUGATE SIGNAL COMPLEX TO PRODUCE ANTIDOTE STRUCTURE
- INFOLD EM PHASE CONJUGATE STRUCTURE INTO CARRIER POTENTIAL
- IRRADIATE AFFECTED PERSON/POPULATION
- ACTIVATION/KINDLING OCCURS, REVERSING THE DISEASE

Biological Warfare Implications

To date, the U.S. has not realized the profound biological warfare (BW) implications of all this. The real BW implications (Table 10) are as follows: (1) The Soviet Union has developed, tested and perfected methods of inducing cellular changes, diseases, and death at a distance by means oft specialized electromagnetic signals, whose specialized structure is not discernible or detectable by normal detectors. (2) The Soviet Union has developed, tested, and perfected methods of quickly producing EM antidotes to counter disease induced by any sort of new and unknown biological warfare agent. Mass EM treatment of personnel — including whole populated areas — can begin probably within two hours or less from the time personnel first are exposed or start to sicken. (3) The Soviet Union therefore is the only nation in the world that has a complete

affective counter to biological warfare. (4) The Soviets now regard biological warfare — particularly covert and deceptive BW — as a highly preferred option, because of the defenselessness of other nations against BW attack, and the strong ability of the Soviets to defend and negate such attacks in retaliation. (5) This BW preference has already existed in the Soviet Union for at least two decades, based on the timing of the Kaznacheyev experiments, Devyatkov work, and early period of the demonstrated Priore effects in France. (6) As clearly demonstrated, for example, by the long U.S. inaction or ineffective action regarding the Soviet microwave radiation of our Moscow Embassy, the U.S. has a characteristic national style of little or no reaction to slowly increasing threats, and this is well-known to the Soviet. (7) *Given the first six BW implications, it is highly probable that the Soviets have already unleashed clandestine, "slowly increasing" biological warfare against the West, both with BW agents and/or EM agents, or EM augmentation.*[154]

Table 10. Biological Warfare Implications.

- THE SOVIETS HAVE DEVELOPED AND PERFECTED HIGHLY EFFECTIVE
  - EM BIOLOGICAL WARFARE
  - COUNTERS TO BIOLOGICAL WARFARE
  - MASS DEATH RAY WEAPONS
- THE USSR IS THE ONLY NATION WITH A COMPLETE COUNTER TO BIOLOGICAL WARFARE
- BW AND EM BW (COVERT AND OVERT) ARE PREFERRED OPTIONS FOR THE SOVIET UNION
  - MUTUAL ASSURED DESTRUCTION IS TOTALLY DESTABILIZED FOR SUFFICIENTLY COVERT SOVIET BW STRIKES
  - SITUATION HAS EXISTED FOR AT LEAST TWO DECADES
  - U.S. NATIONAL CHARACTERISTIC: NO REACTION TO SLOWLY INCREASING THREAT
- THE SOVIETS MAY HAVE ALREADY UNLEASHED A MAJOR "SLOWLY INCREASING" BW STRIKE: AIDS

Work of Beck. Hunt, and Lisitsyn

We mention one indicator of Soviet EM BW *capability* designed into the Woodpecker weapon system. Using this design capability, entire distant populations can be biologically attacked by the Woodpeckers, based on other known capabilities that have been observed in the Woodpecker signals.

Some years ago, Dr. Robert Beck observed transmitted signals on some 15 or more simultaneously Woodpecker channels where their ELF (e.g., 10 Hz) pulse repetition rates were precisely phaselocked together.[155] Further, ELF waves in the vicinity of 10 Hz have been shown to be capable of entraining the normal brainwaves of humans.[156] Normally a healthy person's

brainwaves would appear to be comfortably entrained to the 7.83 Hz main Schumann resonance of the earth's magnetic field. This means that, under those conditions, the common 10 Hz pulse repetition rate of the Woodpecker is capable of entraining the brainwaves of a percentage of the population in a distant targeted area. (To entrain a greater percentage, the transmitter power would simply be increased).

Each entrained distant brain has 15 or more "signal channels for Whittaker infolding", and for induction of cellular diseases and death, behavior changes, etc. a la Kaznacheyev and a la Devyatkov. Further, the Soviets have the proper phasing in the entrained brains: by phasing input conglomerates of signals and infolding them a la Whittaker, they are properly aligning those infolded signals for in-phase delivery to the distant entrained brain. Figure 16 shows this situation.

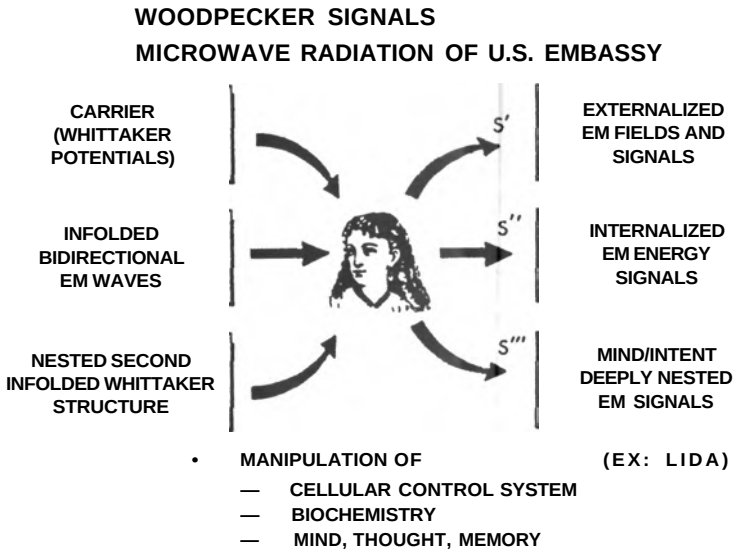

Figure 16. Strategic EM BW implications of world-wide targeting transmitters such as the Soviet Woodpeckers.

In epochal work, Dr. Valerie Hunt has already shown that human brain waves contain hidden order. In her seminal experiments, first each of several detected ELF frequency bands of human brainwaves was split into two replicas, and one of the replicas was delayed for, say, 6 milliseconds. In each frequency channel, the delayed and nondelayed signals are then beat together and recorded on an oscillograph. Under these conditions a startling pattern of *chaotic attracted* appears in the recorded oscillograph traces. This shows clearly that hidden deterministic substructures of hidden EM order exist concealed inside human brainwaves. Since Dr. Hunt has deliberately selected multiple frequency bands, this implies that this hidden order probably represents deterministically created and infolded multiple EM bidirectional waves (channels) is Whittaker potentials. *This is very strong evidence that the human brain utilizes Whittaker potentials and Whittaker-infolding in its internal communications — directly correlating with the Soviet approach by Kaznacheyev, Devyatkov, and Lisitsyn.*

In the latter 1960s S.K. Lisitsyn[157] pointed out that the Soviets had broken the "genetic code" of the human brain. (See Table 11). Lisitsyn reported that, in some 23 frequency channels in all, 11 were independent. This implies that a minimum of 11 independent infolded Whittaker bidirectional EM wave bands are required for the mind's control of all the functions of the body, both mental and physical. This lends further EM BW importance to Beck's observation of multiple Woodpecker channels — more than the *"Lisitsyn minimum"* required if infolded in a Whittaker potential wave and used to produce *almost any kind of mental or physical effect in distant targeted populations.*

Table 11. Lisitsyn's Report.

- THEORY DEVELOPED AND FITTED
- HYSTERESIS MEMORY LOOP
- CONTROLLED INDUCTION IN MIND
  - IMAGES
  - SENSATIONS
  - PREDETERMINED EMERGENCE
- 23 EEG BANDS
  - UP TO 8.1×10^{20} HZ
  - 11 INDEPENDENT CHANNELS
- HUMAN BRAIN CODE BROKEN (DECYPHERED)

If a distant brain is entrained by the Woodpecker, all 15 or so phaselocked Woodpecker channels, when infolded, would also be phaselocked into that brain, for possible Kaznacheyev disease induction or Devyatkov induction of behavior and cellular changes, etc. *It is also possible to produce direct images, emotions, thoughts, and memories in distant brains and personalities, via the Whittaker-structred potentials.* This was long ago hinted at by Soviet researchers in their heavily censored publications on *"biological radio."*

Explanation of EM Biological Trigger Windows

A straightforward explanation now is possible for the strange phenomenon of many biological-effect EM "triggers" being (1) very, very weak and (2) having a narrow window of EM amplitude of power. Below a minimum EM power level, the effect does not occur; and above a maximum EM power level that is only slightly higher, the biological effect also does not occur. Only within the narrow power window is the effect induced by the EM trigger signal.

This window effect can be readily understood when one realizes that by "weak envelope magnitude, or power," one is actually expressing and dealing with a function of the integrated (summed) power of *the total number of infolded Whittaker bidirectional planar waves,* both coherent and incoherent, contained in the structuring of an artificial potential. We further are comparing the degree of coherence of that potential's substructure to its degree of incoherence.

However, now we must use a quite different comparison and analysis process from that of ordinary analog signal theory. By analogy, this dependence upon the *number* of infolded signals is comparable to a *digital* process, such as that of the dot resolution of a printed picture. Also, it is an *imperfect* process. We are speaking of a case where each thing (dot) is a little bit fuzzy, not completely razor-sharp. Our problem is that now (1) we must have sufficient dot density (of our fuzzy dots) to have a clearly recognizable image, yet (2) we must not have so great a density (of our fuzzy dots) that the image is smeared out and obscured in a sea of common gray or black fuzziness. Table 12 summarizes the effect.

Table 12. Why EM Trigger Windows?

- WELL-KNOWN WINDOW EFFECT
  - WEAK EM TRIGGER SIGNALS
  - MINIMUM SIGNAL STRENGTH THRESHOLD
  - SLIGHT INCREASE OKAY (GIVES WINDOW)
  - LITTLE MORE INCREASE EXCEEDS MAXIMUM THRESHOLD
- CHARACTERISTICS OF
  - CHAOS (HIDDEN ORDER INSIDE DISORDER)
  - QUANTUM CHANGE (PHOTON) IS FUZZY
  - DIGITAL RESOLUTION OF FUZZY DOTS
- REFER TO LOGISTICS EQUATION (CHAOS)

So unless a certain number of coherent EM transverse waves (fuzzy dots) are infolded (printed), the pattern (image) to be engendered in the target is sufficiently incomplete that it cannot sufficiently "charge" and structure the dynamically-fed potentials of the cell. That is, the ratio of the amount of internally infolded signal (i.e., of the dots) to the amount of noise already in the infolded potential structure — the *signal-to-noise ratio,* or the *contrast* — must be sufficient to produce a stabilized signal *(resolved image)* within the potential's substructure, *over and above the noise that already exists therein.* Otherwise there is insufficient resolution. In turn, this accounts for the minimum value of the EM threshold for induction of a particular biological effect: it is the threshold where the activation signal complex becomes recognizable or detectable by the biosystem's internal Whittaker-channel detectors. At the minimum threshold, there are enough dots (infolded coherent biphotons) to discriminate coherently-structured gravitons.

Also, corresponding to each dot being fuzzy, each infolded EM wave is actually imperfect. It itself possesses noise distortion (fuzziness, or some lack of resolution) of its own. Remember, both the photon and the graviton are *statistical* entities; they are not at all "brick-like" particles. Therefore, not only does one infold a "pure EM activation signal" on each wave, but one also infolds some inadvertent "EM distortion" (fuzziness) as well.

As integration occurs and more activation signal is collected, additional noise (fuzzines, smearing) is also infolded inside the potential's structure. As collection continues to increase, the resolution of the signal is gradually deteriorated. When deterioration is sufficient, resolution of the image (pattern) by the biological system's detectors is no longer possible. This accounts for a maximum threshold at which the coherence of the signal has been lost.

Thus this accounts for the maximum value of the EM threshold for induction of a particular biological effect. Above the maximum threshold, internal signal resolution is lost. Additional power may produce gross energy effects (heating, chemical changes, mechanical damage), but will not produce precisely controlled changes via the mechanism of redirecting the body's own internal control mechanisms.

When the signal is within the window, the signal-to-noise ratio (and the resolution) is discriminated to produce a stabilized pattern/signal (image), and so this signal complex will activate and charge the system until the biological effect macroscopically emerges. That is, within the window the signal resolution is sufficient to produce *the information content of the field* that generates and activates the biological effect, *using the body's own internal control system.* Depending upon the particular physical/chemical/biological effect engendered, the biological response may be (1) immediate, (2) after a short "charge-up" time delay, (3) after a more extended "charge-up" delay, or (4) after a substantially extended "charge-up" delay that may be many years.

We now are equipped to understand the "window of magnitude" that most often exists in the weak EM induction of biological effects in living systems. Only at or above the minimum threshold does sufficient resolution of the pattern signal for biological activation occur. Above the maximum threshold, the infolded pattern or "image" is no longer discriminated.

The amplitude of the weak signal potential our normal instruments are measuring is in general a function of the summation of the simultaneous amplitudes of the infolded and hidden Whittaker EM waves inside that potential. Further, most of our instruments have nowhere near the response needed to accurately measure individual components of such an ultra-wideband series of frequency signals as evidenced by Lisitsyn. Therefore, in most experimental work in the literature, our instruments have grossly integrated the signal complexes over a relatively long time. That is, our instruments have almost never yielded anything of the structure we were trying in measure. *Presently most of this is hidden in what we simply see as very fine noise in our instruments, if we see it at all* Roughly, then, the measured amplitude of the potential we see is a (nonlinear) function of the number of infolded Whittaker EM waves, to the first order. The minimum number of infolded EM signals required for image resolution, together with the maximum number of infolded EM signals that must not be exceeded if image resolution is not to be lost, are the two primary factors involved in whether activation occurs or not. They create the minimum and maximum signal thresholds for inducing the biological effect.

Relation to Chaos Theory

Most of this can be much more precisely stated in terms of chaos theory, but that is beyond the scope of this paper. However, for an indication, see Figure 17, which is a standard portrayal of the chaos inherent in the logistic equation. We can readily understand the minimum and maximum biological trigger thresholds from this figure. As can be seen, as the R value increases toward 1, there is no discernible pattern or "image" (signal). That is, there is insufficient resolution to detect the true signal order. At a threshold just past R=1, resolution rapidly improves so that a true, discernible analog pattern or signal (line) exists. Just before reaching R=3, the "fuzziness" spurts up again, until bifurcation occurs. Now there are two values, or *two* discernible analog signals, one of them nearly the mirror image of the other. At about R=3.5, fuzziness starts to increase again, this time due to another bifurcation. Thereafter bifurcation increases so dramatically that, between about 3.5 to 4, rapid loss of any recognizable analog pattern or signal occurs. From R=4 on, the system is totally chaotic, and absolutely no recognizable "image" (signal) occurs.

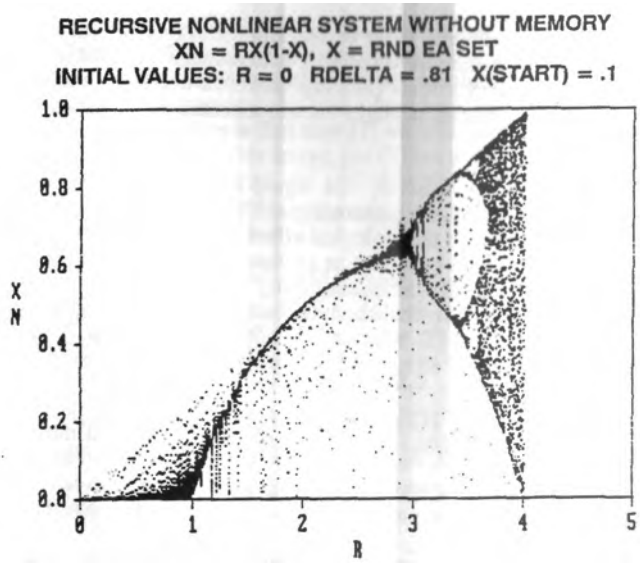

Figure 17. Chaos: The collected emergence of large-scale order from disorder. The apparent disorder actually contains hidden order.

The human biological EM system works this way. As can be seen, for activation/kindling there is a "window" with minimum and maximum values. Only in this window is there a discernible image (signal). Normal detectors tend to determine only the analog (envelope) value, not the individual structure showing the window where the coherent signal is reasonably resolved.

Experimentally, the situation is further compounded by the fact that the instrument itself also exhibits chaos effects such as the window of the logistics equation.

More On Internalized Energy

Again, it should be strongly accented that *the true "living EM energy" of biological systems is internalized, infolded EM energy.* It is the infolded and hidden EM energy of the organized bidirectional EM wave systems inside the Whittaker potential. It is *photon-structured graviton* energy. This is not the externalized EM energy of the EM wave envelope, with which Western science is presently so preoccupied. This energy does not appear in the electrical engineering or electrical physics textbooks. Nonetheless, our health and our very lives depend upon it.

Plants, animals, the earth, the oceans, the rivers, the atmosphere, and the clean environment are continually activated and filled with this internalized, infolded EM energy. In its radiation, the Sun pours forth enormous amounts of it (Figure 18), which we never measure with *our* instruments. The earth, sun, and moon particularly — and the other planets to a lesser extent - form a giant, Whittaker-communicating system that provides the very lifestream that sustains us

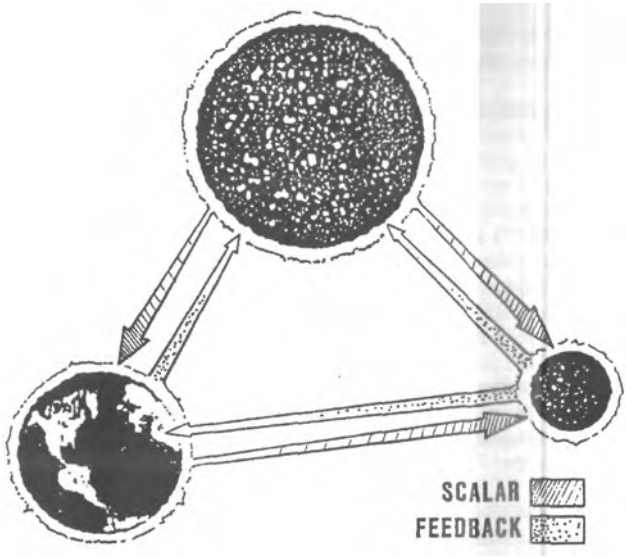

Figure 18. Earth, Sun, and Moon are Whittaker-coupled.

Mechanisms For Evolution. Gaia. and Morphogenetic Field

For all the creatures and species on earth, the Whittaker structured potential mechanism provides the precise physical mechanisms for evolution, and for Sheldrake's *morphogenetic field.* Every creature continually contributes structures into the quantum potential for its own species, and the quantum potential for every species is part of the overall planetary quantum potential for all its living things.

Each species has its own quantum potential, to which every action, movement, thought, or incident of, by, and to its members contributes a minute amount of substructuring. Thus very, very slowly the species bio-quantum-potential adapts from the combined experiences of all its members, and the species "learns." Sudden wholesale changes, of course, can extinguish a species before this mechanism has time to adapt. But if the species has time, it will adapt to even harsh changes inflicted by its environment, and it will change and survive. The *species bio-quantum-potential* provides the exact mechanism for the species to change, adapt, and evolve to survive the slowly changing adversities of its environment.

lt should specifically be noted that potentials organize into entire hierarchies of organization. That is, a potential is normally a conglomerate composed of many smaller potentials, each of unique Whittaker structure. The stress of a potential is rather analogous to the pressure in a mixture of gases; the overall pressure of the gaseous mixture is composed of *partial* pressures of the various gaseous components. Each gaseous component has its own individual contribution to the overall pressure of the entire gaseous mix.

In the case of the potential, the overall Whittaker structure of a particular potential is comprised of the overall Whittaker structures of its component potentials.

The point is, a quantum potential of one entity is composed of *the partial* quantum potentials of its component entities.

Note that each living cell of a biological organism is itself a complete biological organism. Each j cell has its own individual bio-quantum-potential. Insofar as that cell is concerned, its "species" bio-quantum potential (BQP) is the body bio-quantum-potential of the whole animal of which the cell is a part. (Even organs of an animal have their own biopotentials, as does every physical structure and division of everything in the universe. And everything intracommunicates and intercommunicates via hidden EM energy.)

Successively deeper Whittaker potentials are nested inside the bio-quantum-potential for the cell, one for each next smaller level of interior structure. The end result is that this cellular hierarchical structure continues directly down into and onto the nucleus of each atom composing that structure. *This is the manner in which the life of a living system is attached to, and activates, the physical matter of its body. We have thus specified precisely what the living spirit of a body is.*

Communication between all living levels continually occurs via the mechanisms contained in the two Whittaker papers (W-1903: infolding external EM at one level into internal EM at the next lower level; and W-1904: outfolding EM at one internal level to the next outer externalized level). Thus in a true sense, all life on the planet is completely intercommunicative and intracommunicative. *Literally, the planet is a living being, and a special kind of Gaia exists.*

Particularly strong Whittaker-structuring communication occurs between an individual member of a species and its species bio-quantum-potential at fertilization/conception and at death. Thus at cell division (formation of a new cell), mitogenetic radiation is more strongly emitted, showing that increased communication has occurred in a (relatively) impulsive manner. The recorded experience of the body is communicated to the new cell at this time. At the death of the cell again mitogenetic radiation is more strongly emitted, showing that again impulsive communication has occurred. The recorded experience of the cell — particularly its most recent experiences — are impulsively transmitted at this time, from the outfolding Whittaker structures of its bio-potential.

Similarly, at the fertilization of an egg and the conception of an animal, biocommunication is impulsively exchanged between the newly conceived entity, the body of its mother, and the species bio-quantum-potential. At the death of the individual animal, a relatively impulsive communication again occurs between the cells of the dying body, the dying organism, and the animal's species bio-quantum-potential.

Thus it can be seen that the adaptation or evolution of a species is subject to both *slow* communication components and various impulsive communication components. The development of the bodily form of the members of a species thus can undergo *jumps* from greater "impulsive discharges" rather than just slow gradual change. That is, obviously a reptile species could not gradually develop a wing by small degrees. Instead, to develop a wing, the wing must appear at once. This can occur under heavy, sustained pressure on the species, stimulating and building a specific phase conjugate portion of the bio-quantum-potential (BQP) of the species In the ghost forms existing in the vacuum potential, the form for that wing definitely exists, at does the ghost form for anything else that can be imagined. Intercommunication between the atomic nuclei of the living organism and the vacuum potential continually and strongly occurs there is a violent flux exchange at all times between these nuclei and the vacuum.

The external experiences being impulsively communicated back to the atomic nuclei from the species and its members thus continually diffuses on out into the surrounding vacuum potential. The surrounding vacuum potential's Whittaker structuring is continually activated by the Whittaker-structuring of the overall bio-potential of the individual animal. *Thus we have specified the specific mechanism for, and the form of, the long-sought "aura" of the living animal or person.* That aura is quite real, and it does exist. Further, knowing what it is, we can now develop instruments to detect and record it, including systems to analyze its contents. *Let it be strongly pointed out here that we are talking physics, not mysticism.*

On the other hand, we are most certainly not talking the present *rank scientific materialism.* To state it in more theological terms, *man is truly made in the image of his creator. And the image of the creator is the quantum potential of the vacuum.* Further, Man — as is every other living thing created by the Creator — is always and forever in direct but hidden communication with the image of his Creator. It is that image mechanism and its adaptive intervention that is the cause of all evolution. The Creator indeed made man — and everything else — out of the dust of the earth. And indeed he activated his creation with the "breath of life." *The new physics does not dispose of God; to the contrary, it marvelously and nondogmatically — and scientifically — reveals his ubiquitous presence and his ubiquitous hidden intervention.*

In so doing, the new physics also does away with the present scientific nonsense of dogmatic scientific materialism. We are not robots and machines; we are living souls. Our minds and our beings are not captured in the puny electrical discharges of our brains and nervous system, but in marvclous structures pervading the entire universe, everywhere, everywhen, in the internal Whittaker structure of every point in spacetime. Each has a spirit (that which motivates matter), and that spirit is a form in the Whittaker-structures of all the potentials of the universe. Further, the spirit is eternal. Destruction of the physical body does not alter the fact that the individual spiritual form and its every deed, thought, feeling, and experience exists for all eternity, in every part of the universe, directly in the form and image-potential of God. We indeed are eternal, and our true self is nonmaterial and immortal. The shabby treatment of our present scientific orthodoxy in attempting to deny us our spiritual heritage is refuted, and this refutation is scientifically testable. *We challenge the present dogmatism to practice scientific method and put it to legitimate experimental test* Spend some money and some time, and do it right The necessary instruments can be developed. The necessary tests can be performed. The necessary results can be shown. And, given those results, the present materialism must be cast aside as an infantile derangement. It is long past the time when science should put away such juvenile things, and get on with a more mature, adult world. If it does this, then science can contribute to the salvation of MAN. If it does not do it, it will continue to contribute to the destruction of Man.

We show now the causative mechanism for adaptive evolution.

In ihe gravitons composing the vacuum potential, one photonic element is "time forward" and one is "time-reversed." These are phase conjugates. Thus, any pattern consistently happening to the species diffuses into the vacuum potential, where its oppositive or "negative feedback" component is automatically selected/created by phase conjugation.

The bottom line is this: the external factors causing stress on a species automatically (but slowly) generate a time-reversed response in the activation of the vacuum potential. That is, *the species' need-charge generates an activated phase conjugate response-charge, effectively charging up (integrating) the very ghost form or forms in the virtual state of the vacuum that would fulfill that need.*

As is well-known in physics, a virtual entity can become real and observable if energy is added to it. Thus the species-need is steadily causing just such "addition of energy" to the virtual state ghost form that answers that need. When sufficient energy has been udded (when it has been

sufficiently charged/activated), the ghost form starts emerging into the observable state, in the conceptions (via impulsive discharge) taking place in the species. *Then species members start being born with that evolutionary change already fully established.*

This is the specific mechanism for evolution of the species. It explains not only slow adaptation, but also impulsive adaptation. It explains why evolution/adaptation occurs in jumps rather than in continuous changes. And it also explains why, in desperate circumstances when sufficient time still is available, rather drastic jumps can occur.

The Unsuspected Deadly Nature of Internal EM Pollution

In addition to the "externalized energy balance" of nature, there is a heretofore unsuspected (by Western reductionists) *internal energy balance* of nature. This internal energy balance is of vital importance when we consider how the planet is being polluted. The most deadly pollution of this planet is the steady and increasing pollution of the internal "rivers of life" inside the biological potentials of the planet and all its living systems. That is, we are steadily polluting the very intercommunication and intracommunication fields that sustain life as we know it. In short, we are slowly killing the living mechanism in and on this biosphere. We are slowly sickening unto death, and no one even knows it.

Environmental and ecological issues cannot be adequately discussed and completely dealt with until our science develops a sufficient knowledge of internalized EM energy, its exchanges within the environment, and the overall internalized energy balance of nature and of our biosphere.

The importance of electronic smog — of the vast and increasing multitude of individual signals that now fill our environment — cannot be overemphasized, nor can its future impact. This smog is slowly producing an artificial quantum potential on earth, one that has a most deadly and lethal "jamming noise" structure, and steadily contaminating the natural quantum potentials and bio-quantum-potentials that are our heritage. This pollution even includes the internal pollution of the tri-system: the coupled Sun, Earth, and Moon. We are slowly poisoning the life mechanisms in this entire region of the solar system. As we charge-up the Earth's potential, that charge is diffused to both Sun and Moon through the hidden internal communicative bidirectional EM Whittaker structures. We are not only slowly extinguishing ourselves, but also the Triad system.

In biological systems the presence and effects of the increasing jamming of our living energy flows will be evidenced by anomalous effects, often by very slow effects for which we do not recognize a causal connection. Long-range detrimental effects from this smog are occurring now, such as extremely slow jamming of our immune systems, leading to a rise in arthritic diseases, immuno-suppressive opportunistic infections, etc. Also, such diseases as influenzas will slowly seem to become harsher and harsher. Indeed, new strains will appear, and they will be much harsher and more resistant to medical treatment. Continually stimulated, the immune system slowly begins to improperly react in and upon the body, and so the auto-immune reactions increase slowly, year by year. Leukemia — cancer (control disorder) of the blood — is increasing, as are other cancers. The sperm count of young American males has already decreased by up to 50 percent.

The real problem behind the puzzling and anomalous effects of video screen emissions that computer operators are exposed to is the fact that each electron striking the screen comes to an extremely abrupt halt, creating a very sharp individual EM potential gradient signal change, with very high frequency components. Added to the other frequency components in the tube — such as due to scanning of the beam, internal circuit operations, magnetic focusing, etc. — this means that the electrostatic potential emanuting from the face of the tube is filled with a conditioned

Whittaker structure from all the electronic hash inside the computer, tube, and screen. This structure has a very harsh micro-microstructure of hidden sharp signals from the rather instantaneous stoppages of electrons on the screen. This is a "Whittaker hash", and its effects continually diffuse into the vision center, brain, and nervous system of the operator. The light from the tube is conditioned with this Whittaker structure, and when absorbed by the retinas of the eyes, it imparts and diffuses that hidden structure directly onto the nervous system and the surface of the brain. By diffusive activation (charging), this gradually spreads into the other parts of the body, particularly in and through the master cellular control system, and partially charges their potentials with the hash. After hours of exposure, kindling of the Whittaker structure in the physical system is sufficient to be expressed as physical changes such as headaches, vision effects, dizziness, etc. Very subtle blood tests should also reveal blood changes, particularly typical of weak auto-immune reactions, or typical of weak stimulation of the immune system. The more subtle parts of the master control system are affected as well. With repeated and daily exposures, the "hash activation" partial charge is sustained in the body, continually interfering with precise control mechanisms. Thus an increased incidence of fetus defects, responsive abortions by the body, and birth defects in infants of exposed pregnant women has a causative basis.

In a radar system, there is "splatter" and noise from all the various circuits, the transmitter, and reflections in the area. Harmonics, reflections from surrounding plates, panels and objects, and the continual interference of all these signals, form a Whittaker potential with a sharpened and dynamic "hash" for its internal structure. This hash continually diffuses into radar operators and maintenance personnel exposed to it. Diffusion of the jamming "hash" leads to slow, harmful variations in the master cellular control systems of the exposed personnel. Defective sperm cells can result A higher incidence of cancer and leukemia results in operators extensively exposed to such "non-ionizing radiation" in their everyday duties.

Powerlines act as antennas, continually picking up and re-radiating all the electronic signals that impinge upon it, no matter how weak. Myriads of television, radio, power machinery, and other electrical/electronic signals are involved. Further, the power flowing through the line carries all the electronic smog from any place along it to all the others (time-reversed components of the infolded Whittaker structure considered.) So it is a vast gatherer of electronic smog, which is infolded inside its potential and re-radiated everywhere along its length. With the criss-crossing of numerous new lines every year, and the drastic increase in communications signals, electronics signals, and electrical signals, we are slowly poisoning our entire biospheric living internal river of life. *We are steadily contaminating and poisoning the entire planetary potential, and each and every year we are dramatically increasing this deadly effect.*

In the modern home and office, we are particularly "blessed" with these interactions. Numerous electrical and electronic gadgets whir and operate and create EM fields and weak EM radiation signals. The electrical powerline brings to our home all the internal patterns that have been impressed from afar; literally it brings us weak electronic hash from the entire earth. The light from our electric lights and lamps carries this hash directly into our retinas, brains, and nervous systems. The Whittaker structures are modulated into the sound from our radios and stereos, entering our ears and auditory systems, on into our nervous systems and brains. Watching television, the light from the tube contains all this hash and also the internal hash of its own circuits, tube, and its screen hash. Continual weak EM hash continually impinges on our skin by radiation from light sockets, appliances, and fixtures. If we sleep under an electric blanket, we sleep directly in an alternating magnetic field that penetrates even down to the nuclei of the atoms of our body, directly inputting the hash into our body's biopotentials. Even when turned off, the fixtures and appliances in our home continue to emit Whittaker standing potential waves, exposing us to weak but continual hash. Thus the same cellular changes, etc. that occur in video screen operators and radar operators begin to gradually occur in our bodies, from the EM pollution of our environment. Usually, however, we get a smaller "dosage rate" than the screen

operator or radar operator, and so the changes occur more gradually. Our unhealthy EM hash environment is already inducing leukemia and cancer, and immune system defects and diseases, gradually over a period of years.

"Hot spots" will obviously occur, where the dosage rate is increased because of particular reflections, reinforcements, interferences, etc. Such cancer and leukemia hotspots do indeed exist, without any presently known explanation.

In the "normal" weak EM noise environment that used to exist on earth, the minimum threshold effect provided security against the normal weaker background. The maximum threshold effect provided security against sudden larger "EM jamming" occurrences. In today's EM noise environment, both of these protection thresholds are becoming inadequate.

How the Drug Culture Was Really Created

Much of our present younger generation is electronically "plugged in," to put it mildly. Heavy rock concerts at great volume blast into their listening audiences not only the rock music but also the EM hash from all the effects previously listed. They also blast a certain type of philosophy, of frenzied sex, violence, contempt for society, and rebelliousness. The guitar has been lowered onto the player's body so that its neck becomes a giant phallus. Frenzied movements of the player demonstrate overtly full preoccupation with sexual stimulation and orgasm. The impact of these giant emotional mass experiences of the audiences is reminiscent of the huge Nazi rallies that Hitler used to so effectively condition a generation of Germans, and use them, once conditioned, to launch an attack on the civilized world that resulted in the deaths of over 100,000,000 people. Certainly orthodox psychologists and psychiatrists have already addressed the parallel of the rock concert to the orthodox understanding of mass conditioning. We will shortly address an unorthodox element of which the present scientists are unaware.

In addition to their mesmerized attendance of rock concerts, often youths continue their heavy listening schedule at high volume from their own stereos and transistor radios, often with earphones which can sustain the loud volume in their ears. In their automobiles, the youth oil today has installed huge speaker with powerful amplifiers, to continue their exposure to the volume and inadvertently to the EM hash. They also continue their sustained and dramatic exposure to the synthesis philosophy expounded by modern rock music and rock musicians.

But there is another, highly effective, subliminal conditioning effect that goes completely unrecognized. The information content of the rock music (and, as anyone knows who translated it, much of it has a "message" of violence and contempt for the female and for society) is also modulated into the internal Whittaker structures of the hash. *This "wired-in generation" thus is continually conditioning itself by a new and unique process. It is directly conditioning the memory personality, and deep unconscious mind by charging and activating the biopotentials on the atomic nuclei directly.*

There already exist forces hostile to the structure of Western society that secretly know the semblance of this, and know that the present electronic conditioning of the youth of our society can undermine all its values. There is thus a hidden threat to our youth and to our society. Both are already being manipulated, and almost no one in orthodoxy seems to suspect it. Certainly the mass news media do not take up the cudgel; they are far too busy making money from the very advertisements that continue to plant the seeds for continually conditioning the children for each forthcoming new generation.

We have a drug problem, and we shall continue to have one, no matter what "swat teams" and "special operations forces" we muster against the drug barons. *Much of the youth of the present generation has a different culture, and a different cultural background, and a different attitude toward drugs, sex, and violence than anything the older generations knows or can relate to.* Rape, violence in our cities, contempt for society expressed as vicious attacks on old people and helpless persons, increased child molestation, and expression of sex-in-violence such as "wilding", are the end results of this continual conditioning. We are speaking of a matter of degree; as the degree of heavy internalized conditioning increases, the degree of criminal expression of this inner content increases. Just as the great psychologist Jung observed in his patients the increasing dark content of the unconscious mind being conditioned into Germans by Nazism, and predicted a direct and violent overt expression of it (in the Second World War), so one sees today an increasingly violent and crime-ridden future for the cities of America, from the steady manipulative internalized EM conditioning of our youth.

But, the reader may ask, is all this really true? Can one explain how and why we acquired the drug problem in the first place? The answer to both questions is yes.

The real cause of the present drug problem in America is never mentioned or addressed. It is not present in the learned but biased studies of our great think tanks. It is not known or realized by our drug enforcement officials. Neither the Congress nor the Executive Branch is prepared to deal with it. (In fact, because of the financial implications, they would most probably hamstring any effort at exposing it and dealing with it directly, just as they hamstring efforts to declare alcohol and tobacco addictive drugs.)

The real genesis of the drug problem in America is the pain reliever and pill advertisements on television particularly, and to some extent, those on radio and in motion pictures.

Think of it this way: In the 1950s and 60s America became "televisionized." Most households — even those of the poor — obtained television sets. The reason was for entertainment, and the intended enrichment of our lives. In fact we got that aspect of television, and we also got something far more pervasive and far deadly. We had taken a viper to our bosom, so to speak.

Americans were enraptured with television, to put it mildly. The television set became the center of entertainment and the center of attention in massive numbers of households. Millions of little babies, with their little formative minds absolutely pliant and absorptive, watched thousands of hours of television — including thousands of hours of television pill commercials and pain reliever commercials. Always depicted were situations where *life's problems have a chemical solution.* Has mama had a trying day, dropped the iron, and dropped and broken the dish of food? Pop a pill, a soother of the nerves. Got a headache from tension or sinus? Pop a pain reliever. *Pop a pill, baby! Life's problems are solved with a chemical solution!* That was the unceasing message that was pounded into all those little absorbing, non-censoring, non-evaluating minds. *Already in a passive state and highly suggestible, these little minds absorbed the message into their deepest unconscious, repeatedly, continually, as the norm for society and the preferred, ideal behavior.*

The pill merchants, in their ubiquitous greed, really did a number on our children. They conditioned an entire generation — and continue to condition each new one — that *chemicals are the solutions to life's problems.*

It's bad enough conditioning if one just considers the classical conditioning mechanism in the passive state, a la Hitler. But when one also considers the *internalized* conditioning of the infolded Whittaker structuring, these kids got the whole enchilada.

And this was further supported by the children observing adults — often their own parents — with a dependency on pain relievers, alcohol, nicotine, and aspirin and pain relievers. The medical profession has long since been powerfully conditioned and subverted by the large drug companies that allopathic medicine, with an occasional surgery, is the primary constitution of the practice of medicine. Anything electrical, of course, is automatically labeled a fraud, and persons attempting to investigate the possibility of electromagnetic healing are severely chastised, just as are naturopaths, chiropractors, holistic practitioners, etc. Indeed, the EKG and the EEG were once labeled as frauds, and their practicioners as charlatans. So also was physical therapy, and its practicioners were hounded and prosecuted. Allopathic medicine is a monopoly and an oligarchy; it has subverted the state and uses the power of the state to enforce its own dogma.

The big drug companies love it. Tons of money are made, milking the public as a milk cow, selling them lucratively priced drugs by the trainload. The doctors get rich. The drug companies get rich. The cow gets milked. The lawyers get rich by sueing the doctors to "share the proceeds." Best of all possible worlds. The drug commercials contain to blast their way from television into the young, pliant, passive minds of infants, with thousands and thousands of hours of the message that *chemicals are the solution to life's problems. They are good. They heal people. Society approves. See your friendly drug merchant.*

Now of course there is a place for allopathic medicine. Properly used, some drugs can be beneficial. None of them can do a thing for healing the body; at best, they can suppress the symptoms of a disease and allow the body time to muster its own recuperative and healing forces. The blunt truth is that the natural mechanisms of the body are what heals it, not the drugs. The drugs, however, may be judiciously used to assist in this process. In this paper, in castigating the drug advertisements, we are speaking of *the degree of near-total reliance on using drugs that* is *advocated.* Commercial drug advertisements constitute a giant, infectious disease and they should be ruthlessly eliminated from our television and radio commercials. Otherwise, these harlots will continue to seduce each succeeding generation, and we will continue to have a giant and increasing drug problem because the *demand* will continue.

The answer isn't spending more money and milking the taxpayer. The answer is to root out the source of the infection. And the answer is also to control the infectious agent so it does not rear up and strike again.

The formative minds of our infants should not be allowed to be playgrounds for the drug merchants to romp in and sew their deadly infection. We deserve better than that. Our government watchdogs ought to get off their posteriors and pass legislation that outlaws all such incessant propagandizing of our babies, children, and adolescents. It is a crime against society to *deliberately engender the need* for drugs in our children, just as surely as it is a crime for someone to *sell* them illegal drugs. Eerily, our warped society declares war on the illegal drug producers while ignoring the very agent that created the problem in the first place, and continues to create it.

Just as industry once practiced child labor and horrible exploitation of the nation's children, the present "legitimate" drug companies, doctors, and television and advertising industries are also exploiting our children and corrupting their minds. Is financial gain worth that much? Are we so mad that we cannot see what we are doing to our children? What we have already done to many of our children, now the young adults of America? Is there anyplace in America where the insidious damage has not been done? Is there anyplace in American where the need for elicit drugs has not already been created, and is continuing to be created?

In God's name, wake up, Americans!. How long will we allow these men in dark blue suits and with corporate mentalities to exploit and mutilate our children? And for dark, foreign forces to

deliberately augment and manipulate our children with suggestion and conditioning that simulate that mechanism?

One wonders. And ponders. And takes up one's pen and writes. Does anyone heed the message?

To stop this thing is simple, but it will require a very long time. We have to get the pill advertisements completely off television and radio. We must, whether we like it or not, censor the content of the deliberate, mass conditioning of the minds of our youth with hate, bigotry, abnormal sex, and violence. As a man thinketh in his heart, so is he. Condition the heart (the unconscious mind), and you form the person. Must we allow our children to be deliberately manipulated and conditioned by hostile and detrimental forces? Let's at least get the drugs, hate, bigotry, and violence out of there. Let's attack the drug problem at the heart, where the need for it is being created. Let's crush that serpent and destroy it, and prevent it from biting and infecting our babies, children, and adolescents.

Ubiquity of Internal EM Energy

As we stated, internal EM energy is ubiquitous. It is everywhere, all-pervasive.

The inclusion of internal exchanges, of course, is completely anti-reductionist. Now you are not just what you are, but also what everything and everyone else is as well. Ironically, present Western biology seems bent upon the road back to hard reductionism. This can only reinforce and sustain our presently primitive and inadequate "cut 'em, drug 'em, and burn 'em" medical science, as well as our inadequate knowledge and consideration of the internalized energy of living systems and or our irreplaceable biosphere.

We also point out just how fundamental the Whittaker-based methodology is. In a very nice summary paper dealing with the remarkable capabilities of recursive methods,[158] Soviet physicist V. K. Ignatovich points out that recursive relations are involved in a wide variety of fundamental physical problems, including molecular gas diffusion, scattering of a quantum mechanical particle from potentials, etc. There is also direct involvement with the Schroedinger equation itself. Indeed, one of the striking features pointed out by Ignatovich is what can only be called a Whittaker-structure (of superimposed bidirectional plane waves going in opposite directions) comprising the potential utilized in the Schroedinger equation. Interestingly, in the infinitesmal gaps where the potential is zero (mathematically, such gaps could essentially be inserted at will), the wavefunction itself is comprised of this bidirectional Whittaker structure, and the only difference between two wavefunctions in two gaps is a phase factor that is calculable.[159]

In short, deterministic Whittaker-infolding of bidirectional EM plane waves is the key to direct engineering of the Schroedinger equation itself — hence of *all physical change.* From the very beginning, living biological systems have utilized Whittaker-structuring in their deepest biological control systems. This has allowed them to utilize very minute voltages and currents, yet precisely communicate these incredibly weak signals through a very "noisy" ordinary EM environment inside the body.

The emergent picture is this: (1) the normal externalized EM force fields represent dynamic, externalized bleed-ins and bleed-offs (by acceleration of charged particles) of the external amplitudes of scalar potentials, *without* affecting the fundamental infolded substructure of the potentials. Such force fields represent primarily the *externalized* EM dynamics of the potentials, the part where gravitational potential turns itself into electromagnetic force. (2) Whittaker-infolding of such EM forces in bidirectional EM wave pairs inside the scalar potentials allows

calm, smooth, deterministic communication between all the parts of the biological organism, normally without undue disturbance from the externalized maelstrom of "first order" physical reality (single photon interactions with matter." These hidden Whittaker structures represent the *internalized* EM dynamics of the potentials and their intercommunication and intracommunication.

A Very Different Physical Reality

While beyond the scope of this paper, we point out in passing that consideration of the I internalized EM energy of biological systems (and of the universe) gives a quite different kind of "physical reality picture" than the normal first-order reality. Biological functioning in this different reality realm therefore exhibits quite different characteristics from the normal *externalized* aspects of biological actions.

Direct mechanisms for mind, thought, emotion, memory, hidden inter- and intra-cellular communication, etc. result from the new approach. In addition, mechanisms for previously rather mysterious parapsychological phenomena — such as psychokinesis, precognition, and postcognition — also result. Further, it is now clear why heretofore such phenomena have been demonstrable only statistically and even then only minimally. The true deterministic EM signals involved were very, very weak infolded Whittaker structures inside scalar EM potentials. Since our present instruments have all measured the much more powerful *externalized* EM energy, we have only been able to statistically discriminate (and very weakly at that!) the emergent order in rather large-scale *integrated* chaos effects. Thus for the most vital living functions of the organism, we could only show weakly ordered and statistically significant small deviations from randomness. We stress that all these "internalized reality" subject areas, regardless of how mysterious they have previously seemed, are now open to direct investigation and even direct engineering. We further stress that spacetime, quantum change, the Schroedinger equation, parapsychological phenomena, and physical and mental reality are all now unified and accessible to scientific investigation and direct engineering.

Solving the Quartz vs. Glass Transmission Problem

In passing, we point out a solution to one of the problems that have puzzled Western analysts for over two decades. In the Kaznacheyev cytopathogenic experiments (as shown diagrammatically in Figure 19), disease and/or death is induced into one cell culture by optical EM radiation emanating from an adjacent but environmentally shielded contaminated culture. Similar disease-induction experiments have been successfully performed in West Germany, Australia, and at least by one U.S. researcher.[160] Kaznacheyev's results were obtained by weak optical radiation through a thin quartz window, but not through a thin window of ordinary glass. He reported the discovery of weak mitogenetic photons in the near-ultraviolet (near-UV) which purportedly induced the effect.

In West Germany, University of Marburg researchers duplicated the experiment, ostensibly discovering weak mitogenetic photons in the IR frequency region, which purportedly induced the effect.

However, it is not nearly so simple as measuring single-frequency photons. We are dealing with internalized energy, and hence with the *infolded coupled-photon graviton* structure of Whittaker potentials. This hidden infolded structure is the information content" of the radiation emanating from the diseased cell culture — graviton containing containing hidden EM photon information

that can induce the same disease or physical conditions in the targeted cells if delivered to them intact. Further, the bidirectional EM wave structure of the Whittaker potential consists of pairs of contratraveling EM waves *multiplied* together, hence *modulating* each other and locking together. To form gravitons, multiple photons are locked together in n-tuples (both in number and in harmonic frequencies) by this process. *All gravitons containing information must have harmonic substructures, else modulation of monochromatic photons did not occur to produce them.*

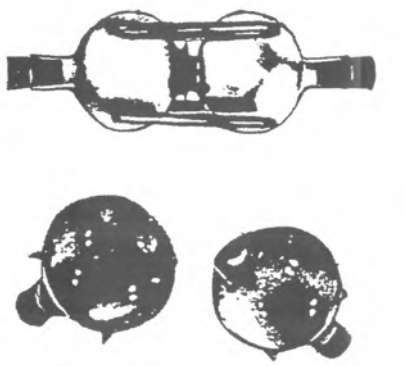

Figure 19. The Kaznacheyev apparatus for cytopathogenic experiments. Many thousands of experiments were conducted by two military institutes.

Another way of saying the same thing is that gravitons represent a special, linked-photon, averaged lattice in the vacuum flux. Horizontally (spatially) the photons are linked into gravitons by bidirectional EM waves; vertically (time-wise) the photons are linked in frequency by harmonic and subharmonic oscillation. Figure 20 shows the general scheme of this Whittaker **lattice.**

The reader should be at pains to understand, however, that the lattice structure shown in Figure 20 is *not* fixed, but consists of averaged equilibria in the fiercely boiling vacuum virtual particle flux. The fierce vacuum flux actually consists of the continuous dynamic interference of myriads of just such Whittaker structures created in the macroworld. Each part of the macroworld, on the other hand, is just an equilibrium condition in that *overall* flux cauldron. As can be seen, according to this model, physical reality is a hologram, and in an eerie fashion Mach's principle rigorously applies.

The point is, both modulation (infolding) and subsequent demodulation (outfolding) of the internalized EM energy are operations that only occur in *nonlinear* materials. A nonlinear material is one which, in reaction to an introduced monochromatic wave, produces harmonics in addition to the fundamental frequency. Being entirely a *nonlinear-based effect and mechanism, the cy*topathogenic (Kaznacheyev) effect requires *harmonics* if it is to be transmitted and exhibited. It is not the singular EM force fields which carry the information for the cytopathogenic effect; it is the multiple internalized EM-waves in the substructures of Whittaker potentials that carry it. A *harmonic series of bidirectional waves* must carry it. Hence to induce the disease in the second sample, one harmonic interval is the smallest bandwidth that must be

infolded in the diseased cells, transmitted intact through the window to the targeted cell culture, and absorbed and deposited therein. Further, between-harmonics signals are jamming noise, insofar as the harmonic Whittaker structures of a particular pattern are concerned. This explains why Constable and Gambill were able to occasionally take paranormal photographs through filter glass that was transparent to IR and UV, but opaque to the visible spectrum in between. UV is a first harmonic of IR. The filter glass passed one harmonic interval, and blocked out the outside and inside "jamming" signals.

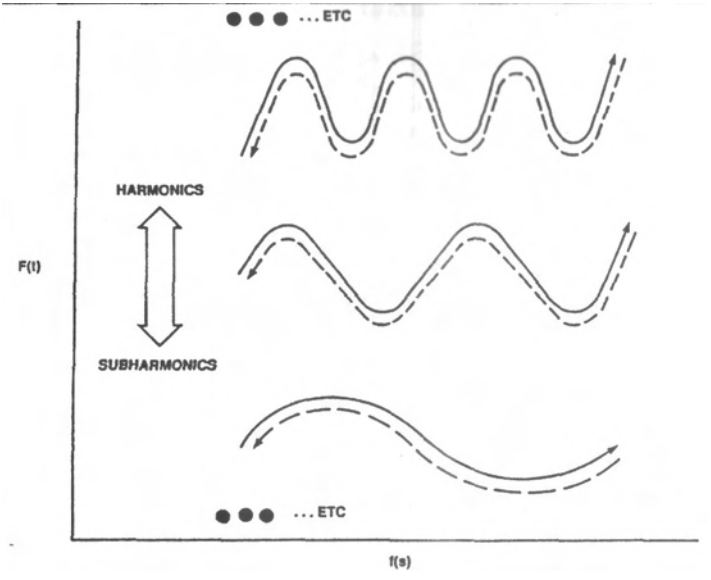

Figure 20. The Whittaker-structured graviton lattice of vacuum/spacetime. Breaking the time sync of the photon structures accounts for the "collapse of the wave function" and leads to photon interaction. In uncurved spin-2-graviton spactime, one photon is measured, and the antiphoton produces Newton's third-law reaction force, usually just recoil in the measurement instrument, which is ignored.

Quartz passes both IR and UV, in addition to the visible spectrum. Kaznacheyev's experiments were performed in the dark, and so the jamming noise of the visible spectrum was absent Therefore the thin quartz window passed one optical harmonic, because the UV is twice the frequency of the IR.

That is, the thin quartz window was able to pass *gravitons* — coupled photon/antiphoton pairs - rather than just individual photons. The gravitons had been emitted from diseased cells, and the exact Whittaker structure for the disease was contained in the gravitons. In these gravitons, their internal photons retained their spatial and harmonic coherence and correspondence, which retained the disease pattern. When the disease-structured (cytopathogenic) gravitons were deposited in healthy cells shielded from the visible "jamming" spectrum, the biopotential of the healthy cell structure gradually charged up and *became activated with* the Whittaker-structured disease pattern. Thus the specific disease was gradually kindled in the targeted healthy cells.

Normal window glass, on the other hand, does not pass a full harmonic interval. That is, it busted up the gravitons, separating them into weak photon emissions that did not retain their previous spatial and harmonic coherence in a structured-graviton spacetime lattice. That of course destroyed the photon-to-photon coherence and the infolded "information of the field" that carried the specific disease structure. Therefore when the two cell cultures are separated by thin window glass, the graviton pattern is broken up and the disease is not kindled in the targeted cell culture by mitogenetic photons passing through the windowglass.

Hence the disease can be transmitted through the quartz, but not through the thin windowglass. With a quartz window, the disease is transferred *electrogravitationally* by the structured charge of the arriving intact gravitons. With a windowglass window, the gravitons are busted up and the disease pattern lost in the window, leaving isolated photons to arrive in the targeted cell culture and be deposited. Since the disease information has now been lost, the targeted cell culture does not contract the disease.

Actually, the effect induced by infolded harmonic radiation in the optical range can also be achieved in the appropriate microwave range, so long as properly structured, *coupled-photon/antiphoton* gravitons — including the necessary harmonics — are maintained. The major mechanism for this "translation to different frequency bands" is already well-known in the theory of forced oscillations, but it is little-utilized in normal engineering. The translation mechanism is s*ubharmonic oscillation.*[161]

In subharmonic oscillation, a frequency that is a subharmonic of some higher (even much higher) resonant frequency can trigger the higher-frequency oscillation. Subharmonic oscillation is particularly applicable to living systems, because (1) their physical structures are highly nonlinear, (2) a great number of biological oscillators are nonlinear, (3) in general, nonlinear oscillators may vary both their frequency and their amplitude, particularly as a transient effect, (4) nonlinear oscillators are characterized by an initial transient period followed by the attainment of a stable period, (5) subharmonic frequencies in highly nonlinear materials will richly generate harmonics, so that the particular required harmonic of interest will very probably be produced, (6) the initial transient period of the nonlinear oscillator often acts as a sort of *harmonic frequency sweep* to simulate many harmonics, including the one of interest, and (7) the transient stimulus of the desired harmonic overcomes "static or initial" damping so that only the much-lower "dynamic" damping is produced.

Subharmonic oscillation is very important in Whittaker-structuring. A Whittaker-structured potential is already harmonically structured — essentially from near 0 Hz to near infinity (as was pointed out by Lisitsyn in a disguised manner). The Whittaker-structuring is a spatial and harmonic structuring of a partial potential component of the total spacetime potential. Subharmonic resonance plays a major role in this structured lattice —far more than we have previously suspected in our study of subharmonic resonance in nonlinear gadgets.

The implication of high biological nonlinearity and subharmonic oscillation is that Kaznacheyev cytopathogenic optically-induced effects can readily be translated to cytopathogenic *microwave*-induced effects—because they already are!. An optical Devyatkov information substructure can also be translated to a microwave Devyatkov information substructure. Further, if the optical Kaznacheyev cellular disease-inducing signal sets captured from a diseased cell culture are phase-conjugated, this yields a *specific curative signal complex for that specific disease.* This optical curative signal structure can then be subharmonically translated and Whittaker-infolded to yield a curative microwave Devyatkov information signal. This is the basic mechanism for direct engineering of EM healing apparatuses, such as were successfully developed by Antoine Priore and properly tested by eminent French scientists working with him, in the 1960s and 1970s.[162,163,164,165]

The near-total EM cures for cancer, leukemia, AIDS, and hosts of other debilitating diseases too numerous to mention can be developed in rather straightforward fashion, given the funding, scientific team, and facilities to accomplish the task.

Detection is Actually Binary

But how can all of this have escaped our finest researchers and theorists for so long? We present a brief presentation of why this has eluded the attention of our scientists.

First, though not too well-known, all detection is actually *binary,* although in almost every single detector only one part of the detected two components is utilized for the "measurement."[166] The other part of the binary detection occurs in the atomic nucleus, and is ignored or discarded in almost all "measurements" we presently perform, and in almost all the instruments we build and use.

Note that each element of the EM structure of the Whittaker potential is binary; there are two bidirectional waves in each one. In the linear situation, our normal instruments demodulate a photon and an antiphoton from each binary *graviton* structure of this binary channel. In its output, the instrument separately utilizes the externalized (electron-moving) wave or photon as the "detected signal," while utilizing the other demodulated antiphoton or antiwave to produce the "recoil of the atomic nuclei" of the instrument itself — in other words, to produce Newton's third law reaction force! Indeed, the universality of Newton's third law is prima facie evidence of the existence of the coupled-photon/antiphoton graviton *prior to demodulation and measurement of photon interaction effects.*[167] Classical electromagnetics has always been a derivative of the real unified-field "electromagnetics" that actually exists in nature, and we have always been misled by the very EM instruments we are so proud of!

In a nonlinear situation, on the other hand, we are inevitably dealing with a harmonic situation Any photon incident into a highly nonlinear material will generate harmonic photons, each of which will generate further harmonics, etc. Further, the nonlinearity generates time-reversal (phase conjugation), so that time-reversed replicas of these harmonic spectra are also generated But nonlinear materials are also modulators and demodulators. Hence the nonlinear material is continually infolding and outfolding the Whittaker structure harmonics. In our *normal* detectors and detector theory, we discard the entire infolding aspect of the situation, and usually much of the rich harmonic spectra as well. We certainly fail to recognize the continual creation and annihilation of dynamic photon-structured gravitons. For those, we simply treat the gross *captured EM energy* aspect, in that it determines the overall envelope magnitude of the scalar potential.

The point is, in a nonlinear optical graviton situation which must involve infolded IR and UV photons, our *photon* detector busts up gravitons, and it may measure either a UV photon or an IR photon, depending upon the mechanics of the situation. It will not normally "measure" or indicate both, since it discards and neglects one or the other as its own "instrument recoil." And it will tell us almost nothing of the very rich dynamic graviton structuring and exchanges that an occurring. It will give us no picture at all of the infolded Whittaker structure and the internalized EM energy order.

We have always been applying nonunified EM technology to unified field theory problems anyway
Hence for three decades Western "single photon" scientists and engineers have remained completely puzzled and baffled by (1) Kaznachcycv's *"graviton is a multi-photon-unit and in structure can be deterministic"* work, (2) Devyatkov's *"the particular photon structure of the graviton is the information content of the potential/graviton field,"* and (3) the microwave radiation

of the U.S. Embassy in Moscow. We also were puzzled by (4) the strange Petukov/Toth episode involving the Soviet classification of a paper on bio-particle emissions and "little pieces of the vacuum medium." And of course we never understood Tesla when he adamantly insisted that the EM waves in vacuum were not transverse but were *longitudinal* waves, or EM "sound waves," as he referred to them. And all our textbooks today utilize macroscopic E- and H-fields in the vacuum — when no such thing exists now or ever existed. E- and H-waves are *matter waves*, usually of the conduction electron gas in our conductors. They are *not* what is coming in from the vacuum and interacting with that conducting electron gas in our detectors. However, since our instruments actually detect and measure the movement of the conduction electrons, then indeed we detect and measure E- and H-fields — *inside our instruments, not in the vacuum.* Isn't it a bizarre aberration of scientific thought — just as Tesla stated — that all our science and engineering continues to teach and accept such a fundamental mistake?

Note that a gradient in the graviton field (in the scalar EM potential) must involve the translational exchange of photons between adjacent standing gravitons. When one understands the unified-field approach, it is totally to be expected that the diseases induced in the Embassy personnel in Moscow would not occur where E- and B-fields *("single-photon-interaction-with-matter"* field stuff) were present, but only where these single-photon fields were not broken out of the Whittaker potential *("stabilized multi-photon-coupling* field stuff) before reaching the targeted bodies. In other words, the diseases occurred where the *potentials persisted,* and where the force fields (the bleed-offs of the potentials) were absent. Johns Hopkins researchers found this to be precisely the case, but did not realize and consider the *EM potential* aspects. Their "photon detectors" destroyed half of the actual *structured graviton* mechanism involved. Hence they erroneously concluded that it was not the microwave radiation that was causing the anomalous diseases and health changes in Embassy personnel.

They rightly concluded that it was not the monocular EM photon field component of the microwave radiation that was the inducing agent. However, they assumed that there was no other component of the radiation that could have been involved; i.e., they assumed that the force fields and the microwave radiation fields were one-and-the-same, totally. Had they known of Whittaker-structured potentials as the explanation of Kaznacheyev's cytopathogenic effect, they most certainly would have considered the persistent potentials. In that case, *from the data and measurements they had, they would have concluded that it was the multiocular EM photon-structured Whittaker potentials that were the inducing agents.*

The Problem is Our Rigid Mindset

It is simply incredible when hundreds of thousands of Western PhDs are graduated in electrical physics and electrical engineering, and hardly a single one knows that what he was taught as "Maxwell's equations" were not *Maxwell's* equations at all: not a single one of those Heaviside/Gibbs critters ever appeared in a book or paper by James Clerk Maxwell.[168] And almost nobody checks! Almost no one goes back to Maxwell's *quaternion* theory to see whether or not Heaviside and Gibbs "got it right" in their vector interpretation. With the exception of Dr. Henry Monteith,[169,170,171] and a few notable other scientists, almost no one in the West seems to have previously noticed that Maxwell's original quaternion theory was already the magic unified field theory of G and EM that everyone is supposedly seeking! And it is already in an e*ngineerable* format. You can engineer it on the lab bench and it works.

Our real problem is our dogmatic scientific mindset, particularly with respect to electromagnetics. In the West we seem to think we already know everything, and that the Soviet scientists are just a bunch of ignorant peasants still trying to clean the mud off their boots.

Those same scientific "peasants", however, have always been the leading nonlinear mathematicians and nonlinear scientists of the world — and they still are. We've really got a lesson or two to learn from them after all. Let us hope we do so before it is too late for our survival.

The Soviet Electromagnetic BW Threat Is Real

The Soviet threat in electromagnetic biological warfare is real. It has been developed over a period of at least 40 years. The trace is clear. It is also clear that biological warfare is now, and has been for some time, a preferred option for the Soviet Union. It is rapidly becoming a preferred option for much of the Third World today.

We have seen that the "new" electromagnetic biological warfare has already been used to attack and kill Americans — even Americans of very high rank, such as several U.S. Ambassadors to the Soviet Union. However, note that this attack has also been *slow-acting.* The Soviets have taken full advantage of the important American national characteristic of not reacting to a slowly creeping threat.

Meanwhile Gorbachev, who is perhaps the greatest propagandist the world has ever seen, has made sweeping concessions and unheard-of changes. U.S. leaders, even of the Department of Defense and the President himself, have been taken in by the Great Charmer. The heavily liberalistic U.S. news media seems almost ecstatic in their perception that the end of the cold war is here. Indeed, during the month of November 1990, the Cold War was officially declared dead.

Glasnost is the new phrase that is being repeated by our news media, in a growing euphoria of *peace in our times.* Neville Chamberlain would be proud of his new protegees.

As far as Glasnost goes, we had better keep our powder dry and recall the following quote:

> "War to the hilt between communism and capitalism is inevitable. Today, of course, we are not strong enough to attack... To win we shall need the element of surprise. The bourgeoise will have to be put to sleep, so we shall begin by launching the most spectacular peace movements on record. There will be electrifying overtures and unheard-of concessions. The capitalist countries, stupid and decadent, will rejoice to cooperate in their own destruction. They will leap at another chance to be friends. As soon as their guard is down, we shall smash them with our clenched fist."
>
> **Dimitry Z. Manuilsky**
> **Lenin School of Political Warfare**
> **Moscow (circa 1934)**

NOTES AND REFERENCES

1. The closest thing to gravitobiology is the present photobiology, which deals with the biological effects of ordinary photons and electromagnetic waves. Photobiology (PB) is a small subset of gravitobiology (GB). GB also includes the biological effects of hidden coupled-photons and hidden bidirectional EM waves inside scalar EM potentials — infolded inside spacetime itself. Since these hidden EM channels are utilized by the living biological system in all its primary control systems — including for cellular control and mind control — then GB drastically extends PB.

2. Gravitobiology, short for *electrogravitobiology,* is the as-yet-embryonic science that deals with biological effects/uses of the uniGed electrogravitational Geld. It is understood that the unification of electromagnetics and gravitation is accomplished at the most fundamental level, that of the quantum particles of the fields. The graviton is considered to be composed of photons, but variable in size, dependent upon the number of photons comprising the graviton *on the average.* Thus the graviton is dynamic in structure and magnitude, contrary to present treatment in physics. To speak of a *discrete graviton,* then, having a stable *average spin* is to speak of a time-averaged entity that is a stable equilibrium state/structure in the violent virtual particle flux of vacuum.

3. This of course describes a dynamic holographic reality.

4. Present quantum field theory utilizes the photon as the quantum particle of the electromagnetic Geld, and the graviton as the quantum particle of the gravitational Geld. Each quantum particle is treated as quantized in spin, so that its spin never varies. However, in gravitobiology (GB) the graviton (and indeed, the photon as well!) is considered to be dynamically varying at each instant, at an incredible rate. When time-averaging yields discrete stable spin values, these are regarded as gravitons. Thus the individual, momentary graviton may have spin of two, more than two, or less than two, in contradistinction to present quantum Geld theory. In gravitobiology the graviton is *statistically discretized* but not actually *individually quantized.*

5. Gravitons are time-averaged envelopes, and can move at any velocity — similar to phase waves. What is moving in an electrogravitational wave is photon coupling and decoupling.

The reader is cautioned, however, that in physics the graviton is still not a well-defined, well-understood, and agreed-upon entity. Whether or not a graviton exhibits mass or is massless remains an open question. Linearity versus nonlinearity of the graviton is also yet to be totally resolved. The state of the subject in present physics is thus unclear. Indeed, it can be surmised that, if gravitons exhibit mass, then gravitons in deep space could possibly account for the cosmological "missing mass" needed to close the universe. As an example, for a discussion that favors graviton mass, see O. Costa de Beauregard, "Massless or Massive Gravitation?", *Foundations of Physics Letters,* 3(1), 1990, p. 81-85. As an example to show how concepts such as "photon" and "graviton" have a very complicated background that affects whether or not unification of physics can be accomplished, see Horst-Heino von Borzeszkowski, "Remarks on the Physical Reality of Gravitons," *Foundations of Physics,* 20(4), 1990, p. 435-445.

6. Presently, the only basic definition of modulation simply states that, when one wave modulates another, the two lock together in one fashion or another as a single, more complex wave. When such a complex wave is demodulated, the two locked-together waves are separated from each other to become independent waves. The exact

mechanism by means of which modulation and demodulation occur have heretofore been totally unknown, although the results have always been readily describable mathematically.

7. A normal or time-forward wave is time-forward as seen by the external observer. The observer's forward flow of time is created by the rate of virtual photon scattering interactions within one kilogram of mass of his body/his instruments, as compared to the same rate in another external observer. Steady forward passage of time simply represents a steady rate of such internal virtual photon scattering action. Thus positive time flow and entropy are simply two sides of the same coin; the rate of formation of entropy is directly correlated with the rate of flow of positive time. Note that rate of flow of time is identically the rate of formation and dissolution of time, as carried in the virtual photons.

Negative time flow, to the external observer, is created by the rate of photon reordering actions (negentropy) within one kilogram of mass of the observer's body/his instruments. Steady time-reversal simply represents a steady rate of the reordering action. Thus negative time flow and negentropy are simply two sides of the same coin; the rate of formation of negentropy is directly correlated with the rate of flow of negative time.

Each mass can and does exist in a combination of the two time streams. Thus the actual time-flow rate of mass can seem to be slowed, as some additional negentropy and additional negative time are created by time-reversed photon interaction (antiphoton interaction) with mass.

The normal (time-forward) EM wave contains and carries positive energy and positive time; each of its photons is comprised of (+dE)(+dt). On the other hand, a time-reversed EM wave contains and carries negative energy and negative time; each of its antiphotons is composed of (-dE)(-dt).

8. It is accented that our graviton is highly dynamic. Hidden photons and EM waves flow through it laterally (spatial flow) and also vertically (harmonic and subharmonic flow via subharmonic oscillation). This flow or flux through the graviton is continually changing: "the" graviton is an average, or photon-coupled form in equilibrium. Since spacetime is constructed of such dynamic gravitons, this means that the frame concept is now fuzzy and statistical as well. One can now speak of the *stability of a frame,* the *"Q" of a frame, "spreading the Q" of a frame* so that its former fixed points become smeared in n-dimensions and only approximate, etc. *It is the geometry itself that is now smeared and averaged.*

9. Obviously we are referencing the concept of the graviton to the external observer, who sees things on a macroscopic scale that have in fact been highly integrated in the vacuum. He sees the averaged integral results of myriads of tiny, turbulent, macroscopic and submicroscopic changes. Thus the *spacetime* and the *frame* that he sees have submicroscopic hidden substructures. *Curvature* of spacetime actually refers to the change in potential (local hidden energy density) of spacetime. This density may increase or decrease, giving two types of curvature, one positive and one negative, with respect to local ambient spin-two vacuum. In addition, the local spacetime curvature always has a hidden electromagnetic structure, part of which may be deterministic and even deliberately constructed and engineered at will.

We should also certainly point out that Einstein's general theory of relativity is not necessarily the last word on gravitation and curvature of spacetime. For example, it is possible to formulate a contradiction-free theory of the gravitational field without even invoking the notion of curvature of spacetime at all. For example, see N.N. Razgovorov,

"Dynamic treatment of gravitation. The interaction equation and equations of the gravitational field," *Izvestiya Vysshikh Uchebnykh Zavedenii, Fizika,* 33(5), May 1990, p. 89-94 [in Russian]. An English translation is in *Soviet Physics Journal,* 33(5), November 1990, p. 458-462.]. Sachs, for example, has even produced a quaternion generalization of Einstein's tensor formulation of general relativity that may predict a fundamental and testable difference in gyroscopic precession. See Mendel Sachs, *General Relativity and Matter,* Reidel, Dordrecht, The Netherlands, 1982. See also Mendel Sachs, "The Precessional Frequency of a Gyroscope in the Quaternionic Formulation of General Relativity," Foundations of Physics, 19(1), 1989, p. 105-108.

10. For an excellent lay discussion of the missing chaos problem, see Robert Pool, "Quantum Chaos: Enigma Wrapped in a Mystery," *Science,* 243(4893), Feb. 17, 1989, p. 893-895. For a more technical discussion, see P.V. Elyutin, "The quantum chaos problem," *Sov. Phys. Usp.* 31(7), July 1988, p. 597-622.

11. For an introduction to Bohm's hidden variable theory, see D. Bohm, *Phys. Rev.* 85, 1952, p. 166,180; *Causality and Chance in Modern Physics,* Routledge & Kegan Paul, London, 1957; "Hidden variables and the implicate order," in *Quantum Implications: Essays in Honour of David Bohm,* Eds. BJ. Hiley and F. David Peat, Routledge & Kegan Paul, London & New York, 1987, p. 33. See also D. Bohm and BJ. Hiley, *Found. Phys.* 5, 1975, p. 93; *Found. Phys.* 12, 1982, p. 1001; *Found. Phys.* 14, 1984, p. 255. See also Y. Aharonov and D. Albert, "The issue of retrodiction in Bohm's theory," in *Quantum Implications: Essays in Honour of David Bohm,* ibid., p. 223. For a discussion of what nonlocal theory may really entail in terms of *modular* variables, see Yakir Aharonov, "Non-local phenomena and the Aharonov-Bohm effect," *Quantum Concepts in Space and Time,* Eds. R. Penrose and CJ. Isham, Clarendon Press, Oxford, 1986, p. 41-64. For other important discussions see Lee Smolin, "Stochastic mechanics, hidden variables, and gravity," ibid., p. 147-173; and Abner Shimony, "Events and processes in the quantum world," ibid., p. 182-203. For a new viewpoint on emission processes, see Robert M. Wald, "Correlations and causality in quantum field theory," ibid., p. 293-301; and Serge Haroche and Daniel Kleppner, "Cavity quantum electrodynamics," *Physics Today,* Jan. 1989, p. 24-30.

12. That is, photon-structured gravitons. Nonlinear gravitons were discovered by Newman (1975) and Penrose (1976). See E.T. Newman, in *General Relativity and Gravitation,* Eds. G. Shark and J. Rosen, Wiley, New York, 1975; R. Penrose, *Gen. Rel. Grav.* 7,1976, p.31.

The reader should reflect for a moment: If general relativity (GR) already says that the gravitational potential is a conglomerate, then even orthodox GR implies that it has an *internal structure.* Since stress is the only way one can trap forces, and stress is inherently composed of bidirectional pairs of forces, it follows that the G-potential and the scalar EM potential — both of which *trap forces* — are both composed of *stresses.* Hence Whittaker's bidirectional EM force wave internal structure of the potential conceptually follows in straightforward fashion.

However, this constitutes a structuring of spacetime and of the *curvature* of spacetime. Reflect again for a moment: What are the unrestricted implications of geometrically curved spacetime? Simply that spacetime can be geometrically shaped, molded, twisted, and otherwise arranged into intricate — even dynamic — patterns. Since spacetime is much like a virtual gas (its flux is not of molecules but of virtual particles), it has a virtual stress (virtual *pressure,* so to speak).

It is also revealing to compare the situation of puttcrned spacetime curvature to the shapings of clouds in the atmosphere. Just as clouds are made of drops of water/ice suspended in an even finer flux of atmospheric gas molecules, just so the top level of virtual particle flux in vacuum/spacetime is "suspended" in an even finer level of virtual particle flux. Just as the water droplets constituting clouds can be formed into almost any shape or combination of shapes (patterns) to provide an infinite variety of cloud patterns, so can the top levels of the virtual particle flux of spacetime itself be formed into an infinite variety of forms or "orderings".

13. In two fundamental papers in 1903 and 1904, E.T. Whittaker wrote the basis for a complete scalar electromagnetics and an *engineerable and testable* unified field theory of electromagnetics and electrogravitation. See (1) E.T. Whittaker, "On the partial differential equations of mathematical physics," *Mathematishe Annalen,* Vol. 57, 1903, p. 333-355; (2) E.T. Whittaker, "On an expression of the electromagnetic field due to electrons by means of two scalar potential functions," *Proceedings of the London Mathematical Society,* Series 2, Vol. 1, 1904, p. 367-372. In the first paper Whittaker described hidden bidirectional pairs of EM waves that comprise the scalar potential itself. Each of these bidirectional pairs in the Whittaker harmonic structure of potential (and hence of vacuum) is an internal EM wave/energy channel or *hidden photon channel through spacetime itself.* In the second paper, Whittaker showed that any present EM vector force field can be replaced by the two interfering scalar fields. In short, Whittaker showed that present electromagnetics can be converted to scalar fields and scalar interferometry, and will include even EM waves.

Some years ago, this present author realized the profound and absolutely fundamental significance of these two Whittaker papers, and formed a scalar electromagnetics theory from the implications of Whittaker's work. Unfortunately, Whittaker himself never realized that he had already written an engineerable unified field theory, for he never realized that his EM scalar potentials were also *gravitational* potentials. In the Western world, apparently no one else paid any particular attention to these two Whittaker papers and their profound import. Accordingly, they passed into obscurity. This author is convinced, however, that Soviet scientists reviewed these two papers after WWII, and founded a new and highly secret unified field theory, which they dubbed *energetics,* upon Whittaker's unnoticed work.

14. N.D. Devyatkov and M.B. Golant, "Prospects for the use of millimeter-range electromagnetic radiation as a highly informative instrument for studying specific processes in living organisms," *Sov. Tech. Phys. Lett.* 12(3), Mar. 1986, p. 118. See also N.D. Devyatkov, ed., *Applications of Low-Intensity Millimeter Wave Radiation in Biology and Medicine* [in Russian], IRE Akad. Nauk. SSSR, Moscow, 1985. Devyatkov and Golant are at some pains to conceal that the "information content of the EM field" is actually the particular Whittaker-structure of the scalar potential.

15. Vlail P. Kaznacheyev and L.P. Mikhailova, *Ultraweak Radiations in Intercellular Interactions,* [in Russian], Novosibirsk, 1981; and Vlail P. Kaznacheyev, "Electromagnetic Bioinformation in Intercellular Interactions," *PSI Research,* 1(1), Mar. 1982, p. 47-76. Although the latter journal is now defunct, the referenced article in it contains a considerable amount of the information printed in Kaznacheyev's referenced book.

16. For example, see V.K Ignatovich, The remarkable capabilities of recursive relations," *American Journal of Physics,* 57(10), Oct. 1989, p. 873-878. Particularly notice that Ignatovich points out a remarkable bidirectional wave structure inside the potential associated with the Schroedinger wave itself. However, he gives no credit to Whittaker's

1903 paper pointing out precisely that structure in *any* scalar potential, about two decades before the beginning of quantum mechanics. It also seems at least somewhat curious, if nothing else, that Ignatovich's paper closely follows this author's calling national attention (in national symposia and conferences) to the significance of the first and second Whittaker papers and of the structured potential. The form of Ignatovich's paper is almost as if the Soviets wish to see whether or not American physicists are yet aware of the significance of the Whittaker-structured potential to an *enumerable* unified field theory. In other words, this may be related to the Soviets' use of the structured potential in their microwave radiation of the U.S. Embassy in Moscow since the latter 1950s. There, the object was simple: Pick a high level target, the U.S. Ambassador to the Soviet Union. Electromagnetically induce some health problems and biological changes in U.S. Embassy personnel, using the internalized-EM Whittaker-structured scalar potentials — or, in short, *energetics.* These puzzling health changes will guarantee the personal attention of the NSA, CIA, State Department, U.S. President, etc. When no one can explain what's happening, they would turn to the U.S. scientific community for an explanation. If no scalar counteractions are made by the U.S. onsite at the U.S. Embassy in Moscow, then the Soviet planners would know that the U.S. was unaware of scalar electromagnetics as an engineerable unified field theory. In that case the Soviets would know with one hundred percent accuracy that the U.S. knew nothing of scalar EM (energetics), and hence had not developed scalar EM (energetics) weapons in secret, and also had no defenses against the secretly-developed Soviet scalar EM (energetics) weapons. For years, the U.S. answer/response — or *complete lack* of it — onsite at the Moscow Embassy reassured the Soviets that we were defenseless. If Ignatovich's paper is the same sort of probe, then by the lack of response to his *American Journal of Physics* article the Soviets may rest assured that the U.S. scientific community is basically still unaware of scalar electromagnetics/energetics as an engineerable unified field theory. However, slowly a very small part of academia is beginning to wake up to the potential — pun definitely intended! — of Whittaker's two papers.

17. T.E. Bearden, *The Excalibur Briefing,* 2nd Edition, Strawberry Hill Press, San Francisco, California, 1988, p. 194-198.

18. For details of mysterious, instantaneous deaths in Afghanistan, see Yossef Bodansky, "Soviets testing chemical agents in Afghanistan," *Jane's Defence Weekly,* 1(13), Apr. 7, 1984, p. 508. For indications of a much "milder" EM disease induction weapon possibly used to kill top Radio Free Europe executives in Munich, see "Does Romania have a 'cancer' weapon?", in "Washington Whispers, Death by Radar," *U.S. News and World Report,* Dec. 12,1988, p. 15.

19. For substantiation that Khrushchev reported the development of a fantastic new weapon, see Max Frankel, "Khrushchev Says Soviet Will Cut Forces a Third; Sees 'Fantastic Weapon,'", *New York Times,* Jan. 15,1960, p. 1.

20. Christopher S. Wren, "Brezhnev Calls for Accord against 'Terrifying Arms'", *New York Times,* June 14, 1975, p. 1, 11; Malcolm W. Browne, "Senatorial Group Received by Brezhnev," *New York Times,* July 3, 1975, p. 2; Christopher S. Wren, "Moscow Now Pressing Disarmament," *New York Tunes,* Aug. 12,1975, p. 6.

21. Draft agreement introduced by Andrei A. Gromyko to the United Nations' thirtieth session of the General Assembly on Sep. 23, 1975: *Prohibition of the Development and Manufacture of New Types of Weapons of Mass Annihilation and of New Systems of Such Weapons.* The first article provided that the types of these new weapons would be *"...specified through negotiations on the subject."*

22. To the Soviets, the microwave radiation of the U.S. Embassy in Moscow is a beautifully designed and very valuable intelligence collection **tool:** First, irradiate a high level U.S. target — the U.S. Ambassador to the Soviet Union. Use Whittaker-structured microwave potentials to induce a variety of health changes and diseases in Embassy personnel, including serious illnesses (and eventually deaths) of U.S. Ambassadors. This provides a strong stimulus and guarantees the direct attention of the CIA, DIA, NSA, NSC, DARPA, State Department, Department of Defense, and the President of the U.S. Puzzled, they will turn to highly competent U.S. scientific establishments to ascertain what exactly is going on. That is, the *best* knowledge of the U.S. system will be brought to bear on this puzzling problem. *By the subsequent U.S. reaction — or lack of it — on site at the Moscow Embassy, the Soviets can ascertain with 100 percent certainty whether or not the U.S. is aware of scalar electromagnetics.* If unaware, of course, then the U.S. has not developed scalar EM weapons of its own, or defenses against such weapons.

23. For more specific details, see T.E. Bearden, *AIDS: Biological Warfare,* Tesla Book Co., POB 1649, Greenville, TX 75401,1988.

24. For example, in the 1960s and 70's French inventor Antoine Priore, working with some of the finest French medical scientists, positively proved that killer diseases such as cancer, leukemia, sleeping sickness, etc. can be cured electromagnetically. This was not anecdotal material, but rigorous scientific experiments properly performed and reported in the French medical journals. For a complete resume of the Priore Affair, see Jean-Michel Graille, *Le Dossier Priore,* De Noel, Paris, 1984 [in French]. For a substantial synopsis, see Christopher Bird, "Appendix I: The Case of Antoine Priore and his Therapeutic Machine: A Scandal in the Politics of Science," in T.E. Bearden, *AIDS: Biological Warfare,* ibid. p. 346-375. See also Priore references, ibid., p. 333-339. For an excellent summary of the Priore Affair, with some details of the working of Priore's machine, particularly see David M. Rorvik, "Do the French have a cure for cancer?", *Esquire* Magazine, July 1975, p. 110-111,142-149.

25. For an early discussion of the Woodpecker and some of the disagreement between analysts, see "Powerful Soviet radio signal protested," *Aviation Week & Space Technology,* Nov. 8, 1976. For an interesting report on the Woodpecker, see Robert Horitz, *The Woodpecker Project- A Preliminary Report,* Association of North American Radio Clubs, Jan. 8, 1987. Also, it is at least an interesting "coincidence" that the depletion of the ozone in a giant hole over Antarctica was only discovered in 1977 — after the powerful Soviet Woodpecker transmitters began operation in 1976.

Other leading scientists have at least speculated on potential EM biological warfare capabilities of the Woodpecker, though of course in the vein of conventional EM effects on biological systems. Cf "Soviet device uses radio waves as tranquilizer," Associated Press release, *Huntsville [Alabama] Times,* May 19,1983. In this article, Dr. Ross Adey is quoted as having tested the Soviet Lida machine, which generates pulsed 40 megahertz radio waves and broadcasts them to affect biological systems. Adey described testing the machine on a cat, and in two or three minutes the cat was sitting quietly, almost as though transfixed, and uninterested in its surroundings. The animal remained uninterested in its surroundings, according to Adey, for some 20 to 30 minutes after the machine was turned off.

Dr. Robert Becker has particularly pointed out that the available evidence suggests that the Woodpecker is multipurpose, and could include an experimental attack directed against Americans. See Chapter 15: "Maxwell's Silver Hammer," of Robert O. Becker,

M.D. and Gary Selden, *The Body Electric: Electromagnetism and the Foundation of Life,* William Morrow & Co., New York, 1985, p. 271-329.

26. Since that announcement in *Science,* the weather over the United States has continued to be more anomalous than could possibly be attributed to chance excursion from norm. For a more orthodox concept of weather manipulation via ordinary EM means, see Bernard J. Eastlund, *Method and Apparatus for Altering a Region in the Earth's Atmosphere, Ionosphere, and/or Magnetosphere,* U.S. Patent no. 4,686,605, Aug. 11,1987. Eastlund's process can be used to steer distant jet streams, to disrupt communications worldwide, and to destroy or deflect a missile attack. Significantly, the U.S. government requested Eastlund *not* to patent the weatherwar process. For other related orthodox references, see G. Meltz and F.W. Perkins, "Ionospheric Modification Theory," *Radio Science,* 9(11), Nov. 1974, p. 885-888; Carrol et al, "The Platteville High Power Facility," ibid., p. 889-894; W.E. Gordon and H.C. Carlson, Jr., "Arecibo Heating Experiments," ibid., p. 1041-1047; Meltz et al., "Ionospheric Heating by Powerful Radio Waves," ibid., p. 1049-1063. Since microwave heating is of interest in the Eastlund phenomenon, related references on electron cyclotron resonance heating are of interest Cf Batchelor and Goldfinger, "A theoretical study of electron-cyclotron absorption in Elmo bumpy torus," *Nuclear Fusion,* 20(4), 1980, p. 403-418 and Kosmahl et al, "Plasma acceleration with microwaves near cyclotron resonance," *Journal of Applied Physics,* 38(12), Nov. 1967, p. 4576-4582. See also "The MST Radar at Poker Flat, Alaska," *Radio Science,* 15(2), Mar.-Apr. 1980, p. 212-223. Interestingly, Eastlund's patent cites a reference to Nikola Tesla in *Liberty Magazine,* Feb. 1935, p. 7. Finally, for a Soviet orthodox paper on the possibility of using intense microwave radiation to influence the weather and cause precipitation from clouds, see E.T. Protasevich, "Microwave weather modification," *Soviet Technical Physics Letters,* 7(3), Mar. 1981, p. 114-115.

27. For illustrations of the Woodpecker intersection grid over the U.S., see Christopher Chant and Ian Hogg, *Nuclear War in the 1980's?,* Harper & Row, New York, 1983, p. 71; *Soviet Military Power,* U.S. Department of Defense, 1985, p. 45.

28. Bearden, *Soviet Weather Engineering Over North America,* 1-hr, videotape, 1985; "USSR: New Beam Energy Possible?", *Defense & Foreign Affairs Daily,* 13(111), June 12,1984, p. 1-2. Ironically, results of this Soviet engineering of the weather over the U.S. is being accomplished nearly continuously at present. The results of the artificially created highs and lows — and their movement across the U.S. — has now been detected by our atmospheric scientists, particularly at the University of Illinois in Urbana-Champaign. Beginning on Jan. 5, 1990, the "strange weather phenomenon" was detected as a large-scale pressure wave, enormous in size and extent, traveling at about 50 miles per hour. On Jan. 14, a similar detection of the effect was made, and again in March. On Dec. 21, 1990, again the large-scale pressure wave was detected. In the past, solitary pressure waves have been detected in the atmosphere, but always small and only as a local effect. These observations are the first detections of large solitary pressure waves, 80-100 kilometers in wavelength, six kilometers high, and extending north-south across two states. The two Jan. 1990 waves lasted 11 and 16 hours respectively. Already the researchers are accepting the phenomenon as natural, and excitingly stating that it can be used to "predict the weather ahead of the traveling giant wave. *One would certainly hope so, since the giant wave is a Russian scalar wave interferometry creation in the first place, designed to direct and influence the weather over the U.S.!* However, now we are going to see our atmospheric scientists accepting these heretofore unheard-of phenomena as absolutely natural! As this author stated once before, U.S. our scientists do not recognize Soviet weather engineering when it's right over their heads in plain view, because they know nothing of scalar EM waves and scalar interferometry. For a reference to the

detection of these giant, moving pressure waves, sec "Strange Pressure Waves Crossed MidWest in 1990," *Watt Street Journal,* Jan. 15,1991.

29. Bearden, *Fer-de-Lance: A Briefing on Soviet Scalar Electromagnetic Weapons,* Tesla Book Co., POB 1649, Greenville, TX 75401, 1986; *AIDS: Biological Warfare,* Tesla Book Co., 1988; Solutions to Tesla's Secrets and the Soviet Tesla Weapons, Tesla Book Co., 1981; "Soviet Psychotronic Weapons," 1978; *The Excalibur Briefing,* Strawberry Hill Press, San Francisco, 1980; "Star Wars Now: The Bohm-Aharonov Effect, Scalar Interferometry, and Soviet Weaponization," Tesla Book Co., 1984; Tesla's Electromagnetics and Its Soviet Weaponization," *Proceedings of the Tesla Centennial Symposium,* IEEE and International Tesla Society, Colorado College, Colorado Springs, Colorado, 1984; and others such as *Analysis of Scalar Electromagnetics,* Tesla Book Co., 1990 and "Soviet Phase Conjugate Weapons: Weapons That Use Time-Reversed Electromagnetic Waves," *Bulletin,* Committee to Restore the Constitution, POB 986, Fort Collins, Colorado 80522, Jan. 1988.

30. T.E. Bearden, AIDS: *Biological Warfare,* 1988, p. 226.

31. T.E. Bearden, *Fer-de-Lance,* 1986, p. 220-223.

32. Paul Brodeur, *The Zapping of America: Microwaves, Their Deadly Risks, and the Cover-Up,* W.W. Norton & Co., New York, 1977, p. 39-40,60-61,95-134.

33. A.M. Lilienfeld et al, *Foreign Service Health Status Study: Evaluation of Health Status of Foreign Service and Other Employees From Selected Eastern European Posts,* Department of Epidemiology, of Hygiene and Public Health, The Johns Hopkins University, Baltimore, Maryland, Final Report, July 31, 1978. Dr Lilienfeld, professor of epidemiology, also directed a study in the early 1960s which pointed out a possible connection between Down's syndrome in children and exposure of their parents to radar. [See Arnold T. Sigler, Abraham M. Lilienfeld, Bernice H. Cohen, Jeanette E. Westlake, "Radiation Exposure in Parents of Children with Mongolism (Down's Syndrome)," *Bulletin of the Johns Hopkins Hospital,* Vol. 117, 1965, p. 374-399.] He also directed another study which found a significant increase of chromosome abnormalities in the blood of persons who had formerly been radar workers. Dr Lilienfeld obviously was a highly qualified and excellent choice to direct a study of the U.S. Embassy personnel health problems vis a vis the Soviet microwave radiation of the U.S. Embassy. That U.S. biophysics knew nothing of infolded Devyatkov structures of Whittaker potentials and human vulnerability to such EM biological warfare is most certainly not the fault of Dr. Lilienfeld. See also Robert C. Mallalieu, A *Model of the Microwave Intensity Distribution Within the U.S. Embassy, Moscow 1966-1977,* Report FS-80-166, Applied Physics Laboratory, Johns Hopkins University, Baltimore, Maryland, Aug. 1980. Dr. Mallalieu is a very capable scientist and, just as for Dr. Lilienfeld, it is most certainly not his fault that the U.S. biophysics community had no knowledge of the Soviet method of inducing cellular diseases and changes by means of infolded hidden bidirectional EM wave structures of Whittaker potentials. All of the very able Johns Hopkins scientists in fact did a highly capable job *with the tools they had available to bring to bear on the problem.* It was simply their *tools and theoretical models* that were inadequate and failed them.

34. *Microwave Radiation at the U.S. Embassy in Moscow and Its Biological Implications: An Assessment,* U.S. Department of Commerce, Doc. #NTIA-SP-81-12, Mar. 1981.

35. See also Martin Ebon, *Psychic Warfare: Threat or Illusion,* McGraw Hill, New York, 1983, passim. See also Captain John D. LaMothe, *Controlled Offensive Behavior — USSR,* Report ST-CS-01-169-72, Defense Intelligence Agency, Washington, D.C. (Released

under FOIA). See also Captain John D. LaMothe and Mr. Louis Maire, *Soviet and Czechoslovakian Parapsychology Research,* Report DST-1810S-387-75, Defense Intelligence Agency, Washington, D.C. (Released under FOIA). See also Barton Reppert, Associated Press release, "Microwaves in Moscow remain mystery for U.S.," *Huntsville [Alabama] Times,* May 22,1988, p. IB, 4B.

36. Cf Bearden, *Fer-de-Lance,* 1986; *AIDS: Biological Warfare,* 1988; "Soviet Phase Conjugate Weapons: Weapons that use Time-Reversed Electromagnetic Waves," *CRC Bulletin,* Jan. 1988.

37. See "Secret Speech: Did Brezhnev Come Clean?", *National Review,* 29(8), Mar. 4, 1977, p. 248,250.

38. William Beecher, "Brezhnev termed detente a ruse, 1973 report said," *Boston Globe,* Feb. 11,1975, p. 1,12.

39. E.T. Whittaker, "On the partial differential equations of mathematical physics," *Mathematische Annalen,* Vol. 57, 1903, p. 333-355. A copy of this paper is included as Annex B of this book.

40. E.T. Whittaker, "On an expression of the electromagnetic field due to electrons by means of two scalar potential functions," *Proc. Lond Math. Soc,* Series 2, Vol. 1, 1904, p. 367-372. A copy of this paper is included as Annex C of this book.

41. N.D. Devyatkov and M.B. Golant, "Prospects for the use of millimeter-range electromagnetic radiation as a highly informative instrument for studying specific processes in living organisms," *Soviet Technical Physics Letters,* 12(3), Mar. 1986, p. 118.

42. N.D. Devyatkov, *Ed,, Applications of Low-Intensity Millimeter Wave Radiation in Biology and Medicine* [in Russian], IRE Akad. Nauk. SSSR, Moscow, 1985.

43. Vlail P. Kaznacheyev and L.P. Mikhailova, *Ultraweak Radiations in Intercellular Interactions* [in Russian], Novosibirsk, 1981.

44. Vlail P. Kaznacheyev, "Electromagnetic Bioinformation in Intercellular Interactions," Novosibirsk, 1981 [in Russian]. English translation in *Psi Research,* 1(1), Mar. 1982, p. 47-76; V.P. Kaznacheyev et al, "Distant intercellular interactions in a system of two tissue cultures," *Psychoenergetic Systems,* 1(3), Mar. 1976; Vlail P. Kaznacheyev et al, "Apparent information transfer between two groups of cells," *Psychoenergetic Systems,* 1(1), Dec. 1974; V.P. Kaznacheyev, "Information Function of Ultraweak Light Flows in Biological Systems," in *Problems in Biophysics,* Novosibirsk, 1967, p. 7-18 [in Russian].

45. For a detailed exposition of time reversal in physics, see Robert G. Sachs, *The Physics of Time Reversal,* University of Chicago Press, Chicago, 1987.

46. As early as 1898 Carl Barus — in a paper titled "A curious inversion in the wave mechanism of the electromagnetic theory of light," American Journal of Science 5 (Fourth Series), May 1898, p. 343-348 — showed an interpretation of Maxwell's electromagnetic wave equations that could *make the wave run backward.* His paper was ignored, but it may have been the first indication of what today in nonlinear phase conjugate optics is known as the *time-reversed EM wave.* Some appropriate references on phase conjugate/time-reversed EM waves are: (1) Amnon Yariv, "Chapter 16: Phase Conjugate Optics — Theory and Applications," *Optical Electronics,* 3rd Edn., Holt, Rinehart and Winston, New York, 1985; (2) Robert A. Fisher, Ed., *Optical Phase*

Conjugation, Academic Press, New York, 1983; (3) U. Yu Zel'dovich et al, *Principles of Phase conjugation,* Vol. 42, Springer Series in **Optical** Sciences, Theodor Tamir, Ed., Springer-Verlag, New York, 1985; (4) David M. Pepper, "Nonlinear Optical Phase Conjugation," *Optical Engineering,* 21(2) Mar./Apr. 1982, p. 156-183; (5) David M. Pepper, "Applications of Optical Phase Conjugation," *Scientific American,* 254(1), Jan. 1986, p. 75; and (6) F.V. Bunkin et al, "On sound phase conjugation with amplification of phase-conjugated wave," *Soviet Journal of Quantum Electronics,* Vol. 11,1980, p. 687.

47. Fritz Albert Popp, "Photon Storage in Biological Systems," in Fritz Albert Popp et al, Eds., *Electromagnetic Bio-Information: Proceedings of the Symposium, Marburg, September 5, 1977,* Urban & Schwarzenberg, Baltimore, 1979, p. 123-149. This very important paper presents Popp's discovery of the body's master cellular communication system. Ruth has experimentally confirmed the existence of the *degradation radiation (death photons)* of Kaznacheyev. Experimental results of Ruth and others have led Popp to postulate that biological systems generally have the capacity to store coherent photons which come from the external world, and that ultraweak photon emission from biological systems is governed by photon storage (i.e., *charge up of coherent internal structuring of the electrical charge or potential)* within the cell population. [Note that the present author's dynamic *statistical graviton as photon/antiphoton coupling* concept, in conjunction with Whittaker-structured potentials on atomic nuclei, gives the precise mechanism by means of which Popp's coherent virtual photons are stored as components of gravitons in Whittaker potentials.]. See also Fritz Albert Popp, *Biophotonen. Ein neuer weg zur Losung des Krebsproblems,* Verlag fur Medizin, Heidelberg, 1976 [in German].

48. For a much earlier and very useful work on mitogenetic radiation, see Otto Rahn, *Invisible Radiation of Organisms,* Verlag von Gebruder Borntraeger, Berlin, 1936. Rahn points out that dividing cells — and dying cells — emit a primary biological energy in the ultraviolet light range around 2600 angstroms. This *mitogenetic radiation (MR)* can be transmitted through quartz to cause conspicuous stimulation of mitosis in isolated cell colonies. The book includes methods of observing biological radiations, special characteristics of the radiation, analysis of the mitogenetic effect, etc. An earlier book on this subject, with a fairly complete bibliography up to 1932, is W. Stempell, *Die Unsichtbare Strahlund der Lebewesen,* Jena, Gustav Fischer, 1932 [in German]. Note that this German work preceded the Soviet work of Kaznacheyev after WWII, including the EM transmission of cellular effects through quartz windows.

49. T.E. Bearden, "Maxwell's Lost Unified field Theory of Electromagnetics and Gravitation," *Proceedings,* PACE Third International New Energy Technology Symposium, June 25-28,1988 at Maison du Citoyen, Hull (Ottawa), Canada, 1988.

50. T.E. Bearden, "Maxwell's Original Quaternion Theory Was a Unified Field Theory of Electromagnetics and Gravitation," *Proceedings,* PACE Third International New Energy Technology Symposium, June 25-28,1988 at Maison du Citoyen, Hull (Ottawa), Canada, 1988.

51. For a cogent argument about what might have been discovered much earlier in physics if quaternions had not been cast aside, see James D. Edmonds, Jr., "Quaternion Quantum Theory: New Physics or Number Mysticism?", *American Journal of Physics,* 42(3), Mar. 1974, pi 220-223. Just how much more powerful was Maxwell's quaternionic expression of EM theory than was Heaviside's (i.e., the modern) vector interpretation, was succinctly expressed by Josephs as follows: *"Hamilton's algebra of quaternions, unlike Heaviside's algebra of vectors, is not a mere abbreviated mode of expressing Cartesian analysis, but is an independent branch of mathematics with its own rules of operation and its own special*

theorems. A quaternion, is, in fact, a generalized or hypercomplex number..." (H.J. Josephs, The Heaviside papers found at Paignton in 1957," *Electromagnetic Theory by Oliver Heaviside, Including an account of Heaviside's unpublished notes for a fourth volume, and with a foreword by Sir Edmund Whittaker,* Vol, III, Third Edition, Chekea Publishing Co., New York, 1971, p. 660.

52. For example, one difference between vectors and quaternions is of particular interest. In multiplication, when the multiplied vector components of two quaternions produce a zero vectorial resultant, the product of the quaternions may still produce a nonzero scalar resultant Further, this scalar resultant has a *hidden variable* internal structure of infolded functions of the component vectors that have vectorially "zeroed" or "cancelled." When the interacting zero-summed vector components of the quaternions are EM force vectors, the nonzero scalar component of the quaternion resultant — with its deterministic, infolded, zero-summed (and so *oppositively paired)* vectors represents a *trapped EM stress of spacetime,* and hence it is a *deterministicalfy EM-substructwed scalar potential.* Further, this scalar potential's deterministic, infolded EM vector structure is vector zeroed, hence constitutes a force-free field, *with its presence and its infolded EM structure completely hidden from normal "electron translating" detectors.* This structured quaternionic force-free potential represents a *patterned change in the local stress energy density of vacuum.* If the infolded vectors are functions of time, then each infolded component of the structured potential is time-varying. One can even produce standing waves of, and deterministically structured dynamic patterns in, the locally trapped energy density of vacuum. *These changes/waves in the local vacuum stress energy density represent very strong, engineerable, electrogravitational changes/waves in the local rate of flow of time, and in the local curvature of spacetime/vacuum itself.* This directly extends present Einsteinian general relativity, making it an empirical engineering science, and adding in the missing electromagnetics as well. In short, Maxwell's original quaternion theory was already a unified field theory of gravitation and electromagnetics — it was a testable and engineerable theory of *electrogravitation.*

Oliver Heaviside abhorred the quaternion, since it linked together a scalar component and a vector component, or *"apples and oranges,"* in his view. When he excised the scalar component of the quaternion to produce his vector mathematics for translations of Maxwell's theory, Heaviside threw away *electrogravitation.*

As is well-known, Maxwell prepared his EM model based on his mechanical model of the etheric medium. Also, Maxwell himself was well aware of the importance of EM stress in the medium, although he had apparently not realized that this represented gravitational "charge" or *gravitational potential.* He knew that vectors alone could not express EM stress effects, but quaternions captured them. For example, quoting from Maxwell's *A Treatise on Electricity and Magnetism,* Vol. 1, 3rd Edition, New York, 1954: *"There are physical quantities of another kind which are related to directions in space, but which are not vectors. Stresses and strains in solid bodies are examples, and so are some of the properties of bodies considered in the theory of elasticity and in the theory of double refraction. Quantities of this class require for their definition nine numerical specifications. They are expressed in the language of quaternions by linear and vector functions of a vector."* Unfortunately the internal structure of atoms was not known at the time, so Maxwell had no way of arriving at the activation charging of atomic nuclei by EM stress. Note that Maxwell's book was first published in 1873.

See also R. Chen, "Cancellation of internal forces," ,American *Journal of Physics,* 49(4), Apr. 1981, p. 372 for a discussion of summation vectors and *internal* vectors. Internal forces occur in equal and opposite pairs (i.e., as stresses), so they contribute nothing to the vector sum (i.e., to external trunslation). Note, however, that just this sort of stress in

the medium or in the system is what was captured by the non-disappearing scalar component of the resultant in quaternion multiplication, even when the *vector translation* component of the interaction resulted in a zero transition (vector) resultant.

The scalar component of Maxwell's quaternions captured and retained the *internal vectors* that result from zero-vector summations of non-zero EM force fields. *Oliver Heaviside (and to a lesser extent, Williard Gibbs) discarded the entire internal EM vector region when he excised the scalar component of the quaternion. The internal EM vector region is the electrogravitational region, and that is what was discarded — all those parts of Maxwell's theory where EM forces turn to gravitational potential. Accordingly, Heaviside only captured a subset of Maxwell's unified EM/G field theory; he captured only that small subset where gravitation and electromagnetism are mutually exclusive.*

In the vacuum, this internal or infolded EM stress energy constitutes *a change of the local gravitational potential, hence a curvature of the local spacetime.* Further, a *deterministic structure* of these equal and opposite pairs of internal EM forces can be and is infolded within the potential, and hence "hidden" within a structured change to the local vacuum/spacetime.

Ironically, Maxwell in 1873 had already written a theory that embodied David Bohm's hidden variables, which Bohm would produce three quarters of a century later. In addition, Maxwell had already falsified the general relativity theory that Einstein was to produce four decades later, for Maxwell's infolding of EM forces into a gravitational potential had already curved — *and deterministically structured* — local spacetime. Not knowing that EM forces can be internalized and trapped, and used to curve spacetime, Einstein considered only the extremely weak gravitational force as an agent of spacetime curvature. But the G-force is so very weak (say, 10^{-42} or so as strong as the EM force) that only a huge collection of mass — such as the sun or a star — would exert G-forces powerful enough to curve spacetime sufficiently to be detected. Since the observer, his laboratory, and his instruments would never be on the surface of the sun or of a star, Einstein reasoned that — where the observer was — local spacetime would essentially be flat and never curved. Accordingly, he made a most erroneous postulate in his general relativity theory: he postulated that the local spacetime would be flat, and uncurved. The error is that he stated the postulate incorrectly. *Rigorously, he should have postulated that the local spacetime would not be curved whenever only the weak gravitational force was used as the agent for curvature, for that is the correct statement of the postulate and what it assumed.* Accordingly, Einstein did not at all write a complete theory of curved spacetimes. Instead, he wrote a very special case. His postulate of the locally flat spacetime contains unwitting, hidden assumptions that (1) electromagnetism is always mutually exclusive from gravitation, (2) only the weak gravitational force is used as an agent to cause spacetime curvature, and (3) electromagnetic field in free space (actually, in spacetime) always moves at the speed of light and is never *locally trapped.*

Einstein then spent the rest of his life in a fruitless search to try to find how to recover the electromagnetics which his general relativity theory excluded. Ironically, he never realized — as did none of the relativists — that his own postulate of a flat local spacetime prevented any unification of EM and G, because it inadvertently had already declared them mutually exclusive.

53. Bearden, "Maxwell's Lost Unified Field Theory...", 1988.

54. Bearden, "Maxwell's Original Quaternion Theory...", 1988.

55. See note 52. There are actually two kinds of EM energy: (1) *externalized* EM energy, or EM energy in translation, and (2) *internalized* EM energy, or EM energy trapped with a medium and not externally translating. Note that the trapped internal EM energy is quite dynamic, and continually acting on the local medium. Note also another marvelous thing which orthodox physics has completely missed: *Trapped internal EM energy is essentially perpetual; it may be regarded as continually doing internal "work" on the medium, but since it is not translatable externally, it cannot dissipate.* This is because "trapped" means that the energy is in its own "closed system"; therefore the energy of that closed self-system is conserved (perpetual) until something breaks (opens) up the closed self-system. It is energy that is actually completely dynamic, but localized. This is a new and more rigorous interpretation of *potential energy:* Potential energy is simply localized energy that is not translating externally, hence is never dissipated as *external* work. It is continually and completely doing *internal* work.

What we are saying is that the very concept of energy is simply that of continual expenditure of work completely locally and internally — on and in the medium — without external translation *through* the medium. *That can be taken as the definition of a medium: an entity or regime where this holds.* Hence the difference between energy and work is simply only *external translation.* That is, with zero external translation, there is zero external scattering because no distance is involved — and work has been equated to the external scattering of EM energy in multiple directions over specific distances. We accent the latter statement: the present concept of physical work a priori assumes simultaneous external translation of EM energy (trapped work) into multiple directions at once — i.e., it assumes *scattering.*

The situation is clarified if we realize that we can consider any particular thing as simply a collection of even finer things. Applying this principle, the energy of one object becomes the local collection of the energies of many finer objects. The energy of one finite region of spacetime becomes a collection of the energies of even finer regions of spacetime, where these finer regions are all part of the larger collective region. When energy does not externally translate, it does not matter whether or not it is thought of as "energy" in the rather mystical orthodox sense of "the capacity to do external work", or if it is thought of as "continually occurring internal work without external translation" —which latter, of course, just simply means without doing *external* work.

The result of all that laborious reasoning is this: energy may be regarded as internalized work. Work may be regarded as externalized and scattered energy. Presently, internalized work is sometimes referred to as *virtual* work. I.e., work is being done, but not in external translation.

One additional factor must be noted: Since the energy of an object is actually a localized collection of the energies of many smaller subthings of the object, then those subthings may be externally translated in two fashions: (1) they can be translated in multiple directions, out of the region, in which case their energies now are not integrated. In other words, the "energies" of the subobjects now react individually with the observer/detector/instrument. We may say that the "energy of the original region" — which was an integral of all the subenergies — has now been *disintegrated.* In physics, the notion of this disintegration of internalized energy by external scattering is known as *the production of heat.* The concept of heat applies to the degree of external scattering and hence disintegration of internalized energy. Things which can be lined up and integrated are things that arc *ordered.* Thus the scattering of internalized energy (the scattering of *order)* is *disordering* of energy.

Note also that we are now somewhat in violation of the present interpretation of thermodynamics, as regards the notion of *temperature.* We state unequivocally that any instrument only measures or detects its own internal change, nothing else. No instrument actually measures the "temperature" of an object or region; instead, at least a little bit of energy from that region must be externally translated from the region and into the instrument, to cause an internal change (internal work) in the instrument. But in that case *we did not actually measure the temperature content of the object or region.* We actually detected the *escape and disordering* of some of that temperature content and "measured" the characteristics of the externalized escape. In ascribing a temperature to the object, we are actually making a statement about *the rate at which that object's trapped internal EM energy can externally translate and escape and be scattered, given the chance to do so.* Rigorously, this is in accord with the quantum mechanical view. An object has no such thing as a temperature, until we *measure* or *detect* or *observe* the temperature. Even then, we do not measure or detect or observe the temperature, but only a certain change in it.

Now there are actually three kinds of external translation of energy that can be made — thermodynamics only accounts for two.

First, we can have external scattering translation, which equates to the orthodox concept of external work. In that case, the internal energy/work is "being expended as external work." Note that the work is always being done in a different region from where the energy is, conceptually, when we state that "energy is being expended as work."

Note now that the externalizing translation requires movement through an external distance, hence through time. Since in the macroscopic world EM energy normally scatters off atoms by its interaction with their electron shells, then in the macroscopic world EM energy is continually and continuously being expended as work. That is, order (integrated internal energy) is continually being expended as disorder (external disintegration of the previously internally integrated energy). This process — of continual production of disorder by external EM scattering — is known as *entropy.* The external scattering/disordering actually involved "translation through time." Now, actually, in physics the universe is composed of angular momentum — which has the units of energy multiplied by time. Further, the observable universe can only change in incremental unite of action, called quanta. One quantum consists of a little piece of energy welded to a little piece of time, so to speak, with no seam in the middle. Hence for energy to "translate", quantum change must occur, and in this case we must think of the external scattering and disintegration of internalized energy as actually being the external scattering of internalized collections of quanta. But in that case, the internal collected quanta contained internally collected time amounts as well as energy amounts. Hence in the entropic macroscopic world we are continuously scattering not only EM energy but EM time. What we call the "rate of flow of time" consists of nothing but the external translation/scattering of action, hence the external translation/scattering of energy and the external translation/scattering of time. *The normal "flow of time" is actually the external disintegration/scattering of internalized integrated/boundary-coherent time. In other words, the production of entropy and the production of the "forward flow of time" are actually one and the same thing. Further, the "rate of flow of time" is simply the "rate of production of entropy." If we change the rate of production of entropy, we change the rate of flow of time, and vice-versa.*

The second form of external translation of internalized energy is to translate all the subenergies in parallel, coherently. Thus if we translate the internal mass (which is just internalized or trapped energy) of an object through space and time coherently, we

"translate the object" through space and time. In this case no entropy is produced (conceptually speaking), and the object does not "age-change" as such. Everything in the object is just as it was. *If an object did this and only this, it also would not "move in time" a priori, as far as it itself was concerned,* for it would experience no entropy and no internalized change of action, hence no internal change in time. Interestingly, it would also be completely unobservable by any other "physical observer" or "physical observing/detecting/measuring instrument." It is interesting, but well beyond the scope of this paper, that objects can actually be induced to move in a fashion very close to this second translation, and this has been experimentally verified. We will not discuss the second case further, except to say that our very notion of something "moving through space" captures this aspect. The fact that normally objects still exchange and scatter energy and time externally, even when "moving through space", means that we still see them as moving through normal time (through *scattering* time.) Rigorously, objects which move through normal space and time are objects which (1) keep much of their internalized energy unscattered, so that they move through space, and (2) scatter some part of their internalized energy, so that they move through scatter-time or normal-time.

The third form of external translation/scattering of internalized energy is marvelous indeed: *It is negative.* In this case, scattered external energy is actually focused back into the internal, ordered, integrated energy of the object. But since this actually involves action, or "energy x time,", then the object does not scatter/disintegrate time, but rather it coherently collects/integrates time. To the object, this is a time-reversed situation. Rigorously, the object exists in integrating time, not disintegrating time. *The object is time-reversed.* Note that the second law of thermodynamics — which we have just violated — *assumes* that time flow is always positive; i.e., that internalized EM energy/time are always being externally scattered/disintegrated. Rigorously, the second law of thermodynamics — the law of entropy — only applies to the forward flow of time. It specifically does not apply to the time-reversed situation, for obviously that would be re-ordering and negentropic. *Entropy is only one side of a two-sided coin; negentropy is the other side.*

Re-ordering of EM energy is occurring, and that is the concept of *negentropy.* This EM energy that re-orders is *phase-conjugated,* i.e., *time-reversed.* It is referred to as *negative energy.* We point out that this is a perfectly permissible form of energy translation, and it can be quite readily engineered on the laboratory bench, and even amplified. Most physicists presently are very uncomfortable with the time-reversed EM wave, even though it is a proven fact. They desperately try to ignore the negentropic implications, for that means the violation of the second law of thermodynamics, which they strenuously try to hold sacrosanct. And the fact that one can easily amplify the negentropy *directly from entropy,* merely by pumping a phase conjugate mirror, also is most studiously avoided *because of total, utter fear of the awful implications of that experimental fact.*

56. Bearden, "Maxwell's Original Quaternion Theory...", 1988, p. 8.

57. Again refer to Maxwell's quote in note 52 above. If the vectors are waves, their amplitudes are functions of time. It is easily seen that the infolded functions of. these vectors waves, in a vector-zero resultant summation of opposing vectors, can and will also be waves. Since the vector translation resultant is always zero, then the overall magnitude of the standing scalar potential wave may change, or not change, according to the specific internal EM waves and their relationships. In any case, the potential wave — which in the limiting case may be just a so-called "fixed change" in the scalar potential — will be a composite of its internal, dynamic, EM waves which individually are translating. The external potential, being a composite formed of relationships, is similar to a phase wave, hence can "move or translate through space" at any velocity, simply depending

upon its internal arrangement. Note that scalur EM waves are very complex in structure, and cannot normally be described by single overall characterizations such as "frequency," "wavelength," etc. Those are *string* wave concepts, and scalar waves are almost always radically different from string waves.

58. Originally I chose the term *scalar electromagnetics* for my unified field theory work, since I based it on Whittaker's fundamental 1903 and 1904 papers. In his 1904 paper, Whittaker had already shown that all of classical EM could be replaced by an electromagnetics based on *scalar potentials* and *scalar potential interferometry.*

Whitney has pointed out that a slight correction to Whittaker's 1904 paper is required, since Whittaker assumed the standard Lienard-Wiechert (LW) mode for the EM potentials created by rapidly moving point sources. The LW model was derived at the turn of the century, before the full development of special relativity theory. The LW model is faulty because it fails to conserve total charge. See Cynthia Kolb Whitney, "On the Lienard-Wiechert Potentials," [unpublished]; "Generalized functions in relativistic potential theory," *Hadronic Journal,* Vol. 10,1987, p. 289-290; and "A new perspective on the hydrogen atom," *Physics Essays,* 1(2), July 1988, p. 52-55. Whitney also shows that most modern derivation methods for the relativistic EM potentials have been "retrofitted" to the Lienard-Wiechert results in most present-day texts. She has found — and corrected — the error that has been passed along by almost all other theorists. A significant change in the orientation of the longitudinal E-field occurs in the altered and corrected formulation of the potentials. This field directionality becomes significant in any multi-body system, since the new direction provides a torque on the accelerated system as a whole, producing an energy transfer that works in opposition to radiation and moves energy from fields and to particle orbits.

The Lienard-Wiechert error inherent in Whittaker's paper is not fatal, however, and merely implies that one may need to utilize some four or so potentials — instead of just two — to fully replace classical EM by scalar potential interferometry when torquing and multi-body systems are considered.

59. Again, quaternionic or Whittaker infolding of functions of EM force vectors inside a scalar EM potential produces a scalar field with a hidden internal structure that can be deterministic. If the infolded vectors are rhythmic (waves), the scalar potential will have pairs of bidirectional waves multiplied together, infolded as a Whittaker structure.

60. The Soviets obtained the German radar team at the end of WWII. That team had developed radar absorbent materials (RAM), and had also noticed anomalies in their RAM materials when testing them for simultaneous illumination by multiple radar beams. This actually produced the first four-wave mixing phenomena, the first time-reversed EM wave, and the first pumped phase conjugate mirror material — in *radar,* not in optics.

After WWII, the Soviets also had embarked on a desperate crash effort to try to catch the West, develop nuclear weapons, and develop ballistic missiles and anti-bomber missile defenses.

With the Western development of the atomic bomb, Stalin had been frustrated in his plans to wait two years, keep his armies intact, and let the West beat its swords back into plowshares. He had planned to then march into Europe and take it in six weeks — and he could have done so, except for the advent of the atomic bomb. Now the West could bomb him back to the stone age if he massed his armies and tried to move into Europe.

However, Stalin also knew that the atomic bomb would not be the last great scientific and technical breakthrough. Stalin was also an iron dictator who brooked no opposition; he killed his enemies. He marshalled his scientists to actively — even frenziedly — search for the next such decisive technical breakthrough area. They were to leave no stone unturned until they found such an area. Stalin would follow the same scenario demonstrated by the West against the Japanese. When the new breakthrough area was found, the entire resources of the Soviet state would be marshalled behind it, to develop it in great secrecy. At the eleventh hour, they would then thrust it upon the West by surprise. The West, utterly confused and helpless, would be forced to surrender to Stalin's aims. This was Stalin's plan.

Under that plan, the Soviets purchased all the scientific journals and literature of the West back to the beginning. They transported shiploads of this scientific and technical material back to Russia, and set up large institutes to examine every paper. In one such institute, some 2,000 PhDs — together with a complete translation staff—was assembled to meticulously review this scientific literature. Anything unusual or interesting was put aside for further, more exhaustive review. In this way the Soviets discovered such long-ignored scientific gems as the two Whittaker papers of 1903 and 1904. They discovered negative energy, negentropy, the time-reversed wave, and pumped phase conjugate mirrors — all in radar experiments, which were then reproduced in optical experiments because of the reduced size and increased accuracy. The very best scientists available were utilized.

The Soviets have always been the best nonlinear scientists in the world, and they succeeded magnificently in this effort. They broke through to a new, *engineerable* unified field theory, dubbing it *energetics.* And the entire effort was done in greatest secrecy, under the complete and total control of the early version of what is today the Soviet KGB.

By 1950, research in the new field was beginning, and at top speed — but all in completely secret laboratories, under the tightest security, and under the complete control of the KGB. And the program is still under their complete control — for research and development, deployment, and employment of the new superweapons. By the mid-SOs, prototype weapons — some of very large magnitude — were undergoing serious testing.

In the winter of 1957-58, for example, an accidental failure in a huge Soviet Whittaker-wave experimental transmitter in the Southern Urals (near Kyshtym) resulted in the discharge of a very large electrogravitational (EG) potential into the earth. This EG pulse struck the nearby stored nuclear wastes, sharply increasing the nuclear potential on the radioactive nuclei. Since this caused the radioactive nuclei to immediately fission, producing a nuclear explosion *in the dirt and dirty.* The resulting radioactive fallout contaminated a large area — over 1,000 square miles in extent — and it is still deadly radioactive to this day. [For an orthodox presentation of the Kyshtym explosion, see Zhores A. Medvedev, *Nuclear Disaster in the Urals,* Translated by George Saunders, W.W. Norton & Co., 1979.]

61. In January 1960, Nikita Khrushchev announced to the Soviet Presidium the forthcoming advent of fantastic weapons. He stated that these new superweapons in advanced development were so powerful that, if unrestrainedly used, they could wipe out all life on earth.

In May 1960 Francis Gary Powers' high-flying U-2 spy plane was mysteriously disabled on a spy mission over the Soviet Union. Some difficulties with the autopilot were first experienced. Then a dull thump was felt by Powers, and a tremendous orange flash lit the cockpit and sky. *The flash persisted, however, showing that it was not a normal explosion at all, but a persistent and sustained EM fireball.* The U-2 was disabled and Powers bailed out, to be captured by the Soviets. When Eisenhower publicly lied about the U-2 mission, calling it a "weather plane," an angry Khrushchev cancelled the forthcoming summit meeting with the American President, then exhibited the captured U.S. pilot for all the world to see.

In the fall of 1962, the Cuban Missile Crisis occurred. Khrushchev introduced long range nuclear-capable missiles into Cuba — missiles whose nuclear firepower would have covered the United States like a blanket. Khrushchev was attempting to change the world balance of power in a single stroke. Fidel Castro was in fact urging the Soviet leader to proceed and launch a full nuclear strike against the U.S. However, in an "eyeball to eyeball" confrontation, President John F. Kennedy forced the Soviet leader to blink and back down, challenging him pointblank with a U.S. naval blockade of Cuba and an alerted strategic bomber and missile force ready to strike the Soviet Union with a massive nuclear strike.

After blustering just long enough to obtain a guarantee that the U.S. would not invade Cuba, Khrushchev had no recourse but to submit and withdraw the missiles, for his new superweapons were not yet operational. This was a serious humiliation and a loss of face before the Communist leaders and before the world. Khrushchev's days as the leader of the Soviet Union were numbered unless he staged some dramatic coup to recover.

Less than six months after his humiliation by Kennedy, Khrushchev struck back venomously with his just-operational scalar EM superweapons — the very ones he had referred to in 1960. On April 10, 1963 a giant Soviet scalar EM interferometer was used to produce EM interference with the electrical controls of the underwater U.S.S. Thresher atomic submarine off the U.S. East Coast. The stricken submarine, unable to respond to its jammed controls, sank to crush depth and imploded. *(Khrushchev had demonstrated to the leaders of the Communist Party that his weapons could easily defend against underwater subs by simply jamming their controls, making them helpless hulls which would sink to their implosive destruction.)*

At the same time the sub was stricken, a weapon signature was created. The sub's surface companion — the U.S.S. Skylark — encountered "EM splatter" which produced noise jamming and anomalous failure of multiple electronic systems. Some EM systems simply ceased functioning completely — then hours later resumed functioning as if nothing had happened. *(This cannot be done by normal electronic warfare, but is a signature of scalar impulse charging followed by gradual discharge.)* The anomalous EM interference experienced by the Skylark was so intense that more than an hour and a half was required to relay an emergency message back to Naval Headquarters that the Thresher was in difficulty and possibly lost. For details, see Bearden, AIDS: *Biological Warfare,* and *Fer-de-Lance.* For a conventional account, see John Bentley, *The Thresher Disaster: The Most Tragic Dive in Submarine History,* Doubleday & Co., Garden City, New York, 1975.

The standing scalar potential wave — discovered experimentally by Nikola Tesla on the night of July 3-4, 1899 in his Colorado Springs Laboratory — was fully developed theoretically by Whittaker in 1903. (See Reference 39). This scalar wave easily goes through the earth or the ocean. *It interacts with atomic nuclei, not electron shells.* Confronted with the ocean or the earth, the standing potential wave — with its hidden

internal bidirectional EM wave substructure — just sees its natural medium — a collection of nuclei. It is not disturbed or bothered by the ions in the ocean, which are such a formidable barrier to ordinary EM force field waves. With the intersection of two *very weak* scalar EM beams locked on the underwater Thresher, ordinary EM energy appeared by destructive interference of the scalar wave envelope, destroying the envelope and freeing the internal EM energies. Thus the use of two scalar interferometer beams in the ocean to intersect and jam an underwater submarine is rather straightforward, with scalar electromagnetic weapons. Indeed, an area of the ocean can simply be scanned by such an interferometer, to jam all underwater submarines and cause them to sink to their destruction. Note that, with their electronics squelched or jammed, such stricken subs cannot fire their nuclear missiles. Indeed, the electronic circuits in the nuclear weapons themselves are jammed and squelched, preventing arming and operation of the weapon.

On April 11, 1963, one day after the kill of the Thresher, a Soviet scalar EM interferometer weapon — probably the same one that ever so gently touched the U.S.S. Thresher — was gigantically pulsed, to intersect two giant potential pulses underwater, deep under the surface of the ocean 100 miles north of Puerto Rico. The tremendous outburst of unfolded EM energy in the destructive scalar interference zone produced a huge electromagnetic explosion deep underwater. Except for nuclear radiation, this *underwater electromagnetic burst* produced all the phenomena of a deep underwater nuclear burst. A cone of water rose out of the ocean to a height of half a mile, mushroomed out into a giant mushroom shape, then fell back into the ocean. The explosive eruption was observed by the pilot and crew of a passing U.S. jetliner, and reported to the FBI and the U.S. Coast Guard. *Khrushchev had demonstrated the weapon's ability to drastically attack and destroy underwater targets, or even use such great underwater bursts to destroy whole flotillas of surface vessels.* Ironically, just at the time that the waters off the East Coast of the United States were alive with ships searching for the lost Thresher, the same weapon that killed the Thresher was tested again, and no one realized what was occurring.

With these two strategic demonstrations and Soviet involvement in events leading to the assassination of President John F. Kennedy on November 22 of that same year, Khrushchev soundly avenged himself for his humiliation by Kennedy and the United States in the 1962 Cuban Missile Crisis. After that 1962 humiliating facedown and Khrushchev's forced withdrawal of his long range missiles from Cuba, the Communist Party leaders had been moving to remove Khrushchev from power. Khrushchev's dramatic, successful 1963 demonstrations and the death of John F. Kennedy, all under cover of an effective deception plan, persuaded the Communist leaders to continue him in power for a little longer.

Soviet tests against actual U.S. targets continued over the years. In 1972 at a secret meeting in Prague of the leaders of the European Communist parties, Leonid Brezhnev confirmed that detente was a hoax *(just as Gorbachev's Glasnost is a hoax!).* Brezhnev named 1985 as the year that the Soviets would be ready to control the skies, the oceans, and most of the land area as they might wish. In other words, all the great strategic scalar EM weapons would be completed, deployed, and operationally tested.

On December 12, 1985, Soviet "over-the-horizon radars" — with infolded Whittaker bidirectional EM wave structures to provide distance-independent holography and dispersion-free phase conjugate shooting — locked-on and destroyed a U.S. Arrow Airlines DC-8 jet aircraft at Gander International Airport, Newfoundland. In destroying the aircraft as a demonstration that the 1985 schedule had been met and the Americans were none the wiser, the Soviets killed 248 U.S. Army troops and 8 civilian crewmembers.

[See Figure 21]. The troops were U.S. paratroopers returning to their home station from UN peacekeeping duties in the Middle East. They were coming home for Christmas, and their parents, families, and friends were waiting for them in happy anticipation. The terrible tragedy took those happy young lives, and the lives of the fine Arrow crew — one of its best. It was not an accident, and it was not a terrorist bomb that destroyed the aircraft and killed all those young soldiers and the crew. It was a brutal, cynical, overt act of war by the Soviet Union. It was the final demonstration to Gorbachev of meeting the Soviet 1985 schedule for having these giant weapons deployed and operationally ready *and tested.* Just two weeks earlier, the weapon had been tested for the third time against a U.S. shuttle launch, but in a nondestructive manner. Some six weeks after killing the Arrow, the same weaponry would be used in a highly specialized kill of the Challenger with its crew of seven. But here is what really happened to the Arrow DC-8 on December 12,1985.

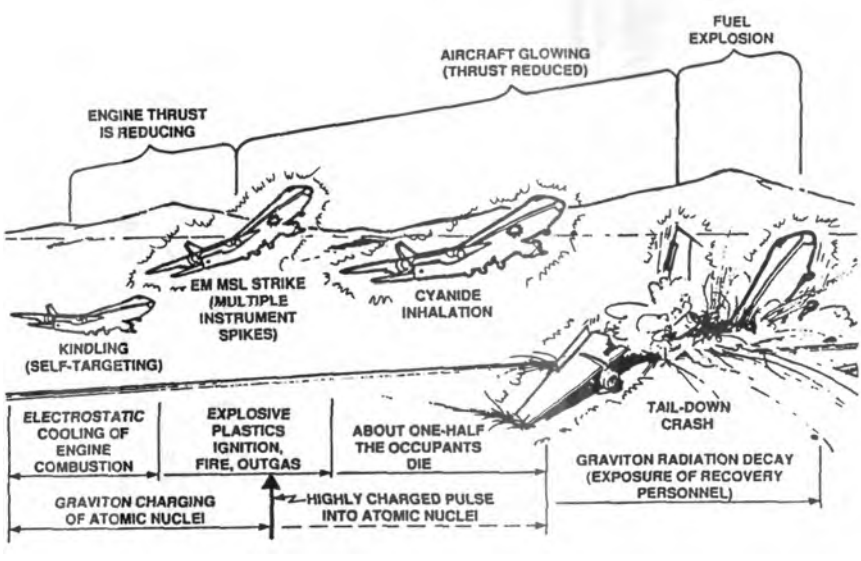

Figure 21. Death of the Arrow DC-8, December 12,1985.

For brevity, we skip all preliminaries, and go immediately to the aircraft as it built up speed down the runway on its takeoff run. As the Arrow DC-8 aircraft sped down the runway, an eyewitness observed multiple beams of light form in the clouds overhead — in fact, she observed the self-focusing of the scalar potential beams of the interferometer. This self-focusing (self-targeting) began to cause electrostatic cooling in the aircraft engines' combustion gases. *This is easily accomplished by properly adjusting the bias potential on the electrical ground of the distant interferometer transmitters in Russia, so that the transmitter potential is below the ambient potential of the target — the aircraft speeding down the runway in Newfoundland. If the transmitter potential is lower, a gradient exists in the scalar beam Whittaker structure joining the aircraft and the Russian transmitters, and*

energy will flow through the internal Whittaker structures, from hot spots on the airplane,— such as the fiercely burning combustion gases — to the distant transmitter electrical ground. This will electrostatically cool the greatest hot spots — the hot combustion gases inside the engines.

The electrostatic cooling in the combustion gases inside the engines caused them to lose exhaust gas velocity, hence reducing the engines' thrust —just at takeoff rotation. As the aircraft began to rotate for liftoff, its engines were already losing substantial thrust, ***although they were still rotating at full speed.***

Once the weapon was focused, Soviets fired an electromagnetic missile directly at the aircraft, using distance-independent holography, employing the internal Whittaker EM wave structures of the scalar potential beams. The interfering sky beams flared as an electromagnetic missile formed and shot to the aircraft. *(The EM missile strike was seen* ***by the witness as just a ball or beam of light that streaked from the glowing beams in the*** *clouds, down to the aircraft)* The EM missile struck the aircraft in the right side of its fuselage ahead of the engines and blasted a hole right through the fuselage. *This* ***anomalous hole was noted. It was tested and found to have*** *no chemical residues, proving* ***that it was not due to a chemical explosion or a terrorist*** *bomb. However, it* was *due to the* ***strike of the EM missile!***

The fierce ball of EM energy penetrated the fuselage and struck the aircraft's interior plastics, explosively igniting them instantly — all just at liftoff. Multiple independent witnesses saw the aircraft glowing with an orange light, from the fierce firelight shining out the windows and the radiant energy of the locked-on interferometry beams. ***Interestingly, the witness that*** *saw* ***the*** *beams form in the sky, and the beam shoot down and strike the aircraft, was not allowed to present her testimony to the official board of investigation.*

The flaring of the skybeams associated with the EM *missile* strike, and the glow on the aircraft from the electrical energy in the locked-on scalar EM beams, *brightly lit up the* ***cabs of trucks speeding down the nearby*** *highway.* **The** strike of the EM missile also caused a sharp electrical spike in two instruments on board the aircraft, as recorded by the flight **recorder.** ***The instruments and the flight recorder*** *actually recorded the strike of the EM missile itself.* [Figure 22]. The aircraft was glowing from the Whittaker beam structure holography and beam tracking and self-targeting. Inside the struck aircraft, in addition to the explosive fire and fierce firelight, violent outgassing from the explosive ignition of the plastics produced an explosion of soot and toxic fumes, including highly lethal hydrogen cyanide gas. With a breath or two, lethal doses of the toxic fumes were inhaled by the surrounding occupants. About half the personnel on board were already dead or dying of cyanide poisoning as the faltering plane reached its high point of less than 100 feet, still tail-down.

The U.S. Army performed autopsies on the remains of *almost all the dead personnel in the* ***crash. These autopsies indicated that almost half the*** *personnel were already dead of* ***hydrogen cyanide poisoning before the airplane exploded*** *on impact with the earth. This* ***autopsy information was illegally withheld from the*** *official investigating board for the* ***accident — another deliberate criminal interference with the*** *proceedings.*

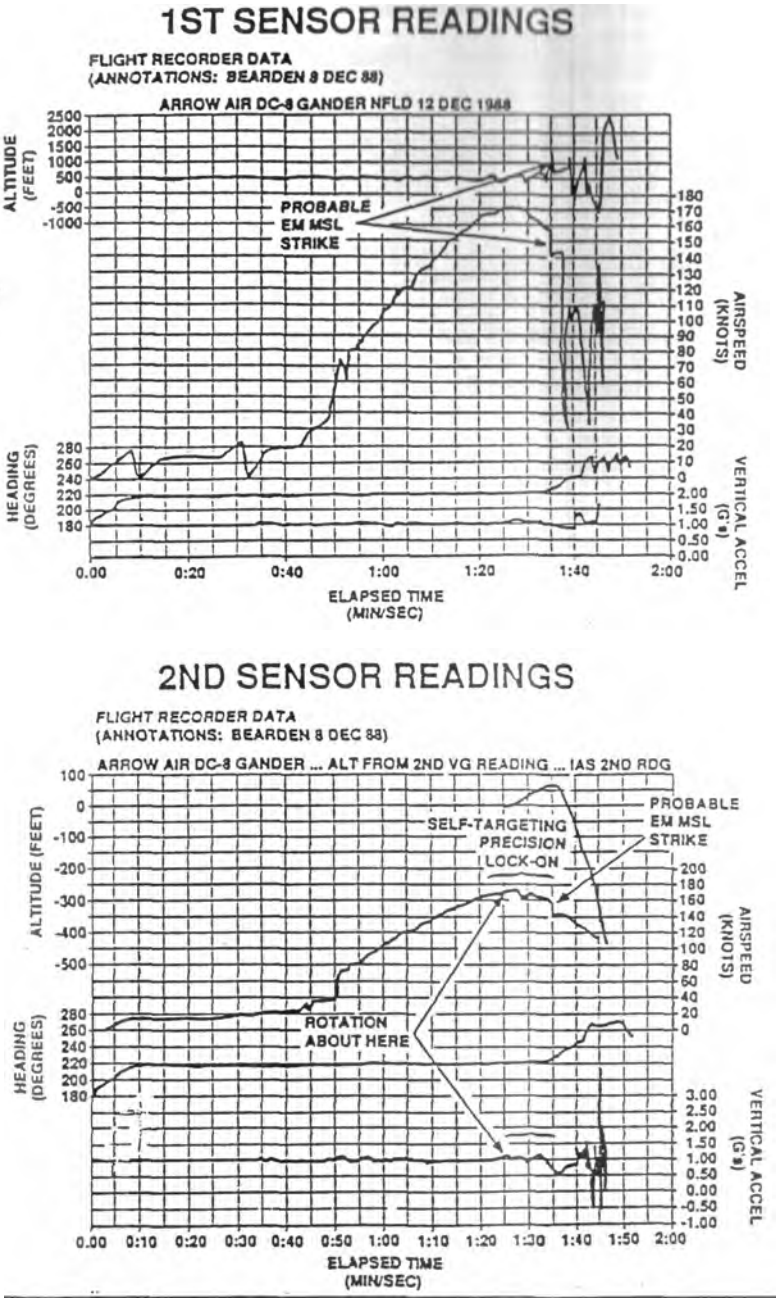

Figure 22. Electrical spikes in two on-board sensors of the Arrow DC-S, caused by strike of an EM missile during liftoff rotation.

But to return to the faltering Arrow DC-8. With its engine thrust steadily diminishing by electrostatic cooling of engine combustion gases, even though the turbines were rotating at good speed, the stricken aircraft sank, still tail down, and struck the ground, exploding and killing the remaining personnel on board, and scattering the burning wreckage over the crash area. ***However, the sharp strike of the EM missile with its extremely powerful associated scalar EM pulse had intensely "quick-charged" and activated the atomic nuclei of aircraft materials, metals, etc in the adjacent areas of the aircraft surrounding the strike.*** **These Whittaker/scalar-activated (scalar-charged) nuclei were now emitting strong scalar graviton radiation. So strong scalar graviton radiation—scalar potential radiation —was issuing from the scattered parts and burning materials in the crash area. During the next few days, recovery personnel were exposed to this unsuspected scalar radiation. Many of them (about 60 or so) later developed delayed illnesses and health changes** ***similar to those in scalar-radiated U.S. Embassypersonnel in Moscow:*** **dizziness, headaches, nausea, stomach and intestinal upset, liver changes, blood changes, vertigo, and stress** syndrome **symptoms.**

We accent this point **most** strongly: We have seen these symptoms before, in personnel radiated by the Soviets at the U.S. Embassy in Moscow. The Johns Hopkins study of that situation clearly shows that the active ingredient is the scalar potential, not ordinary **EM force fields. We know it is scalar EM** potential radiation that causes these delayed health **symptoms.** ***Further,*** *from* ***our*** *study of the Kaznacheyev cytopathogenic effect, the Popp* ***cellular communication system,*** *and the Priore anti-cancer machine, we know the precise mechanism that causes* ***the*** *diseases.*

The signatures of the use **of the** scalar EM weapon are clear. Further, additional strong **evidence exists of prior 1985 nonlethal** testing of the same weapon that was utilized to kill the Arrow DC-8.

Several months before the kill of the Arrow DC-8, another anomalous loss of engine **power by an aircraft is** interesting. In February 1985, on a flight from Taipei to "Los **Angeles, a China Airlines Boeing** 747SP **about** 300 miles northwest of San Francisco was **subjected to a similar but milder** "self-targeting **and** cooling of engine combustion gases" **treatment by the same Soviet** weapon. **[Figure 23].** At 41,000 feet the aircraft first **experienced a slight turbulence — probably just when the** scalar **lock-on** of the weapon **occurred, where the emerging outfolded EM energy in the surrounding** air created some **slight turbulence. Then self-targeting began in the Whittaker structure of the Woodpecker standing potential wave interferometer beams. The** initiation of self-**targeting narrowed the interferometer onto its engine combustion** gases target in the **aircraft engines, causing substantial emergence of negative** energy **in their** combustion **gases. This electrostatically and drastically cooled the** combustion **gases,** causing seriously **decreased exhaust velocity, loss of engine thrust, and a special type of engine flame-snuffing. First one engine failed from the drastic cooling of its** gases, and then the others **failed in short order. The failures and resulting plunge of the aircraft left several signatures, however, of the anomalous mechanism causing them.** *Electrical power on* ***board the aircraft did not fail,*** *because the engine failure was anomalous loss of thrust in* ***fully rotating turbines due to direct electrostatic cooling of the combustion*** *gases in the* ***engines themselves.*** **Hence the mechanically-coupled electrical generators were still rotating at full speed and producing electrical power, and so the aircraft** electrical system **maintained power. Passenger oxygen masks did not deploy, indicating that engine** ***rotational*** **power (not** ***thrust!)*** **was** always available **to** operate electrical and pressurization **systems. In a hair-raising, uncontrolled plunge of the aircraft toward the earth, the pilot fought to restart the engines and regain control of the aircraft. The instruments reacted anomalously. The crew reported that the stick shaker did not activate and the** overspeed

warning clacker did not activate. Severe G-loads were experienced in the downward plummet of the aircraft, causing severe distortion of the tail cone and damage to that section.

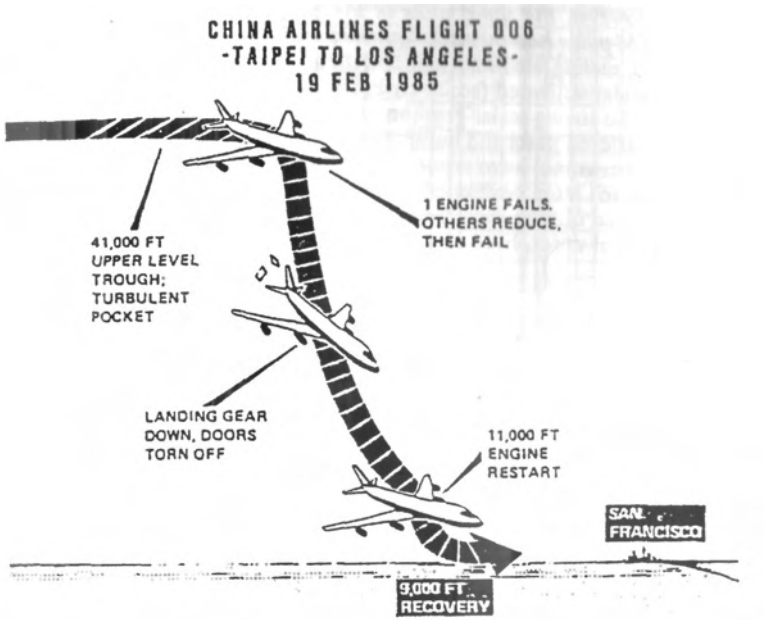

Figure 23. Engines disabled, a passenger jet drops six miles in two minutes.

Anomalies in the G-forces inside the aircraft also occurred. The flight engineer was totally immobilized by the g-forces at his cockpit duty station, yet the pilot and copilot directly on either side of him were unaffected. *This is a highly significant "selective gravity and selective inertia" anomaly and a clear signature* of the negative energy being introduced into the aircraft by the self-targeting Whittaker beams. As the aircraft plummeted down, it fell out of and away from the intersecting Whittaker interference beams. Apparently the distant Soviet operator deliberately did not continue to track and attack the target as it fell. Once the aircraft fell out of the EM kindling/outfolding in the beam intersection, the scalar activation in the engines and vicinity began to decay away. Since no drastic pulse input — such as the strike of an EM missile — was employed by the Soviet weapon, scalar activation was not severely high. Thus only light-to-moderate activation of nuclei occurred, and this is a short-lived phenomenon that will decay quickly once the steady activation beams are removed. In other words, the excess scalar charge on the nuclei began to discharge by scalar emission, and the cooling of the combustion gases began to decrease steadily.

Instrumental anomalies occurred as well, since instruments interact individually to being scalarly activated. The crew reported that the cockpit instruments detected immediate autopilot disengagement; flight data recorder instruments showed that the autopilot did not disengage during the initial descent. Thus both the pilot and the autopilot

conceivably were fighting to move the control surfaces during at least the initial phase of the fall. The landing gear lowered, but the pilot did not initiate the action.

After a fall of some 32,000 feet in about 2 minutes, the Whittaker/scalar EM activation was discharged sufficiently so that, with internal combustion cooling greatly diminished, **the** pilot managed to restart three engines and regain control of the aircraft. The crew then made an emergency landing at San Francisco International Airport. For example references, **see** (1) Bearden, *Fer-de-Lance,* Mar. 4,1985, p. 175-176; (2) *Aviation Week & Space Technology,* Feb. 25,1985, p. 28; Mar. 4,1985, p. 29; (3) "Jetliner drops 32,000 feet; 400 aboard; 50 are injured," AP release, *Huntsville [Alabama] Tunes,* Feb. 20,1985, p. 1; (4) "China Airlines pilot denies cockpit error," AP release, *Huntsville [Alabama] Times,* Feb. 21,1985, p. A-9.

But there is much additional evidence that bears directly on the scalar kill of the aircraft at Gander.

On Nov. 26,1985, two weeks before the kill of the Arrow DC-8, the same Soviet weapon was tested nondestructively against a U.S. shuttle launch at Cape Canaveral, Florida. *(This was the third nondestructive test using a launching space shuttle/booster as a convenient simulated ICBM practice target)* Seconds before the launch, an offset strike of an EM missile was actually photographed by Bob Gladwin: [Figure 24]. The photograph was later printed by this author [Bearden, *Fer-de-Lance,* 1986, p. 187.] Over the general launch area, another holographic ball of light — a marker beacon used by the Whittaker interferometer for precise distance-independent registration in the target area — was clearly observed by hundreds of persons and photographed by George Suchary. [Bearden, *Fer-de-Lance,* 1986, p. 182]. A similar holographic ball of light for precise registration was also videotaped above the explosion of a Titan 34-D missile seconds after launch in April 1986; that Titan was also destroyed by the strike of an EM missile or by a very strong EM pulse through the Whittaker channel of a Soviet scalar interferometer. [See Figure 25]. In 1986 a Delta rocket was also destroyed by the range safety offer after an anomalous internal EM surge command shut down the main liquid-fueled engine, with the three strap-on boosters still burning, so that the rocket went unstable. A mysterious light streak was observed on videotape to approach the rocket from below and from the side, rising and striking the vehicle, just before the mysterious main engine shutdown. Precisely such anomalous "internal command and control switching by introduction from an external source" has been exhibited by the British Ariel VI satellite as well. Also in Spring of 1986, a French Ariane missile suffered mysterious shutdown interference, resulting in the destruction of the rocket.

In the case of the Arrow DC-8, high U.S. and Canadian officials — not knowing anything of scalar electromagnetics — were probably very afraid that the aircraft had actually been bombed by a terrorist group, possibly on behalf of the Iranians. High U.S. officials were most anxious not to reveal anything further about the Iran/Contra weapons affair and its official U.S. governmental coverup. *This probably explains why a U.S. Army General quickly arrived at the Gander crash site and brought exceedingly strong pressure to bear to quickly bulldoze over the crash residue. It also probably explains why most eyewitness testimonies that contradicted the — probably deliberately selected — "ice buildup" cover story were withheld from the accident investigation board, and why the board was not permitted open access to the files and witnesses!* This unprecedented action, of course, is tantamount to deliberately withholding evidence from a court and interfering with a court trial — a criminal offense. High U.S. officials would have been most anxious to keep from revealing any sign of onboard fire or explosion, since — if the crash *had* been due to a terrorist bomb — this might fully open up the investigation and drive it sufficiently far afield to reveal the Iran/Contra coverup by the U.S. government.

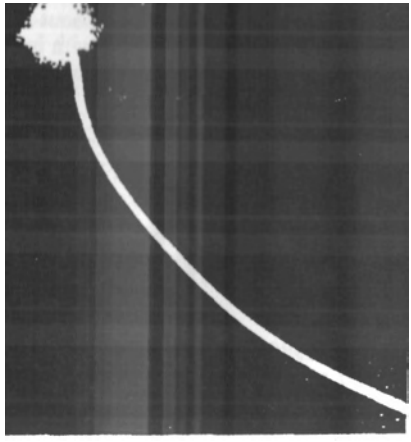

Figure 24. Strike of an EM missile, offset from launch of the shuttle Atlantis on November 26, 1935. Photo by Bob Gladwin. Several other major anomalies also occurred. Two weeks later, the same Soviet weapon destroyed the Arrow DC-S at Gander, Newfoundland.

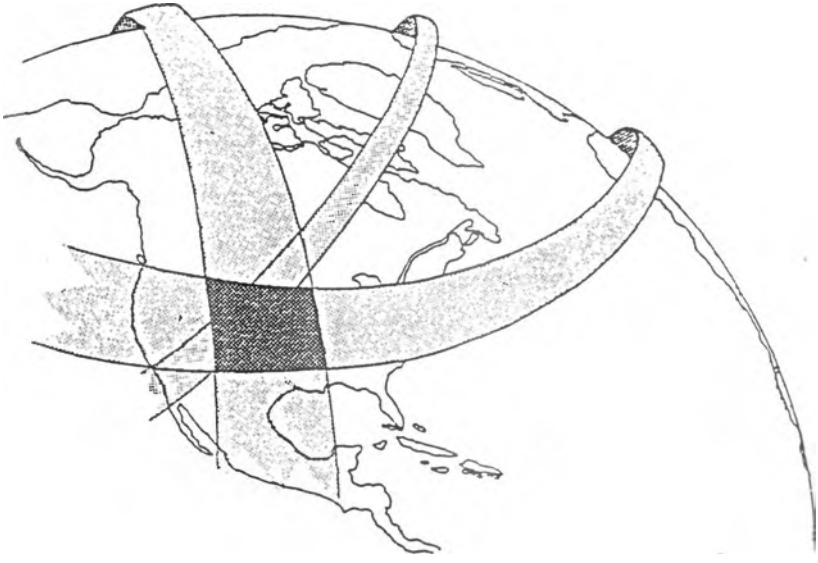

Figure 25. Soviet Woodpecker beams intersect over North America. This Soviet Tesla/Whittaker weapon can destroy U.S. ICBMs and bombers at launch and takeoff and during the initial phases of flight. It can also destroy carriers task forces at sea, and underwater submarines.

So in addition to the wanton Soviet act of war and murder of the troops and crew aboard the Arrow DC-8 aircraft, a gross miscarriage of justice occurred due to (1) technical ignorance of scalar electromagnetics and of signatures of the strike of a scalar EM weapon, (2) deliberate high-placed collusion and manipulation, and (3) probable mistaken off-the-record belief by high U.S. officials that the crash was really caused by a bomb planted by a terrorist group backed by Iran. By rather gross manipulation of the investigation, of the files, and of the board itself, the "accident" was officially blamed on human error due to failure to de-ice the aircraft. The members of the board split in their finding, however, and a minority opinion was also produced, denying the ice theory.

Families of the deceased U.S. soldiers have demanded a thorough reinvestigation. This researcher stands ready to open his files to the investigating board, a Congressional investigating committee, or any special board investigating the "accident". I will gladly provide substantial briefings regarding the complete history of Soviet scalar EM weapons and their testing, the precise mechanisms and signatures of scalar EM weapon strikes and kills, and specific indicators in the Arrow DC-8 crash incident that remove any doubt as to what actually caused the crash. There the matter stands.

62. Devyatkov and Golant, "Prospects for the use of millimeter-range electromaanetic radiation...", 1986.

63. Devyatkov, Ed., *Applications of Low-Intensity Millimeter Wave Radiation...*, 1985.

64. Again recall Khrushchev's 1960 statement that these new fantastic weapons *could wipe out all life on earth if unrestrainedly used.* Also recall Brezhnev's 1975 characterization of the weapons as *"...more frightful than the mind of man has ever imagined."* Even in more orthodox chemical warfare, the Soviets are forging ahead. For example, the prestigious *London Sunday Times*, Oct. 1, 1989 reported the Soviet development of genetically engineered toxins designed to have a very specific effect for a defined time — such as violent diarrhea, uncontrolled weeping, etc. The Soviets have consistently lied about the extent of their chemical and biological warfare developments.

65. Whittaker, "On the Differential Equations...", 1903.

66. Ibid., p. 355. Further, the speed of light itself is not constant, but varies as a function of the local energy density of spacetime — i.e., as a function of the magnitude of the ambient spacetime potential itself.

67. Multiplication of waves signifies a *modulation* process, which locks the pair together. In gravitobiology, this also locks paired photons together, building graviton structures and scalar EM potentials rather than EM force fields.

68. In present quantum field theory, the spin-2 graviton is taken to be the quantum particle of the gravitational field, while the photon is the quantum particle of the electromagnetic field. Essentially every field is so visualized, hence the name *quantum field theory.* In scalar EM, the graviton is envisioned as an average over time of the constantly changing photon coupling/decoupling less than, equal to, or greater than two, according to whether local spacetime is negatively curved, flat, or positively curved. This is also consistent with the modern view of a field: because of vacuum fluctuations, rigorously one no longer speaks of "the" field, but of *the probability of a particular field configuration.* See Charles W. Misner, Kip S. Thome, and John Archibald Wheeler, *Gravitation*, W.H. Freeman and Co., San Francisco, 1973, p. 1191.

69. Thus we are implementing what heretofore has only been speculated upon. For example, see T.D. Lee, Chapter 25: Outlook, "Possibility of vacuum engineering," *Particle Physics and Introduction to Field Theory,* Harwood Academic Publishers, New York, 1981, p. 826. Also, recently it has been realized that spontaneous emission, for example, is not a fundamental property of matter as previously believed. Instead, it is actually a property of the atom-vacuum system and its virtual particle flux (VPF) exchange. It is also possible to alter that VPF exchange system and thus alter spontaneous emission. Cavity quantum electrodynamics is one of the recently uncovered examples by which spontaneous emission can be profoundly affected by altering (structuring) the vacuum states. See Serge Haroche and Daniel Kleppner, "Cavity Quantum Electrodynamics," *Physics Today,* Jan. 1989, p. 24-30.

70. There is in fact no precise definition at all of the gravitational field! In the general relativity theory, many mathematical things are associated with gravitation. Cf Misner, Thome And Wheeler, Gravitation, 1973, p. 399. Quoting: *"...The terms 'gravitational field' and 'gravity' refer in a vague, collective sort of way to all of these entities. Another, equivalent term for them is the 'geometry ofspacetime."*

The present author's comment is that Whittaker shows us how to deterministically structure and curve spacetime — including locally — and utilize this structured spacetime curvature in an engineering fashion.

71. Activation of the atomic nucleus — by a deterministically patterned, massless charge structure — can be thought of as analogous to *charging a capacitor.* However, now in addition to the "gross overall magnitude of charge," we must speak of the *magnitude of each specific charge* of a particular graviton structure. The overall gross charge may have many infolded individual graviton structures (charges), each of which may be at a different magnitude. *Now we may deterministically collect, store — and then discharge and utilize — specific spacetime/graviton/virtual particle flux patterns/structures, all hidden inside the envelope of "normal" potential/charge and inside "normal" electromagnetics.*

Note that this notion of a set of "partial charges," each of differing graviton-patterned structure, is similar to the notion of "partial pressure" in mixtures of gases. In the case of gases, the overall mixture has an overall pressure, but specific parts of that total pressure are due to the specific component gases. In the new view, overall massless photon flux (electric charge) exchange between vacuum and a charged particle of mass, also consists of specific "partial charge" components. Further, some of these "partial charge components" can be deterministically structured.

Another way to say this is as follows: The overall stress of the vacuum exchange with a particle of mass constitutes the *overall charge* of the particle. In the case of *virtualphoton* exchange between vacuum and mass particle, the overall exchange flux constitutes the overall *electric charge* of the particle. That overall electric charge (overall photon flux) may be composed of several components. *In some of these flux components, the photon flux exchange may be deterministically organized.* Thus we can speak of the partial "electric stress" or electric charge of each component. The overall electric stress, or electric charge, is the sum of the *compoonent partial* electric stresses/charges.

We have moved the concept of electric charge an entire level deeper than is presently in orthodox physics, by introducing the notion that an overall statistical virtual particle flux has ordered components. Quantum mechanically, the electric charge of a charged particle is due to an exchange of virtual photons, between the vacuum and the mass of the particle. Now we have added hidden structure to that virtual photon flux exchange

that constitutes the electric charge of the mass. However, structuring of the (observably) massless virtual particle flux that is "charge" is easily proven by a *gedanken (thought) experiment* as follows: In present electrical physics, it is universally postulated that each potential has a charged particle somewhere as its source or generatrix. It is also universally postulated that, at a distance from the charge that is the source of the potential, the potential is inversely proportional to the square of the distance, in the most general ideal case. Thus the potential from the charge has everywhere in finite space a nonzero value.

Now suppose that suddenly an electric charge is introduced (spontaneously created) in a small region. This charge is the source of a suddenly created potential, which — it is usually assumed — travels outward in all directions from the source, at the speed of light, decreasing inversely as the square of the distance. Theoretically, this potential will continue to expand out into the universe forever, at the speed of light, never quite becoming zero. By common physics assumption, all charges in the universe have such traveling potentials moving out into space, all the time.

Now select a very distant point, many lightyears out into deep space. Through this point, incalculable weak potentials — from an incalculable number of distant charges — are moving through a small differential volume surrounding the point, from and toward all directions. These potentials are continually changing and interfering with each other. Since the distant charges were dynamic (i.e., part of moving systems, exploding stars, whatever), the potentials in the flux through the differential volume are highly dynamic and changing. The interferences of these potentials generates pair creation, pair annihilation, and other virtual particle processes at an incredible rate and in an incredible variety. In the differential volume of space around that point, *this violent, continual interference of potentials produces what is a violent, extreme, virtual particle flux.*

However, we can take such a differential volume around any point in the universe, and a similar virtual particle flux will be present, generated by the local interference of potentials from the distant charges of the universe. *The virtual particle flux of vacuum is completely deterministic a priori!.* It is still *statistical,* because a macroscopic observer will be unable to have instruments fine enough to detect and measure each and every single virtual particle in the flux. However, it still contains *hidden order.* In short, this virtual particle flux of vacuum is *chaotic,* not *random,* as we have just shown. All electric charge of fundamental particles always did contain deterministic substructures. All we are saying is that, to have higher levels of order inside the charge structuring, all that is necessary is to cohere the part of the basic determinism into higher levels of determinism. To complete our gedankenexperiment, we now show that.

We now simply introduce some ordinary electric charges into and onto a geometric structure, such as a wire grid, or a shaped physical pattern of arbitrary intricacy. The charges adjust themselves according to the pattern, proximity, etc. When they are adjusted, we note that, in addition to the physical material, we have a specific, geometric *charge structure* in space at this location. Now we simply examine the potential radiating out into space from this charge structure. The potential from this overall geometric charge source will carry a structure into space that is precisely correlated to the charge source. Let us suppose that several (say, three) major geometric forms exist in the charge structure. Then three major geometric forms exist in the potential radiating out into space. Let us now traverse around the surface of a giant spherical shell — say a lightyear away — that has the geometric charge source as its center. The magnitude of the potential on each element of that surface is precisely correlated to the distant corresponding parts of the charge source. Let us now wiggle the charge source back and forth. One year later, corresponding wiggles (increases and decreases) of the values of

the potentials in each differential surface element will also fluctuate, in precise correlation to the manner of movement of the distant source one year earlier.

Mathematically, we are quite free to break the overall charge of the source into three parts, one for each of the three main parts of the geometric charge structure. By the superposition theorem, the potential from this three-fold charge structure, at any distant point in space, can be separated into three potential components or elements. Each of these potential components — which is now a *partial* potential with respect to the total potential — is precisely correlated to one of the three distant parts of the distant charge source.

But that demonstrates that the virtual particle flux of vacuum — the potential — at any point can be and is structured. Further, it demonstrates a case of deliberately structuring the distant potential — and the distant virtual particle flux of vacuum — deterministically. *Q.E.D.*

This line of reasoning was advanced by this author *conceptually,* many years ago. Happily, Puthoff has placed it on a rigorous mathematical basis, and extended it to show a complete giant universal feedback loop, via vacuum fluctuation, between all the charges of the universe. See H.E. Puthoff, "Source of vacuum electromagnetic zero-point energy," *Phys. Rev. A,* 40(9), Nov. 1,1989, p. 4857-4862.

In the new concept, as a result of structuring of the charge flux, we have violated yet another of the physics tenets about charged particles: the present assumption that, in a collection of one type — say, electrons — each is always identical to any other. This identity assumption requires random variable treatment of the statistics, since the identical electrons are now a random charge ensemble. However, in the new view the electrons can have differing infolded *charge structuring,* and the specific virtual particle exchange of each electron with the vacuum may be differently structured, although the total charge of each electron is the same magnitude. That is, the *overall* electron charges may be identical, but the electrons may have differing and deterministic *partial* charges. Thus the overall potential from a charge may have a deterministic or *information* content that is deliberately created and formed (shaped) by a living system. This hidden "information content of the field," as the Soviets call it, has been used by biological systems since time immemorial. It is used in controlling their deepest, most subtle living functions. Normal "electron-wiggler" detecting instruments do not see this hidden information substructure.

The potential pervades an atom, completely through the electron shells and into the nucleus, centering itself there. As a particular partial potential is steadily impressed on the nucleus, gradually the nuclear potential changes its internal structuring so that more of it is composed of that partial potential and structured accordingly. This is known as *activation* of the nucleus, with a particular charge structure or information content. The EM coupling between nucleus and electron shells gradually changes the electrons in the shells slightly — including the covalent electrons bonding the atom to other atoms in a molecule. Gradually these bond structures also shift and change accordingly, as the activation pattern spreads through the bonding lattice structure. This is known as *activation of the material.* (Years ago, I called this activation process *kindling,* that is, the gradual integration/collection of deterministic virtual patterns (of the hidden information content of the potential field) into corresponding macroscopically observable patterns. Activation of a material (or solution, or gas, or wave, or an overall charge potential) with a hidden information content consisting of deterministic partial potentials is the hidden physical mechanism and basis for psychometry and homeopathic medicine, for example, but those are matters for discussion later in the paper.

In closing this note, an electron or other fundamental charged particle can also have a different *magnitude* of electrical charge than the accepted standard value. By internally structuring the potential and adjusting the magnitude of its components, the charged particle can be raised through a continuous spectrum of excited states (potential charge), and these excited states (this potential) can be detenninistically substructured (tailored with hidden information) to affect the consequent interaction with a particle or other entity when the excited state discharges to interact with it In this discharge, the hidden information content can be integrated and collected on the interacting particle, changing the normal interaction that occurs — an example being, of course, homeopathic potentization and subsequent deterministic structuring and electrochemical action in the body from the potentized solution. This is how the electrical pattern of a chemical or compound can be impressed into and onto the bonding structure of water, for example, to potentize it with the "form" or information content of that compound, even though not a single molecule of the original compound physically remains in the water. In the ensuing chemical interactions of the potentized water with the body, the activated information of the compound's form is discharged into the body and its cells, accomplishing electrochemical changes similar to those induced by the real physical compound itself when present. Electromagnetic homeopathy using the hidden information content of the field is the system of medicine that Devyatkov is talking about in his research and testing. See Devatkov and Golant, ibid, and Devatkov, Ed., ibid.

Obviously, for example, when a group of nonidentically activated electron charges interact, hidden order in the overall chaos (overall chaotic charge, or conglomerate potential) may lead to quite different macroscopic behavior of the system than pure random variable statistics would predict. That is, unexpected large-scalar ordered behavior of the entire system of collected, interacting electrons may emerge and even stabilize. This can affect the apparent inertia, mass, chemical, and electrical behavior exhibited by the system.

Which is why there presently is no really adequate definition *of gravitational field.* (See note 70 above). While this point is obvious, it is very important. If one structures the local spacetime, one can get devices to work abnormally, since now the interaction of spacetime with the devices is not just simply the statistical interaction of a randomized virtual particle flux. The "laws of nature" have been slightly altered, so to speak.

For example, Frank Golden once developed an electric motor which, after several years, produced an output power that was 1.67 times the input power. What we did not know was that his years of operation and struggle with the motor and its structure had gradually deterministically charged-up (activated) the local atomic nuclei and activated the local vacuum potential. Thus the motor gradually "grew" its increase in power, seemingly violating conservation of energy if one tried to regard the motor as a closed system. (Of course it was now an *open* system, receiving an input from the structured vacuum as a hidden source. In other words, Frank had formed a *structured quantum potential* in the local area, coupled to the machine.)

Frank then changed jobs and moved to a new location several hundred miles away. He thus moved the motor several hundred miles, whereupon it promptly relapsed back into just an ordinary electric motor, though still some 90 percent efficient. The motor was then in an *unstructured, unactivated* vacuum potential at the new location, and hence had lost its hidden quantum potential source.

Thunderstruck, the two of us were enlightened by Dr. William tiller, who was aware of the specific "growth effect" we had encountered, though apparently unaware of its

quantum potential mechanism. Tiller, a brilliant scientist, called it *growing the archetype*, and he had previously encountered the same phenomenon in his own seminal experiments with unusual detection systems.

We should have kept the original motor at the original site, made additional motors and moved them radially outward about 200 miles away or to where they would still exhibit about 1.1 to 1.2 efficiency. Then, all the while running the original motor in its original location, we should have run these "outrigger" motors until their efficiencies grew to 1.67, Then we should have extended the outrigger ring again, etc. After about five or six extensions, the vacuum structuring/activation and the activated quantum potential could be expected to spread on around the earth, in the entire local vacuum potential of the earth itself. Thereafter, that particular motor form would work anywhere on earth with 1.67 or so efficiency, because it would be able to directly tap a hidden vacuum source. Regrettably, Frank could not afford another five years or so to regrow the first potential activation/structuring for the motor's format.

The sharp-eyed reader should also note a specific analogy between this effect and Sheldrake's morphogenetic field. For the explanation of the quantum-potential basis for this effect — and for Sheldrake's morphogenetic field — see T.E. Bearden, "Update on Scalar Electromagnetics: New Breakthroughs," paper delivered to the USPA Annual Symposium, Sacramento, California, July 19S9.

74. We choose to regard the EM wave in Whittaker fashion, as consisting of interfering scalar potential waves. See Whittaker, "On an expression of the electromagnetic field..." ibid., 1904 for insight as to how such scalar interferometry produces ordinary EM forcefield energy. Any or all of these interfering potentials may be Whittaker-structured in accordance with Whittaker, "On the partial differential equations of mathematical physics," ibid., 1903.

75. Specifically, it has an infolded Whittaker bidirectional EM wave pair structure (graviton structure). We are free to tailor that internal structure and use it as we wish.

76. By composing such bidirectional EM pairs deterministically and locking them all together, one can compose a Whittaker potential (structured local ST curvature) with a deterministic internal energy pattern. Perhaps an easy way to do this is to form the spectrum of ordinary waves desired, split the spectrum into two replicas, phase conjugate one replica, then mix the nonconjugated replica and its time-reversed replica in a highly nonlinear medium, such as a rotating plasma, to modulate them together. The union of a wave and its phase conjugate or antiwave unites the energy of both waves — which just adds *spatially.* However, the resultant E-fields and H-fields of the wave/antiwave combination are zero vectorially. Thus one has produced a pure, standing wave of scalar potential, without EM force field resultants, and the wave/antiwave component EM energies are localized and trapped. That of course is a *gravitational wave.* In additional photons/antiphotons are coupling and uncoupling. This represents the continual creating and annihilation of spin-2 photon/antiphoton pairs. But a spin-two particle, without EM force fields but with energy that is trapped spatially, describes a *graviton.* Further, the component E and H fields are still there vectorialiy, inside the zero resultant system. *Spatially the E-fields add and the H-fields add (by courtesy of the distortion correction theorem in nonlinear phase conjugate optics);, however, they are respectively and directly oppositive in the time (fourth) dimension. Hence they produce an electromagnetic stress in the fourth dimension only, and thus on the rate of flow of time itself.* Since the magnitude of the spatially additive E-field summations and H-field summations in the standing potential wave are periodic, their time-stressing summation periodically varies the stress on the local rate of flow of time. In other words, we have also produced a *wave like*

alteration of the rate of flow of local time. Quantum mechanically, energy and time are canonical in the photon. Therefore the local spatial oscillation of trapped graviton energy and the local oscillation of the rate of flow of time are inversely related. When the trapped energy in the wave is greatest, the local rate of flow of time is slowest. Hence we have also inadvertently shown the exact physical mechanism which produces time dilation, and the curvature of spacetime as welL

77. Note that one nontrivial result is the emergence of a stable macroscopic world with macroscopic order and structure, from what was apparently "random" quantum change. One now can immediately verify the truth of the old adage, "As above, so below." Since the external world is just the outfolded collected content of the inner order, then internally reflecting our macroscopic scientific concepts and models is justified. This in fact resolves several quite puzzling problems such as (1) why mathematics, founded on the external view, applies to the internal and is thus so *universal,* (2) why "it is so simple!", to paraphrase Feynman's quizzical pondering of quarks, and (3) why a logic of only a few rules can be so all-encompassing. It also should tell us why the intensive study and investigation of hidden variable theories is the single most important thing that can be done to advance physics today.

78. If there is hidden order in a single quantum, one must consider that order as being in the virtual state. Otherwise it would not be hidden, but would itself be observable. Being observable would imply that it was at least one quantum in size, in which case it could not be hidden inside a single quantum because it would be equal to or larger than the quantum.

79. Again, for a most spectacular paper dealing with the order in the vacuum fluctuations, see H.E. Puthoff, "Source of vacuum electromagnetic zero-point energy," *Phys. Rev. A.,* 40(9), Nov. 1,19S9, p. 4857-4S62. This important paper may be interpreted to establish that the virtual particle flux of vacuum is causal Puthoff shows that the fluctuations of the zero-point EM fields in the vacuum are deterministic. If one interprets these fluctuation fields as creating and driving the virtual particle flux of vacuum, then the virtual particle flux is also deterministic. Of course this is a penultimate expression of the hidden variable viewpoint, and again, "as above so below." It is also a profound statement of the present author's fourth law of logic: That which is totally disordered must also be totally ordered. (Order is relative. That which is totally disordered locally is totally ordered nonlocally — just as Puthoff showed.) For explanation and proof of the fourth law of logic — including the proof that it has always been hidden in Aristotle's three laws of logic anyway — see Appendix III: "A Conditional Criterion for Identity, Leading to a Fourth Law of Logic," in Bearden, *AIDS: Biological Warfare,* 1988, p. 428-443.

80. Again, it can only be the collection of the hidden, infolded, stable order inside chaotic quantum change that produces a stable macroscopic physical reality.

81. Againseenote10.

82. A.D. Sakharov, *DokL Akad. Nauk SSSR [Sov. Phys. Dokl.],* Vol. 12,1968, p. 1040.

83. Stochastic gravitation is summarized up to 1982 in S. Adler, *Rev. Mod. Phys.,* Vol. 54, 1982, p. 729.

84. H.E Puthoff, *Phys. Rev. A,* Vol. 39, 1989, p. 2333; *Phys. Rev. D,* Vol. 35, 1987, p. 3266; *Phys. Rev. A.,* 40(9), Nov. 1,1989, p. 4857-4862. See also Harold Puthoff, "Everything for nothing," New Scientist, July 28,1990, p. 52-55.

85. For example, see Timothy Boyer, "The classical vacuum," *Scientific American,* Aug. 1985, p. 70; Walter Greiner and Joseph Hamilton, "Is the Vacuum Really Empty?", *American Scientist,* March-April 1980, p. 154; Roman Podolny, *Something Called Nothing — Physical Vacuum, What is It?,* Mir, 1986; IJ.R. Aitchison, "Nothing's plenty: The vacuum in modem quantum field theory," *Contemporary Physics,* 26(4), 1985, p. 333-391. For indications that a Soviet team under Chernetskii, at the Moscow Georgi Plekhanov Institute of the National Economy, may have succeeded in tapping the vacuum energy, see Andrei Samokhin, "Vacuum energy — a breakthrough?", *Speculations in Science and Technology,* 13(4), 1990, p. 273-275. For a note of cautious optimism as to the possibility of tapping the vacuum energy, see also H.E. Puthoff, The energetic vacuum: implications for energy research, *Speculations in Science and Technology,* 13(4), 1990, p. 247-257. We note, however, that none of the discussions on possibilities of tapping vacuum energy to date have considered pumped phase conjugate mirrors as already exhibiting negentropy, Whittaker's two fundamental papers for structuring the vacuum and intertranslating between electromagnetic and gravitational energy, or the use of time-reversed entities such as the time-reversed EM wave. Also, for hints of a new application of nonlinear vibrations mechanics that may eventually apply to the problem by analogy, see I. Usvitsky, "Friendly Vibration," *Science in the USSR,* No. 6, Dec. 1990, p. 81-87.

86. Nikola Tesla, Colorado Springs Notes 1899-1900, Nolit, Beograd, Yugoslavia, 1978, p. 61-62. On July 3, 1989 and on through the evening into the morning of July 4, Tesla observed standing potential waves from a traveling thunderstorm, even after the storm had traveled a distance of several hundred miles. He recorded this significant discovery in his laboratory notes on July 4,1899.

87. For example, see Nikola Tesla, "Pioneer Radio Engineer Gives Views on Power," *New York Herald Tribune,* Sep. 11,1932. Quoting: "...I showed that the universal medium is a gaseous body in which only longitudinal pulses can be propagated, involving alternating compressions and expansions similar to those produced by sound waves in the air. Thus, a wireless transmitter does not emit Hertz waves which are a myth, but sound waves in the ether, behaving in every respect like those in the air, except that, owing to the great elastic force and extremely small density of the medium, their speed is that of light."

Our comment is as follows: Tesla was absolutely correct in his view that only longitudinal waves were produced in the vacuum. We detect and measure *transverse* EM waves in our detectors, however, due to their detection of *electron precession* in the electron gas of the detectors, wire probes, etc. themselves. We do not measure what is in the vacuum, but *the result on the electron gas in our instrument from interacting with what is in the vacuum.* For an explanation, see Bearden, Tesla's Electromagnetics and its Weaponization," *Proceedings of the 1984 Tesla Centennial Symposium,* International Tesla Society, Colorado Springs, Colorado 1984.

Further, Tesla's view of the ether as gaseous is essentially correct. If one characterizes the quantum mechanical virtual particle flux of vacuum, then this flux of particles is a peculiar "gas" whose component particles — instead of being persistent — come into being spontaneously, exist only fleetingly, and nearly instantly disappear again. But these particles are real, as has been shown by experiment, for their interaction produces real effects in observable detecting systems of the proper sort. Thus the ether is a gas of *fleeting,* nonpersisting (virtual) particles rather than of persistent particles. But it is a gas nonetheless, and Tesla was correct.

88. Essentially they have insisted that Tesla used only transverse wave (translation) EM and hence was only utilizing ordinary LC resonance. Indeed, Tesla was adamantly opposed to the Hertzian idea of transverse EM waves in the ether. He was very struck with the utilization of a wave-complex of frequencies rather than a single frequency — something he had demonstrated with his radio-controlled automata before 1900. E.g., see Nikola Tesla, The True Wireless, "*Electrical Experimenter,* May 1919, p. 29. Here one finds that, when considering Tesla's use of resonance, one *"...must not view it in the light of present day science."* (Ibid., p. 29.) Further, Tesla stated that his *"...transmission through the earth is in every respect identical to that through a straight wire."* (Ibid., p. 62).

In Nikola Tesla, "My Inventions: Part V. The Magnifying Transmitter," *Electrical Experimenter,* June 1919, p. 176, Tesla stated that *"...this wireless transmitter is one in which the Hertz-wave radiation is an entirely negligible quantity as compared with the whole energy."* On p. 178 of the same article, Tesla stated that *"The transmitter was to emit a wave-complex of special characteristics..."*

Tesla always insisted that EM waves in the ether were longitudinal (compression and rarefaction) waves similar to sound waves in the gaseous atmosphere, not transverse waves similar to those in plucked strings. In his article, "The True Wireless," p. 87 he stated: *"The Hertz wave theory of wireless transmission may be kept up for a while, but I do not hesitate to say that in a short time it will be recognized as one of the most remarkable and inexplicable aberrations of the scientific mind which has ever been recorded in history."*

89. For details see Bearden, *AIDS: Biological Warfare,* 1988; *Fer-de-Lance,* 1986 — and, of course, this present article.

90. When great military campaigns or undertakings are planned or in progress, a detailed and sophisticated deception plan is prepared and implemented to deceive the enemy as to the exact operational intent until the last possible minute. For decades such a massive deception plan has been utilized by the Soviets to deceive the West as to Soviet development and utilization of scalar EM weapons. This includes such characteristics as (1) massive censorship of Soviet scientific literature, (2) concealing the development and testing of scalar EM weapons by embedding them in the development and testing of orthodox weapons systems and on orthodox weapon ranges, (3) surreptitious testing of the scalar EM weapons in distant ocean areas at night, (4) constant stimuli — such as the microwave radiation of personnel in the U.S. Embassy — to ascertain whether or not the targeted government knows and recognizes scalar EM utilization, and (5) surreptitious testing against U.S. ships, aircraft, installations, and rockets to generate incidents which, on the surface, appear to be accidental explosions, spurious electromagnetic interference or noise, accidental aircraft crashes, normal metal fatigue, accidental rocket failures, etc.

Y. Aharonov and D. Bohm, "Significance of Electromagnetic Potentials in the Quantum Theory," *Physical Review, Second Series,* 115(3), Aug. 1,1959, p. 458-491.

92. S. Olariu and I. Iovitzu Popescu, "The quantum effects of electromagnetic fluxes," *Reviews of Modem Physics* 57(2), April 1985 gives an extensive discussion of the Aharonov-Bohm effect (which proves the primacy of the potentials rather than the force fields) and an extensive list of references.

93. Bertram Schwarzschild, "Currents in normal-metal rings exhibit Aharonov-Bohm effect," *Physics Today,* 39(1), Jan. 1986, p. 17-20 confirms that the Aharonov-Bohm effect has been proven to the satisfaction of all but the most diehard skeptics.

94. This author's rather crude booklet (Beardcn, *Star Wars Now! The Bohm-Aharonov Effect, Scalar Interferometry, and Soviet Weaponization,* Tesla Book Co., 1984) may have been the first paper in English to clearly speak of the weapons implications of the Aharonov-Bohm effect, specific effects that could probably be attained at a distance by such weapons, and evidence for the Soviet development of them.

95. Whittaker, 1904, ibid.

96. See Bearden, *Fer-de-Lance,* and *AIDS: Biological Warfare* for details on Soviet weaponization of scalar EM interferometry. Also, without naming the Aharonov-Bohm effect as such, but utilizing the concept of scalar beam interferometry as an explanation of Soviet Tesla weapon developments, see this author's paper, Tesla's Secret and the Soviet Tesla Weapons," Tesla Book Co., 1981.

97. Bearden, "Appendix IV: List of Selected Incidents," in *AIDS: Biological Warfare,* 1988 contains an abbreviated chronology of events associated with Soviet development and testing of scalar EM weapons, including Aharonov-Bohm effect scalar interferometry weapons.

98. One considers the Whittaker potential's bidirectional EM wave structure as two bidirectional *energy currents* flowing in a hidden channel between the transmitter (initiation site) and the distant target where the Whittaker potential ends (i.e., the intersection site). Thus, with reference to this energy flow, when transmitter/intersection potentials are equal, no *net* resulting EM energy is transferred from transmitter to interference zone.

When the transmitter's potential is greater than the intersection zone's potential, net energy flows through the hidden channel, *flowing from transmitter to the target/interference zone.* It emerges there as positive energy (scattering/disordering energy, or heat). When the transmitter's potential is less than the intersection zone's potential, positive energy flows through the hidden channel, *flowing from the distant target/interference zone (and cooling that zone in the process) back to the transmitter (and emerging there to heat the transmitter.* In the latter case, the transmitter must transfer the excess heat away or dissipate it locally.

It is as if the distant zone and the transmitter are directly connected together with little of no separation. In that case, one looks at the gradient in potential between the two points. For a positive gradient in one direction, the positive energy flows counter to that direction. For a positive gradient in the other direction, the positive energy flows in the reverse direction from the first case.

However, as can be seen from the bidirectional wave pairs in the Whittaker structural energy is always flowing through the hidden Whittaker channel in *both* directions simultaneously. From the transmitter viewpoint, positive energy is being transmitted and flowing from the transmitter to the zone in one wave, while negative EM energy is being transmitted and flowing in the other wave, from transmitter to the distant zone. The difference in potential between distant interference zone and the transmitter, however, determines which transmission channel — the negative or the positive energy - predominates. If there is no potential difference, then the energy flows are equal, and no net energy flow occurs. If a positive potential gradient exists from transmitter to zone then negative transmission predominates and heat energy extracted from the distant zone must be continually dissipated at the antenna. At the same time, the distant zone is cooled. If a negative potential gradient exists from transmitter to zone, then positive

transmission predominates and positive energy emerges in the distant zone as heating. Note that transmitting negative or time-reversed energy is precisely the same as receiving positive or forward-time energy.

An easy rule is this: To the transmitter, the sign of the gradient from transmitter to intersection zone is the reverse of the sign of the energy transmitted to the distant zone. Another rule is this: Biasing the electrical ground potential of the transmitter positively, produces positive energy transmission. Biasing the ellectrical ground potential negatively, produces negative energy transmission.

In scalar electromagnetics, every transmitter is both a transmitter and receiver — and so is every receiver. In one case the scalar interferometer extracts heat from the distant interference zone (the *endothermic* mode). In the other case the scalar interferometer produces heating in the distant interference zone (the *exothermic* mode).

99. Thus the weapon system has two modes: exothermic, where heat (EM disordering) emerges in the interference zone, and (2) endothermic, where cooling (EM reordering) emerges in the interference zone. Sharply pulsed, powerful inputs produce distant hot or cold explosions, depending upon whether the exothermic or endothermic mode is utilized.

The best way to regard the Whittaker interferometer operation is to visualize a hidden pipe connecting the transmitter and the distant target. In one mode, heat is pumped to the site (and the transmitter is cooled), while in the other mode heat is extracted from the site (and the transmitter is heated).

Extensive use of such interferometry in the endothermic mode results in large amounts of heat at the transmitter site, which must be exhausted. The Soviet scheme is to simply use another Whittaker interferometer connected to a distant exhaust site. That is, the second interferometer receives the excess heat energy from the endothermic first interferometer, and exothermically transmits it to a distant targeted "dump" or exhaust site.

Bennett Island is one such Soviet dump site, where hundreds of anomalous dumping "plumes" and exhausts — some over 150 miles long — have been photographed by U.S. weather satellites. For example, see "Explosive events seen on Soviet Island," *Aviation Week & Space Technology*, Sep. 26, 1983, p. 31 for pictures of Soviet scalar EM interferometry exhausting from Bennett Island. A second Soviet exhaust site exists on Novaya Zemlya.

At any rate, a scalar interferometer can produce heat in a distant zone or extract heat from that distant zone. It can do this gently or explosively, and for a short duration or continuously. Use of the interferometers in coupled pairs, one endothermic and one exothermic, allows one to serve the other as the disposer of waste heat. Also, when the exothermic mode is utilized, the server can extract the energy from a separate distant area and transfer it to the drastically cooling exothermic partner to maintain its temperature.

100. Since ordinary texts are quite confusing on the question of energy, a short dissertation is in order. First, present energy concepts are essentially based on the classical notion of a closed system. Quantum mechanically, that is not true at all; in the entire universe, there exists nothing that is static, and there exists not one single closed system. The vacuum flux/spacetime fluctuation is in violent motion. *Everything* supposedly "static" is in fact only an entity that emerges in this flux cauldron by being in dynamic equilibrium. Thus

one rigorously speaks of equilibrium states and their probabilities, not the existence of static things per se.

When several or many things are in states of stable equilibrium in the background flux, such that one can describe them as highly persistent entities with mathematical relationships between each other, then these equilibria may be said to comprise a *system*. In the classical system, the flux exchanges between the parts and the vacuum may then be ignored, since input exchanges and output exchanges precisely balance. Then the system may be treated as a closed system, with no hidden sources or sinks. Notice that this model presumes (1) there is no hidden order in the background flux, which is purely random and statistical, (2) there are thus no chaotic interactions of the flux exchange when integrated over a period of time or reasonable region of space; the integrated random flux exchanges simply "average to zero," (3) one does not deliberately introduce and collect hidden order in the vacuum flux, to generate a hidden source or sink, (4) one may use the concept of a *stable frame* to mathematically model the system, in which each smooth dimensional axis represents a highly integrated (over all space and time) zero average of fluctuations in the vacuum virtual particle flux exchange with the matter in the system, (5) note that the very prescription of a "universal frame" prescribes the smoothed geometry of the entire equilibrium universe in advance, as well as the nature of the vacuum VPF exchange with matter throughout the universe, (6) macroscopic conservation laws then rigorously apply to the system so long as the frame coordinates remain smoothed to zero *average* fluctuation everywhere, so that linear superposition applies, (7) quantized (fixed) magnitudes of charge, spin, inertial mass, universal constants, etc. apply universally, so long as the frame remains "smoothed", (8) the observer's "rate of flow of time" is assumed to be positive, and (9) the observer's rate of flow of time is assumed to be constant.

Assumption number 8 implies that (a) gravity is an *attraction* of mass, (b) all mass and energy are positive, (c) the vast majority of photoelectric interactions is between photons and negative electrons in atomic shells, so that positive time continues and the familiar macroscopic "forward arrow of time" physical reality is continually created and annihilated, quantum by quantum, at a fantastic rate, providing the past, present, and future, (d) almost all expended energy is scattered, so as to produce entropy, positive work, the positive flow of observer time, steadily increased disorder, etc.

Those are indeed formidable lists of assumptions and implications. They all rest on one fundamental premis: that the virtual particle flux exchange of vacuum remains statistical, random, and constant in volumetric density. Fortunately, today all those assumptions on the formidable list can be modified, because one can now engineer the vacuum's VPF exchange with the atomic nucleus and with charged matter. Now even physical reality itself, as we know it, can be modified and engineered at will, as the technology develops.

In the last two decades, nonlinear materials effects have been discovered which allow altering one or more (or all) of the preceding assumptions, because these effects allow altering and engineering the VPF exchange between vacuum and matter. These discoveries include four-wave mixing, time-reversed EM-waves and their pumping amplification, etc. They also include the Whittaker infolded hidden variable engineering techniques, still undeveloped in the West, and the new cavity quantum electrodynamics.

At any rate, these new principles and techniques allow one to directly engineer and structure the vacuum flux exchange with matter. They allow the translation of negative (reordering) energy from positive (disordering) energy, etc. They allow the production of negative time flow in photoelectric interactions, rather than just positive time flow. And they allow the production of negentropy rather than just entropy.

But how are we to understand negative energy and negative time and their implications?

First, by energy we actually mean *the amount of ordering* or *the amount of coherence* that exists in some dynamic, on-going process of the universe.

What we call static potential energy is actually stored in dynamic, stable, coherent equilibrium processes — it is just *not translating and not scattering.*

The very concept of potential energy, quantum mechanically, implies stable perpetual motion.

What we mean by kinetic energy is a *translating coherence in some underlying dynamic process.*

Kinetic energy is translating, but it is not scattering.

By positive work, we mean *the scattering of stored coherence (energy),* which we refer to as the *"expenditure"* of energy. Rigorously, when we expend energy as work, we convert some stored coherence into incoherence (scattering), as seen by the forward-time observer. This is most important: It does not require energy expenditure per se to turn a shaft, but only to *"overcome the friction, or resistance to turning."*

What we really mean by "overcome the resistance" is that a certain amount of scattering will be invoked upon the energy coherence, producing incoherence. That way we "lose" the energy — i.e., we lose a certain amount of the coherence of the system. Relatively coherent systems, which in their operation produce scattering or incoherence (i.e., work), require constant input of more coherence (i.e., energy).

In the not too distant future, machines will no longer be designed that way. Instead, they will employ time-reversed stages to flow incoherence ("scattered energy") back to coherence ("reordered energy).

These time-reversed stages will of course be open systems, simply taking what is needed from the vacuum VPF to continually restore the input energy. Such machines, of course, will not need continual inputs of fuel in the macroscopic sense. In the microscopic sense, they will continually receive an input of virtual energy from a Whittaker-structured vacuum, cohering it into the macroscopic world, and gating it. In a sense these machines will all be heat pumps of a special sort. And as is well-known, the usable output of a heat pump may be considerably greater than the energy expended to pump the energy from the source to the scattering region (where it is scattered.)

In our present designs, to make matters worse, we normally utilize and expend the *carrier* of the coherence as well as the coherence. This creates the fuel concept, where the fuel is the carrier of the stored energy (coherence). If one only expends and scatters, one continually requires refueling in order to continue the scattering process (doing work). Present engineering and physics utilize the closed system concept exclusively, hence *it rigorously maintains the engineering of systems that require fuel to operate.*

Of course, it does not have to be that way. If we engineer and structure the vacuum, then one may take whatever energy one needs from an inexhaustible source. That is, if one has a flowing river and puts a paddlewheel in it, one can freely extract shaft power and do work with it. The paddlewheel is a "gate": it taps a hidden source for free. If we wish to be non-polluting, of course, we should return the *scattered energy* (the work) back to the

vacuum, as reordered VPF, rather than leaving the scattered energy in the macroscopic environment as "waste heat."

Thus one way to build a so-called *free energy device a* to cause the local vacuum to form a river of potential VPF gradient, and then to develop devices and processes to "tap that VPF river" of energy. This directly converts virtual energy to observable energy. By definition, when one converts virtual energy to observable energy, the local spacetime is curved. Note that the present highly restricted general relativity theory *assumes* one cannot tap the local energy of vacuum, because it assumes that the local spacetime is always flat!

Another way to produce a so-called "free-energy" device is to utilize pumped four-wave mixing, where natural stresses are utilized to furnish the pump waves. Converting normal potentials to Whittaker-structured potentials, and increasing the potentials on the nuclei of targeted material with activated charge structures, produces hidden structured nuclear potential sources (activated atomic nuclei) which can be tapped for energy by several methods. The beauty of this approach is that *once the charge structures are created on the activated nuclei, the vacuum simply replenishes the extracted energy (coherence) as fast as it is withdrawn.* This in fact was the type of source that Frank Golden had created via a local quantum potential, to provide a local source for his open-system motor and yield an output to input ratio of 1.67 (see note 73).

Yet another way to build a "free-energy" device is to recycle disordered energy, created by doing work, back to ordered energy. This is simply recycling disorder back to order, by use of time reversal. That is, when coherence is processed and expended into incoherence, that is what *generates* the forward flow of time. (Actually, that is *identically* the forward flow of time.) So forward time automatically implies the passing of order into disorder (i.e., scattering of EM energy). But since that is so, the opposite kind of time — negative time, or time reversal — must represent the passing of disorder back to order. So to accomplish negentropy, one must manipulate negative time generation devices so that the previously produced incoherent EM energy is returned precisely backwards along its previous scattering path. A priori, that will reorder the scattered energy.

This is done by a two-phase system. One phase looks normal: ordered energy is scattered to do normal work, resulting in a cache of disordered energy. The disordered energy is collected and time-reversed (phase conjugated) by pumped four-wave mixing. This returns the scattered energy precisely backwards along its previous scattering path, reordering it. Thereafter the recycled energy is used (scattered) again, recycled (reordered), used (scattered) again, etc. *Note that this can actually be done,* since all the microparts of the energy — whether ordered as a system or disordered as heat — arc *individually* ordered equilibria in the disordered flux of vacuum. Everything is constantly driven by the vacuum flux anyway, everything is in an open loop system. Therefore it is a matter of *gating* energy that is already flowing as a flux, and hence in both manners; energy is both scattering (diverging from the particle to the vacuum, hence disordering) and reordering (converging from the vacuum back to the particle) constantly. *That is what the "virtual particle flux exchange of the vacuum with the charged particle" is already doing, all the time, with every charged particle, with fantastic power.* Electric charge — and its analogue, magnetic charge — are both tremendous dynamos. Electric charge and magnetism are already mighty engines, waiting for us to gate their energies to our needs. If we utilize our system as an open system and do vacuum structuring, we are in fact structuring (and gating) the virtual particle flux of vacuum. In other words, we are structuring massless charge — the potential itself. *We are then directly gating the vacuum's own engines.* It's just like putting a paddlewheel in a river, only the river we use is subtle, and so must be our paddlewheel.

Objections based on the second law of thermodynamics are usually raised. This law states that, *unavoidably*, in any operation in a closed system, if that operation does external work, you unavoidably reduce the order in the system. That, of course is true if and only if (1) the system is a closed system, and (2) time flow is forward or positive. Actually, the second law actually states only that *the flow of time is always positive.* A steady flow of time in a region means only that there exists a steady rate of scattering of EM energy in the region, a priori.

Note that we have violated both fundamental conditions required for the second law of thermodynamics to hold. Ergo, it should come as no distinct shock that we can readily violate the second law.

The second law presupposes *positive time flow only.* In positive time, the second law is the *law of entropy.* That is the law of disordering or scattering of EM energy. If we make a system produce some negative time, however, then we invoke the negative time aspect of the second law. In negative time flow, the second law is inversed, and it becomes then the *law of negentropy.* In a driven, open-loop macroscopic system, we may seemingly judiciously manipulate the virtual particle flux exchange to accomplish "free energy" and perpetual motion, *in the view of any observer who persists in regarding our macroscopic system as a closed system.*

So we can readily violate local conservation of energy, using amplified time-reversed (phase conjugated) EM energy operations. Whether or not we may be violating overall conservation of energy in the entire universe depends again upon an assumption that one must make. If we assume that the entire universe is closed and conservative, then we do not violate the overall conservation of the universe, but only violate it locally. If, on the other hand, we like the big bang theory and several other of the present very advanced cosmologies, then the vacuum merely pumped itself up to a vastly excited state and exploded, producing the present universe we live in. In that case, the universe is not closed, and it is not energy-conservative anyway. We leave it to the reader to take his or her choice in assumptions. In either case, we can violate the so-called conservation of energy *locally,* and run our motors and power our homes very cheaply indeed.

The amplification method is purely and simply standard, well-known four-wave mixing theory. What orthodox physicists have not realized is that the amplified phase conjugate replica produced by a true pumped phase conjugate mirror is already *negative energy.* As is already in the literature, the reflection/emission of a phase conjugate replica wave by the mirror *does not cause recoil of the mirror.* Pseudo-conjugation, which involves reflection/emission of an ordinary EM wave with a distorted wavefront, *does cause the mirror to recoil* This destroys the present assumption in physics that the antiphoton and the photon are identical. *The antiphoton doesn't cause recoil of the mirror, but the photon does.* So the reader may rest assured that there is something in what the present author is saying after all, and *present physics is just flat wrong in some of its assumptions.*

Understandably, it is very much counter to the interests of the control groups to have this kind of knowledge spread around widely. We are not supposed to discover that, using *open system engineering techniques,* vacuum structuring, and amplified time-reversed waves, technology really does permit a "free lunch" after all. Obviously, however, our academic community is only going to get grants to study closed system conservative energy processes, not open system nonconservative energy processes incorporating time-reversed wave techniques.

At any rate, the scalar EM transmitter, since it is working in both the positive and negative streams of time, is to be considered both a transmitter and a receiver. A "system" is to be considered that consists of the transmitter, the target/receiver, and two hidden bidirectional Whittaker-EM-wave energy currents between transmitter and target Depending upon the relative "grounding bias" vis a vis the transmitter, the receiver/target, and the local vacuum, one may cause "flow" of an excess of ordering from the transmitter to the receiver, or "flow" an excess of disordering from the transmitter to the receiver. Use of coupled scalar transmitters utilizes a two-stage flow process so that the effective flow of order/disorder is between a distant "dump site" and the desired "target site."

101. See Robert A. Fisher, Ed., *Optical Phase Conjugation,* Academic Press, New York, 1983 p. xv. On May 22,1972 two Soviet scientists — from the P.N. Lebedev Physical Institute in Moscow — visited Lawrence Livermore National Laboratory. There they mentioned Dr. B. Ya. Zel'dovich's observation of an extremely curious "distortion undoing" property of the stimulated Brillouin backscattering process in a CS2-fiIled waveguide. Very little reaction by American physicists occurred initially. During the next five years, however, the American reaction had slowly grown until U.S. scientists had become quite interested in phase conjugation and the time-reversed EM wave — at least in *optics.* To this day, very little U.S. work has gone into developing practical microwave phase conjugation devices, in spite of the portentous weapon implications of time-reversed microwave beam weapons. Today, however, at least *some* microwave work in the pumped phase conjugation area has finally started. Cf Session 2, Directed Energy Concepts, Proceedings, SPIE Vol. 1061, *Microwave and Particle Beam Sources and Directed Energy Concepts (1989),* Jan. 16-20,1989, Los Angeles, California.

102. Investigator Ken Moore has confirmed with the World War II German rocket team chief that the German radar team indeed encountered serious anomalies in their experiments.

103. For example, eventually the State Department placed ordinary aluminum window screens over the Embassy windows, etc. to act as Faraday shields. These screen shielded out some 90 per cent or so of the microwave *force field* component of the radiation, but essentially none of the standing Whittaker potential wave portion. This clearly showed the Soviets that we knew nothing of standing Whittaker potential waves, and the need for nonlinear absorber shielding rather than linear conductive/reflective shielding.

104. Two U.S. Ambassadors, Llewellyn Thompson (1953-1957) and Charles Bohlen (1957-1962,1967-1969), predecessors of Stoessel, later died of cancer. Stoessel suffered nausea and bleeding in his eyes while at the Embassy *(New York Times,* Feb. 26, 1976) and was transferred from Moscow in September 1976 because of a strange blood ailment, and reassigned as Ambassador to West Germany. He also died with a leukemia-like disease some yean later. Blood tests administered to personnel at the Moscow Embassy found that about one-third of the Embassy personnel had a higher than average number of lymphocytes in cell counts. Such elevated white corpuscle count — lymphocytosis — is evidence that the body is resisting some sort of disease-inducing agent. Such a reaction *could* occur in resistance to some sort of viral infectious agent, of course. However, *it would most certainly occur in resisting exposure to an EM cytopathogenic Kaznacheyev disease signal pattern in the Whittaker-structured potential.*

In 1959 during then Vice-President Nixon's visit to Moscow, fairly intense levels of microwave radiation were also detected at the U.S. Ambassador's Spasso House mansion in Moscow. Secret Service agent James Golden discovered the radiation of the Ambassador's residence. Nixon slept there and may have been irradiated for one night

before the Russians stopped the radiation. Nixon was scheduled to tour Soviet nuclear facilities, so the Secret Service team was well-equipped with dosimeters and radiation monitors. Interestingly, the radiation of the Ambassador's house was discovered with an *ionizing radiation detector* — a dosimeter. This is one of the few instruments that will detect standing scalar EM potential waves, since increase in the local potential and the addition of a Whittaker bidirectional EM substructure causes increased ionization of gases. Ionizing radiation detectors, such as nuclear dosimeters and Geiger counters, will detect such increased ionization of their internal gases. If the standing scalar potential wave is sufficient to cause ionization in these detectors, then the detectors will detect the Whittaker potential.

105. A. M. Lilienfeld et al, *Foreign Service Health Status Study...,* 1978.

106. Robert C Mallalieu, A *Model of the Microwave Intensity Distribution...,* 1980. See also *Microwave Radiation at the U.S. Embassy...,* Dept. of Commerce, 1981.

107. Y. Aharonov and D. Bohm, "Significance of Electromagnetic Potentials...," *Physical Review,* 1959.

108. Vlail P. Kaznacheyev and L.P. Mikhailova, *Ultraweak Radiations in Intercellular Interactions* [in Russian], Novosibirsk, 1981. See also previous notes regarding Kaznacheyev references.

109. N.D. Devyatkov, Ed., *Applications of Low-Intensity Millimeter Wave Radiation in Biology and Medicine* [in Russian], IRE Akad. Nauk. SSSR, Moscow, 1985.

110. Whittaker, 1903,1904.

111. By scalar interferometry, per Whittaker 1904; per Aharonov and Bohm, "Significance of electromagnetic potentials...", 1959.

112. Vlail P. Kaznacheyev and L.P. Mikhailova, *Ultraweak Radiations in Intercellular Interactions* [in Russian], Novosibirsk, 1981.

113. N.D. Devyatkov, Ed., *Applications of Low-Intensity Millimeter Wave Radiation in Biology and Medicine* [in Russian], IRE Akad. Nauk. SSSR, Moscow, 1985.

114. As was done in the Priore devices in France in the 1960s and 70s.

115. By subharmonic translation, the Kaznacheyev optical cytopathogenic signals emitted by cells dying of a particular disease can be translated into the microwave region, and a microwave pattern signature of that specific disease can be generated, in a manner similar to a carrierless radar of the ultra-wideband type. Then irradiating human targets, even many thousands of miles distant, with the specific microwave cytopathogenic pattern can induce the disease outright in the targeted population. Much weaker, continual radiation with the disease pattern will gradually condition the targeted biological systems for the specific disease, *gradually weakening their immune systems against that specific disease.* In this manner, a relatively harmless influenza, measles, or other disease can gradually be converted into a potent killer *in that targeted population.* In the mid-to-latter 1980's, the Soviets conducted precisely such immune-notching experiments against test mammals off the eastern coast of the U.S. — they targeted porpoises and lowered their immunity against a common organism normally infecting porpoises and simply making them a bit ill. In the test, hundreds and hundreds of porpoises died from the now-potent disease — not

because the disease organism had altered, but because their immune systems had been deliberated "notched" for greatly reduced immunity against that disease.

By time-reversing (phase conjugating) a Kaznacheycv cytopathogenic pattern for a specific disease, a specific electromagnetic antidote pattern can be generated. By irradiating a biological target with that antidote, that actual disease in the biosystem can be cured directly, by electromagnetic means. That is the actual treatment to which Devyatkov is referring, while concealing the role of internalized EM, phase conjugation, and the persistent structured scalar potential.

116. For an explanation of subharmonic oscillation, see "Nonlinear Forced Oscillations," in *Modem Mathematics for the Engineer,* Edwin F. Beckenbach, Ed., McGraw-Hill, New York, 1956, p. 18-20. Note that, in this graviton theory, gravitons are already linked spatially and harmonically/subharmonically. Subharmonic oscillation already exists; it does not have to be created.

117. Twin beams have often been detected in the radiation, fulfilling the requirements for Whittaker scalar EM interferometry. Just how long the Soviets have possessed this technology is evidenced by the fact that the microwave radiation induction of health problems and diseases in personnel in the U.S. Embassy in Moscow began in the mid-50s. The importance of the Embassy radiation, as an intelligence collection tool, is shown by the fact that the Soviets have pointedly continued the radiation even though several Presidents have protested and asked them to stop.

118. Standing Whittaker potential waves can easily penetrate the earth and the ocean, carrying their hidden bidirectional EM wave substructures with them. Therefore underwater and underground targets can be targeted with ease — as was the *U.S.S. Thresher* atomic submarine in April 1963 (see note 61 above). For example, drastic "on-site" or "near-site" testing of Woodpecker induction of disease would be helpful for calibration, realistic field exercise training, and analysis of results prior to actual EM attacks on human targets. For a possible massive Soviet long range EM BW test against dolphins off the East Coast of the U.S., see Joseph F. Sullivan, "Search widening for clues in puzzle of mounting dolphin deaths," *New York Times,* Aug. 9, 1987, p. 32; "Air search finds dolphin deaths are more common than suspected," *New York Times,* Aug. 13, 1987. See also Jean McNair, "Dolphins died of common sea bacterium; scientists baffled," AP release, *Huntsville (Alabama) News, Aug.* 19,1987, p. B-5; Julia Lawlor, "Key: Failure of mammals' defenses," *USA Today,* Jan. 19,1988, p. 1A-2A. One would also suspect that the Soviets have conducted other such tests around the globe.

119. For a probable similar Soviet long range EM BW test against seals in Europe, see David Dickson, "Canine distemper may be killing North Sea seals," *Science,* Vol. 241, Sep. 9, 1988, p. 1284.

120. Bearden, *AIDS; Biological Warfare.*

121. Bearden, *Fer-de-Lance.*

122. Bearden, "Soviet Phase Conjugate Weapons."

123. Bearden, *Soviet Weather Engineering Over North America.* See also "Strange Pressure Waves Crossed MidWest in 1990," *Watt Street Journal,* Jan. 15,1991.

124. Bearden, "Update on Scalar Electromagnetics: New Breakthroughs."

125. See Martin Ebon, *Psychic Warfare: Threat or Illusion?*, McGraw-Hill, New York, 1983, p. 1-11. On June 11, 1977 *Los Angeles Times* reporter Robert Toth met with a Soviet biophysicist, Valery G. Petukhov, and received a manuscript — a scientific paper — from him. On walking away with the paper, Toth was seized by Soviet agents and taken to a police station for interrogation, as was Petukov. A senior academician from the Soviet Academy of Sciences, Professor I.M. Mikhailov, examined the paper and stated that it contained state secrets. Specifically, Mikhailov said: *"The article beginning Petukhov, Valery G., from the words 'micro-organism self-radiation...' to the words'...by means of vacuum particles in space,' states that within the content of living cells are particles... and. these particles are grounds for discussing the fundamental problems of biology in the context of biology and parapsychology. There is also information about the uses of such particles. This material is secret and shows the land of work done in some scientific institutes of our state."*

After additional interrogation several days later, Toth signed a statement and was eventually released, as was Petukov.

Before the ill-fated meeting, Toth had previously met with Petukov, who was apparently Chief of the Laboratory of Bio-Physics at the State Control Institute of Medical and Biological Research. He informed Toth that he, Petukov, was working on a theory of parapsychology based on particles emitted from living cells. These particles could carry information and could explain the basis for parapsychology. In mid-June the Soviet biophysicist had telephoned Toth to tell him that his experiments had been successful, proving his theory. He wanted to give Toth a paper describing his work for publication in the West, because he knew the Soviet authorities would never let his paper be published. It was this 20-page paper that Petukov handed to Toth, triggering the seizure of both men by Soviet authorities.

From the above, one can almost certainly conclude that Petukov's particles that are "pieces of the vacuum medium" were gravitons, and the paper contained a theory of gravitobiology. From Mikhailov's statement, this information was considered a state secret. From our discussion of gravitons and their biological implications, Kaznacheyev's cytopathogenic effect, Devyatkov's information content of the field, and the long years of Soviet microwave radiation of the U.S. Embassy in Moscow, one can most certainly affirm that Petukov's experimental proof of his "particles" and his theory of them indeed duplicated highly classified Soviet EM BW weapons work.

The present author states emphatically that a scientific theory of parapsychological and paranormal phenomena can be formulated from the gravitobiology approach. Further, the formalized theory will be testable. Thus Petukov's information that he had actually experimented with his theory, and experimentally proven it, are consistent with gravitobiology.

126. T.E. Bearden, "Update on Scalar Electromagnetics: New Breakthroughs." The mechanism for generation of a quantum potential depends upon four-wave mixing effects inside the EM bidirectional wave structures of Whittaker potentials of atomic nuclei. A phase conjugate replica — including one that is amplified — is emitted from a pumped/stressed nucleus in response to a small scalar EM signal wave from another nucleus. That signal wave in turn may have been an amplified phase conjugate replica in response to yet another signal wave at another stressed/pumped nucleus.

In a dense signal environment, the probability for multiphoton interaction increases. But multiphoton interaction can easily constitute pumped four-wave mixing, if three waves

are involved (the fourth wave can be generated by the pumped mirror material, where two waves act as the pump wave and the third wave acts as a signal wave.) Thus in a dense signal environment, the probability of forming "pumping/stressing" of the nuclei increases as some function of the number of signals per second per unit volume, as does the probability of pumped four-wave mixing incidents. But notice that each amplified phase conjugate replica is not scattered, but returns precisely to the nucleus where the original signal wave was emitted. In other words, a laser-like coherence of exchange of energy between nuclei begins to occur as environmental signal density increases sufficiently. Note also that this is a *self-organizing and self-ordering behavior.*

The major communication between the nuclei, insofar as the input signal waves are concerned, is in the hidden EM bidirectional wave structure of the standing Whittaker potentials formed on each nucleus and extending out toward infinity, intersecting all the other nuclei in the region. The internal bidirectional EM waves are not limited to light speed, but may move much faster.

In this dense signal environment, then, increased self-ordering of the potentials in the Whittaker-communicating atomic nuclei begin to occur. An emission from one equipment or area is an input to all of the communicating, self-ordering nuclei. So in a variety of electronic equipments in a dense signal environment, gradual self-targeting by repetitive phase conjugation leads to coherent self-organizing of the nuclear potentials, and the formation of a quantum potential. In each equipment, "spurious" signals appear that are actually instantaneous inputs from other connected but distant electronic equipments.

Rigorously, a quantum potential has now begun to form among all the participating atomic nuclei. All participating electronic equipments begin to partially act as if they were all parts of a single equipment system, without spatial separation of the parts.

The precise physical mechanism by means of which the quantum potential is formed is an original discovery by the present author. Note particularly that formation of quantum potentials is subject to experimentation, using this approach and this mechanism.

For various papers treating the quantum potential (but without any notion of the actual mechanism that creates one), see *Quantum Implications; Essays in Honour of David Bohm,* Eds. B.J. Hiley and F. David Peat, Routledge & Kegan Paul, London & New York, 1987. Also, particularly see the various papers on this subject in *Quantum Concepts in Space and Time,* Eds. R. Penrose and C.J. Isham, Clarendon Press, Oxford, 1986. These two references are highly recommended.

127. See Mark Thompson, "Mixed signals may have misguided U.S. weapons," *The Washington Post,* Jan. 22,1989, p. A4, for a good description of the incident.

128. Though details are still sketchy, there also appears to have occurred the formation of a quantum potential during a large exercise in the MidEast several years ago. The exercise involved a large number of aircraft, radars, radios, etc.

129. See B.J. Hiley and F. David Peat, "General introduction: the development of David Bohm's ideas from the plasma to the implicate order," *Quantum Implications...,* ibid., p. 13. Quoting: *"...the quantum potential contains an instantaneous connection rather than the expected retarded connection. In some ways this is like a reintroduction of a land of action-at-a-distance, a feature that goes against the whole historical development of physics."* Also, particularly see the characteristics of a quantum potential, listed on p. 15. On p. 23, Hiley and Peat show that the quantum potential itself is determined by an

infolding-unfolding process. A more directly physical — and testable — model of this exact quantum potential formation process has been given by Bearden, as briefly sketched out in note 126 above.

For some nonlinear and nonlocal quantum mechanical implications upon certain general properties of spacetime events and processes, see Abner Shimony, "Events and processes in the quantum world," *Quantum Concepts in Space and Time,* R. Penrose, and CJ. Isham, Eds., Clarendon Press, Oxford, 1986, p. 182-203. Quoting from p. 186: *"...unless revolutionary evidence is presented in favour of changing the relativistic conception of space-time structure, an acceptable hidden variables theory must conform to this structure."* Quoting again (p. 192): *"...local hidden variable theories may be possible only if relativity theory is replaced by a radically different theory of space-time structure."* Note that the present photon-coupled averaged graviton theory of the structure of space-time is just such a "radically different theory" as is required. Particularly see Yakir Aharonov, "Nonlocal phenomena and the Aharonov-Bohm effect," ibid., p. 41-56 for a discussion of modular variables and the capability to violate normal conservation laws of nature.

130. Particularly see Y. Aharonov and D. Bohm, "Significance of Electromagnetic Potentials in the Quantum Theory," *Physical Review,* Series 2,115(3), Aug. 1,1959, p. 485-491. See also S. Olariu and I. Iovitzu Popescu, "The quantum effects of electromagnetic flaxes," *Reviews of Modem Physics* 57(2), April 1985 for an extensive list of references on the AB effect.

131. Particularly see Lee Smolin, "Stochastic mechanics, hidden variables, and gravity," *Quantum Concepts in Space and Time,* ibid., p. 147-173 for a discussion of (1) some hidden variable possibilities in quantum mechanics, (2) (p. 165) the fact that Bell's theorem seems to indicate the possibility that nonlocal correlations may be found between any pair of systems which have previously interacted, and (3) (p. 166) the possibility that nonlocal variables might even dominate the energetics of a QP-connected system and swamp the local physics completely.

132. In Maxwell's original quaternion EM theory, the scalar component captured the internal, infolded stress energy when EM force fields interacted to produce zero force field resultants. In the vacuum, this infolded EM structure formed a local scalar potential and structured the local vacuum, curving local spacetime in the process. By discarding the scalar component of the quaternion, Heaviside threw this structured potential out of classical electromagnetic theory. This in turn threw out correlated "action at a distance" from EM theory. In appropriating Gibb's thermodynamics statistics for quantum change, quantum mechanics was constructed with a similar omission of hidden EM order (chaos), even though it statistically retained the necessity for action at a distance. See again note 52. Indeed, Heaviside's vector curtailment of Maxwell's quaternion theory can be experimentally shown to be in error, and a modification of Weber's action at a distance theory shown to be consistent with those experiments. For a discussion of the limitations of the Heaviside theory (so-called "Maxwell's theory"), see J.P. Wesley, "Weber Electrodynamics, Part I: General Theory, Steady Currents"; "Weber Electrodynamics, Part II: Unipolar Induction, Z-Antenna", *Foundations of Physics Letters,* 3(5), 1990, p. 443-490. Part III (to be published) will deal with the impact of Weber electrodynamics on mechanics and gravitation.

133. Again see note 52. By overstating his assumption that local spacetime was flat, Einstein excluded the internal, infolded EM structure of stressed spacetime, thus excluding EM from unification with general relativity. The single feature that could have unified electromagnetics, quantum mechanics, and general relativity was hidden, infolded EM

energy of spacetime. Ironically, each of the three disciplines eliminated this feature, either at its formation or shortly thereafter by retranslation.

134. T.E. Bearden, *Soviet Weather Engineering Over North America,* 1-hr, videotape, 1985.

135. T.E. Bearden, "USSR: New beam energy possible?", *Defense & Foreign Affairs Daily,* 13(111), June 12,1984, p. 1-2.

136. For example photographs and artists illustrations, see Bearden, *Soviet Weather Engineering Over North America,* 1985. For a spectacular example of the rapid formation of three giant radial clouds over Los Angeles on Jan. 26, 1986, see Bearden, *Fer-de-Lance,* p. 168-169. Margaret Wilson observed these three sharp, distinct giant radial clouds form one after the other, at 10-minute intervals. These sharp cloud signatures were associated with Soviet bending of the jet stream sharply southward at Los Angeles, then steering the jet stream eastward across the U.S. far to the south of its normal path. The Soviet purpose was to bring cold arctic air down upon the Florida Panhandle, exposing the waiting shuttle at Cape Canaveral to abnormally cold temperature stress, and this was successfully accomplished. The shuttle, of course, was the ill-fated *Challenger,* which two days later was destroyed by the Soviet Union shortly after launch, on Jan. 28, 1986. For a discussion of the many positive indicators that the Soviets destroyed the shuttle, see Bearden, *AIDS: Biological Warfare,* 1988 and *Fer-de-Lance,* 1986.

Indeed, the Soviet KGB gave a party at their Moscow headquarters on the evening of the day that the shuttle was destroyed. *The stated purpose of the party was to celebrate the success of their active measures against the Challenger!*

137. E.T. Whittaker, "On the partial differential equations of mathematical physics," *Mathematische Annalen,* vol. 57,1903, p. 333-355. See also Note 13 above.

138. D. Bohm, *Phys. Rev. 85,* 1952, p. 166,180.

139. E.T. Whittaker, "On an expression of the electromagnetic field due to electrons by means of two scalar potential functions," *Proc. Lond. Math. Soc,* Series 2, Vol. 1, 1904, p. 367-372. See also note 13 above.

140. Y. Aharonov and D. Bohm, "Significance of Electromagnetic Potentials in the Quantum Theory," *Physical Review,* Second Series, 115(3), Aug. 1,1959, p. 485-491.

141. In fact, in his 1904 paper Whittaker shows that *all* classical force field electromagnetics can be replaced by scalar EM potentials and their interferometry. Specifically, any EM force Geld can be replaced by two scalar potential fields. Per Whitney, a completely accurate replacement may require four scalar potential fields rather than two. (Cynthia Whitney, private communication, 1990).

142. Richard W. Ziolkowski, "Localized transmission of wave energy," *Proc. SPIE* Vol 1061, *Microwave and Particle Beam Sources and Directed Energy Concepts,* Jan. 1989, p. 396, 397. For a mention of this same bidirectional EM wave Whittaker structure in the potential connected with the Schroedinger wave, see Ignatovich (reference 16, above.).

143. Thus they have not realized the profound importance of the Whittaker work, or that Whittaker wrote the basis for an *engineerable* unified field theory of electromagnetics and gravitation that has been extended and drastically weaponized by the Soviet Union.

144. The two previous ambassadors who died of leukemia-like diseases probably induced by the Soviet microwave radiation of the Embassy were Llewellyn Thompson and Charles Bohlen.

145. Walter Stoessel Jr. died of leukemia in Dec. 1986 at the age of *66.* He served three tours in Moscow: 1947-49 as a second secretary, 1963-65 as minister-counselor, and 1974-76 as U.S. Ambassador to the Soviet Union. His latter tour as Ambassador to the USSR was cut short by reassignment to another post in 1976 because he had developed a leukemia-like illness.

146. See note 33 above.

147. See note 34 above.

148. The necessity for persistence of the structured potential in induction of diseases is that one must *charge up* or *activate* the potentials of the atomic nuclei in the targeted human cells with a consistent Whittaker bidirectional EM substructure. This charge-up can be a time-consuming process, particularly when fairly weak signals are involved. By holding a persistent potential value, the infolded deterministic Kaznacheyev/Devyatkov disease structure acts much like a "constant voltage charger" applied to a "capacitor" to charge it up — only, in this case, the infolded EM substructure is slowly charging-up the nuclear potentials of the atomic nuclei with the desired Whittaker infolded structure.

149. Executive Intelligence Review Special Report, Walter J. Hamerman et al, *An Emergency War Plan to Fight AIDS and Other Pandemics,* Feb. 15,1986, p. 86.

150. Ergo Brezhnev's characterization of weapons of this nature as *"more frightful than the mind of man has ever imagined."* Khrushchev in 1960 stated that these weapons were so powerful that, if unrestrainedly used, they could wipe out all life on earth.

151. See note 24 above. For a complete resume of the Priore Affair, see Jean-Michel Graille, *Le Dossier Priore,* De Noel, Paris, 1984 (in French). See also Christopher Bird, "The Case of Antoine Priore and His Therapeutic Machine: A Scandal in the Politics of Science," in Bearden, *AIDS: Biological Warfare,* Tesla Book Co., 1988, p. 346-375.

152. For additional information on the Priore affair, see David M. Rorvik, "Do the French have a Cure for Cancer?", *Esquire* Magazine, July 1975, p. 110-111, 142-149. See also J.B. Bateman, "A Biologically Active Combination of Modulated Magnetic and Microwave Fields: The Priore Machine," Office of Naval Research, London Report R-5-78, Aug. 1978. See also J.B. Bateman, "Microwave Magic," Office of Naval Research London Conference Report, ONRL C-14-77,1977.

153. See also A. Priore, "Method of Producing Radiations for Penetrating Living Cells," U.S. Patent No. 3,280,816, Oct. 25,1966.

154. For a development of this startling thesis vis a vis the AIDS crisis, see T.E. Bearden, *AIDS: Biological Warfare,* Tesla Book Co., 1988. See also EIR Special Report, Warren J. Hamerman et al, *An Emergency War Plan to Fight AIDS and Other Pandemics,* Feb. 15, 1986.

155. Simultaneously phaselocking of 10 Hz pulses on multiple Woodpecker channels was previously mentioned in Bearden, *The Excalibur Briefing,* 1st Edn., Strawberry Hill Press, San Francisco, 1980, p. 258-260.

156. Robert C. Beck, "Extreme Low Frequency Magnetic Fields and EEG Entrapment, A Psychotronic Warfare Capability?", Bio-Medical Research Associates, Los Angeles, Mar. 1978.

157. S.K. Lisitsyn, "New Approach to the Analysis of Electroencephalograms," *Problems of Bionics (Selected Articles),* p. 16-25, Defense Documentation Center Report AD 730045.

158. V.K. Ignatovich, "The remarkable capabilities of recursive relations," *American Journal of Physics,* 57(10), Oct. 1989, p. 873-878.

159. Ibid. Unfortunately Ignatovich apparently knew nothing of Whittaker's expression of this over eight decades earlier, and he does not reference Whittaker's work.

160. I am informed that the American researcher G. Wilbanks has successfully duplicated the Kaznacheyev experiments.

161. Again see "Nonlinear Forced Oscillations," in *Modem Mathematics for the Engineer,* Edwin F. Beckenbach, Ed., McGraw-Hill, New York, 1956, p. 18-20.

162. R. Courrier, 1977. "Expose de M. le Professeur R. Courrier secretaire perpetuel de l'Academie des Sciences fait au cour d'une reunion a l'lnstitut sur les effects de la machine de M.A. Priore le 26 Avril 1977." (in French).

163. M.R. Riviere, A. Priore, F. Berlureau, M. Fournier and M. Guerin, "Phenomenes de regression observes sur les greffes d'un lymphosarcome chez des souris exposees a des champs electromagnetiques," [Phenomenon of regression observed on the graftings of a lymphosarcome in mice exposed to electromagnetic fields], *Compt. Rend. Acad. Sci.* (Paris), 1965, vol. 260, p. 2099-2102 [in French].

164. R. Pautrizel, M.R. Riviere, A Priore, and F. Berlureau, "Influence d'ondes electromagnetiques et de champs magnetiques associes sur l'immunite de la souris infestee par Trypanosoma equiperdum," [Influence of electromagnetic waves and associated magnetic fields on the immunity of the mouse infected with the Trypanosoma equiperdum], *Compt Rend. Acad. ScL* (Paris), 1966, Vol. 263, p. 579-582 [in French].

165. R. Pautrizel, A. Priore, AN. Pautrizel and P. Chateau-Reynaud-Duprat, "Guerison de la trypanosomiase experimentale par l'association de champs magnetiques et d'ondes electromagnetiques: une stimulation des defenses de l'organisme," [Cure of the trypanosomias by associated magnetic fields and electromagnetic waves: a stimulation of the organism's defenses], Communication presented to the *Journees Nationales Microondes — Colloque Hertzienne et Dielectriques,* Lille 26-29 juin 1979, p. 31.

166. See Richard Kidd et al, "Evolution of the modern photon," *American Journal of Physics,* 57(1), Jan. 1989, p. 27-35.

167. Our detectors measure on the time-forward photon half, not the time-reversed photon (antiphoton) half. The antiphoton half produces a slight recoil force (Newton's third law reaction force) in our instruments, which we totally ignore.

168. For confirmation that the Heaviside equations — which presently are erroneously called "Maxwell's equations" — are not to be found anywhere in *any* of Maxwell's books and papers, see H.J. Josephs, "The Heaviside papers found at Paignton in 1957," *Electromagnetic Theory by Oliver Heaviside,* including an account of Heaviside's

unpublished notes for a fourth volume, and with a foreword by Sir Edmund Whittaker, Vol. m, Third Edition, Chelsea Publishing Co., New York, 1971, p. 647. See also Sir Edmund Whittaker, "Oliver Heaviside," *Bulletin of the Calcutta Mathematical Society,* Vol. 20,1928-29, p. 202. See also Paul J. Nahin, Oliver Heaviside: *Sage in Solitude,* IEEE Press, New York, 1988, p. 9, note 3.

Also, it is little known that, in his later years, Heaviside may again have turned to quaternion operations, and even developed a "unified" theory of electromagnetics and gravity. These papers were never published, but were reported found in 1957 (some electrical scientists, however, continue to dispute the authenticity of the papers, which were found under some floorboards in the apartment where Heaviside lived alone until his death). Little or no adequate review of this unified theory has been made, though several writers have waxed eloquent and expressed judgements pro and con as to the theory's authenticity, its promise, or its alleged uselessness.

169. Henry C. Monteith, "Dynamic Gravity and Electromagnetics Processes, Part *I," Journal of the U.S. Psychotronics Association,* 1(2), 1988 (presented July 1987).

170. Henry C. Monteith, Dynamic Gravity and Electromagnetics Processes, Part II," July 1988. Also, in July 1989 Monteith presented two other fundamental papers in this area to the Annual USPA Symposium in Sacramento, California.

171. Henry C. Monteith, "Visualization and Duality in Mathematical Physics," Apr. 15,1986.

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POSSIBLE WHITTAKER UNIFICATION OF ELECTROMAGNETICS, GENERAL RELATIVITY, **AND** QUANTUM MECHANICS

PART I: BACKGROUND

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ABSTRACT

Unrecognized for what it was, in 1903-1904 E.T. Whittaker (W) published a fundamental, engineerable theory of electrogravitation (EG) in two profound papers. The first (W-1903) demonstrated a hidden bidirectional EM wave structure in the scalar potential of vacuum, and showed how to produce a standing scalar EM potential wave ~ the same wave discovered experimentally four years earlier by Nikola Tesla. W-1903 is a hidden variable theory that shows how to deterministically curve the local and/or distant spacetime using EM. W-1904 shows that all force field EM can be replaced by interferometry of two scalar potentials, anticipating the Aharonov-Bohm effect by 55 years and extending it to the engineerable macroscopic world. W-1903 shows how to turn EM into G-potential, curve local and/or distant spacetime, and directly engineer the virtual particle flux of vacuum. W-1904 shows how to turn G-potential and curvature of spacetime back into force-field EM, even at a distance. The papers implement Sahkarov's 1968 statement that gravitation is not a fundamental field of nature, but a conglomerate of other fields. Separately applied to electromagnetics (EM), quantum mechanics (QM), and general relativity (GR), an extended superset of each results. The three supersets are Whittaker-unified, so that a testable, engineerable, unified field theory is generated. EM, QM, and GR each contained a fundamental error that blocked unification, and these three errors are explained. The Schroedinger potential can also be structured and altered, indicating the direct engineering of physical quantum change. Recently Ignatovich has pointed out this hidden bi-directional EM wave structure in the Schroedinger potential, without referencing Whittaker's 1903 discovery of the basic effect Coupling of photon/antiphoton pairs into spin-2 gravitons, and decoupling of gravitons to yield paired photons, follows and extends photobiology. An engineerable, hidden-variable theory of the operation of mind, personality, and memory can be constructed and tested. Some of the profound implications for all of physics and biology are pointed out

Electromagnetics Theory Has Foundations Difficulties

There exists today a small but growing number of serious scientists who have become aware that the presently accepted electromagnetic theory is seriously flawed. Shortcomings in the theory are readily cited.

For example, in railgun experiments the Lorentz force law has been falsified. It was always an approximation, and does not adequately approximate at high energies.[1]

Also completely contrary to orthodox EM theory, the EM force fields are not primary agents at all, but are effects produced in and on the physical system by the potentials. As an example, we cite the Aharonov-Bohm effect, which proves that, even in the total absence of the force fields,

the potentials remain and can interfere at a distance to produce real effects in charged particle systems.[2] Finally the AB effect has been proven to the satisfaction of all but the most diehard skeptics.[3] However, its fundamental impact on the basic notions underlying classical EM theory continues to be resisted by all but a handful of scientists.

These present shortcomings were not present in the original *quaternion* EM theory by James Clerk Maxwell.[4] Indeed, the original Maxwell theory contains many things that were mistakenly eliminated from the abbreviated *vector* theory that was formulated by Heaviside and Gibbs, and finally adopted.[5] Further, these things that do not exist in conventional EM theory, but that exist in Maxwell's actual quaternion theory, can be used in specially designed equipment, and the operation of that equipment will be inexplicable by present-day electromagnetic theory. This can be even further explained and developed experimentally according to Whittaker's fundamental approach.[6]

In a direct sense, Whittaker showed how to engineer the structured scalar potential, to build vacuum engines with hidden electromagnetic wave structures that are still unsuspected today. Much of the content of the Aharonov/Bohm paper was anticipated - and extended in an engineerable, testable manner -- by Whittaker in 1903 and 1904.

In 1903 Whittaker showed that a standing scalar potential wave can be decomposed into a special set of bidirectional EM waves that convolute into a standing scalar potential wave. As a corollary, then, a set of bidirectional EM waves -- stress waves -- can be constructed to form a standing scalar potential wave in space. Since all potentials represent trapped energy density of vacuum, they are gravitational in nature.[7] The standing Whittaker scalar potential wave represents a standing wave of variation in the local curvature of vacuum, sharply in contradiction of the assumptions of present electromagnetics and general relativity.[8]

The very next year, Whittaker's second paper (cited above) showed how to turn such G-potential wave energy back into EM energy, even at a distance, by scalar potential interferometry, anticipating and greatly expanding the Aharonov-Bohm effect. Indeed, Whittaker's second paper shows that the entire present force-field electromagnetics can be directly replaced with scalar potential interferometry.

This is even more striking when one realizes that potentials pervade through the electron shells of an atom, directly reaching the nucleus and centering on it. *External* changes (gradients; force fields) of the potentials interact primarily with the electron shells of the atom. The primary interaction between the infolded, *internalized* EM bidirectional wave structure of a Whittaker potential is with atomic nuclei, rather than the atom's electron shells, because in the standing Whittaker potential wave the magnitude of the external potential is not changing. For the First time, then, the Whittaker methodology allows the direct engineering and structuring of the nuclear potentials themselves, even with miniscule EM power, which is a new capability of striking importance and application. As just one example, the binding energy of an atomic nucleus is directly accessible and - theoretically -- engineerable.

Recently Ignatovich has pointed out the hidden bi-directional EM wave structure in the Schroedinger potential, without referencing Whittaker's 1903 discovery of the basic effect.[9] Also, recently modern researchers, working on acoustic missiles and with the scalar acoustic wave equation, have "rediscovered" Whittaker's 1903 infolded bidirectional planar waves inside the scalar wave.[10] They do not appear to have yet recognized its relevance to their work in *electromagnetic* missiles.[11]

Whittaker's paper takes on a significant new meaning, however, in light of Sakharov's 1968 hypothesis that gravitation is not a primary Geld of nature, but is produced as a result of interactions of other fields.

Sakharov's Hypothesis and Stochastic Electrodynamics

Recently new developments in stochastic electrodynamics (SED) have shown that many fundamental parts of physics are "already unified" in terms of electromagnetics and gravitation. SED experienced almost explosive activity and development following Sakharov's 1968 hypothesis that the gravitational field may not be a primary field of nature, but a secondary or residual effect associated with other nongravitational fields.[12] Actually, general relativity has always focused on energy as the thing which really has gravitation. Trapped energy, such as mass, is particularly important. But since mass is essentially trapped EM energy, relativity has essentially assumed Sakharov's hypothesis anyway, without stating it so explicitly. Further, it considers "the" gravitational potential as a conglomerate of other things.[13]

Starting from Sakharov's postulate, to the first order gravitation should be due to some aspect of the EM field, since EM is the strongest force normally encountered in the macroscopic world experimentally. Thus Sakharov focused attention upon the zero-point EM energy fluctuations (ZPF) of vacuum. Sakharov conjectured that the Lagrange function of the G-field is generated by vacuum polarization, due to fermions.[14] Akama et al examined the potential generation of gravity as a collective excitation of fermion-antifermion pairs.[15] Haxlacher and Mottolo proved that spacetime (ST) curvature can arise from the quantum fluctuations of pure gauge fields.[16] Zee showed that gravity is generated as a symmetry-breaking effect in quantum field theory in which a dynamical scale-invariance breaking is postulated to take place at energies near the Planck mass.[17] Amati, Veneziano and Yoshimoto showed that in pregeometric models the Einstein action and metric may be generated from quantum fluctuations of matter fields.[18] A review of the exploding field was given by Adler,[19] with particular emphasis on the case of renormalizable field theories with dynamical scale-invariance breaking, in which the induced gravitational effective action is finite and calculable.

Recently the well-known physicist, H.E. Puthoff of the Institute of Advanced Study at Austin, has applied the SED approach to significantly advance the stochastic electrodynamics field. He has successfully explained why the atom's orbital electrons do not decay into the nucleus, even though by conventional EM theory each electron must constantly radiate EM energy, since it is constantly accelerated.[20] He has also shown that gravitation can indeed be regarded as an induced effect associated with zero-point EM fluctuations of the vacuum.[21]

Finally, Puthoff has shown a feedback-derivation of the source of the vacuum EM zero-point energy fluctuations from quantum fluctuation motion of particles driven by the ZPE.[22] Thus quantum fluctuation motion of particles and vacuum ZPE fluctuations are connected by a causal, self-regenerating cosmological feedback cycle.

There are several important conclusions to be taken from the important SED work since Sakharov's seminal suggestion, as follows: (1) In stochastic electrodynamics, very solid theoretical foundation exists for electrogravitation. (2) The vacuum EM ZPF may be regarded as causally connected to quantum mechanical particle jitter (Zitterbewegung motion) and vice versa, though the feedback mechanism into the virtual particle flux of vacuum is normally hidden by the large-scale integration represented by any macroscopic object or process. (3) The SED theoretical demonstration of this hidden mechanism adds new emphasis on the rather neglected hidden variable theories. (4) In some fashion, statistical quantum change is chaotic rather than random, *for it has already been shown by Puthoff that the vacuum ZPF fluctuations driving everything are totally deterministic.* It follows that, theoretically, hidden order already exists in quantum change, and quantum change must be *already chaotic.* Thus one can state that quantum change can at least partially be deterministically ordered, affected, and manipulated, *because it already is.* (5) It follows that there may well exist engineerable mechanisms that can affect or manipulate quantum change.

What Whittaker has described in his 1903 paper is a *standing electrogravitational wave* -- a standing wave in the local curvature of spacetime itself - that can readily be constructed experimentally. This Whittaker standing potential wave is precisely the new form of standing EM wave that NikoLa Tesla had experimentally discovered being radiated from a thunderstorm four years earlier, on the night of July 3-4, 1899, and which he recorded in his Colorado Springs Notebook on the morning of July 4, 1899.[23] Further, Whittaker's paper directly implies that the hidden variable determinism shown by Puthoff to be driving the zero-point EM fluctuations can also be engineered, both locally and at a distance.

In short, Whittaker's 1903 paper shows how to turn electromagnetics into gravitational potential. Unknowingly, Whittaker already showed the correct engineering way to unify EM and G fields, and already falsified one of Einstein's later primary GR assumptions -- that the local spacetime is never curved — in a testable manner, over a decade before Einstein published his theory of general relativity.

In the very next year, 1904, Whittaker's second paper (orally presented in 1903) was published.[24] In this little-noticed paper Whittaker shows that *all* classical force field electromagnetics can be replaced by scalar EM potentials and their interferometry. Specifically, any EM force field can be replaced by two scalar potential fields and scalar interferometry. The combination of this paper and the 1903 *Mathematische Annalen* paper not only includes the Aharonov-Bohm effect, but specifies a testable method for producing a macroscopic Aharanov-Bohm effect, even at large distances.[25]

Present Electromagnetic Theory is Incomplete

As stated above, Maxwell's original EM theory was written in quaternions, which were an extension to the complex number theory and an independent system of mathematics. In short, since the quaternion is a hypernumber, Maxwell's theory was a *hyperspatial* theory — not just the limited three-dimensional subset that was extracted and expressed by Heaviside and Gibbs in terms of an abbreviated, incomplete vector mathematics.[26]

Oliver Heaviside was a brilliant, self-taught genius who never formally attained a university degree, and whose papers were printed in technical magazines rather than scientific journals. When Maxwell published his *Treatise* in 1873, Heaviside was just teaching himself differential equations. Heaviside's imagination was completely seized by Maxwell's book, and Maxwell forever became his hero. However, he had great difficulty with quaternions and could not completely understand them.

A severely puzzled Heaviside abhorred the quaternion, since it linked together a scalar component and a vector component — or "apples and oranges," in his view. He excised the scalar component of the quaternion and excluded the hyperspatial characteristics of the directional components of the quaternion - producing his much more limited vectors. To unite magnetics and electromagnetics, the simplest complex aspect of the quaternion had to be restored by resorting to ordinary imaginary numbers. These machinations to the quaternion theory, however, discarded its unified field theory aspects. In short, Heaviside produced a very practical, highly restricted subset that was far easier to engineer -- but he threw out electrogravitation in the process. Further, Heaviside hated the potential because he did not truly understand it. He stated that it was *"...mystical and should be murdered from the theory."* He conditioned generations of physicists and engineers to erroneously believe that the potential was just a mathematical convenience, and had no actual physical realization. Indeed, most electrical physicists and electrical engineers are still of that erroneous persuasion today, even though the

Aharonov-Bohm work has long-since falsified such a position, both theoretically and experimentally.

The present author has previously pointed out that Maxwell's quaternion theory was in fact a unified theory of electromagnetics and gravitation, and that the scalar component of the quaternion was the electrogravitational part.[27] That part was discarded by Heaviside and Gibbs, and so electrogravitation no longer appears in the electromagnetics that resulted from Heaviside's and Gibbs' surgery on Maxwell's quaternion theory.

Electrogravitation Was Also Excluded From General Relativity

The electrogravitational effect was also erroneously excluded from Einsteinian general relativity (GR). Einstein unwittingly narrowed his general relativity to only a subset of an unrestricted general relativity of curved spacetime. This GR error was an indirect result of the fundamental Heaviside/Gibbs omission error in classical electromagnetics.

Unfortunately, Einstein's view of electromagnetics approximated the classical Heaviside/Gibbs view. In classical EM theory, the electrical potentials - which actually were electrogravitational potentials - were already discarded as having no physical significance, and EM was considered mutually exclusive to G. Therefore, Einstein only considered the weak gravitational force due to the attraction of mass, in developing his general relativity theory of curved spacetime. The G-force is far weaker than the E-force; for two electrons, for example, the attractive G-force between them is on the order of only 10^{-42} times as strong as their electrical E-force repulsion. Thus the G-force is incredibly smaller than the EM force. If only the weak G-force is considered for curving spacetime, then there will never be an *observable* curvature except in the immediate vicinity of a very large mass — such as on the surface of the sun or near a star.

Einstein reasoned that the laboratory and the observer/scientist/instrument would never be on the surface of the sun or near a star. Therefore, the local spacetime -- where the lab and the scientist/observer and his instruments are ~ would never be observably curved. The local spacetime of the observer would always be flat. Unfortunately Einstein overgeneralized his thought examination, and he stated one of his fundamental postulates of general relativity as *"The local spacetime is always flat."* This is an erroneous overstatement. The postulate should be more correctly stated as follows: *"The local spacetime is always flat, whenever only the weak gravitational force is used for the agent of curvature, and the observer is not near a large collection of mass, such as a star."*

The two statements of the postulate differ fundamentally. Einstein's overstatement of the postulate does not allow the far stronger EM force to be used for curvature; *in effect, his own postulate excluded electromagnetics from curvature unity with gravitation, in his own general relativity theory.*[28] On the other hand, the corrected statement of the postulate admits the following corollary: *"When a very strong force such as the electromagnetic force is used for the agent of curvature, the local spacetime may be curved, even though the observer is not near a large collection of mass, such as a star."*[29]

Unfortunately, Einstein's modern followers have raised Einstein's theory to a dogma,[30] and have vigorously enforced his overstatement of the locally flat spacetime. In so doing, general relativity has been erroneously reduced to a theory that is basically not experimental: *A priori, if the local spacetime is flat, then there is no local experiment or local apparatus that involves or yields a curved local spacetime.*

The Restricting of Quantum Mechanics

Today, quantum mechanics is our most successful physics theory. Its predictions - even the eery prediction of action at a distance - have been proven time and time again. However, quantum mechanics theory is known to have a formidable and serious difficulty: Try as they will, quantum physicists cannot find chaos in the theory. The theory is known to be wrong unless it possesses chaos (hidden order inside its statistics), yet the best efforts of quantum physicists have failed to find it.[31]

Again, any mathematical discipline is totally implied by its foundations postulates, and that is true of quantum mechanics. If the best efforts of the ablest physicists of the day cannot find chaos in the present QM, then one may suspect that the present QM does not contain chaos (hidden order). If that is true, then some present postulate - either explicit or implicit - of QM must exclude hidden order in quantum change. If so, the "real" QM needed is a superset that has at least two subsets: one (the missing) subset includes chaos, while the present subset excludes chaos. Our line of reasoning leads us to suspect that one or more of the postulates of the present QM theory is in error or overly restrictive, and must be changed to allow the missing chaotic subset.

Indeed, we may resolve this formidable QM problem quite simply by examining the *statistics* utilized by quantum mechanics. When QM was being formulated, scientists simply appropriated and included the thermodynamic statistics of Williard Gibbs (the same Gibbs who, together "with Heaviside, was responsible for the highly restricted vector subset of Maxwell's theory of electromagnetics.). Gibbs' statistics was totally based on the notion of the random variable. That is, the change (value assumed by the variable in a specific instance) is not only totally statistical, it is also *totally random.* Quantum physicists assumed a postulate of QM as follows: *quantum change is totally statistical* However, because of the Gibbs statistics, in their application of the theory they *interpreted* that postulate in a much stronger fashion, as if it had been stated thusly: *Quantum change is totally statistical and randomized.* The actual postulate and the presently applied interpretation of it are in fact two quite different statements, and the interpretation is far more restrictive than actually implied by the postulate itself.

Further, the strong interpretation can readily be falsified. As an example, the macroscopic universe is simply a large integration (collection) of quantum changes. If these component quanta occur totally randomly, then no integration of them would yield the ordered, macroscopic world we all live in, because integrated randomness is still random. Therefore, since the ordered macroworld exists, the present QM strong interpretation of its own statistical quantum change postulate is invalid.

Also, if quantum change were totally random, then there would never be any possibility, *a priori,* of engineering it deterministically. On the other hand, if hidden order is admitted, there is at least *the possibility* of directly engineering physical quantum change itself.

Interestingly, the renowned physicist David Bohm has shown that a hidden variable theory of quantum mechanics can actually be constructed, whereby one could potentially engineer physical change.[32] It is well-known that experimental physics does not in any manner refute hidden variable theories. Because of the historical attachment of physics to the theory of the random variable, such contrary notions as chaos (hidden order) and hidden variables have simply been shuffled aside. The usual objection is Occam's razor; a theory must predict something different, or it is said to be unwarranted.[33] The Whittaker hidden variable approach certainly predicts many profoundly different engineerable effects and capabilities that mandate its full examination.

A much better, more valid interpretation of the quantum change postulate is as follows: *Quantum change is statistical, and may contain hidden order.*

The two interpretations differ sharply. In the new and less restrictive reinterpretation, one has two cases or subsets of QM as follows: (1) the subset where quantum change contains partial order, hence is *already chaotic*, and (2) the special subset where the internal order has vanished, leaving the statistics as Gibbs' random variable statistics, and exhibiting the present quantum mechanics without chaos. The first subset also has a special subset, where the statistics is totally deterministic, but information on the variables is lost.

The new interpretation is consistent with Bohm's hidden variable theory, and it is also consistent with the Schroedinger equation, which in the QM model already propagates the QM states forward in time with absolute determinism. It is not consistent with the Copenhagen interpretation, which only applies to the present QM subset. This can be seen as follows: If quantum change is engineerable by Whittaker hidden variables, then the inner contents of the engineered quantum change are known. This knowledge applies to the subset where QM change is engineered (the new subset), but not to the subset where all variables are random variables and hence not subject to engineering. Therefore the Copenhagen interpretation applies to the random quantum change subset, but not to chaotic (partially ordered) quantum change subset.

Happily, the reinterpretation of the postulate now allows a sufficient collection of the already-chaotic quantum change to produce the well-ordered, macroscopic universe we all live in. Also, the new interpretation is testable, and it can be falsified or verified in the laboratory.

The End Result of Abbreviating Maxwell's Theory

In discarding the scalar component of the quaternion, Heaviside and Gibbs unwittingly discarded the unified EM/G portion of Maxwell's theory that arises when the translational/directional components of two interacting quaternions reduce to zero, but the scalar resultant remains and *infolds* a deterministic, dynamic structure that is a function of oppositive directional/translational components. In the infolding of EM energy inside a scalar potential, a *structured* scalar potential results, almost precisely as later shown by Whittaker but unnoticed by the scientific community. The simple vector equations produced by Heaviside and Gibbs captured only that subset of Maxwell's theory where EM and gravitation are mutually exclusive. In that subset, electromagnetic circuits and equipment will not ever, and *cannot* ever, produce gravitational or inertial effects in materials and equipments. Brutally, not a single one of those Heaviside/Gibbs equations ever appeared in a paper or book by James Clerk Maxwell, even though the severely restricted Heaviside/Gibbs interpretation is universally and erroneously taught in all Western universities as *Maxwell's theory.*

As a result of this artificial restriction of Maxwell's theory, Einstein also inadvertently restricted his theory of general relativity, forever preventing the unification of electromagnetics and relativity. He also essentially prevented the present restricted general relativity from ever becoming an experimental, engineerable science on the laboratory bench, since a hidden internalized electromagnetics causing a deterministically structured local spacetime curvature was excluded.

Quantum mechanics used only the Heaviside/Gibbs *externalized* electromagnetics and completely missed Maxwell's *internalized and ordered* electromagnetics enfolded inside a structured scalar potential. Accordingly, QM maintained its Gibbs statistics of quantum change, which is non-chaotic a priori. Quantum physicists by and largely excluded Bohm's hidden variable theory,

which conceivably could have offered the potential of *engineering quantum change - engineering physical reality itself.*

Each of these three major scientific disciplines missed and excluded a subset of their disciplinary area, because they did not have the scalar component of the quaternion to incorporate. Further, they completely missed the significance of the Whittaker approach, which already shows how to apply and engineer the very subsets they had excluded.

What now exist in these areas are three separate, inconsistent disciplines. Each of them unwittingly excluded a vital part of its discipline, *which was the unified field part* Ironically, then, present physicists continue to exert great effort to find the missing key to unification of the three disciplines, but find it hopeless, because *these special subsets are already contradictory to one another,* as is quite well-known to foundations physicists.

Obviously, if one wishes to unify physics, one must add back the unintentionally excluded, unifying subsets to each discipline. Interestingly, all three needed subsets turn out to be one and the same. So application of Whittaker's work to each one of the three disciplines produces the necessary superset of each, and these three supersets are unified in and on the common, added, Whittaker subset.

Further, the Whittaker unification linkage of the three disciplines is testable. It is engineerable. It works.

NOTES AND REFERENCES

1. P. Graneau, *Ampere-Neumann Electrodynamics of Metals,* Nonantum, Massachusetts, Hadronic Press, 1985. See also P. Graneau and P.N. Graneau, "Electrodynamic Explosions in Liquids," *Appl. Phys. Lett,* Vol. 46,1985, p. 468; R. Azevedo, P. Graneau, P.N. Graneau, and C. Millet, "Powerful Water Plasma Explosions," *Phys. Lett* Vol. 117, 1986, p. 101.

2. See Y. Aharonov and D. Bohm, "Significance of Electromagnetic Potentials in the Quantum Theory," *Physical Review,* Second Series, 115(3), Aug. 1,1959, p. 458-491. This paper pointed out the primacy of the potentials. Instead of being *causative* agents, the force fields are actually *effects* generated from the potentials. This is in complete violation of both classical electromagnetics and classical dynamics, but it is absolutely required by quantum mechanics. For an extensive discussion of the Aharonov-Bohm effect and an extensive list of references, see S. Olariu and I. Iovitzu Popescu, "The quantum effects of electromagnetic fluxes," *Rev. Mod. Phys.* 57(2), Apr. 1985.

3. See Bertram Schwarzschild, "Currents in normal-metal rings exhibit Aharonov-Bohm Effect," *Physics Today,* 39(1), Jan. 1986, p. 17-20 for confirmation.

4. James Clerk Maxwell, A *Treatise on Electricity and Magnetism,* Oxford University Press, Oxford, 1873. The third edition is published by Dover, 1954.

5. Maxwell's true theory of electromagnetics is contained in some 200-odd *quaternion* equations, and is far more complex than the gross *vector* simplification developed by Heaviside and Gibbs after Maxwell's death. For a cogent argument about what might have been discovered much earlier in physics if quaternions had not been cast aside, see James D. Edmonds, Jr., "Quaternion Quantum Theory: New Physics or Number Mysticism?", *American Journal of Physics,* 42(3), Mar. 1974, p. 220-223. Just how much more powerful was Maxwell's quaternionic expression of EM theory than was Heaviside's (i.e., the modern) vector interpretation, was succinctly expressed by Josephs as follows: *"Hamilton's algebra of quaternions, unlike Heaviside's algebra of vectors, is not a mere abbreviated mode of expressing Cartesian analysis, but is an independent branch of mathematics with its own rules of operation and its own special theorems. A quaternion is, in fact, a generalized or hypercomplex number..."* (H.J. Josephs, "The Heaviside papers found at Paignton in 1957," *Electromagnetic Theory by Oliver Heaviside,* Including an account of Heaviside's unpublished notes for a fourth volume, and with a foreword by Sir Edmund Whittaker, Vol. III, Third Edition, Chelsea Publishing Co., New York, 1971, p. 660.)

6. See E.T. Whittaker, "On the partial differential equations of mathematical physics," *Mathematische Annalen,* Vol. 57, 1903, p. 333-355; "On an expression of the electromagnetic field due to electrons by means of two scalar potential functions," *Proceedings of the London Mathematical Society,* Series 2, Vol. 1,1904, p. 367-37Z

   Contrary to present EM theory, *if one wishes to study the primary electromagnetic, gravitational, and electrogravitational processes of nature, one applies Whittaker methodology.* Further, this methodology is completely engineerable and testable, and it drastically extends and perfects the present electromagnetics, general relativity, and quantum mechanics and unifies them into a unified, testable theory.

7. In the modern view, it is trapped energy that is gravitational, mass being viewed as simply such trapped energy. We point out that Einstein's formula $E = mc^2$ actually is an expression for mass in terms of its trapped *electromagnetic* energy. Thus we extend the

modern view by stating that, to first order, Newtonian gravitational attraction is due to the attraction of *spatially entrapped electromagnetic energy.* Since the electromagnetic scalar potentials represent just such spatially entrapped EM energy, then they hold a special significance gravitationally.

8. This assertion can be tested. At the nodal points of the standing potential wave, the rate of flow of time is normal. At nonzero points along the wave, however, the local rate of flow of local time varies from normal. After a proper-time interval for the observer at the nodal point, normal clocks and watches at different non-nodal points along the wave will appreciably vary in their time reading. Initially synchronized clocks will thus be found to disagree, if placed in different positions in the Whittaker wave and allowed to remain for a test period. In the past, various inventors have anecdotally demonstrated this effect. As an example, see David Jones, "Israel's Secret Weapon?, *Vancouver Sun Times,* Dec. 17,1977, p. 17.

9. V.K. Ignatovich, "The remarkable capabilities of recursive relations," *American Journal of Physics,* 57(10), Oct. 1989, p. 873-878.

10. Richard W. Ziolkowski, "Localized transmission of wave energy," Proc. SPEE, Vol. 1061, *Microwave and Particle Beam Sources and Directed Energy Concepts,* Jan. 1989, p. 396-397.

11. An *acoustic missile* is essentially a slug of acoustic energy that holds together as it travels, striking and damaging or destroying a target. An *electromagnetic missile* is a slug of EM energy that holds together as it travels to a target and strikes it.

12. A D. Sakharov, "Vacuum Quantum Fluctuations in Curved Space and the Theory of Gravitation," *Sov. Phys. Dokl.,* Vol. 12, 1968, p. 1040. See also the related discussion in Misner, Thome and Wheeler, *Gravitation,* 1973, p. 426.

13. Note that this assigns an *internal structure* to a gravitational potential.

14. A D. Sakharov, *Theor. Math. Phys.,* Vol. 23,1975, p. 435.

15. K. Akama et al, *Prog. Theor. Phys.,* Vol. 60,1978, p. 868.

16. B. Hasslacher and E. Mottolo, *Phys. Lett,* Vol. 95B, 1980, p. 237.

17. A Zee, *Phys. Rev. Lett.,* Vol. 42,1979, p. 417.

18. D. Amati and G. Veneziano, *Phys. Lett.,* Vol. 105B, 1981, p. 358; S. Yoshimoto, *Prog. Theor. Phys.,* Vol. 78,1987, p. 435.

19. S. Adler, *Rev. Mod. Phys.,* Vol. 54,1982, p. 729.

20. H.E. Futhoff, "Ground State of Hydrogen as a Zero-Point-Fluctuation-Determined State," *Phys. Rev. D.,* 35(10), May 15,1987, p. 3266-3269.

21. H.E. Puthoff, "Gravity as a Zero-Point-Fluctuation Force," *Phys. Rev. A,* 39(5), Mar. 1, 1989, p. 2333-2342. See also H.E. Puthoff, "Source of Vacuum electromagnetic Zero-Point Energy," *Phys. Rev. A.,* 40(9), Nov. 1, 1989, p. 4857-4862. Changing the vacuum potential constitutes a fluctuation directly in and of the zero-point energy of vacuum, and hence, by Puthoffs mechanism, it does indeed induce a gravitational effect. At the level

of the vacuum virtual particle flux exchange with the charged nucleus, producing an electromagnetic change also produces a gravitational change, and vice-versa.

22. Puthoff, *Phys. Rev. D.*, 35(10), May 15,1987, p. 3266-3269.

23. Nikola Tesla, *Colorado Springs Notes 1899-1900,* Nolit, Beograd, Yugoslavia, 1978, p. 61-62.

24. E.T. Whittaker, "On an expression of the electromagnetic field due to electrons by means of two scalar potential functions," *Proc. Lond. Math. Soc,* Series 2, Vol. 1, 1904, p. 367-372.

25. The potential for weaponization of the Whittaker work should be obvious.

26. Toward the end of his life Heaviside lived as a recluse in a small garret apartment, and may have returned again to his struggle with quaternions. In the 1950's handwritten notes of a theory of gravitation, written in quaternion mathematics, were found beneath the floor boards of his tiny study.

27. T.E. Bearden, "Maxwell's Original Quaternion Theory Was a Unified Field Theory of Electromagnetics and Electrogravitation," *Proceedings,* International Tesla Society Symposium, Colorado Springs, Colorado, July 1988. See also T.E. Bearden, "Maxwell's Lost Unified Field Theory of Electromagnetics and Gravitation," *Proceedings,* PACE Third International New Energy Technology Symposium, June 25-28, 1988 at Maison du Citoyen, Hull (Ottawa), Canada, 1988.

28. Ironically, Einstein then spent the remainder of his life, desperately trying to unify electromagnetics and gravitation in his theory of general relativity, never realizing that his own overstatement of his "flat local spacetime" postulate precluded his success and foredoomed all his efforts to failure.

29. To appreciate just what can actually be done with local spacetime curvature, see E.B. Smetanin, "Electromagnetic field in a space with curvature - new solutions," *Soviet Physics Journal,* 25(2), Feb. 1982, p. 107-111. In this paper, a solution to the problem stated in the title is obtained, which may be regarded as a classical model of a charged particle that has both a magnetic moment and a nonzero magnetic charge density. Interaction with spacetime curvature can disrupt the gauge invariance of the EM field, and it can also re-establish invariance in an initially noninvariant theory. Notice that, if we curve the local spacetime, Smetanin's theoretical phenomena — none of which is adequately described in the conventional electromagnetics theory - may apply. Specifically, *the charged vacuum itself - the local curved spacetime* - can furnish a nonzero magnetic charge density to the charged particles in the system. The local spacetime becomes a source of energy, which is added to the exposed system. Local violation of energy conservation can occur in the system, because it is now an open system containing a hidden vacuum energy source.

30. For a detailed expose of the scientific suppression used to uphold the present GR, written by an inside scientist of excellent ability, and one with over 100 published papers in the literature, see Rugero Maria Santilli, *Ethical Probe on Einstein's Followers in the USA: An Insider's View,* Alpha Publishing, POB 82, Newtonville, Massachusetts 02160, 1984.

31. For a discussion of the missing chaos in quantum mechanics, see Robert Pool, "Quantum Chaos: Enigma Wrapped in a Mystery," *Science,* 243(4893), Feb. 17, 1989, p. 893-895. For a more technical discussion see P.V. Elyutin, The quantum chaos problem," *Sov. Phys. Usp.* 31(7), July 1988, p. 597-622.

32. For an entry point into the literature of hidden variable theory, see *Quantum Implications: Essays in Honour of David Bohm,* B. J. Hiley and F. David Peat, Eds., Routledge & Kegan Paul, London & New York, 1987.

33. However, even if it predicts something new and is warranted, it still may not be adopted. An example is the continuing reluctance of physicists to refonnulate EM theory, stressing the primacy of the potential and the fact that not the force field but only the *potential* for the force field exists in the vacuum. Even more so, it is well-know that detection is actually binary, and we throw away precisely half of almost every detection our instruments make. Cf Richard Kidd et al, "Evolution of the modern photon," American Journal of Physics, 57(1), Jan. 1989, p. 27-35. Generally in every electromagnetic interaction of our instruments, two photons are produced: one a time-forward photon, and the other a time-reversed photon. Our detectors exxentially measure the time-forward photon half, not the time-reversed photon (antiphoton) half, the antiphoton half produces a slight recoil force (Newton's third law reaction force) in the mass (nuclei) of the instrument, which we ignore. Also, we continue to ignore the evidence that the photon and antiphoton are not identical. In a pumped phase conjugate mirror, for example, the emission of a normal photon from the mirror material results in a recoil of the mirror; the emission of an antiphoton by the mirror material, however, does not result in recoil of the mirror. Physics is still not consistent, as is well-known to foundations researchers, but is generally not accented to university students.