Mechanisms for Deep Penetration of Environmental Dense Weak EM Noise Interference Into the Body, and Long-Term Deleterious Effects Thereof

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There are some little-known mechanisms which provide unsuspected deep penetration of EM "hash" into the living body. By EM "hash" we mean an environmental dense weak signal flux of some 500,000 signals per square meter per second or greater. The amplitudes of the signals have little effect on the mechanisms we are speaking of. They are almost entirely a function of the signal density. So these signals can be extremely weak, so weak as to be considered completely benign by the orthodox community. Accordingly, the mechanisms have apparently not been studied by the EM-bioeffects community, and have not been taken into account in any major studies that I know of. We summarize these mechanisms briefly.

1. The "difference frequency" effect. In some respects, to first order the body tissue can be approximated (not really well, but sufficient to give the effect when the weak signal environment is dense) as a nonlinear homogeneous environment. This means that individual sine wave signals absorbed in the medium have a medium velocity proportional to the amplitude. In other words, on the curve of the wave itself, the points at higher amplitude travel faster, resulting in overshoot and wave break-up, etc. From the conventional view, a single wave thus "dies" quite quickly in a short penetration distance.

   However, now consider the dense weak signals impinging. Oddly, if we take the difference frequencies between any two real signals, that difference frequency propagates through a nonlinear homogeneous medium as if it were a sine wave in a linear medium -- even though the two waves we took the difference between, individually break up and spread all over. So the difference frequency propagates far deeper into the body than do the apparent signal themselves. And oddly, they do produce EM wave effects, absorption, etc. -- or can be modeled that way. A reference for this effect is Owen Flynn, "Parametric arrays: A new concept for sonar," Electronic Warfare Magazine, June 1977, p. 107-112. The major transmission in the body appears to be primarily through the body water content.

   As Flynn shows, any two sine-wave frequencies as simultaneous drivers combine to produce a sine-wave difference frequency propagating in water, essentially without sidebands or reverberations. *Like laser beams almost!* Its pattern has a main lobe approximately equal to that of the high frequency drivers, but devoid of sidelobes. The level of the propagating difference frequency is proportional to both the product of the two fundamental drive levels and to the square of the desired value of difference frequency.

2. Amplification of the Difference Frequency. The "difference transmission" effect is a new form of heterodyning and it is also amplified by the presence of the hash, which

may be considered noise. A reference for such noise amplification of the difference frequency effect is M.I. Dykman *et al.*, "Noise-enhanced heterodyning in bistable systems." Physical Review E, 49(3), Mar. 1994, p. 1935-1942.

3. Non-Linear Optical Functioning. As one examines ever smaller regions in the body, everything is highly nonlinear. Further, we must change our notion of "current" when we examine these smaller physical regions. When we have a simple DC current, for example, that is a very gross summation of an incredible number of individual microscopic actions, currents, etc. The electrons (in the Drude electron gas) are individually moving intensely all over the map, at a furious rate, with intense collisions. While there is a "mean free path", the actual path lengths between electron collisions cover a very wide range. Hence the electron current exists as a harmonic set of current frequencies, including well up into the optical range. The overall average "drift" is the DC current we use in macrophysics. But the actual "minute currents" themselves are quite something else again.

   Any current in a wire or other antenna has the same property of being a great "averaging" of a very large number of microscopic currents, at a great number of frequencies up through the optical range. So we really do not have a nice "sine wave" EM wave transmitted into space from the Drude electrons in a transmitting antenna, except as a gross "average" of a very great many frequencies of microscopic EM waves. So a "frequency" of a wave impinging on the body is actually a very great number of frequencies which sum to that frequency wave. The point is that the Drude electrons in the body and other charges receiving the incoming "sine wave" EM wave body's own potentials and fields that result in the absorption, and so what EM bioeffects scientists "measure" in the body are actually gross high level summations. They miss the entire internal rich structuring, and all the resulting long term deleterious effects from the dramatic alteration of the internal electrodynamics of the body's own EM fields, potentials, and waves.

   We should also point out that the body may have enormous EM fields in its cell membranes, even at very low potential (voltage). A millivolt potential, e.g., may be dropped across a 10exp(-9) distance between the last atom in the membrane and the first atom in the adjacent fluid. That gives an E-field of 1 million volts per meter! So when we change the internal makeup of that little "weak" millivolt, in that tremendous E-field we have made enormous, amplified changes to its internal EM structure, which is to an enormous set of bidirectional EM longitudinal waves, as we shall see.

   In 1903, E.T. Whittaker showed that any scalar potential is actually a harmonic set of bidirectional EM longitudinal wavepairs. In 1904 he showed that any EM wave or field is just two scalar potential functions. Since each of those scalar potential functions can be decomposed into a set of harmonic bidirectional longitudinal wavepairs, then in effect we can just replace all potentials, fields, and waves in the body with appropriate longitudinal EM waves and wavesets. In short, there is a vast "internal" bidirectional EM longitudinal electrodynamics inside all the little

"summation" fields and potentials and waves that we grossly measure with our instruments.

Here is where the EM hash comes in. Those methods of deep penetration through the body fluid and amplification of it by the noise, actually amplify the bundles of longitudinal EM waves comprising what we normally call the fields and waves and potentials in the body.

The longitudinal EM waves (LWs) are never "pure" in nature, but always with a bit of "transverse EM wave residue". So a practical LW is called an "Undistorted Progressive Wave". [For a very useful and highly technical summary, see W.A. Rodrigues, Jr. and J.-Y. Lu, "On the existence of undistorted progressive waves (UPWs) of arbitrary speeds $0 \leq v < \infty$ in nature," Foundations of Physics, 27(3), 1997, p. 435-508. A slightly corrected version is downloadable as hep-th/9606171 on the Los Alamos National Laboratory web site. It includes corrections to the published version]

The UPW is not limited to light speed, but can move slower than the speed of light (in which case it is called an "electromagnetic particle", or faster than the speed of light, in which case it is a superluminal wave.

The bottom line is that "normal" EM fields, waves, and potentials are just giant bundles of longitudinal EM waves with impressed dynamics (e.g., transverse dynamics).

Not only that, we can consider "ordinary" EM just "superhighways" for longitudinal EM waves. Mass is mostly empty space, filled with "ordinary" potentials, fields, and waves, with a particle here and there, much like the solar system, e.g. So once we have alteration of longitudinal EM make-up of weak EM potentials, fields, and waves in the body at any point, those LW alterations communicate essentially to every other point.

It must also be realized (though the EM bioeffects researchers have seemed to ignore it) that emission or absorption of a photon at any point in or on a dielectric, is not just from that point alone. Every point in the entire dielectric participates in the emission or absorption. A reference showing that, e.g., is G. C. Reali, "Reflection from dielectric materials," American Journal of Physics, 50(12), Dec. 1982, p. 1133-1136. The reflected field from a dielectric material is not generated just at its surface but comes from everywhere in the interior of it. Note that reflection involves both absorption and re-emission.

In the EM hash and amplification, by looking at the "internal structures" LWs that are inside of and compose the "normal" EM, we see that the LWs from even a reaction seemingly "dying" right on the skin reaches through the entire body, including the bone marrow. That is because the LW component itself is vastly penetrating. A reasonably pure LW will penetrate the entire earth and ocean, with only a small

interaction. In the body, the LWs produced from the hash have lots of TW residues, so one gets interaction all through the body, weakly.

These are the mechanisms that, while very weak and such that we presently do not have the necessary instruments to measure them, account for the long-term deleterious effects of very dense, very weak EM noise radiation.

4. Other Novel Non-Linear Optical Effects. There are a host of laser and nonlinear optical effects that have been uncovered in intensely scattering optically active media in the last decade (although Letokhov predicted many of these as early as 1958). The emission of coherent light -- a so-called "random laser" -- is one of the effects. It is also called lasing without population inversion. Recently, some researchers have discovered that living matter -- vegetables, fruit, etc. -- exhibit similar effects. None of this appears to have yet been investigated with respect to the EM hash in our environment, impinging continuously upon the body. However, one suspects that what happens within the body may be a form of self-ordering, so that more coherent and amplified "jamming" signals can form in this manner, deep within the body. Here we have to defer until there has been more experimental investigation. In ordinary materials, however, the effects have been demonstrated widely. The body has an enormous number of trace minerals and compounds within it, many of which are optically active. Even though still essentially uninvestigated with respect to EM bioeffects, the effects are important because they exhibit amplification. I presently hold the hypothesis that an adaptation of this process is responsible for the rare but sufficiently documented phenomenon of spontaneous human combustion, particularly if one allows Mills hydrino effects upon the hydrogen ions in the body, as a result of the sharp discharges of millivolts that occur widely. Remember, if that discharge of a millivolt occurs across a sufficiently small distance, an E-field local energy discharge of a million volts per meter may result. That should be quite sufficient to sometimes produce the hydrino effect, in which case anomalous heat energy would be suddenly and locally produced, as well as electrolysis of the H2O. Given hydrogen, oxygen, and heat energy suddenly in a very small region, together with a violent million-volts per meter discharge, ignition can certainly take place. If conditions are just right, the condition may persist and spread, resulting in an anomalous combustion of the body or some portion thereof. This would certainly explain the intense local heating in a body sitting in a chair, with most of the body consumed, but with the chair little damaged. The hydrino condition simply did not exist in the chair.

5. The Cellular Regenerative System of the Body. In the body, the cellular regenerative system, which actually restores damaged cells, is very poorly studied (largely by Becker, and a few others, but then with a totally insufficient electrodynamics). The immune system heals nothing! Not even its own damaged cells. It is the Army and the battlegroups, and it meets the hostile invaders, has a great battle, wins, and litters the battlefield. Many cells are damaged in that melee. It is the job of the cellular regenerative system to restore those damaged cells back to health, within its limited capabilities.

The cellular regenerative system is an electromagnetic system, but not using conventional EM. Instead, it uses the internal electrodynamics inside the fields, potentials, and waves that we measure. And it uses primarily LWs, which also allow it to produce time-polarized EM waves as well.

There are four polarizations of EM waves in quantum field theory: x- and y-polarizations or any combination give us the familiar transverse EM wave. This means that the spatial energy transported by the wave is oscillating in the x- or y-direction, or both in some combination. If x- and y- spatial energy oscillation is inhibited, the spatial energy will oscillate to and fro like an accordion, along the line of propagation, which is taken as the z- axis by convention.

Well, photons carry not only a piece of energy but also a piece of time. Usually the time component is ignored, which is unfortunate. Time is actually spatial energy compressed by the factor c-squared, and so it has the same energy density as mass. In other words, a photon carries two kinds of "spring" energy: weak spring energy (spatial energy) and very stiff spring energy (time-energy). Waves are made of photons, and transport photons, so waves also carry time as well as energy -- and electrodynamics is grossly deficient in not accounting for this time-energy of the wave as well as its spatial energy. In fact, no text book or paper has ever shown an illustration of the EM wave as it actually exists prior to interaction with mass, but only as it exists after the interaction. The EM wave in spacetime is not an E-H wave, but an Et-Ht wave. In short, an "impulse-type" wave. We used the differences in a phase conjugate pair of impulse waves (as compared to the so-called E-H waves) to derive mechanisms for EM wave polarization transduction, essential to unlock the secret mechanism unwittingly used by the cellular regeneration system of the body and by the Priore device in the 1960s and 70s in France.

Now if x-, y-, and z- directions for the spatial energy (weak spring energy) of the wave are all inhibited, then the wave is forced to oscillate its time-energy (stiff spring energy). So that is a time-polarized EM wave. It is also the most powerful of all EM waves, because of the intense densification of energy in that time-portion. Since the spatial energy component in a photon is canonical to the time component, it follows that the magnitude of the time-component is an inverse function of frequency. In short, the lower frequency EM waves have the greatest time portion. To grasp the enormous energy in low frequency EM waves, multiply the time portion by c-squared. So the highest energy EM waves of all are the low frequency EM waves! But that extreme high energy is locked up in the time component, and normally does not transduce into spatial energy, so we do not even notice it or take it into account.

Anyway, the cellular regenerative system utilizes weak time-polarized EM waves. Here's why. Take the usual nonlinear optics phase conjugate mirror and pumping. Heretofore, scientists have always meant pumping by EM transverse waves, or in other words, by spatial energy pumping. That sort of pumping of a phase conjugate mirror material will create an amplified phase conjugate EM WAVE in response to an input signal transverse EM wave. In short, it will time-reverse EM wave energy input

in the signal wave, and also amplify it.

Now general relativity tells us that, for every nuance in every structure of the energy and mass energy in a cell, there exists a corresponding exact correlated curvature of spacetime. So any cell and its dynamics, also possesses an exact set of spacetime curvatures and their dynamics. Further, the two precisely interact one with the other.

Let us refer to that precise set of spacetime curvatures and their dynamics as the "resident engine" (i.e., the resident spacetime curvature engine).

When we pump a cellular mass with *time-polarized* EM waves, we do a marvelous thing. The cellular mass and every internal structure, right down to the genetics and even to the atomic nuclei, are totally nonlinear with respect to a time-polarized EM wave. So the cell and every part of it acts as an array of pumped phase conjugate mirrors, pumped in the time domain rather than the spatial energy domain.

A marvelous thing then happens. The "input signal wave" to the *cell-as-a-time-pumped-phase-conjugate-mirror-set* is now the resident engine. So what is formed by the pumping is an amplified *antiengine*. A time-reversed resident engine, amplified. This beast will act upon each and every component of the cell, right down to the genetics.

For a damaged cell, one may separate its resident engine into two components: (1) a "normal" component engine which would be there if all the cell were normal, and (2) a delta component engine which, added to the normal component engine, produces the actual resident "damaged cell engine" in the damaged cell.

When you pump such a cell in the time-domain, you produce an amplified antiengine for the entire resident engine, including both components. So this antiengine has two components: the antiengine for the resident "normal cell" component, and the antiengine for the resident "damage delta" component. Further, the antiengine is amplified, so easily overrides the resident engine.

In short, what happens is that, by applying that time-domain pumping in sustained fashion, you time-reverse the damaged cell back to a normal cell again! Time-reversing the "normal component" doesn't change it, except to make it just a "little bit younger". Time-reversing the "abnormal or delta component" moves it back along its previous physical states as it grew, so that it just gradually disappears, leaving only the resident normal component and a restored "normal" cell again.

In biology terms, time-domain pumping the diseased cell dedifferentiates the cell and all its parts back to an earlier physical condition.

That is the way the body heals itself, within its capability, and the cellular regeneration system performs the time-domain pumping action, though limited. The Priore mechanism in France rigorously demonstrated the unwitting use of this natural

healing mechanism, in amplified form. Hence astounding and revolutionary cures were generated in lab animals by the Priore team, under rigorous laboratory conditions.

We get the time-polarized EM waves in the nonlinear cells, in a two-step process, by pumping the cells with longitudinal EM waves. The nonlinearities add the phase conjugate LWs, thereby forming time-polarized EM waves as the pump waves. (I filed an invention disclosure on these wave polarization transduction processes).

6. Dense EM weak hash affects all the above mechanisms. Now we are finally able to comprehend the continual, long-duration damage that can result from low level dense EM hash.

   With the deep penetration mechanisms, we get this hash (which is just a mess of longitudinal EM waves) and its effects throughout the body. Well, that interferes directly (at low level) with the cellular regeneration system. That system also controls the immune system, and several other very sensitive and essential body systems such as some regulatory systems, cellular growth control, the centralized cellular control system (Popp's system), etc.

   All this is now "noise jammed" at low level by the impinging massive numbers of low-level longitudinal EM waves. Cellular metabolism, control mechanisms, regulatory mechanisms, etc. are all affected. Over the long term, a great variety of deleterious effects will then result in the body, the cells, the metabolism, etc. Everything from an increased tumor formation, to difficulties in the immune system, to autoimmune disorders, to cancers and leukemias, to asthma, to hormonal disorders, to atheriosclerosis, to diabetes, etc. Our present medical science will track and detect the physiological, metabolic, hormonal, biochemical, and cellular disorders, but will not detect the causes at all, or even monitor the body's electrical regulatory and control system changes. Eventually the functioning of the body regulatory and support systems will be sufficiently affected and degraded that the body's ability to resist disease and continue to function will be impaired, a little at first, then a little more, and finally such that opportunistic diseases begin to ravage the body, eventually one of them killing the individual.

   None of the above effects have ever been the subject of rigorous scientific investigation, and in fact the necessary instruments and tools have not even been developed. Gross energy deposition still forms the bulk of the investigative EM bioeffects techniques, sometimes altered for frequency. That is totally inadequate to investigate and detail the subtle, long term, deep penetration, interference effects of the EM hash in our environment.

   I hope this helps you understand some of the problems in EM bioeffects that have not been experimentally investigated, but that do exist and do affect millions of persons. The gross physical results do show up in epidemiology studies, but cause and effect

eludes the experimental investigators since they do not have appropriate models, tools, test environments, etc.