

Refresher 1

Manual



By Gordon L. Ziegler

Cover photo: If all goes well, this is the property where we wish to put Refresher 1. (Photo taken by Gordon L. Ziegler, January 1, 2009.)

Refresher 1
Manual

by Gordon L. Ziegler

Refresher 1 Manual

by Gordon L. Ziegler

© 2007 Gordon L. Ziegler

©2009 Gordon L. Ziegler

© 2010 Gordon L. Ziegler

©2012 Gordon L. Ziegler

Last revised September 4, 2012

Permission is granted to quote from this book,
to freely share its electronic files,
and even to print and sell paper copies of this book,
provided the text is not changed.

Author:

Gordon L. Ziegler

P.O. Box 1162

Olympia, WA 98507-1162 USA

ben_ent100@msn.com

Publisher:

Benevolent Enterprises

P.O. Box 1162

Olympia, WA 98507-1162 USA

ben_ent100@msn.com

PREFACE

The most important invention in human history is the Refresher 1. If it works as calculated, it would reverse all aging, disease, and decay processes in humans, animals, vegetation, and minerals to young adulthood, and there preserve them. While designed to be tested in an area as small as five acres, it is designed to be capable of expansion of the active field in increments, as governments permit, until the whole earth is covered simultaneously by the field from one small machine system. One machine could restore the whole earth to Edenic perfection.

The machine would work by reversing the order to disorder arrow in the second law of thermodynamics. Here are several examples of what that means. Processes with which we are familiar progress in one direction. For examples, fresh picked fruit is fresh only for awhile. Then it ripens too much, spoils, then decays. Newly built barns last quite awhile, but eventually sag, and if never maintained, eventually fall down and collapse. Fresh paint on houses gradually oxidizes, blisters, and peels. A young human grows older, gets wrinkles, loses hair and teeth, gets stooped, gets sick, dies, gets cremated, the ashes are scattered. There are an infinite number of similar possible ordered pathways such as this that could be cited. The events as we have ever observed them always go in one direction. That direction forms one of the important arrows of time. What governs this direction is the order to disorder arrow in the second law of thermodynamics.

The author has discovered a theoretical way to reverse the order to disorder arrow in the second law of thermodynamics. That means everything in the above examples could be played in reverse: Decayed fruit could un-decay, un-spoil, become fresh picked fruit again. Blistered, peeled, oxidized paint could be restored to new again automatically. Scattered human ashes could be automatically re-gathered, unburned, assembled into a dead

person, brought to life, and then healed of all diseases and infirmities, made younger, until the process would saturate out at young adulthood. These pathways would all be reversed like this because the order to disorder arrow in the second law of thermodynamics is reversed. This would be possible by the operation of a theorized machine called the Refresher 1. The author has never discovered an existing ordered aging pathway that is not thrillingly better when reversed. To reverse the order to disorder arrow would be to solve all our problems. Thus the creation and operation of the Refresher 1 is highly desirable—a worthy project at any cost.

This book will describe the restoration that machine could give, summarize the theory of operation, give the description and specifications of Refresher 1, present the builder who can design and build it, with some of the costs and timelines. This book will present the plan for ownership and operation of the machine. This book will also present part of a Draft Environmental Impact Statement for the creation and operation of the Refresher 1.

The Refresher 1, however, is not alone for good health. It could enable the operation of another important machine—a radioactive waste free power reactor. The reactor would cost about 0.83 percent of a new nuclear reactor for 150% as much electricity generated. It would be 1,000 times as energy efficient as a nuclear reactor. It would hardly need any fuel, and would not need uranium, plutonium, or hydrogen for fuel. It could use dirt, sand, ground garbage, or sewage, yet it could easiest use brass. And yet it is totally free of radioactive wastes. The world desperately needs this new energy source, but it is cost effective and safe only when built in the active circle of the Refresher 1. The last chapter of this booklet will recap the derivation of these things as it derives the features of the radioactive waste free power generating reactor.

CONTENTS

Chapter	Page
Preface	3
Contents	5
1. Restoration.....	7
2. Theory.....	11
3. Refresher 1 Design Specifications.....	22
4. Cost Analysis/Builder.....	24
5. Plan for Ownership and Operation	25

Selections from
Draft Environmental Impact Statement:
High Energy Sub-particle Fusion Facility

1.4 Facility Environmental Impacts and Mitigations	13
2.0 Purpose and Need of Proposed Action	15
3.0 Significant Issues or Sensitive Receptors	16
4.0 Alternative Development.....	17
5.0 Affected Environment—Existing Conditions.....	18
6.0 Environmental Consequences; Prediction of Environmental Impacts	19
7.0 Mitigation—What Will Be Done to Reduce or Prevent Impacts?	20

Selection from
Advanced Electrino Physics

6. Radioactive Waste-free Power Reactor	57
---	----

Chapter 1

RESTORATION

The human race is subject to the second law of thermodynamics and all its horrors. All disease, decay, and death are the results of processes working out that law. However, the author has discovered that may not be an inviolable law. It appears the law itself may be reversed in a large or small area. That is, the order to disorder arrow in the second law of thermodynamics may be reversed in a given area, reversing aging, disease, and decay processes.

How can such a thing be? First we must know about the order to disorder arrow in the second law of thermodynamics. And second we must theorize how to reverse it.

Events come in order. A new thermos bottle falls off a countertop and shatters the glass bottle inside. No one expects the thermos to fall back up to the countertop and restore the glass bottle. Why not? Because it is a law for items in a closed system to progress from order to disorder. The whole thermos was more order. The broken thermos is more disorder. From order to disorder is the direction of the order to disorder arrow in the second law of thermodynamics. That arrow is one of several arrows of time which indicate the passage of and direction of time. [1, 2]

The next point to take cognizance of is the nature of the order and disorder in the order to disorder arrow in the second law of thermodynamics. Order requires slightly more energy than disorder. In going from order to disorder, the system loses energy. But here is where the author has something to contribute. He has discovered there are at least two kinds of energy, not just one. He has named them order energy (E_O) and entropy energy (E_S). Order energy is the positive and negative energy in the creation of particles.

Entropy energy is the absolute value, term by term, of the order energy in the equations. For instance, when an electron and a positron annihilate, order energy tends to zero. $(E_e) + (-E_e) = 0$. However, entropy energy tends to a positive value. $|E_e| + |-E_e| = 2E_e$. Entropy energy almost always increases. Entropy increases. Entropy energy is the common energy measured every day. Order energy is different. It is the quantum mechanical energy utilized in the creation and annihilation of particles. Entropy energy E_S is involved in the entropy arrow of time. $\Delta E_S \geq 0$. Order energy E_O is involved in the order arrow of time. In the present state of things, $\Delta E_O \leq 0$. The entropy arrow and the order arrow have been thought to be one and the same. But the author has discovered they are two different and separate arrows of time. It is possible to reverse the order arrow without affecting the entropy arrow of time.

How could we reverse the order to disorder arrow in the second law of thermodynamics, and make disorder tend to order? We would have to find in a closed system a process that would create positive order energy—in other words make $\Delta E_O > 0$. Natural decay processes won't do that. Decay processes create a trace of antimatter in the decay products, which has negative order energy. The longer or more a system decays, the more negative the change in the order energy ΔE_O . Pair production will not make a net positive change in order energy either. While matter particles produced have positive order energy, the antimatter produced has negative order energy. The positive and negative order energies cancel out, leaving the net order energy unchanged. The Standard Model of Physics has no reaction that will yield a positive change of order energy. But the author's model of physics, Electrino Physics, does have one reaction that can take away from the negative order energy and add to the positive order energy, thereby yielding a positive change in order energy. As long as the Standard Model of Physics governs our research, and no other model of physics is permitted to be

tested, the human race will be subject to all the horrors of the second law of thermodynamics—aging, disease, decay, and death. But there is hope to reverse the order to disorder arrow in the second law of thermodynamics if a new model of physics can be tested.

The author's model of physics was already presented in an article in the *Galilean Electrodynamics Journal*—"A New Way to Calculate Electron and Muon $g/2$ -factors," in the January-February, 2006 issue. [3] The model is an aether model, where the aether is a sea of bosons of a variety of different spins [whole integral spin (like 0, 1, 2, 3, etc.) particles that can go through objects without colliding, as opposed to fermions (half integral spin (like $1/2$, $3/2$, $5/2$, etc.) particles) that collide with other particles or objects]. In the model symmetric smooth charge distributions cannot have detectable spin. But electrons and muons have detectable spin. Therefore they cannot be symmetric point charges. With the addition of a parsimony postulate, electrons and muons are seen to have two sub particles in them, called semions. Semions can fuse to unitons (whole particles). This is the key reaction that can affect the second law of thermodynamics. But electron semions fusing would not produce positive change in order energy. But the fusion of positron anti-semions would produce positive change in order energy—just what we need to reverse the order to disorder arrow in the second law of thermodynamics. These features of the model are carefully and completely derived, amplified, and illustrated in the volume published on the internet, *Electrino Physics*, by the author. [4]

A positive order energy test facility (a Refresher) has already had a rough design, and has been costed. A leading well qualified builder and agency have been identified (James M. Potter, PhD, JP Accelerator Works, Inc., Los Alamos, New Mexico). All we lack is the money. With \$70 million and an army of workers, the facility could be designed and built in one year. Every year over 100

million people die who could be saved by the facility. (While the facility is designed to operate in an area as small as five acres for test purposes, it could be made to work in larger areas up to the whole earth.) Thus it is important that we work as quickly as possible to save as many as possible. This is the only chance known whereby we may reverse the order to disorder arrow in the second law of thermodynamics. Tax deductible donations may be made to Benevolent Enterprises, PO Box 1162, Olympia, WA 98507-1162 USA.

[1] Stephen Hawking, *A Brief History of Time*—From the Big Bang to Black Holes (New York: Bantam Books, 1988), pp. 102, 103.

[2] F. Reif, *Statistical Physics*, Berkeley Physics Course—Volume 5 (New York: McGraw-Hill Book Company, 1967), p. 283.

[3] G. L. Ziegler, “A New Way to Calculate Electron and Muon $g/2$ -factors,” *Galilean Electrodynamics*, Vol. 17, No. 1, January/February 2006, pp. 11-15.

[4] Gordon L. Ziegler, *Electrino Physics*—from the beginning studies of light to particle structure and a unified field theory (PO Box 1162, Olympia, WA 98507-1162 USA: Benevolent Enterprises, last revised June 19, 2012)—available for downloading free at <http://www.benevolententerprises.org> Book List.

Chapter 2

THEORY

Refresher

The Principal Investigator has discovered a new Grand Unification Theory (GUT). It has deeper symmetry and lower orbital structures than the Standard Model of Physics. It has greater parsimony than the Standard Model. Whereas the Standard Model requires 61 different elementary particles to construct known light and matter [1](page 48), the GUT requires only two different elementary particles to construct known light, matter, and gravitons; and those two different particles can both be ionized from empty space with a single particle, and can combine in a single particle.

What differences does this GUT have to the Standard Model? The GUT is an aether model of physics. It has aether special and general relativity, rather than Einstein's aether-less Special and General Relativity. This makes a simple model of gravity and inertia possible [2](Chapter 5). Up until now, uniting special and general relativity in particle physics has been as difficult as uniting fire and ice. This problem is solved with aether special and general relativity in the GUT [2](Chapter 6). Special and general relativistic calculations are both exact fits in the particle structures calculated in that chapter.

The GUT has one postulate that states that cylindrically or spherically symmetric smooth charge distributions cannot have detectable spin. But electrons and positrons have detectable spins. Therefore they must not be symmetric point charges, but have two half charges in them orbiting about each other. The orbiting like charges show that fracton charges come in $\pm e$, $\pm e/2$, $\pm e/4$, and $\pm e/8$ (the Electrino Hypothesis), rather than in $\pm e/3$ and $\pm 2e/3$ (the Quark Hypothesis). The Electrino

Hypothesis is very different from the historic and accepted Quark Hypothesis. Yet it does not lead to untenable particle structures. The Principal Investigator has induced the particle structures of all known light, matter, and gravitons, through the simultaneous satisfaction of eight criteria: particle charge, spin, parity, mass, spin feasibility, preceding particles (to avoid duplication), Pauli Exclusion Principle, and decay schemes. [2](Appendix B) Satisfying all the listed Decay Modes published in *Summary Tables of Particle Properties*, by the Particle Data Group [3] (which reference [2](Appendix B) does), is the satisfaction of thousands of tests. Except for being an unknown model, the GUT is in a strong position. Its particle structures are all unique. The quark model particle structures are not all unique.

Another difference of the GUT to the Standard Model is that charged sub-particles of like flavors can fuse to particles of higher flavors. [2](Chapter 12). The secret of why that should be is that when sub-particles orbit or travel faster than the speed of light in the relativistic frame relative to the baseline non-relativistic frame, their radii become imaginary because of the relativistic length contraction formula. The strong electric force equation for these super luminal sub-particles has two such imaginary radii multiplied together. That makes an additional minus sign in the force equation, which makes like charges attract. When two bound sub-particles of a positron collide with 1880 MeV energy or more with two other bound sub-particles of another positron with like oriented spins in the Center of Mass Frame, the four sub-particles are attracted into the same orbit. Then one sub-particle from one positron is more attracted to one sub-particle from the other positron than to any other sub-particle because of closer proximity. These are like charges, and here like charges attract because they travel faster than light. [Einstein predicted that nothing could go faster than the speed of light. But it has recently been shown that neutrinos go

faster than the speed of light. Einstein was wrong. [4-6]] The two sub-particles are attracted by the electric strong force. Nothing stops them from fusing. The other two positron sub-particles fuse also. Four sub-particles fuse down to two particles each with twice the charge as the charge of one of the four sub-particles. The four sub-particles are $\frac{1}{2} e$ charges. The two fused particles are $1 e$ charges each, but though they are numerically whole particles, they cannot exist alone. That is why on creation they scavenge from the graviton sea the necessary sub-particles to become protons or neutrons. But when the positron four $\frac{1}{2} e$ sub-particles fuse to the two $1 e$ particles, they switch from antimatter to matter. The fusion of sub-particles in positrons results in the generation of solely positive order energy (quantum mechanical energy in the creation of particles). This phenomenon is theorized to reverse the order to disorder arrow in the second law of thermodynamics [because it is positive order energy as opposed to negative order energy which surrounds us and which determines the current order to disorder arrow direction and the direction of reactions]. [2](Chapter 16)

The fusion of the sub-particles of positrons can result in the reversal of the order to disorder arrow in the second law of thermodynamics—but over what distance?

We guess the desired relationships for reversing the order to disorder arrow in the second law of thermodynamics through dimensional analysis. We want to solve for r , the maximum radius in which the reversed law would be effective. There is a way we can obtain a length from combinations of our variables and constants. That way is in the right hand side of Eq. (1). The whole expression is the thermodynamic relation we are seeking. The thermodynamic relation is:

$$(\Delta E_o)_t > 0 \text{ where } r < \frac{(\Delta E_o)_1 c}{ik},$$

(1)

where E_o is the order energy—the positive or negative energy in the pair production of particles; ΔE_o is the change in the order energy, where $(\Delta E_o)_t$ is the change in the total order energy of the system, and where $(\Delta E_o)_1$ is the change in the order energy for a single source reaction—for a positron fusion reaction it is approximately 2×10^9 eV/collision $\times 1.6 \times 10^{-19}$ joules/eV = 3.2×10^{-10} joules/collision; c is the speed of light—approximately 3.0×10^8 m/s; we shall solve for the effected radius r ; i is the beam current in each beam in Coulombs per second (we will solve for 10^{-11}); k is the ratio of particle energy to particle charge. This energy per charge is the accelerated energy of the particle (roughly 1×10^9 eV times 1.6×10^{-19} joules/eV = 1.6×10^{-10} joules) divided by the charge of each positron ($q = 1.6 \times 10^{-19}$ coulombs), which equals 10^9 joules per coulomb. The collision efficiency eff is not needed in this equation, because the result is not in particles, but is already in collisions.

Incredibly, the lower the current, the bigger the radius of the affected area. And the greater the current, the smaller the radius of the effected area. With 10^{-11} A beam currents, the effected radius r solves for 9.6 meters—roughly 10 meters, which describes a small area—less than a tenth of an acre.

To get an idea of the positron beam currents needed to reverse the order to disorder arrow of the second law of thermodynamics in what size of affected radius, see Table 1 below.

For an area the size of	r	beam current
House	10 m	10 pA
four football fields	100 m	1 pA
community	1 km	100 fA
city	10 km	10 fA
Israel	160 km	0.6 fA
U.S.	2,400 km	0.04 fA
World	13,000 km	0.008 fA
Sun	1.7E11 m	6E-22 A

Table 1. Beam currents versus affected radius for reversal of the order to disorder arrow of the second law of thermodynamics.

The author will now calculate the rate at which reverse aging will occur in the calculable radius of the active Refresher: The beginning energy of the host particles (positrons) from which the fusion process takes place is $2m_e c^2$ per individual reaction. The ending energy of the host particles (protons) to which the fusion process tends is $2m_p c^2$ per individual

reaction. $\frac{\Delta E_p}{\Delta E_{e^+}} = \frac{+2m_p c^2}{-2m_e c^2} \approx -1836$. This is a unit less

expression from the available energy terms. What we seek is another unit less expression $\frac{\Delta t_r}{\Delta t}$, where t is

the normal time during which a person or object ages, and t_r is the reverse time (negative) during which a person or object un-ages. The quotient is the relative rate of un-aging compared to aging. This also is a unit less quotient. What use of particle fusion parameters can yield such a unit less quotient? What terms are available to derive such a unit less quotient?

What about the first terms and unit less quotient? If we equate them, we have $\frac{\Delta t_r}{\Delta t} \approx -1836$. Reverse time would be negative and 1836 times as fast as forward aging time. Forward aging of 100 years would be un-aged in 19.89 days. Forward aging of 1 year would be un-aged in approximately 4.77 hours of machine time.

The Refresher would have many different effects in a controlled area, and the controlled area could be varied in size from five acres or less to the entire earth. Some such effects would be reverse aging; backing diseases out of existence; backing decay and pollution out of existence; disaster and war relief; making a demilitarized zone in the controlled area where no explosives will explode; building and vehicle maintenance; making a new form of food preservation; removing criminal tendencies in brains; taming animals; and making Clean Energy Sources possible; etc.

The Refresher would be quite versatile: It could be built on land, in or on ships, in large airplanes, in long rail cars, in long semis, and in space craft and space bases. It would revolutionize the earth and would bring peace to earth.

[1] David Griffiths, *Introduction to Elementary Particles* (New York: John Wiley & Sons, Inc., 1987).

[2] Gordon L. Ziegler, *Electrino Physics* (PO Box 1162, Olympia, WA 98507-1162 USA: Benevolent Enterprises) [downloadable for free at <http://www.benevolententerprises.org> Book List].

[3] C. Caso, *et. al.* (Particle Data Group), “Summary Tables of Particle Properties,” (including “Gauge and Higgs Bosons Summary Table,” “Lepton Summary Table,” “Meson Summary Table,” and “Baryon Summary Table”), *CRC Handbook of Chemistry and Physics*, 80th Edition, David R. Lide, Ph.D., Editor-in-Chief (Boca Raton: CRC Press, 1999-2000), pp. 11-1 to 11-42.

[4] Frank Jordans and Seth Borenstein, “Neutrinos clocked moving at faster-than-light speed” (Associated Press):

http://www.msnbc.msn.com/id/44629271/ns/technology_and_science-science/?gt1=43001

[5] Robert Evans, “Particles found to break speed of light” (Reuters):

<http://www.reuters.com/article/2011/09/22/us-science-light-idUSTRE78L4FH20110922>

[6] “Do neutrinos move faster than the speed of light?” – physicsworld.com:

<http://physicsworld.com/cws/article/news/47283>

Chapter 3 [about to be amended]

Refresher 1 Design Specifications

Size of accelerator (folded)	20 m long by 3 m wide
Diameter of accelerator	100 mm (plus cooling channels)
Beam aperture	7 to 10 mm
Type of accelerator	Folded linear accelerator with pulsed klystron rf power supplies and S-band cavities (2856 MHz)
rf power supplies	Eight 35 to 50 MW pulsed klystrons
duty factor	0.1% (peak current 1000 times average current)
Average power	400 kW (20 kW per meter of accelerator)
klystron efficiency	~50%
total system power	800 kW
cooling water requirement for each 5 m section	5 to 10 gpm
cooling water required by each klystron	~ 5 gpm

cooling towers capacity	800 kW
Creation time total (if not super funded (\$50 million))	3 years
Design time (beam dynamics, rf power systems, cooling, and computer control)	1 year
Fabrication and subassembly testing	18 months
Installation and commissioning	6 months
Creation time total (if super funded (\$100 million))	1 year

Chapter 4

COST ANALYSIS/BUILDER

As of April 2010, the cost for the accelerator equipment constructed in 3 years is \$33 million. The total cost of that project would be about \$50 million.

As of September 2012, the cost for the accelerator equipment constructed in 12 months is \$42.9 million. The total cost of that project would be about \$70 million.

These costs change with time, going up an average of 3% per year. A current detailed cost analysis is available on request if you have a need to know. Contact

Gordon L. Ziegler
PO Box 1162
Olympia, WA 98507-1162 USA
ben_ent100@msn.com.

Accelerator Builder

James M. Potter, Ph.D., President
JP Accelerator Works, Inc.
2245 47th Street
Los Alamos, NM 87544
505-690-8701
jpotter@jpaw.com
<http://www.jpaw.com>

Chapter 5

PLAN FOR OWNERSHIP AND OPERATION

The plan is that the non-profit research foundation Benevolent Enterprises (EIN 91-1177242) shall own and operate the Refreshers. Tax deductible grants or donations can be made to

Benevolent Enterprises
PO Box 1162
Olympia, WA 98507-1162 USA
ben_ent100@msn.com

The plan is to operate the Refreshers with grants and donations, but totally free from fees, so the poorest individuals can be healed and made younger by the facility.

Chapter 6

RADIOACTIVE WASTE-FREE REACTOR

Gordon L. Ziegler
PO Box 1162, Olympia, WA 98507-1162;
ben_ent100@msn.com

Abstract

Nuclear reactors do not give off carbon gases, and so could help fight global warming. But they have such nasty and dangerous radioactive wastes, which stay active and dangerous for centuries. What we need is a powerful, radioactive waste-free, inexpensive reactor. The author proposes one in this paper. The technical name for such a reactor is Electrino Fusion Power Reactor (EFP Reactor). Electrino is the author's name for tiny electric particles that compose all light, matter, and gravitons in the authors' new Grand Unification Theory (GUT). The main difference between the Standard Model and the new GUT is that fracton charges in the GUT come in $\pm e$, $\pm e/2$, $\pm e/4$, and $\pm e/8$; whereas fracton charges in the Standard Model come in $\pm 2e/3$ and $\pm e/3$. The change in fracton charges did not lead to untenable particle structures. The author induced the structures of every known particle according to the scheme in the GUT. They all worked out all right. And whereas it takes 61 elementary particles to build known light and matter in the Standard Model, it takes only one according to the GUT. The GUT has deeper levels of symmetry and lower orbits. This paper develops the features of the radioactive waste-free EFP Reactor using the new GUT.

1. Elementary Particle Fusion

In the new GUT (which, by the way, is called Electrino Fusion Model of Elementary Particles), the particles are held together by symmetrical orbits, not glued together by gluons. The quarks, with $\pm 2e/3$ and $\pm e/3$ fracton charges, do not lend themselves to stable, symmetrical orbits, but the electrinos, with $\pm e$, $\pm e/2$, $\pm e/4$, and $\pm e/8$ fracton charges, do. In the model, photons are composed of heavy positive and negative whole charges orbiting about each other, and traveling together at the speed of light; electrons are made up of like light half charges orbiting about each other; and pions are made up of two orbiting pairs of like light fourth charges orbiting about each other. [See [2] front and back covers.] Notice the symmetry. Notice the orbits. Notice the space between the particles. Notice the individuality of the particles—bound only by the speed of light barrier and orbital mechanics.

It is important to notice the velocities of the particles and their behaviors at those velocities. All fractons (called electrinos in the model) travel either just slightly faster than the speed of light, or significantly faster than the speed of light. The point is, they all travel faster than the speed of light. For the light ones, this affects their radii—making them imaginary. This affects their force. Whereas slow like-charges repel, faster than c like-charges attract. This affects the potential energy of particles. This makes deep potential wells at the top of potential hills for the potential energy of charged particles. This affects the perceived mass-energy of the particles—positive instead of negative.

Faster than c like-charges attract. Negatively charged like half charges traveling just faster than c orbit around each other forming electrons. If the electrons never collide with any other electrons—at least not with sufficient energies—the half particle inertias in them cause the half charges to orbit always opposite each other—never approaching each other. But if electrons collide with each

other with over 938 MeV each, four half charges come near to each other. The four half charges are not all held opposite each other. They all attract each other. What will happen? One half charge from one electron will be attracted to one half charge from the other electron. Nothing will stop the half charges. They will travel until they contact each other. What happens then? They are like charged. They form a new particle with twice the half charge—in other words a whole charge. We could say the half charges fuse to a whole charge.

When high energy electrons collide, not only do two half charges from opposite electrons fuse, the other two half charges on the opposite side fuse. We have four half charges from two electrons fusing to two whole charges. What then?

It is profitable at this juncture to assign fraction or electrino structures to simple particles. Pions are composed of four positive fourth charges in the manner already explained in the abstract. Electrons are made of two light weight negative half charges. Neutrons are constructed of a heavy positive whole particle orbited by an electron. If the constituents of pions were fused to the constituents of electrons, it would be to positive electrons—positrons—antimatter. If the sub-particles of negative electrons were fused to the heavy whole core particles of neutrons, it would be to negative core neutrons—antimatter. If we started with the opposite charges of above, the particles would fuse to matter instead of antimatter. Every time there is a fusion of electrinos, there is a switch from matter to antimatter or visa versa.

What would happen to the negative half charges in electrons fused to whole particles above? The half charges would be negatively charged matter. The whole charges would be negatively charged core particles of antimatter—anti-protons and anti-neutrons. The anti-core-particles would scavenge from the graviton sea the remaining portions of anti-protons and anti-neutrons. The resultant

anti-protons and anti-neutrons would drift into local protons and neutrons and annihilate them, giving off gamma rays, which could be converted into electricity. This is the foundation of the science of the radioactive waste-free EFP Reactor. The electricity comes from processed gamma rays, which come from the annihilation of protons and anti-protons and neutrons and anti-neutrons, which come from anti-protons and anti-neutrons, which come from negative heavy whole core particles (antimatter), which come from the fusion of half particles in electrons, which come from the collision of electrons above 938 MeV each electron, with like spins in the center of mass frame.

2. Efficiencies

Before electrons can have fusion of their half particles, they must be accelerated to at least the masses of protons— 938.27231 ± 0.00028 MeV [1]—roughly at least 939 MeV. That is a necessary energy investment into the process. When the particles fuse, there follows an annihilation of both a proton and an anti-proton or a neutron and an anti-neutron. Nearly twice as much energy in gamma rays results as was invested in the acceleration of electrons. At first this sounds good. But then we realize we must be more than 50 per cent efficient over-all in order to be self-sustaining and be an energy source using this energy phenomenon. That is hard to achieve. State of the art accelerator efficiency in 1988 was itself only 50% [2]. While individual steam turbine efficiencies were as high as 96.1%, the world record steam turbine gross efficiency recently was 48.5% [3]. That is an overall efficiency for our process of less than 24.25%. And we need 50% to break even, let alone have a surplus to become a new power source!

If we get away from the expansion of gases and turn to the gamma absorption of layer upon layer of stacked

photovoltaic cells shielding the gamma source, we can achieve over 90 percent energy efficiency [DC voltage convertible to AC voltage]. This is one important way to make Electrino Fusion Power [without the Refresher 1 field]. Except for the fusion of the constituents of electrons, this would be totally within the known laws of physics. But it would have a couple of drawbacks: It would have to be built in a strong containment building; and the electricity extraction of the gamma field would have to be by many layers of photovoltaic cells. And the photovoltaic cells would degenerate in time and become radioactive.

3. A Surprising Turn

The author put this process on the back burner until he would receive greater light upon the subject. Things took a surprising turn. Through fusing the sub-particles of positive electrons—positrons—in theory, he learned how to reverse the order to disorder arrow in the second law of thermodynamics. That is huge! That is a way to reverse aging, disease, and decay processes—to make old people young again and back out all diseases from existence! Let us read what he first wrote about the process and the phenomenon.

"The explanation that is usually given as to why we don't see broken cups gathering themselves together off the floor and jumping back onto the table is that it is forbidden by the second law of thermodynamics. This says that in any closed system disorder, or entropy, always increases with time. In other words, it is a form of Murphy's law: Things always tend to go wrong! An intact cup on the table is a state of high order, but a broken cup on the floor is a disordered state. One can go readily from the cup on the table in the past to the

broken cup on the floor in the future, but not the other way round.

"The increase of disorder or entropy with time is one example of what is called an arrow of time, something that distinguishes the past from the future, giving a direction to time." [4]

4. Electrino Model and 2nd Law

The natural tendency of leptons in beta decay is that the parent lepton combines with one or more gravitons to produce more particles. In all natural reactions, the order energy of the resultant particles is less than or equal to the order energy of the original particles.

1. Negative Energies. Let us consider antimatter more carefully. "In the Dirac theory also, *the permissible energy values for a free particle range from $+mc^2$ to $+4$ and from $-mc^2$ to -4* . The first of these results is of course just what we expect for a free particle—that its total energy can have any value greater than its rest energy. But the second result is quite puzzling, since it implies the existence of states of *negative total energy*." [5] Anderson in 1932 discovered positrons in cosmic radiation. These were regarded as Dirac's negative energy particles. "The first two solutions of the Dirac equation . . . clearly describe a free electron of energy E and momentum \mathbf{p} . The two negative energy electron solutions . . . are to be associated with the antiparticle, the positron." [6]

However, in the annihilation it is not $(+mc^2) + (-mc^2) = 0$, but $2mc^2$ is the result of annihilation. [7]

There is something strange going on with the minus signs in these equations. The calculations are inconsistent.

Maybe there are two kinds of energy considered. One we can call entropy energy E_s . In the annihilation reaction, $\# + mc^2 \# + \# - mc^2 \# = 2mc^2$. Entropy energy is the higher value. The other energy is order energy E_o . In order energy the same reaction is $(+mc^2) + (-mc^2) = 0$.

Let us consider entropy energy and order energy for particle decay schemes. There are a few decay schemes where no negative order energy (anti-matter) is introduced in the right hand side of the decay schemes. In those few instances, the final order energy is equal to the initial order energy (when kinetic energy is taken into account). But in most cases, a trace of negative order energy (anti-matter) is introduced into the right side of the decay schemes. There is nothing on the left hand sides of the decay schemes to correspond to this addition of a trace of negative order energy on the right sides of the decay schemes. Therefore, total order energy is less on the right hand sides of the decay schemes than on the left hand sides (if only by a trace). A few decay schemes introduce a lot of antimatter (as K^-) on the right side of the decay scheme. The loss of order energy in the systems is greater in those cases. But in every case, for all natural processes, the order energy final is \leq the order energy initial, or

$$\Delta E_o \leq 0. \quad (1)$$

Let us check the order energy for electron positron fusion reactions. Electrons made energetic by acceleration (as heavy as protons) fuse and form

anti-protons. Matter is converted to anti-matter. Entropy energy is conserved, but not so order energy. Order energy is reduced in the extreme from +938 MeV to -938 MeV or more for each electron fused (two electrons are fused in each reaction). The order-disorder arrow for electron electrino fusion points in the usual direction. The system does obey the second law of thermodynamics.

2. Reversing the Order to Disorder Arrow. What would happen if we fused the electrino constituents of positrons instead of the electrino constituents of electrons? Entropy energy E_S would again be conserved. Entropy would be increased. However, order energy E_O would go from -2×938 MeV to $+2 \times 938$ MeV—from disorder to order. The order to disorder arrow would be reversed. This would be a reaction that would be prohibited by the second law of thermodynamics—unless the strong gravitational force that fuses the anti-semions would be stronger than the second law of thermodynamics (which otherwise governs weak interactions). The stronger of the strong gravitational force and the second law of thermodynamics should be determined by experiment. More rides on that one experiment than perhaps on any one other experiment in this generation. If it is found that strong gravity is stronger than the second law of thermodynamics, then order can be restored at first in a small area, then for the whole earth.

Here we see that the entropy arrow of time and the order to disorder arrow of time are separate and distinct, and are not one and the same thing. While all the reactions the author has studied increase entropy, the fusion of positron anti-semions reverse

the order to disorder arrow, making more order out of the disorder.

Positron constituent electrino fusion might not only take the electrinos from disorder to order. It could make other physical processes in a local area go from disorder to order. The positron fusion not only violates the second law of thermodynamics, it reverses the order to disorder arrow of that law in a local area, making other processes in that area reverse. Let us consider that process more to see how it might be regulated.

We guess the desired relationships for reversing the order to disorder arrow in the second law of thermodynamics through dimensional analysis. We want to solve for r , the maximum radius in which the reversed law would be effective. There is a way we can obtain a length from combinations of our variables and constants. That way is in the right hand side of Eq. (2). The whole expression is the thermodynamic relation we are seeking. The thermodynamic relation is:

$$(\Delta E_o)_t > 0 \text{ where } r < \frac{(\Delta E_o)_1 c}{ik}, \quad (2)$$

where E_o is the order energy—the positive or negative energy in the pair production of particles; ΔE_o is the change in the order energy, where $(\Delta E_o)_t$ is the change in the total order energy of the system, and where $(\Delta E_o)_1$ is the change in the order energy for a single source reaction—for a positron fusion reaction it is approximately 2×10^9 eV/collision $\times 1.6 \times 10^{-19}$ joules/eV = 3.2×10^{10} joules/collision; c is the speed of light—approximately 3.0×10^8 m/s; we shall solve for the effected radius r ; i is the beam current in each beam in Coulombs per second (we

will solve for 10^{-11}); k is the ratio of particle energy to particle charge. This energy per charge is the accelerated energy of the particle (roughly 1×10^9 ev times 1.6×10^{-19} joules/ev = 1.6×10^{-10} joules) divided by the charge of each positron ($q = 1.6 \times 10^{-19}$ coulombs), which equals 10^9 joules per coulomb. The collision efficiency eff is not needed in this equation, because the result is not in particles, but is already in collisions.

Incredibly, the lower the current, the bigger the radius of the affected area. And the greater the current, the smaller the radius of the effected area. With 10^{-11} A beam currents, the effected radius r solves for 9.6 meters—roughly 10 meters, which describes a small area—less than a tenth of an acre.

To get an idea of the positron beam currents needed to reverse the order to disorder arrow of the second law of thermodynamics in what size of affected radius, see Table 1 below.

For an area the size of	r	beam current
House	10 m	10 pA
4 football fields	100 m	1 pA
community	1 km	100 fA
city	10 km	10 fA
Israel	160 km	0.6 fA
U.S.	2,400 km	0.04 fA
World	13,000 km	0.008 fA
Sun	1.7E11 m	6E-22 A

Table 1. Beam currents versus affected radius for reversal of the order to disorder arrow of the second law of thermodynamics.

Remarkably enough, the affected area of second law reversal calculates to increase with the reduction of positron beam current. Area control is merely a matter of timed gating of the positrons in the positron-positron collider. [8]

5. Rate of Reversed Aging

The author will now calculate the rate at which reverse aging will occur in the calculable radius of the active Refresher: The beginning energy of the host particles (positrons) from which the fusion process takes place is $2m_e c^2$ per individual reaction. The ending energy of the host particles (protons) to which the fusion process tends is $2m_p c^2$ per individual

reaction. $\frac{\Delta E_p}{\Delta E_{e^+}} = \frac{+2m_p c^2}{-2m_e c^2} \approx -1836$. This is a unit less

expression from the available energy terms. What we seek is another unit less expression $\frac{\Delta t_r}{\Delta t}$, where t is

the normal time during which a person or object ages, and t_r is the reverse time (negative) during which a person or object un-ages. The quotient is the relative rate of un-aging compared to aging. This also is a unit less quotient. What use of particle fusion parameters can yield such a unit less quotient? What terms are available to derive such a unit less quotient? What about the first terms and unit less quotient? If

we equate them, we have $\frac{\Delta t_r}{\Delta t} \approx -1836$. Reverse time

would be negative and 1836 times as fast as forward aging time. Forward aging of 100 years would be un-

aged in 19.89 days. Forward aging of 1 year would be un-aged in approximately 4.77 hours of machine time.

6. Miracle Working Power of the Refresher 1

The theoretical discovery of the order to disorder arrow in the second law of thermodynamics reverser (Refresher 1 for short) was a surprising turn, and engrossed the author for several years. By simply reversing the natural arrows between ordered events, many miraculous results were found to take place in theory.

What does it mean that the order to disorder arrow in the second law of thermodynamics is reversed? Events naturally come in order indicated by the arrows:

Healthy young adult→aging→wrinkles→aging→
cancer→death→cremation→scattering ashes

Reversing the order to disorder arrow in the second law of thermodynamics means all the arrows between the ordered events are turned around. The old and diseased become young and healthy. The clock is not really reversed. Adults do not become children again and disappear to extinction. The system just tends to maximum order, which is at young adulthood. Children still grow up to maximum order at young adulthood.

Many similar reversals can occur in the animal kingdom and the environment. The author imagined many marvelous things, but virtually forgot about the EFP Reactor.

7. EFP Reactor in the Field of the Refresher 1

Finally the thought came, “What would occur if the EFP Reactor were in the field of a Refresher? The

concepts of the effects assembled slowly. The accelerator electronics would not have resistive heating in the field. As a result the accelerator would be room temperature superconductive. There would not be any need for cryogenic energy losses. The accelerator would be 100% efficient.

Reversing the order to disorder arrow in the second law of thermodynamics greatly affects all things with which we are familiar. But what would it do to photovoltaic cells in a high energy gamma field? Outside the Refresher field, photovoltaic cells in the high energy gamma field would become damaged. They would become more and more damaged with time. This is a form of aging. What would happen if the aged photovoltaic cells were put in an order reversed Refresher field? The cells would un-age back to the original condition. What would happen if photovoltaic cells in an order reversing Refresher field were exposed to high level gamma radiation? They would not become damaged or aged. What would happen to the power that would ordinarily be absorbed in the aging process? Would it not be added to the power converted from radiation to electricity in the photovoltaic cells?

But what about the miscellaneous heating that would occur to photovoltaic cells in a high level radiation field outside an order reversing field of a Refresher? The heating process, though not necessarily damaging and aging, also occurs as an ordered process in the second law of thermodynamics. If the order to disorder reversed field of the Refresher were added, the photovoltaic cells would be cooled down. Heating would not occur in the field. What would happen to the power ordinarily lost to heating? Would not it be added to the power converted from radiation to electricity in the photovoltaic cells?

But what about the gamma photons that would not age the photovoltaic cells or heat them, but would pass through them without affecting them? What if the Refresher field were added, what would then take place? The next

question can resolve this question. Is the shielding loss included in the order to disorder arrows in the reaction equations? Yes. Then with the addition of the Refresher field, the elusive photons would return or never penetrate the photovoltaic cells. What would happen to that power? Would not it be added to the power converted from radiation to electricity in the photovoltaic cells? This result is the hardest to take. We need experiment to settle this. If this paragraph were not true, we would expect it would take layers upon layers—many feet of photovoltaic cells piled on top of each other to stop the gamma photons. But if this paragraph is true, then gamma rays as well as sunlight could be stopped by a single layer of photovoltaic cells in the order to disorder in the second law of thermodynamics reverser of the Refresher. In the reversed field, the photovoltaic cells should be 100% efficient.

An Electrino Fusion Power (EFP) Reactor must be built and operated in the field of a Refresher.

While an individual photovoltaic cell may be 100% efficient, it would not be possible to cover every spot around the reactor with photovoltaic cells. But it should be possible to achieve 60% to on the order of 100% efficiency—enough for the source to be self-sustaining and an energy source.

8. What about Radioactive Wastes?

As we now experience the second law of thermodynamics, neutrons + products \rightarrow neutron activation products. Reverse that and activation products become deactivated and neutrons are given off. Another reaction involving neutrons: $n \rightarrow p + e + \text{anti } \nu_e$. Reverse that and neutrons are produced. In the field of the Refresher 1, neutrons appear stable. Also in the field, radioisotopes are all backed out of existence. As long as the Refresher 1 field is on, the EFP Reactor will be radioactive waste free.

With two or three layers of photovoltaic cells to absorb the gamma rays that leak through the cracks between photovoltaic cells, nearly 100 percent efficiency energy conversion would be possible in the order reversed state. This would save the need for layers upon layers of photovoltaic cells for shielding and energy conversion. Also the rapid denaturing of any radioisotopes produced would mean that there would not need to be such strong large containment buildings for the process. Also the photovoltaic cells would not age, degenerate, or become radioactive. In every way the second law reversed facility would be safer and more efficient than the same facility without the reversal of the second law of thermodynamics.

References

[1] SUMMARY TABLES OF PARTICLE PROPERTIES, January 1, 1998, Particle Data Group, as quoted by *CRC Handbook of Chemistry and Physics, 80th Edition* (Boca Raton: CRC Press, 1999), pp. 11-1 to 11-49.

[2] SDI: technology, survivability, and software (Diane Publishing Co., May, 1988), p. 140, NTIS order #PB88-236245.

[3] Mathias Deckers, Steam Turbine Blading Technology for Siemens, Germany, "CFX AIDS DESIGN OF WORLD'S MOST EFFICIENT STEAM TURBINE," <http://www.ansys.com/assets/testimonials/siemens.pdf>.

[4] Stephen Hawking, *A Brief History of Time--From the Big Bang to Black Holes* (New York: Bantam Books, 1988), pp. 144, 145.

[5] Robert B. Leighton, *Principles of Modern Physics* (New York: McGraw-Hill Book Company, Inc, 1959), p. 665.

[6] Francis Halzen, Alan D. Martin, *Quarks and Leptons* (New York: John Wiley & Sons, 1984), p. 107.

[7] David S. Saxon, *Elementary Quantum Mechanics* (San Francisco: Holden-Day, 1968), p. 386.

[8] Gordon L. Ziegler, *Electrino Physics* (Lacey, Washington: Electrino Energy, 2008), Chapter 16, <http://www.benevolententerprises.org/>, Book List.

1.4 Facility Environmental Impacts and Mitigations

The facility (Refresher 1) is a low beam current, high energy (over 1876 MeV in the Center of Mass Frame) positron-positron accelerator-collider. One environmental impact is that the system will emit positron, beta, and gamma radiation. Because the beam currents are very low (less than or equal to 10 pA each beam), the radiation levels (yet to be determined) of the accelerators and collider will be very low. The radiation levels will be mitigated further by twelve feet of earth shielding. The resultant residual radiation levels will be far below the federal de minimus level for radiation exposure to the general public (0.01 mSv per year to members of the public).

Whereas the general public will not be exposed to significant amounts of radiation by this facility, the general public may expose themselves to a field caused by the reversal of the order to disorder arrow in the second law of thermodynamics in the grounds of this facility. The field is beneficial to individuals and/or the planet in every way, so mitigations will not be necessary for the active field, except several relevant advisories will be posted for the visitors' comfort and pleasure. The following is the notice in English that will be posted around the periphery of the active area:

“NOTICE:

- **Welcome to the Eden-like field of Refresher 1. There is no charge for this blessing. But we accept donations.**
- **You may find that your aging is reversed to young adulthood in the active area of this field. You may also find all your diseases backed out of existence, so you find yourself in perfect health.**
- **However, there are certain things about this field you should be aware of before you enter the active area: the field will try to heal all your old wounds. All body pierced jewelry should be removed before entering.**
- **The field will make sexual relations more fertile, more efficient, and safer, but will not safeguard against pregnancy.**
- **The field also will attempt to resurrect dead animals and the leaves, stems, and roots of vegetables. To avoid**

the discomfort of animals and vegetables re-organizing in your stomach, it is recommended that visitors eat only fruits, nuts, grains, legumes, and fruit-like vegetables, eggs, and dairy products in the active area and 72 hours before entering the active area. Food designed for Eden-like living will be provided for no charge for those within the active area.”

[Refresher 1 is not only for good health. Particle detection equipment can be placed in the containment building of the accelerators to test for revolutionary physics data.]

2.0 Purpose and Need of Proposed Action

The purpose for this proposed action is three-fold: 1) detect high energy sub-particle fusion; 2) measure the efficiency of sub-particle fusion for power generation purposes; and 3) test the reversal of the order to disorder arrow in the second law of thermodynamics, thereby reversing aging, disease, and decay processes in a test area, and in larger and larger areas as the public demands.

The need of the proposed action is also three-fold: 1) high energy sub-particle fusion is needed to simplify, give added symmetry and an additional layer of orbits to particle structure and increase parsimony to the science; 2) $e^- e^+$ collisions have 1.602×10^{-19} efficiency. But $e^+ e^+$ and $e^- e^-$ collisions have a theoretical efficiency of 1.0 in the new model at over 1876 MeV in the Center of Mass Frame, due to the magnetic and weak forces making the particles smart bombs with respect to the strong force. That is a big difference of efficiency. Should all the efficiencies be 1.602×10^{-19} ? If so, a new breed of power generators would not be possible which would be very helpful. Our facility would be able to measure the efficiency in more than one way. 3) Every sickness, every pain, and every death on this planet is a need for reversing the order to disorder arrow in the second law of thermodynamics, which our proposed Refresher 1 Facility might be able to do in a small test area, in larger and larger areas if the public demanded and governments permit.

3.0 Significant Issues or Sensitive Receptors

The Refresher 1, reversing the order to disorder arrow in the second law of thermodynamics, does many things that seem too good to be true. Thus the reviewer of these things may reject this project out of hand. But all these things happen naturally when that arrow of time is reversed. Notice a possible sequence under the existing second law of thermodynamics:

Healthy young adult → aging → cancer → death → cremation → scattering of ashes.

What if the arrows were reversed—all of the arrows? Well, not only could one be healed from cancer, made a healthy young adult again, but scattered ashes could gather themselves again, a person could be un-cremated, come to life again, be healed of cancer, made young again, and made a healthy young adult again, which is the maximum state of order in human beings. The system goes to and is stable at the maximum state of order with the reversed order to disorder arrow. But notice in all this, it is order that is increased, not the clock that is turned backward. The clock continues forward. Sometimes it is difficult to keep that distinction in mind in imagining second law reversals.

Let us imagine some second law reversals: A fallen down barn with weathered wood and rusty nails falls back upright, ceases to sag, and becomes a new barn again with new wood and new nails. A burned out forest un-burns. The burned to death forest creatures come alive again and are restored to health. In the battle field, explosives refuse to explode. Killings stop. Exploded ordinance un-explodes, restoring all that was lost. Slain soldiers are resurrected. Maimed soldiers are made whole again. There is no more pain or sorrow. Enemies are grateful for the blessings of life, and are reconciled. Generation after generation is resurrected, and the foundations of many generations are raised up. Such possible scenarios are endless. They all seem too good to be true, but they would all be possible if only the order to disorder arrow in the second law of thermodynamics could be reversed in a controllable area. That may be the case with the proposed Refresher 1. In view of the incredible blessings it may offer to us, we must permit the Refresher 1 to be built and tested.

What will be impacted the most? Those who have been dead the longest, whose remains are the most scattered. It would take the most machine time to resurrect them. It would take nearly three and a half years machine time to resurrect those dead 6,000 years.

What are the most important impacts? The elimination of pain, suffering, disease, decay, and death. The Refresher 1 will be designed to do this in a small test area, in larger and larger areas as the public demands and governments permit, and for the entire earth at once, when all the governments of the world OK it. [The planet would not be over crowded. See Section 1.4.]

It would be desirable to build one or two more Refreshers as backups when there is an outage. That Benevolent Enterprises would do with donation money.

4.0 Alternative Development

Are there better ways to meet the Purpose & Need? No. The only alternative the human race has had for thousands of years is the religious promise that God would come in the end of the world and do this for the saved few, whereas the lost great majority would perish eternally. The Refresher 1 promises to save everybody, without the loss of one. There is no scientific or religious alternative to this that can offer such a positive promise. And we do not have to wait in faith for centuries or thousands of years. We can have it as soon as we can build and test the device—in one year.

5.0 Affected Environment – Existing Conditions

The environment and wildlife habitats are increasingly stressed, depleted and threatened by increasing and intensifying natural disasters and over harvesting by man. Hundreds of species are going extinct. The planet is experiencing the dangers and loss of habitat by global warming. The environment still supports life, but time is apparently running out.

The Refresher 1 can operate in a small test area, but it is designed to operate globally. No baseline environmental data is provided for its small test area, but every large facility in the world, such as nuclear reactors, can provide current environmental data of their areas, which can be baseline environmental data for Refresher 1 gone global.

6.0 Environmental Consequences Prediction of Environmental Impacts

The Environmental Consequences of the field of Refresher 1 have already begun to be told in the Notice posted and given out to visitors entering the field, and in section **3.0 Significant Issues or Sensitive Receptors**. It is impossible to predict every occurrence of law reversal that would be experienced. However additional typical cases that would be representative are presented here for both positive and negative impacts: Aging concrete would become like new concrete again. Houses with blistered paint on siding boards would not only have the paint become like new, but the underlying boards become like new—and there remain stable. Oxidized paint on cars would un-oxidize and become like new. The worn parts would un-wear. The engines would not operate backwards (that would be the backing up of the clocks, not the reversal of the order to disorder arrow).

There are considerations on a global scale that would not be a problem in a small test area. Planes and rockets would fly forward, but would be reversed in aging. Their parts would not wear out or fail. If the decision were made to go global, earthquakes would happen backwards. But instead of causing serious damage, the rubble would be convulsed and fused back into the original beauty of the buildings.

If things went to maximum order, people, animals, and vegetation would glow with coherent light suitable for individual flight like angels, not needing rockets or planes. There would be a bonanza of energy efficiency and availability. With so much light, the sun would not be needed.

7.0 Mitigation – What Will Be Done to Reduce or Prevent Impacts?

The field of Refresher 1 has impacts at every turn. But most or all of them are highly positive, not negative. They describe a much better world. It is the opinion of the Principal Investigator, Gordon L. Ziegler, that there are no true negative impacts from the reversal of the order to disorder arrow in the second law of thermodynamics.

It would be very frightening to the non-initiated, however, to see faces glow when it was not expected. Thus the best mitigation of the impacts would be an educational program through the media explaining these things. That work starts here with this DEIS.