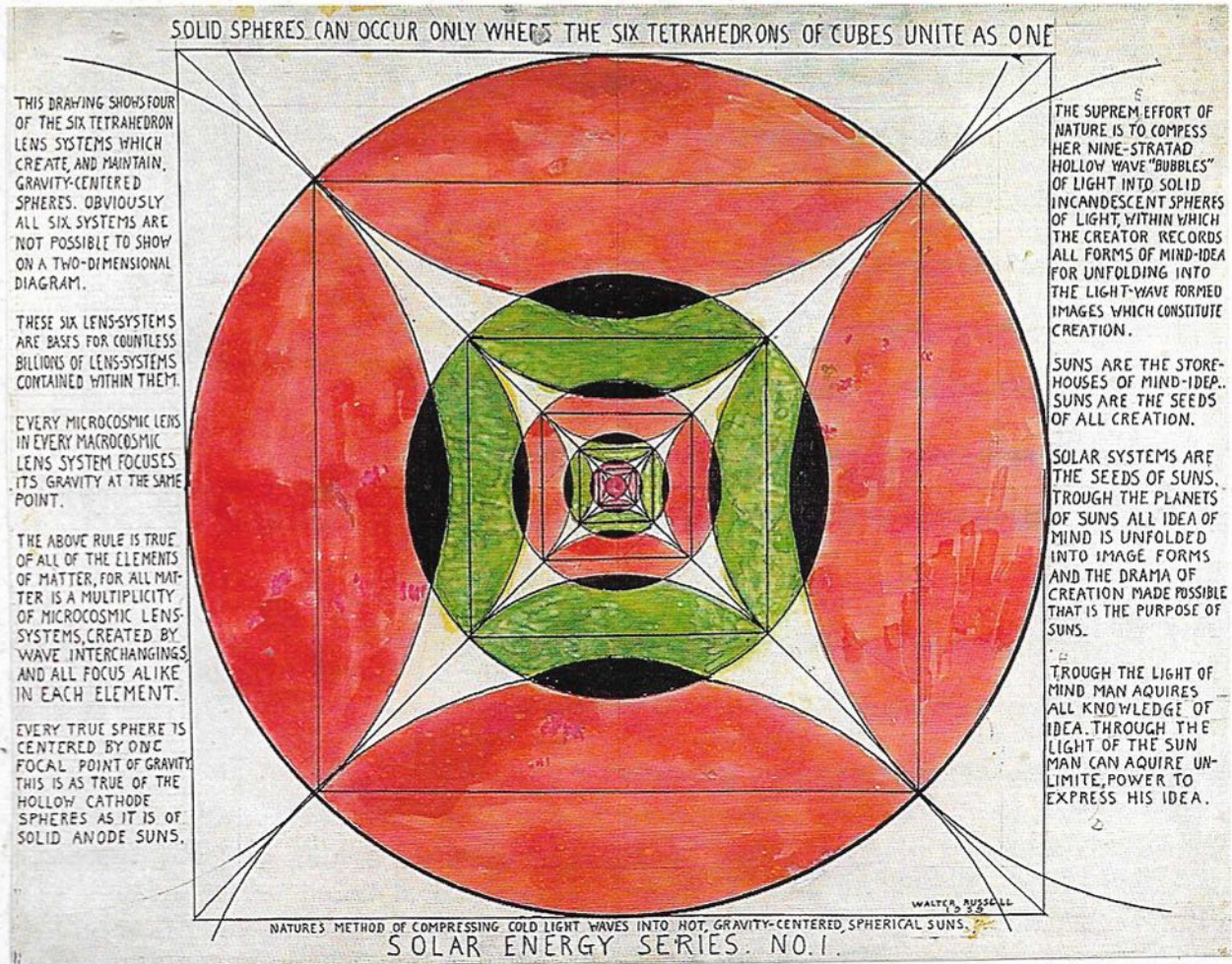


FULCRUM

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*The Science Journal of
The University Of Science And Philosophy*



The cover painting & description following both copied from "In the Wave Lies the Secret of Creation."

Solar Energy Series, No. 1

This painting has four series of black convex lenses focusing from top and bottom and both sides to the center of the painting in centripetal cathode to anode multiplying systems. Although all cubes have six tetrahedrons, only four are visible in two-dimensional renditions. These four are distinguishable as triangles with their bases as the sides of the large cube. The other two tetrahedrons can be visualized by seeing the area of the cube these four form as the base of each of the other two tetrahedrons; the center of the painting is their apex.

The significance and symbolism of the colors in this chart elude my complete understanding other than Dr. Russell's typical usage of red or red-orange to signify the male spectral side and green the female. Black signifies the cathode with its formless, tenuous, beginning life stages, and the violet surrounding the central orange-red solid sphere signifies the female spectral color. There is a male to female alternating sequence from the outside to the center except that the last female green pattern is followed by another female violet pattern. The convex multiplying lens system illustrated in the chart is black. Perhaps the color choice was simply artistic license.

Dr. Russell named this chart, *Solar Energy Series, No. 1*. Therefore, he must have felt that this figure had some significance in relation to his ideas on solar power production: arranging banks of convex lenses in direct square ratio and focusing them on a common point to superheat water to power steam turbines. I also see partially complete concave lenses between the convex lenses.

This chart suggests an arrangement where the banks of lenses are placed to correspond to the six tetrahedrons that unite their focus as One at the center of the system. This would be the most all-encompassing and powerful geometric placement possible to focus maximum light and heat to a central point whether the source were omnipresent - coming from all directions at once - or even intermittent, and granting that it was not possible or desirable to turn the lens bank to align with the source.

The question as to how any lens system can do more than focus the existing light and heat from any source to a focal point remains unanswered, although the Russells implied that it could and did do more. A convex lens simply focuses the light and heat from any source to a tighter focal point, so a series of lenses would appear to do no more. Or is there some other explanation not yet seen that would explain how such a series could multiply the total amount above the original source. Presently I see none.

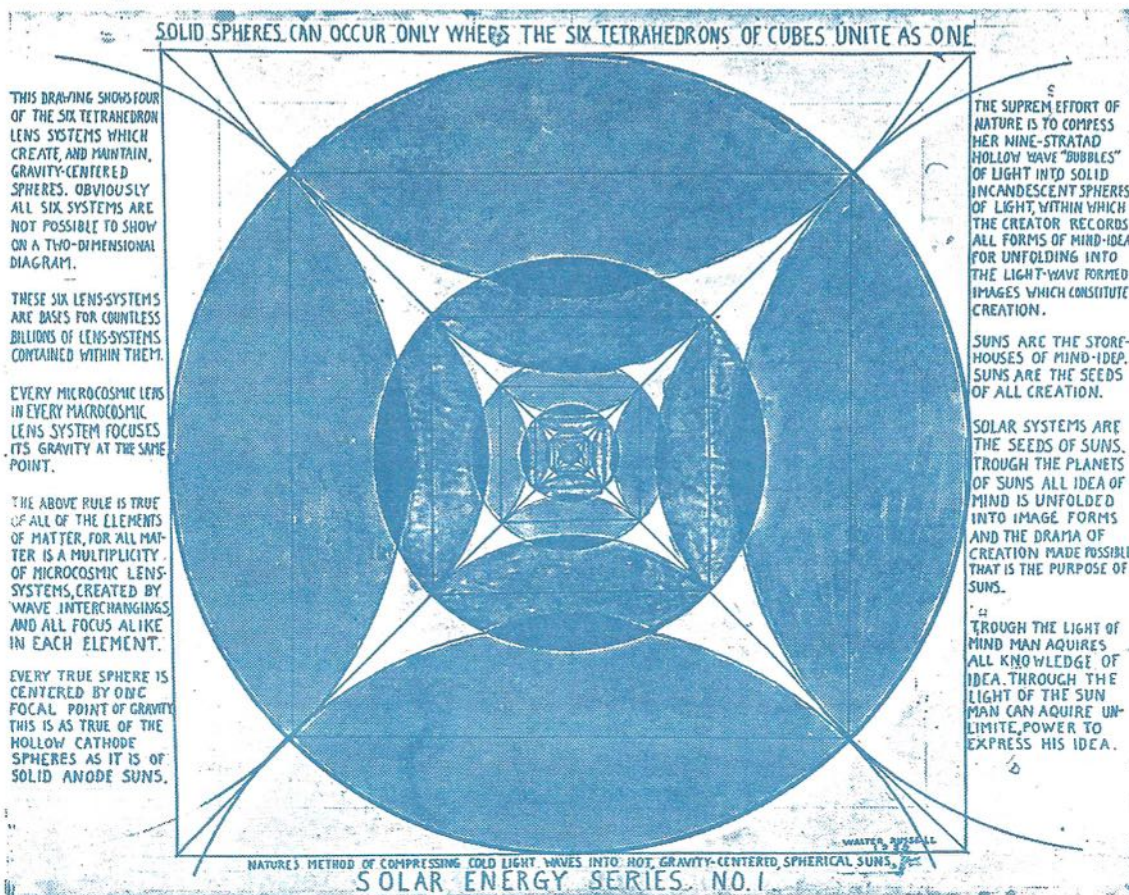


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Dialogue: Questions for the Next Issue

Questions:

Question #1. Walter Russell had Luminon in his periodic chart right after hydrogen or in the mass two position. He put deuterium and tritium in the positions right preceding hydrogen. Establishment science and mass spectroscopy or “experiential evidence” both recognize masses two and three as elements that follow hydrogen as they all have their respective masses which we recognize. In addition tritium is recognized as a radioactive element . Experiential evidence shows it to be a beta emitter even though it only has a mass of three. There are other radioactive elements of relatively low mass compared to the ninth octave of radioactive elements such as radioactive potassium. The Russells spoke of the radioactive elements as being the result of compressing so much mass into form that it could no longer be contained, like pumping a tire so full to the point that it would start to explode and pop holes in it to let the excessive pressure escape. In this sense the radioactive elements are mass that can no longer be “frozen” into form. 1) How might we explain the apparent contradictions of Russell’s placements of luminon, deuterium and tritium with mass spectroscopy and 2) the appearance of a radioactive element in his third octave of elements rather than only in the ninth octave where he placed the radioactive elements?

Question #2. Each octave becomes more dense up to carbon and from carbon to the last octave it again loses density but the mass increases continually. Walter said that carbon was the densest element but plutonium or uridium was the heaviest or has the most mass. So the question for me in this case is what is the difference between density and mass? Or, how can carbon be more “dense” than plutonium or lead or other higher octave elements when they have more “mass”? What is the essence of this difference?

Some of the featured articles for the next issue

A Primer On Transmutation by Chester A. Hatstat Jr.

A Synopsis Of The Russell Science Research Experiments And Results- Spanning the years 1927 and 1954 to 1963 and 1989 to 1998. By Dr. Timothy A Binder

A Visual Proof Of Walter Russell’s Clairvoyant Vision - photographs of the fields around magnets illustrating the same form, colors etc. as the Russell paintings that illustrate the Cosmogony.

Dialogue: Responses to Previous Questions

Questions:

1) What is the geometry of the wave field and the core for any (at least one) other element than carbon? Give an example or examples of “*The*” geometry for an element preceding and for one following carbon. Larry has already given us some of the answer in his discussion of element structure preceding and following carbon and in the male and female pairs of elements in each octave in the last issue. I would like to see the geometric form or forms, so drawings please, and more details which I suspect exist.

Question #1 What is the geometry of the wave field and the core for (at least one) other element than carbon?

Silicon, which is carbon one octave higher, is identical to carbon, only less dense. Silicon has a cubic wave field and solid (hole filled) core. Its molecules crystallize as a cube. The cores of carbon's higher octaves (cobalt, rhodium and lutetium) are also solid core elements with no holes in them (Home Study Course, page 786). Because of the increasing pressures of the higher octaves their molecular crystallization complexes. Cobalt, however, comes close to the simple cubic crystallization of carbon and silicon. (See Crystallization Chart #1, page 235, The Universal One.)

All the other elements have holes in them. The theory of atoms having proton nuclei is not true to Nature's creative gyroscopic wave process. Elements are not substances. They are not fixed created things. Elements are pressure conditions of light waves. **Elements are motion only.** All motion is rings of light spinning around points or shafts of still Light compressing to "fill their holes" or expanding their mass into rings of light centered by holes.

All elements are vibrations only within wave fields. Everything in the visible universe is vibration only. All vibrations are invisible rings of light compressing/expanding into 3-dimensional waves of visible motion. Waves are created within wave fields. You can't have waves without wave fields. Wave fields appear when motion appears. Wave fields are the boundaries, the backboards which reflect motion. **Wave fields determine the wave lengths of motion** and the orbits of large masses. Wave fields are the universal mechanics that cause motion to multiply and divide as increasing and decreasing pressures. Wave fields are the instruments, the containers, the generators and oscillators which compress, resonate, project and reflect light, sound, thought and all wave motion throughout the universe. **The only wave field geometry which can "fill all space"** and perfectly reflect motion universally **is the cube.** All Nature's wave fields are cubic.

Nature only has two wave motions within wave fields. Both are tornado-like, 3-dimensional spiral vortexes. Both look alike.

- * **Centripetal waves** compress cold gases into hot, high pressure spheres. Winding-up motion moves from vacuous cone bases toward dense apexes.
- * **Centrifugal waves** expand hot spheres into cold gases. The unwinding motion moves from dense apexes centering spheres toward vacuous cone bases.

Together, centripetal and centrifugal waves flow through each other, resist each other, create friction/heat/density at seven octave focal points and alternately become each other. **This rhythmic balanced interchange creates the wave frequency.** These two wave motions are Nature's creative/destructive process. They are the sole force, the **creators of and "atomic glue" for** holding atoms, suns, planets and moons together.

The Divine Iliad says, "Behold, I am within all things, centering them; and I am without all things, controlling them." The "I Am" is the still zero point of Omnipresent Light which centers each ring of light, atom, element and cell of creation. Six planes of still Omnipresent Light surround each atom, element and cell as the wave field of its creation.

Question #2 Give an example of "the" geometry for an element preceding and for one following carbon. Pictures please.

The Dimension Chart #1, page 159, The Universal One, illustrates the cubic volume of lithium, beryllium, boron and carbon. It also illustrates Nature's octave principle (the square of the distance in direct and inverse ratio) in the generation of all effects of motion be they elements, musical tones or colors.

The Evolution of Mass from Plane to Sphere Chart, page 209, The Universal One, illustrates "the" geometry for the cores of the silicon octave perfectly and for the positive half of the carbon octave. It pictures the cosmic two-way spiral gyroscopic principle of growth, the winding up of nebulous gases into dense spheres like winding string on a ball with two hands simultaneously. The six reflective mirrors of wave fields focus and concentrate at six balancing points upon the spinning vortexes. This creates three concentrating/generating/gravitating/winging-up predominately alkaline/male elements. In the opposite half of the same wave field on the other side of the mirror equator, three equal but opposite balancing mirror-image acid/female elements are simultaneously formed. These elements are predominately expanding/radiating/levitating/unwinding. At the wave amplitude of greatest pressure a fourth pair of equal but opposite elements are fused together as the octaves seventh tone. These two elements form two hemispheres of one sphere with a flat cleavage uniting equator. When two previously separated equal but opposite unbalanced elements as sodium and chlorine come together, they void their individual identities, fuse into two hemispheres of one solid core sphere with a uniting equator and crystallize as cubes which chemistry call salts.

Structure of the Atom, Chart #2, page 101, The Universal One, illustrates in two-dimension, magnesium (2+) and aluminum (3+) in the silicon octave. Beryllium (2+) and boron (3+) of the carbon octave could be of similar forms only larger and of less weight, pressure and density. Hydrogen shown in this drawing as a (1+) element (Russell drew this previous to his 1926 revised elemental charts), is a 4 $\frac{1}{2}$ amplitude element one octave lower than carbon. The nebulous form shown as hydrogen would be more typical of lithium (1+) in the carbon octave. Hydrogen, an extremely nebulous gas with a melting point of -259°C would be almost to faint to draw.

Nature, after winding motion into the densest of elements, carbon, with a melting point of 3550°C (like winding a watch spring to its absolute maximum), snaps, unwinds and almost totally explodes on the predominately negative/acid/blue side into nitrogen (-210°C), oxygen (-218°C) and fluorine (-233°C). These are all very nebulous gas with little form.

Nature freezes wave motion as crystals. (Always remember that our environment, the universe through which our space vehicle, Earth, travels, is a frigid -273°C absolute cold.) Any forming matter anywhere which is generating internal heat against the resistance of the universal cold is simultaneously frozen in motion; the crust freezing first like ice on the surface of a lake; the core freezing last like ice cubes in your freezer. While the compressed motion called carbon and silicon freeze as perfect cubes, **all other crystal shapes are sections of cubes.** Crystals are known by their flat cleavage planes as in quartz and gem stones. Crystals break apart on these flat planes. These cleavage planes are wave field planes within a larger cubic wave field and give each crystal its shape and light reflecting qualities.

It may be hard to imagine but **space is composed of crystals;** crystals of invisible still Light. All space within and without matter is composed of 3-dimensional, 6-sided cubic Light crystal wave fields. Their cleavage planes, or as Russell calls them, "boundary planes of zero curvature," are planes of still Omnipresent Light. Motion does not pass through stillness. Stillness anywhere functions as a mirror, reflecting and compressing motion within its wave field. Stillness also acts as a transparent mirror reflecting motion to adjoining wave fields throughout the universe. These space crystals of Light are structurally firm yet fluid and flowing, expanding and contracting, passing through each other unchanged and unobstructed. **Being cleaved together as 'One'**, they insulate, balance and adjust to the changing orbits of any motion anywhere. As Russell says, "the farthest planet adjusts to the flap of a butterfly wing on this planet."

In space these Light crystals are invisible to our eyes and instruments because: stillness is invisible; they are millions of times larger than their centering spheres of matter; "Complex bodies are multiples of spheres of matter surrounded by multiple cubes of space in multiples of wave fields." (Secret of Light, page 224.)

In matter, however, we can see these Light crystal cleavage planes. The Earth and all spherical matter is formed at the intersection of eight cubic wave fields. Earth's equator is a flat Light crystal cleavage plane, a plane of zero curvature. All spheres as suns, planets and moons are two hemispheres fused together with a reflecting Light crystal equator which mirrors each half in the reverse image. All seeds as almonds, all grains, beans and fruits are two hemispheres joined by a balancing still equator (some more noticeable than others). Every leaf of all plants is two halves, each a mirror image of the other joined by a uniting equator of still Light. A tree and its root system are mirror images divided by the still equator of the earth's surface. Your own body is two hemispheres fused as one. A Light crystal equator divides your two brain hemispheres, two eyes, ears, nostrils, arms and legs. Each of your organs has two lobes. Each side of your body has a separate nervous system. All complex matter is two compressed halves fused together as one with a uniting equator. This equator is one plane of Nature's space cubic Light crystals.

ENERGY IS CONCEIVED IN INERTIA, STORED
IN MASS AND RECORDED IN PLANE

EVOLUTION OF MASS FROM PLANE TO SPHERE



NEBULOUS 1+ PLANE



OVOID 2+ MASS

APPEARANCE

Centripetal force exerts its attractive pull toward the point of north in a common vortex from all directions, but preponderantly by the way of the poles.

The ultimate result must be a sphere.

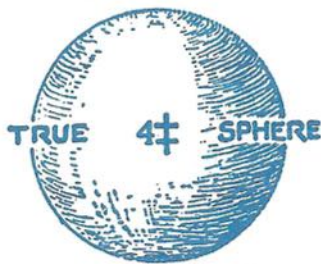


OBLATENESS 3+ DECREASES

DISAPPEARANCE

Centrifugal force exerts its repellent thrust away from a common vortex in all directions, but preponderantly from the plane of the equator.

The ultimate result must be the dissolution of spherical form



TRUE 4+ SPHERE

THE ROAD TO APPEARANCE OF FORM IN MASS MUST BE BY THE WAY OF PLANE

THE ROAD TO DISAPPEARANCE OF FORM IN MASS MUST BE BY THE WAY OF PLANE



OBLATENESS 3- INCREASES



OVOID 2+ MASS

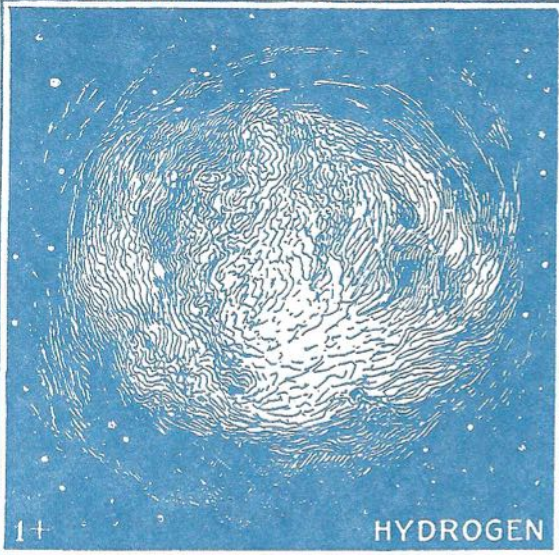


NEBULOUS 1+ PLANE

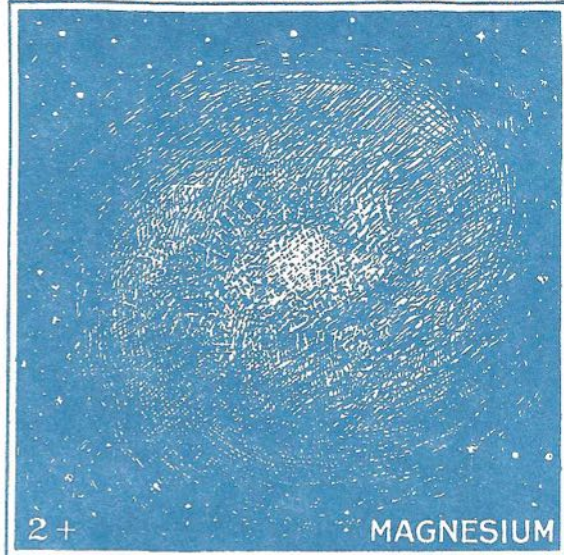


MASS IS GENERATED INTO THE APPEARANCE OF FORM BY THE ATTRACTION OF GRAVITATION AND IS RADIATED INTO THE DISAPPEARANCE OF FORM BY THE REPULSION OF RADIATION

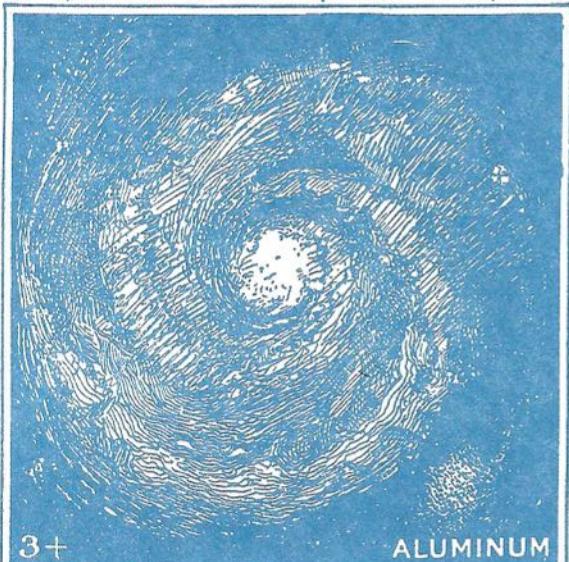
EVOLUTION OF FORCE INTO TONES OF THE UNIVERSAL CONSTANT



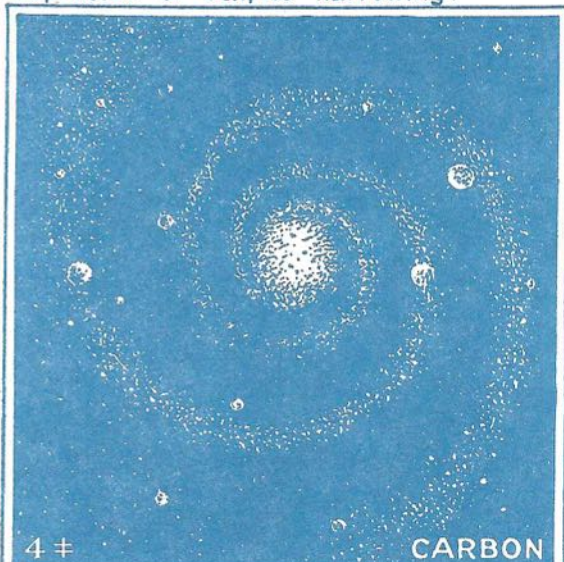
1+ . Positive charge seeks itself. Area of disturbance of first tone of universal constant. Form is spherical. Maximum expansion of ecliptic.



2+ . Electricity gains in second tone. Positive charge is forming a nucleus. Form is ovoid. Expansion of ecliptic narrowing.



3+ . Nucleus defined. Masses forming separate vortices and developing separate nuclei and pressure zones.



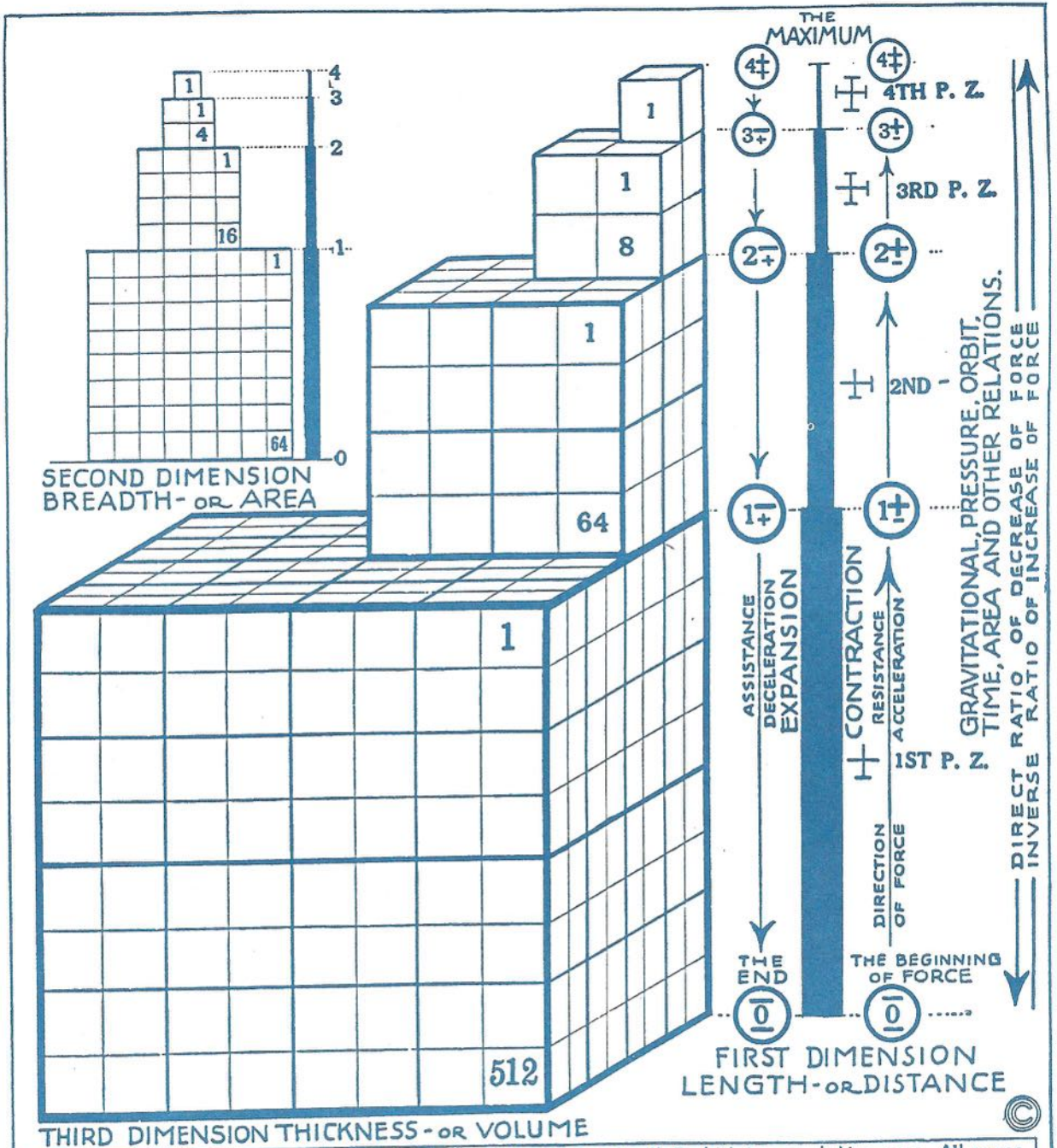
4+ Maximum positive charge has gathered into definite nucleus and magnetic resistance registered in heat.



4+ . Shown edge on in plane. Note absolute symmetry of ecliptic with no projecting planets. When outer planets project from ecliptic, the element changes to nickel, then copper, zinc, etc.

CHART No. 2. STRUCTURE OF THE ATOM. ALL EFFECTS OF MOTION ARE REPEATIVE. SIZE IS PURELY RELATIVE. THE HEAVENS SWARM WITH REPLICAS OF THE ATOMS OF ALL THE ELEMENTS. WITH A KNOWLEDGE OF BASIC LAWS THEY MAY ALL BE MEASURED AND CLASSIFIED

UNIVERSAL MATHEMATICS



The universe is divided into the appearance of separate parts all of which have relative mass. All mass is accumulated into systems which are in absolute equilibrium. All mass, and all systems, and all systems of systems, are divided into a series of equal plus and minus dimensions, all of which appear to be independent dimensions. There are no independent dimensions in this universe of motion in equilibrium. When one dimension appears to change all of the other seventeen appear also to change, but always in the same ratios, and always in conformity with the formula of the locked potentials.

DIMENSION CHART No. 1. DISTANCE AREA AND VOLUME RATIOS IN CONTRACTING AND EXPANDING UNITS OF ALL EXPRESSIONS OF MOTION

FROM TIMOTHY A BINDER

Larry has done an excellent job of bringing the essential points together that I wanted to focus on in these questions; but I believe he has misinterpreted some of the Russellian mechanics and geometry. I will attempt to clarify this and intend to develop the ideas further and welcome Larry and other readers input for this further development.

Larry says that, "silicon which is carbon one octave higher is identical to carbon, only less dense. Silicon has a cubic (underlining is the editors') wave field and solid (hole filled) core. It's molecules crystallize as a cube" (underlining again the editor's). The text on page 786 of the *HSC* is a little difficult to interpret as the sentence in question was written in a long complex form that I can identify with - having had such a propensity all my life to write the same way. Here is the sentence: "The fact is that as the octaves progress from the carbon octave, which has no hole in it as all previous octaves have and in which densities multiply from the inside outward - whereas the octaves which have closed their holes increase their densities from the outside in, which means from outward toward their centers within — they complex their crystal forms. The cube form of the carbon octave complexes to hexagonal and each succeeding one complexes still more to octahedral and so on, until the complexity increases so much that in the niton inert gas it has no reflecting mirrors to multiply light power inward". My interpretation of this is that silicon is hexagonal and crystallizes as such. In all other places where Larry speaks of carbon and silicon as both having cubic form I think he is in error. Further on page 831 of the *HSC* the Russells plainly state, " The succeeding amplitude positions lose that simplicity. Silicon, the next one on its wave amplitude, complexes to hexagonal symmetry". So it appears to me that all elements other than carbon will vary from the cubic in their wave field form. I also wonder about the *absolute* solid closed hole core of all other elements than carbon. When talking about lenses on page 798 of the *HSC* they say the following: These seven lenses begin to thin at their centers and holes (underlining the editors) return to oblate the planets or suns until their masses eventually become rings and disappear in the outside dark of the earth. To me this implies that elements, like planets or suns, after they have reached their mature point or their carbon amplitude point, have holes bored through their centers and disappear from the inside out. I think I remember somewhere where they said something almost

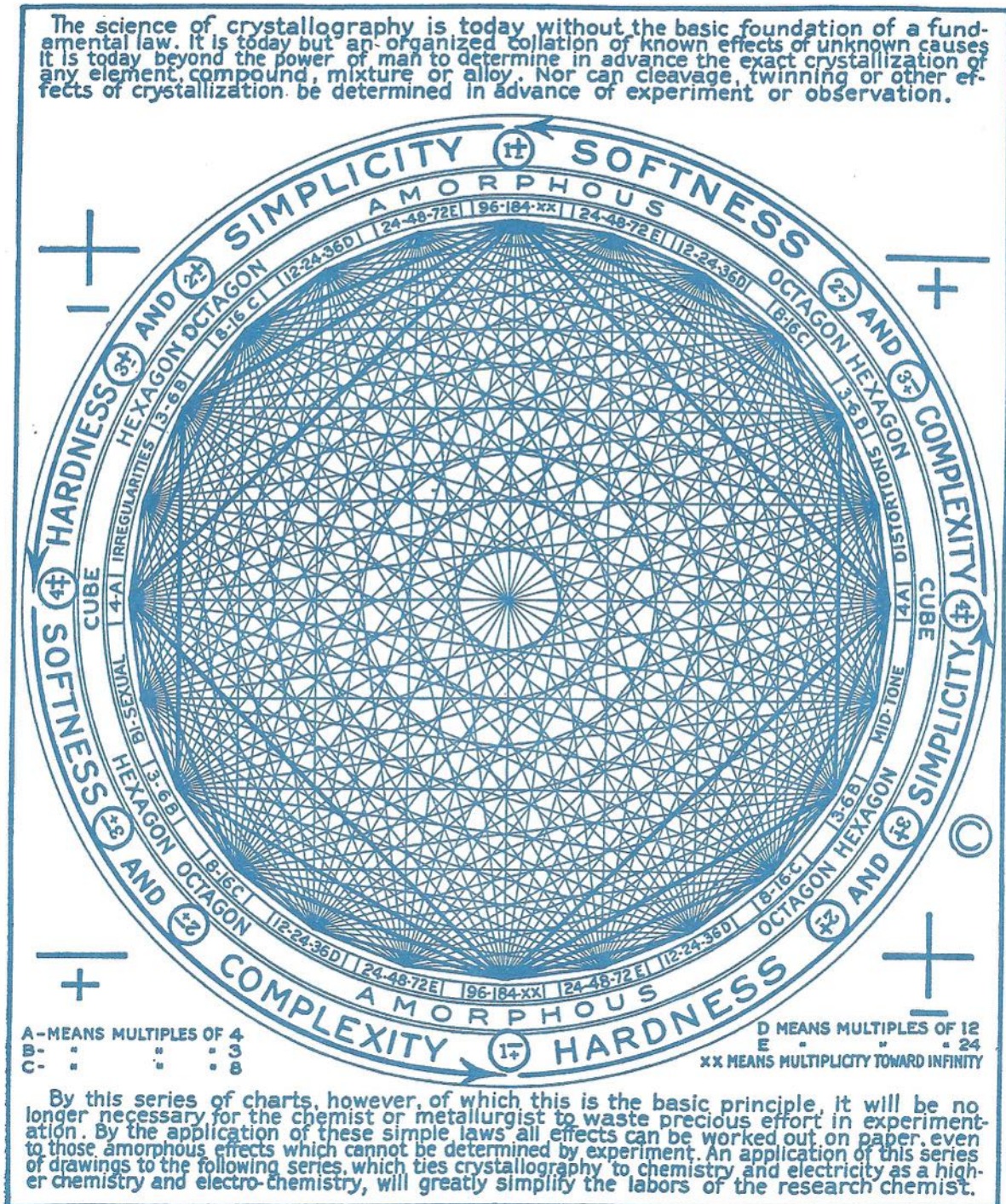
exactly like that in the *HSC*. On page 96 of *In The Wave Lies The Secret Of Creation* Figure 27 exemplifying natures disintegrative process illustrates this process and the chart says, " As spheres oblate, their lenses develop two ever widening foci, between which holes develop and rings are projected. This chart from that book is reproduced at the end of my comments to illustrate the point.

I think carbon is the only element that has close to absolute true sphere core and cube wave field geometry. In each octave the male and female elements on each side of the amplitude element for the octave progress from more prolate forms on the male side towards the spherical and from more oblate forms on the female towards the spherical as each progresses from the plus or minus one to the plus/minus four position in the octave. And , I suspect something similar for all the octaves. And yet in *The Universal One* as Larry has pointed out in the chart on page 209 he shows mass evolving and devolving or at least appearing and disappearing from nebulous plane to ovoid to oblate to sphere and then reversing these steps back to nebulous plane. Where does a prolate form appear in this? Does prolation have a place here? In *A New Concept Of The Universe* he speaks of elements being more or less prolate and more or less oblate. On page 98 he says, "*The north -south poles control generation into form . (this is prolation?) The east-west poles control degeneration of form back to its source. When true spheres have been generated, the four poles unite as one and then reverse their directions. Prolation then ceases and obliteration begins*". I suspect that in his earlier work he had not thought of what the difference between prolation and obliteration was and I don't think he used the term prolation in *The Universal One*. For me it is easy to visualize the difference geometrically as simply turning an oblate sphere ninety degrees sideways to make it prolate or turning a prolate sphere sideways to make it oblate. Walter gives further insight about prolation and obliteration on pages 99 and 100 of *A New Concept Of The Universe*. I'll let you look it up to see for yourself the complexity of geometry that the elements possess, even though the archetypes for all forms are to be seen in the cube and the sphere.

The questions for next issue help to further develop these ideas. I think the question of the geometry of the elements is yet to be fully answered but at least we have taken a stab at it. Thanks Larry for giving us all a starting point to consider this!

There is one other point in Larry's answer that appears to me to be questionable. He says, "(Always remember that our environment, the universe through which our space vehicle, Earth, travels, is a frigid -273 'C absolute cold)". I simply take exception to the -273'C absolute cold. I don't think that absolute cold exists in our relative universe of relative hot and cold. Absolute -273'C is the lower limit of temperature just as zero is the lower limit of numbering and as such it has no reality other than as an abstraction in our relative Universe of many seeming

things. In the absolute One, then and there, Zero and Infinity are ONE. I do not think anyone has been able to demonstrate absolute -273'C, or absolute zero, as support for my exception to his statement. Close to it yes, but absolute zero and no motion and therefore no degree at all of any friction and heat, no. The environment through which our space vehicle, Earth, travels, continually varies. We cycle between the seasons and between relative hot and cold as we approach and recede from the sun.



CRYSTALLIZATION CHART No.1. BASIC PRINCIPLE OF CRYSTALLIZATION IN ACCORD WITH THE FORMULA OF LOCKED POTENTIALS 4.3.2.1.0.1.2.3.4.

Figure 27.

Exemplifying Nature's Disintegrating Process

Two of the convex lenses of the four sets in the octave wave that focus to form the amplitude balanced, perfect sphere position are illustrated along with the four disintegrating concave lenses that oblate spheres; they are depicted with their respective blue-green female and red-orange male colors to differentiate sex. The lower set of spheres show an oblated sphere undergoing further oblation from left to right. This represents the disintegration process.

The oblation process can perhaps be better visualized by turning the book 90 degrees so that the blue compressing, interpenetrating cones are at the top and bottom of the picture. Oblate spheres are flattened at the poles and extended at the equator, while prolat-

The picture of the dumbbell nebula is already positioned with the compressing vortex motion on the top and bottom and expanding vortex motion on the sides.

These oblate spheres demonstrate the widening equatorial ecliptic plane that develops as they oblate further. The widening separating foci of the centripetal polar spiral vortical apexes create a thinner convex lens at the polar cone base, with more concavity to the other seven concave lenses.

The separating foci represent and form the hole that is bored through the center of disintegrating systems and through the equatorial area from which rings are projected centrifugally at 90 degrees to the compressing rings.

The celestial pictures show this effect with the lower one of the pair in a similar position as the oblate spheroids to its left, except that it is rotated 90 degrees from the oblate spheroids and is shown in a horizontal equatorial plane view. The upper picture is the same structure as the lower one, but seen from a viewpoint

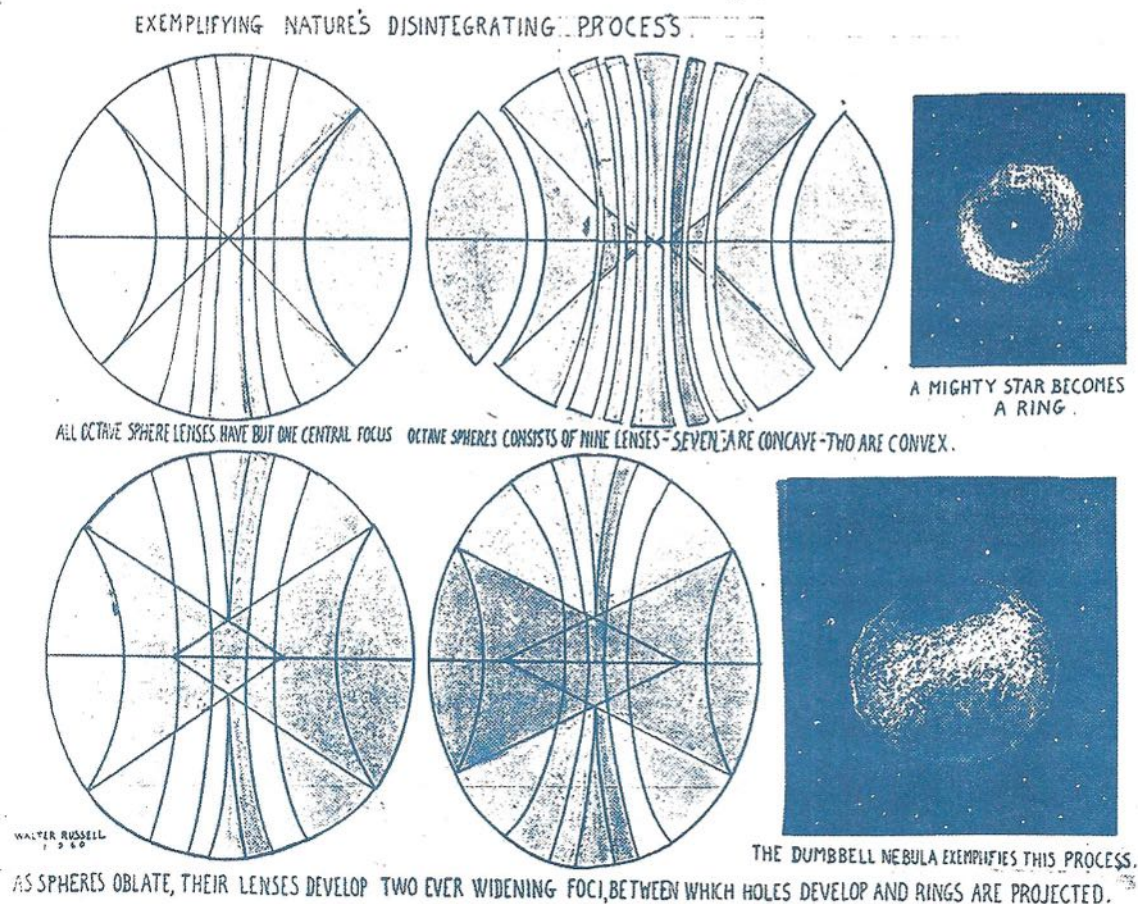


Figure 27

Completed in 1960 and not previously published.

ed spheres are extended at the poles and flattened at the equator. We usually envision these forms with the poles at the top and the equatorial plane extending horizontally rather than as Dr. Russell has placed them in this painting — exactly 90 degrees opposite.

rotated upward 90 degrees to look down on the poles and to view the horizontal ring in end or plane view. In other words, the lower picture is seen on a side or edge view, and the upper is seen from a top or bottom view.

Letters to the editor

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June 4, 1998

Dr. Timothy Binder
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Dear Tim:

The original EM equations of James Clerk Maxwell were indeed in cartesian and quaternionic terms. Maxwell's theory is really 20 quaternion-type equations in 20 unknowns, and they are still given in a chapter in the second volume of his book, A Treatise on Electricity and Magnetism, 3rd Edition, 1954, reprint available very reasonably (2 volumes) from Dover Publications. One can look up the Maxwell equations oneself. Or if one really wants to insure the original, check Maxwell's "A dynamical theory of the electromagnetic field," Philosophical Transactions of the Royal Society of London, Vol. 155, 1865. This was his third exposition of his theory, and it is his definitive statement of it. Here he finally discarded the mechanical clockwork model of the ether, and first used the term "electromagnetic field." A more available source for this paper is The Scientific Papers of James Clerk Maxwell, edited by W.D. Niven, Dover, New York, 1952, Vol. 1, p. 526-604.

Quaternion algebra is a higher topology algebra (higher than either vectors or tensors), which means it has more degrees of freedom. E.g., you can do things in electrical circuits that cannot be predicted by "normal" tensor analysis, but quaternion analysis will see them. For a concrete example, Tesla's actual patented circuits do things that today's engineers using vectors and tensors CANNOT find in their models. On the other hand, a quaternion analysis will show them. As proof, see T.W. Barrett, "Tesla's Nonlinear Oscillator-Shuttle-Circuit (OSC) Theory," Annales de la Fondation Louis de Broglie, 16(1), 1991, p. 23-41. Barrett analyzes Tesla's patented circuits and shows that they perform functions that our vector/tensor engineers have never recognized and do not know how to do. For instance, Tesla could obtain what is called "optical phase conjugate functioning" without use of optical materials, as Barrett shows and discusses. So the old master, Nikola Tesla, did indeed have a few tricks up his sleeves that modern engineers who think they understand his work have never realized.

Anyway, there are still books and papers on quaternions in the literature. There are also some Internet sites that show lots of quaternion electrodynamics and quaternion mathematics. Quaternion theory is still used by aerospace engineers in guidance and

autopilot theory, since it eases the simulation of rotations of the missile, fins, gyros, etc.

A quaternion contains three vector terms and a scalar term. Oliver Heaviside, working his way through Maxwell's 1873 Treatise, despaired that the crude "engineers" of the time (which were more like electricians) would ever be able to handle quaternion mathematics. He felt that mixing scalars and vectors was "like mixing apples and oranges." So he chopped off the extra scalar term, to form the mathematics that today we call "vector algebra." And he reinterpreted Maxwell's 20 equations in 20 unknowns into a much smaller subset of only 4 equations. In the late 1880s and early 1890s, there was a short argument in the journals (mostly in the journal Nature) and the vectorists just threw out quaternion electrodynamics and adopted vector electrodynamics. Remember, at the time there were probably less than 100 "electrodynamicists." (When Maxwell *wrote* his equations, there were only about three dozen electrodynamicists world wide.). Hertz and Gibbs also contributed in the same direction taken by Heaviside.

But Heaviside's work was what was finally adopted. Indeed, the "Maxwell" equations in all the university textbooks today are Heaviside's equations, not Maxwell's. Not a single one of them ever appeared in that form in any book or paper by James Clerk Maxwell. Heaviside also could not understand the potential, thought it was "mystical and should be murdered from the theory," and took the view that only the fields had physical significance. Unfortunately that impression still prevails, even though now we know that it is the potentials that are the primary causes, not the force fields.

In fact, we know that the force fields *do not even exist* as such in massless space, although all the electrodynamics texts erroneously teach that they do! Instead, the force fields only exist in and on charged mass. Look at it this way: $F \equiv d/dt(mv)$. Mass must always be present to have a force. As Feynman put it in his three volumes of physics,

"...in dealing with force the tacit assumption is always made that the force is equal to zero unless some physical body is present... One of the most important characteristics of force is that it has a material origin, and this is not just a definition. ... If you insist upon a precise definition of force, you will never get it!" Richard P. Feynman, Robert B. Leighton, and Matthew Sands, Lectures on Physics, Addison-Wesley, Reading, MA, Vol. 1, 1964, p. 12-2.

A very good book (educated layman level) is Paul J. Nahin, Oliver Heaviside: Sage in Solitude, IEEE Press, New York, 1988. Beginning on p. 108 there is a neat little discussion of how Heaviside came to modify Maxwell's equations from quaternions into vectors. Quoting one line:

"When Maxwell died in 1879 he left his theory... as twenty equations in twenty variables.... Maxwell wrote his equations out in cartesian component form, and in his Treatise he also mixed in quaternionic concepts (about which Heaviside had much to say, none good... Maxwell's original equations display no obvious symmetry in their form... To Maxwell, the magnetic vector potential, not the fields, played the central role in electrodynamics... Both of these ideas were rejected by Heaviside (and Hertz)."

For light on the argument between the vectorists and the quaternionists, see A.M. Bork, "Vectors versus quaternions — the letters in *Nature*," American Journal of Physics, Vol. 34, Mar. 1966, p. 202-211. In the paper, Bork also references some of the primary sources.

The best (highest topology) algebra is probably Clifford algebra, which includes as a subset the quaternion algebra, Pauli algebra, and several others. See E.F. Bolinder, "Clifford Algebra: What is It?" IEEE Antennas and Propagation Society Newsletter, Aug. 1987, p. 18-23. Bolinder is a well-known Swedish electrical engineer, and he gives the historical background of the development of Clifford algebra, including Grassmann's exterior algebra, Hamilton's quaternions, Clifford's n-dimensional geometric algebra, and Lipschitz's re-invention of Clifford algebra. He also shows the relationship to the Gibbs-Heaviside vector subset. Clifford algebra was built upon Grassman algebra and Hamilton's quaternions. Quaternions are a subset of Clifford algebra (and Gibbs-Heaviside vectors are a further subset of quaternions.)

One can make a good argument that a great deal of physics would have been discovered much earlier if quaternions had not been discarded in favor of the much more limited vectors. For that argument, see James D. Edmonds, Jr., "Quaternion quantum theory: New physics or number mysticism?", American Journal of Physics, 42(3), Mar. 1974, p. 220-223.

For a definitive statement that the lower topology algebras such as vectors and tensors do not include everything in the higher topology algebras such as Clifford algebra and quaternion algebra, see D. Hestenes, "Mathematical Viruses," in Clifford Algebras and their Applications in Mathematical Physics, J.S.R. Chisholm and A.K. Common, Eds., D. Reidel Publishing Co., Dordrecht/Boston, 1986, p. 1-23.

Presently a number of younger and middle-aged physicists have returned to Clifford Algebra and are beginning to rewrite electrodynamics. It is fair to say that a new revolution in electrodynamics is beginning. Excitingly, one finds both faster-than-light and slower-than-light Maxwell solutions, and longitudinal EM waves have reached the forefront. As an example, such waves are called "undistorted progressive waves." You can find a number of papers on them, on the Los Alamos National Laboratory Web site. Particularly the papers by Rogrigues and Lu give a summary.

However, in addition to using an algebra of too low topology, electrodynamic theory has very, very serious foundations problems. Here is a deliberately simplified and slightly tongue-in-cheek gist of a letter I recently wrote to a friend on that subject.

On the Foundations Errors in Electrodynamics

T.E. Bearden 1998

As Mario Bunge put it,

"...it is not usually acknowledged that electrodynamics, both classical and quantal, are in a sad state... the best modern physicist is the one who acknowledges that neither classical nor quantum physics are cut and dried, both being full of holes and in need of a vigorous overhauling not only to better cover their own domains but also to join smoothly so as to produce a coherent picture of the various levels of physical reality."
Mario Bunge, Foundations of Physics, Springer-Verlag, New York, 1967, p. 176, 182.

The photon is made of action (angular momentum), which is (energy x time). So a photon carries a 3-spatial energy dynamics and also a time component. It's a "piece of energy welded to a piece of time, with no seam in the middle." I was once astounded after a beautiful hour-long conversation with Eugene Wigner, when he asked me what I worked on. I explained the mechanism that generates the flow of time, but Wigner was astonished at my assertion that photons carried time as well as energy! He would agree it was made of energy x time, but thought it only carried energy. (That's rather like saying a board is made of length x width, but can only carry length when it's moving). Of course I had great respect for him, and so I just shut up. Nonetheless, photons carry time, and also carry energy. An ensemble of dynamic photons not only has an energy dynamics, but also a "time structure" dynamics.

Well, EM waves are comprised of photons. So they actually are comprised of angular momentum.

A so-called transverse EM wave (as it is conventionally modeled, never mind what it really is) is essentially a transverse dynamics of the energy density of spacetime. However, concomitant with that, there also exists a dynamics of the "time component density" of the rate of flow of time.

But the time domain structuring and dynamics are ignored in the conventional notion of the transverse EM wave. Let us accept that transverse wave notion at the present. Well, this means there is another degree of freedom, for the time dynamics, that the transverse wave does not cover.

A *longitudinal* EM wave (LW) by definition cannot vary its 3-space energy density transversely as it travels, else it would be a *transverse* EM wave. Since the LW is "oscillating" somehow, but cannot be oscillating its energy spatially, there is only one other possibility because there is only one other degree of freedom: It is oscillating the "time density" of the time-elements of its photons, in the time domain.

And it turns out that this is true.

Now recheck the two Whittaker papers I am so fond of quoting (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. 367-372. Whittaker's 1904 paper

shows that all EM fields and waves are just two scalar potential functions. But Whittaker 1903 shows that any scalar potential is comprised of a bundle of bidirectional EM wavepairs, where each wavepair consists of a longitudinal EM wave and its phase conjugate (its antiwave, or time-reversed twin.). So a "scalar" potential is not a scalar *entity* at all. Instead, it is a multivectorial, multiwave entity – but the waves are longitudinal EM waves and are paired in conjugate fashion.

And so all of the EM potentials, waves, and fields are themselves filled with a marvelous *infolded* longitudinal EM wave dynamics moving bidirectionally through them. Potentials, waves, and fields are superhighways for longitudinal EM waves.

Whittaker showed that (1) scalar potentials make all the fields and waves, and (2) those scalar potentials in turn are each composed of a beautiful set of longitudinal EM wavepairs.

In short, longitudinal EM waves (1) can be assembled to MAKE all potentials, fields, and waves, and (2) they are time domain oscillations rather than 3-spatial energy density oscillations. The Russian/KGB clandestine energetics scientists call these longitudinal EM waves *infolded* inside (and actually comprising and creating) all potentials, fields, and waves the information content of the field. Our guys mistakenly think they are referring to the transverse EM wave spectral content. They are not.

Since a longitudinal EM wave is a time domain oscillation, it is pure general relativistic! One can engineer powerful spacetime curvature effects, using LWs. A time-oscillating wave produces a very powerful energy effect in any mass reacting with it. Time may be thought of as a highly compressed length, by a factor of 3×10^8 . Energy of a wave is proportional to L^2 , because it is proportional to the square of the transverse amplitude of the wave. When the mass interacts with the time oscillation and changes the time oscillation into energy, the time oscillations "decompress" and "extend" by a factor of c^2 , or about 9×10^{16} . We may view time as energy compressed by that enormous factor! So very powerful local spacetime curvatures can be obtained, when one uses longitudinal EM waves.

We are presently (quietly) preparing an Invention Disclosure to send to the U.S. Patent Office, dealing with how to use longitudinal EM waves to do direct engineering. Then when some funds are available, we'll file the formal patent application.

As Bunge pointed out so bluntly, electrodynamics is thoroughly fouled and needs to be completely overhauled. There are no force fields in the absence of mass, as has been well-known for decades. There never has been an E-field or a B-field, as a *force* field, in space. Many foundations scientists – such as Feynman, Wheeler, Margenau, Lindsay, Aharonov, Bohm, etc. have affirmed that statement or its equivalent. E.g., the entities ϕ , E, and B are all defined only as what happens to the point standard charged mass (electric or magnetic as applicable). Electrodynamists *assume* a unit charged mass at every single point in space. The EM equations tell how that assumed mass reacts when the spacetime perturbation reaches it and interacts with it. Electrodynamics as presently written is rigorously a mass-to-mass transformation. It

has nothing at all to say about the form that EM entities exist in, in space (i.e., in spacetime) devoid of mass - i.e., in space between the transmitter and the receiver.

This production of EM theory as a mass-to-mass transform was a natural mistake for Maxwell to make! Maxwell and all his peers (there were only about three dozen or so real electrodynamicists in the world at the time!) all believed in a material ether. I.e., they thought a thin material fluid filled all space. In their view, there was nowhere in all the universe where mass was absent! So everything out there in space had to be made of mass, at least of this material ether, which had mass. Further, neither the electron nor the atom had been discovered. Charge q meant nothing else but just a quantity of electric fluid, much like a cubic centimeter. It had nothing to do with particles, electrons, protons, and all that, as it does today.

So Maxwell (and everyone else) defined all the electromagnetic entities (fields, waves, potentials) as quantities of mass (fluid, fluid aspects). Recall, this was during the time of the American Civil War. Neither special or general relativity had been born yet.

Then in the 1880s, the Michelson-Morley experiments destroyed the notion of the material ether. They destroyed those assumed point coulombs of charged mass that Maxwell and everybody else assumed in all their definitions. They did not destroy space as a medium, but just the assumption that it was a material medium (this pointed out by Dirac, for example.). Maxwell died in 1879, and so he was already dead when the material ether notion was destroyed, literally tearing the heart right out of his equations by annihilating part of their fundamental foundations concepts.

But even though one of its ubiquitous, primary foundations assumptions was annihilated, Maxwell's theory had not been corrected accordingly. Not a single Maxwell equation has ever been changed! Instead, the electrodynamicists later announced that, well, since there was no material ether, they were not using one! But all their equations *were* using one. And they *still* are using one. Every electrodynamicist in the U.S. and Western Europe is still using that old material ether, 110 years after it was falsified. Tesla rightly called the prevailing EM theory, with its transverse waves in space, the "most inexplicable aberration of the scientific mind that has ever been recorded in history." And that comment, though bitingly acid, was correct and still is.

Anyway, this led to the absolutely inane notion that EM waves "move through space without a medium." Nonsense! In general relativity, *spacetime itself* is a medium, as well as being the geometry itself! You can curve (perturb) spacetime, and the perturbation will oscillate, and that oscillation in the curvature of spacetime will also propagate through space. That's already well-known in general relativity. Further, just use logic. A wave is something waving, i.e., it is a wave in and of a medium. To say that a wave has no medium, is to say that "something is shaking without something shaking." It's an oxymoron. Yet that or some version of it is still in most textbooks.

Then there's the matter of the electrodynamicists all assuming perpetual motion machines. You see, they assume that charge(d) (mass) is the source of all potentials and fields. The potential and field from any charge reaches out to infinity in all

directions. Well, that source charge means that the charges are also the *sources of all that energy* in their fields and potentials, filling the universe. And each charge has been pouring out that energy continuously, since its formation at the big bang, billions of years ago. The electrodynamicists assume that all that energy for all these billions of years has been created by the charges, *right out of nothing!* Then, so help us all, they turn around and assume that space has no energy.

Zounds! Go out there in deep space somewhere, and look at a little increment of volume. That little volume has "field" energy and "potential" energy pouring through it, from every charge in the universe. Gee, that little volume ought to have a whale of a lot of EM energy density, from all that dynamic energy continually present in it as it passes through it. And if you put a charged mass into that volume, that energy has to interact with it, or else electrostatics itself is destroyed. Yet electrodynamicists would have us believe that space is not energetic, and there is no energetic exchange between space and charge.

Eerily, it's been experimentally and theoretically established in particle physics for 40 years that space is active, and it does constantly exchange energy with any charge. The charge is a broken symmetry in the vacuum virtual energy flux; that means it absorbs fierce energy in virtual form from the vacuum, radiates most of it back to the vacuum in virtual form, but coheres some of it into "potentially observable" form and reradiates that portion back out in potentially observable form. In other words, it radiates that component back out as the so-called "Poynting energy flow."

So four decades after particle physicists falsified the notion that the vacuum is inactive, electrodynamicists have not modified the resulting errors in their models.

In assuming the inert vacuum and thereby assuming the charge as the absolute source of the potential and field and their energy, electrostatics violates the most sacrosanct of all physical laws: *Energy can neither be created nor destroyed.* It also assumes the grossest number of perpetual motion machines – all the charges – that the mind of man ever dreamed of.

Yet many of these same electrodynamicists have the unmitigated gall to accuse the free energy researchers of preaching perpetual motion! Free energy researchers advocate open dissipative EM systems far from equilibrium, freely receiving excess energy from their environment (the energetic vacuum), and dissipating it in a load. Such overunity systems are permitted by Maxwell's equations before the early electrodynamicists tampered with them and "symmetrically regauged" them. In short, they assumed that every Maxwellian system's energy may be freely changed (regauged). However, if they made just ONE change, then that system has (1) free excess energy, and (2) a free net force which can expend that energy in a load. Well, that's asymmetrical – and if there's one thing that modern physicists have welded into their heads, it's the notion that "symmetry is pure beauty." So the early electrodynamicists just threw in a SECOND asymmetrical regauging, to add some more free energy, but carefully selected just so that the new free net force created was the equal and opposite of the first one. Voila! That system can never put out any excess energy, and it will never

exhibit a coefficient of performance greater than unity. But in doing this "symmetrical regauging" of the equations to change them into new equations much easier to solve (now the variables could be separated), they threw out far more Maxwellian systems than they retained. They also added two hidden Maxwell demons, adding excess energy to the system and fighting each other through the system so that the system has additional stress. And these two ubiquitous demons are also "perpetual motion machines."

And some of these same electrodynamicists have the unmitigated gall to accuse the free energy researchers of preaching perpetual motion! Heck, we can't hold a candle to *those* fellows! They are *expert* evokers of perpetual motion machines on a grandiose scale. Figuratively they should remove the mote from their own eye, for it's as big as a mountain.

Electrodynamics presently is missing two major transforms: (1) the matter-to-spacetime transform, which is what happens in a transmitting wire antenna when the disturbed Drude electrons perturb the surrounding spacetime (not a surrounding material ether of standard charged masses at every point in space as is still assumed in electrodynamics), and (2) the spacetime-to-matter transform, which is what happens in a receiving wire antenna when the incoming spacetime perturbation interacts with the waiting Drude electrons, perturbing the longitudinally restrained electrons, so that they precess laterally. Being electron wiggle detectors, our instruments detect these electron lateral oscillations inside themselves. (Any detector only "measures" its own internal perturbation. It does not measure "that which perturbed it.")

The early scientists - still thinking in terms of the electric fluid oscillating (before the electron and atom were discovered) - believed that this detection of longitudinal oscillations in the "electric fluid" proved that EM waves in vacuum fluid were transverse, and the instruments intercepted them as such. That is not true. Our instruments detect electron precession waves; the little electron beasties are spinning, are longitudinally restrained in a wire (only move longitudinally a few inches per hour!), so when perturbed they precess laterally like nice little perturbed gyros.

Maxwell also inadvertently discarded the simultaneous perturbation (in the transmitting antenna) of the atomic nuclei, since electrons and nuclei are coupled. Of course Newton's third law describes it, but says nothing about any "cause" of it. The simple truth is, in every experiment, when you perturb the Drude electrons you also perturb the atomic nuclei. Whatever you did that caused the Drude electron perturbations, also caused the atomic nuclei perturbations. Since their mass-to-charge ratio is so much more massive than the electron's mass-to-charge ratio, the nuclei perturbations (equal in force, opposite in direction, and of equal energy) are highly damped in amplitude.

However, at the same time that the Drude electrons perturbed the surrounding spacetime, so the atomic nuclei also perturbed it, and with equal energy (equal virtual photon exchange) and opposite direction. So the spacetime medium was perturbed in expansive-compressive fashion - in other words, just as Nikola Tesla stated. Maxwell missed half the wave and half the energy. Now draw two equal sine waves kissing and

antiphased (or nearly so; there is a finite distance between average electron and its nucleus) and so the phasing is not quite 180° . You get a net wave of expansion and compression of the surrounding spacetime – a sound wave type, which we model as a longitudinal wave. And it's a wave of the curvature of spacetime. You do not get a plucked taut string wave, as you would get if the vacuum was considered to be filled with material taut strings as assumed by Faraday and Maxwell. Faraday thought his lines of force in space actually were taut material strings, and Maxwell accepted it and just made them tubes instead of strings. So the notion of the transverse EM wave in space was just assumed from a tight material string analogy, and the fact that the instruments detected transverse EM waves in their own Drude electron gas, viewed as just a "shaking material fluid. The assumption of the transverse EM wave in vacuum has no other substantiation than that.

What actually *exists and propagates* in the spacetime between the transmitter and the receiver, is a *spacetime perturbation*. Spacetime is the *intervening medium*. A wave (oscillating curvature) in spacetime is what is "launched" by the transmitter. The transmitter's perturbed charges slap the immediate spacetime, perturbing it. That spacetime curvature perturbation oscillates, and propagates to the receiver. There the incoming spacetime perturbation interacts with the waiting charges, perturbing them. Our instruments measure the perturbations of the charges, *not* the incoming spacetime perturbations.

And the spacetime perturbation contains both the perturbation component generated by the perturbed electrons in the transmitter, and the perturbation component generated by the perturbed atomic nuclei in the transmitter. The electron-generated perturbation component is forward-time in nature. The nuclei-generated perturbation was generated by positive charges, so is time-reversed in nature. That is, it is a time-reversed twin of the forward-time perturbation.

On the receiving end, the forward-time element of the incoming spacetime disturbance reacts with the forward-time (electrons) elements, and the time-reversed element (made by the perturbed transmitter atomic nuclei) interacts with the atomic nuclei in the receiving wire. Electrodynamics accounts for that perturbation of the electrons, but ignores that accompanying interaction in the receiver's atomic nuclei occurring in all its experiments. Inexplicable! Every experiment exhibits *both* interactions in the receiving antenna, every time the incoming spacetime perturbation interacts with the wire. Yet the electrodynamicists say that the incoming perturbation caused only half of that observed effect (remember, the old electrodynamicists who started this, did not even know there were electrons, atoms, and nuclei with positive charges. Instead, they just thought a material fluid in the wire was shaking. Since that material fluid was shaking transversely (electron precession waves), to them that conclusively proved that the material ether perturbation that came in was also transversely oscillating.)

Well, with our modern knowledge this assumption – that the incoming spacetime perturbation cause only half the effects observed – violates the basic notion of causality in experimental observation. Instead of accepting their experimental results *as caused by the incoming spacetime disturbance*, electrodynamicists piously roll their eyes

toward heaven, and invoke a Newtonian EM demon, lurking in there and carefully watching the interaction with the electrons. This mystical demon – right out of thin air – furnishes the extra energy and creates the equal energy reaction in the atomic. So the electrodynamicists discard that reaction as having been due to the electrostatics. Instead, it's obviously that mighty, hidden, and very clever demon.

Zounds! I think that we ought to start insisting on a course in logic for all engineering and physics students. In describing the results obtained in experiments, we must not assume mystical demons that do work for us out of nothing, and that create extra energy out of nothing. We cannot just discard half the results, else physics becomes pathological. Newton's third law reaction itself either has an EM cause coming in from spaces as a phase conjugate companion of the spacetime perturbation we recognize, or else its ubiquitous appearance "out of nowhere" universally destroys the conservation of energy law itself and much of physics.

A "law" is just a description, it is not a "cause." When "fields" are the causes, then it follows that when Newton's third law appears in relation to another field action, whatever caused that other field action also caused the Newtonian field "reaction." In other words, Newton's third law should be restated as an accompanying action, not a mystical reaction invoked by some hidden demon.

So if one analyzes the transmission-reception problem, one sees that electrostatics only tracks the mass perturbations (and only half of them, even so). It only prescribes mass-to-mass transformation. Comprising that EM mass-to-mass transform – i.e., between the causative mass perturbation in the transmitter and the effect perturbation in the receiver, there is (1) a mass-to-spacetime transformation to give the spacetime perturbation, i.e., the "signal in space" that propagates, and (2) a spacetime-to-mass transformation to give again the mass perturbations in both the electrons and the nuclei.

So the two mass-to-spacetime transform and the spacetime-to-mass transform are infolded inside electrostatics' mass-to-mass transform.

But the two infolded transforms are actually just Wheeler's principle of general relativity. So it turns out that infolded inside electrostatics there is a very powerful and startling general relativity, using the very strong EM force as the agent of spacetime curvature.

Now when you assemble and utilize longitudinal EM waves (LWs), you can and are directly engineering that "inner structure dynamics" – that powerful general relativity – inside all potentials, fields, and waves.

Call a specific clustered set of spacetime curvatures a spacetime engine or vacuum engine. However, it's also just a specific set of longitudinal EM waves, as can be arrived at from Whittaker 1903 and 1904.

Now you really have something! For electrons, the E-field force between them is on the order of 10^{42} times as strong as the far weaker G-force between them (we are temporarily using conventional models). By using the strong EM force as the agent of ST curvature, you have a very powerful general relativity.

I've had remarkable success in applying this new unified EM-GR to theoretical healing processes in the human body. We found that the regenerative and recovery (R&R) system (as opposed to the immune system, which fights and destroys and cleans up residue, but heals nothing) uses this EM-GR! It literally time-reverses damaged cells back to a previous normal state. That is the fundamental healing principle of the entire body.

We found another magical, magical thing that we believe will eventually revolutionize science. Not only can one time-reverse energy that is in the form of *wave-energy*, but also one can time-reverse energy that is in the form of *mass-energy*. We can time-reverse a selected piece of mass – living or inert – back to a previous state.

First, with and to any mass whatsoever, in general relativity there is an exact set of spacetime curvatures corresponding to that mass and interacting with all its parts, down to the finest detail, including the quarks in the nucleons. The mass continually acts upon space to form that engine, and that engine continually acts upon mass to generate its form and dynamics. In other words, any mass has its specific *spacetime engine* acting upon it.

When we pump a mass with longitudinal EM waves (LWs) instead of transverse EM waves (TWs), we dramatically extend phase conjugate optics theory (I'm preparing an Invention Disclosure to file in the U.S. Patent Office on this). The mass's vacuum engine is now the input (corresponds to the "signal wave" in ordinary nonlinear phase conjugate optics). Further, you are pumping in the time domain, not in the 3-spatial energy domain. Well, to time, all the 3-spatial mass is "totally nonlinear," since it's all orthogonal. This means that nonlinear "optical type" functioning occurs at any and all frequencies, including ELF and infrasonic regions.

The LW pumping forms an exact, *amplified, time-reversed replica* for the "input" or "present" spacetime engine of the mass – it forms a *spacetime anti-engine*, but one that is more powerful than the mass's own spacetime engine. In turn, this stronger antiengine overrides the action upon the mass of its own engine. So it time-reverses the entire mass back to a previous physical state (including even the quarks in the nucleons).

Now in diseased or damaged living cells, this produces a startling and near-miraculous result. *It time-reverses every cell, all its parts including its genetics and even the quarks in the nuclei of its atoms, back to a previous state.* In short, in biological terms it "dedifferentiates" the damaged cell back to its previous healthy state.

Without knowing the mechanism they were evoking, the Prioré team in France in the 1960s and mid-70s did this in a great number of lab animal experiments. They produced revolutionary cures of terminal tumors, clogged arteries, infectious diseases such as terrible trypanosomiasis, and restored suppressed immune systems.

The regenerative and restorative (R&R) system in the body, which heals everything, uses this exact methodology within its weaker limitations. For the first time in history, we have discovered how the R&R system really performs its healing function. And we have found how to utilize a much more powerful expression of nature's own master healing mechanism.

Think of an AIDS patient, say, after this technology is developed. The AIDS patient, once he tested positive for HIV infection, could be cured in several pleasant sessions with no side effects (except that parts of his body got a little younger and more vigorous again!) and cheaply, without waiting for the disease symptoms and debilitation to appear. And we mean totally cured. In an AIDS patient, the HIV-infected cells – all of them – have become factories for producing more HIV viruses. Well, one would just time reverse all the cells of the body, and hence all those HIV-infected cells – genetics and all – back to normal cells with normal healthy genetics. One could eradicate this disease from every infected patient.

Now here's our second discovery. Suppose we're working on a nonliving substance. Well, reversing copper, e.g., back to a previous state, just gives you the same old copper. Suppose we wish to make it something else.

Let's go for making gold. There is a delta between the spacetime engine for copper and the ST engine for gold. Suppose we can calculate that delta, and express it transformed into the necessary longitudinal EM waves. We specifically calculate the delta from gold to copper, and get the LW transform.

Then we simply make that delta, and introduce it to the copper that we are simultaneously pumping with LWs. Now we have "two engines" as input. The copper engine, and the "gold to copper" engine. Well, the pumping amplifies and time-reverses both. So my "amplified antiengine" that is produced is an amplified "copper-to-copper" engine and an amplified "copper to gold" engine. I increase the gain of my input gold-to-copper engine, while simultaneously increasing the gain of my pump LWs. So I have a small copper-to-copper component of my antiengine, and a much larger copper-to-gold antiengine component.

Voila! We will slowly turn that copper into gold, nicely and smoothly.

Let's look at cold fusion. In the experiments, subtly and unwittingly the scientists are getting some longitudinal EM waves as uncontrolled variables. So they get LW pumping also, where multiple LWs interact with a single particle.

In solutions you have lots of ions, including H⁺ ions which are just free protons. Pump a couple of those H⁺ ions near each other. Get an amplified spacetime antiengine on both of them. Voila! In time-reversed conditions, two H⁺ ions *attract* each other instead of repel. They fuse together, scarf up a couple of available free electrons, and you have helium. You have achieved fusion and the appearance of new nuclides. There are of course a myriad of other combinations that can and do occur, due to the richness and vastness of the ions that appear and disappear in the solution.

I'm also preparing an Invention Disclosure to file with the U.S. Patent Office upon this process and a proposed embodiment.

Notice what is involved here. As the technology develops, one will eventually be able to do whatever one wishes with matter. Transmute it. Fuse it. Fission it without harmful nuclear radiation (produce a specific "sink" in the local vacuum curvature, to "absorb" the radiation). Materialize it. Dematerialize it.

These are some implications of the foreseeable engineerable general relativity technology using electrodynamic means, that will eventually be developed from this. One should eventually be able to clean up all the toxic chemical wastes, the hazardous nuclear wastes, etc. Spacetime engines, electromagnetically applied and controlled, will revolutionize everything in science.

This is where I am now, and what I am working on.

We believe this will be the science and engineering of the 21st century, as soon as the scientific community picks it up and runs with it.

Best wishes,



Tom Bearden

Editor's comments -

Tom's letter gives more information about the original Maxwell equations, quaternions and scalar potentials. I have yet to digest the material he has sent us but decided to publish it as it is with only the following comments: My intention is to understand what he has written and respond to it in terms that the readers of this journal might understand whether or not they already understand his letter. I intend to look up the references and publish the original equations. His letter appears to my foggy understanding at this point to have contradictions within it that I intend to clarify as I sense that there is also a huge amount of potential for accomplishing what Tom says is possible through clarification of these ideas. And Tom appears to have done that as he is filing patents on some of them. If any of you have clarifications about what he has written I encourage you to share them with *Fulcrum* readers too. Perhaps his explanations are already clear to you?

Some clarification about what a scalar potential is I have found in One of Feynman's books on physics that Toby Grotz pointed out to me. In it a scalar potential is defined as follows: "The simplest possible physical field is a scalar field. By a field, you remember, we mean a quantity which depends upon position in space. By a *scalar field* we merely mean a field which is characterized at each point by a single number - a scalar. Of course the number may change in time, but we need not worry about that for the moment. We will talk about what the field looks like at a given instant. As an example of a scalar field, consider a solid block of material which has been heated at some places and cooled

at others, so that the temperature of the body varies from point to point in a complicated way. Then the temperature will be a function of x , y , and z , the position in space measured in a rectangular coordinate system. The temperature is a scalar field".

He goes on further to say that heat flow is a vector field, so that say only the temperature in a body that is at say 70 degrees is a scalar field. Also he uses the idea of all the contours on a map that have the same value are a scalar field; in this case I guess a given height is a scalar field. So, if this is the case then I muse that the scalar of an electric field is all those points in the field of a given EMF; or the scalar in a magnetic field will be all those points in the field of a given gauss and so on for Gravity and Light fields. Also, I've heard it is claimed that it is the scalar electric that moves a current (and can we see it as all the magnetic flux lines of given intensity surrounding the current?) And, then, is the scalar magnetic all those points of electric current of a given intensity that surround a magnetic line or lines, the field of force that must move through some conductor; and are these the magnetic scalar that move the "magnetrons" in a magnetic field? Might the light scalar be all those transverse waves of a given intensity that surround the longitudinal component of the light wave and might they move the light wave? How is reflection (or movement) of the light wave accomplished from wave field to wave field? Similarly for gravity, might the transverse components that are usually not recognized in gravity be the movers of the mostly longitudinal force of gravity that is recognized say between Earth and Sun?

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FULCRUM
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8/4/98

Dear Editor,

Early this morning while shuffling papers, I decided to look for my copy of ATOMIC SUICIDE. Not finding it, I realized that it's message is more important than ever.

There is no question that the World's Leadership - putting money above morality has insured the nuclear death of our planet within three years.

Dear Readers, please pray for Peace and for the future of the children of this planet.

Sincerely yours,

Warren F. Kimball III

Captain Warren F. Kimball, III

1 ENCL.

Editors comments -

Captain Kimball's letter underscores the need to get the message in *Atomic Suicide?* to the public and the need to demonstrate the sustainable and non-polluting alternatives to what we are and have been doing in

science/technology - power production, war, economics, human relations, agriculture, education, art, medicine, religion, government, and all of our institutions.

Subject: concentrating light and other comments

Date: Thu, 25 Jun 1998 13:42:21 -0400

From: frank hartman <suemc@gate.net>

To: USP@RICA.NET

WOULD YOU VERIFY THE RECEIPT OF THIS EARLIER E-MAIL AND ADVISE AS TO WHETHER ANYONE HAS ANSWERS TO THE QUESTIONS ?

THANKS

FRANK HARTMAN

Conceptually russell had the idea correct but his execution was flawed. When we tested for the truth of what he has in lens focus, it was incorrect.

The concept can be accomplished by radially polarizing light in a counter clock wise direction in a magnetic field. In the time of his experiments little was known about radial polarization and the Ziemer effect. There are a number of ways to get this and the web has a great deal of information. "Polarized light in Nature" is a good reading source.

Inteestingly enough thin slices of south american quartz appears to be n excellent material.

Arkansas quartz has the wrong rotation.

A doddechhedron will work better than his arrangement of the array of focusing lenses.

this was one piece of work that was inconsistent with the principles but as much as he had on his mind, no wonder.

There are some errors in the literature that should be corrected as Russell is difficult enough to understand.

1. In the Wave- Page 30 . the vortex rotations are backwards
2. . Atomic suicide figure 8 page 87-Both sides marked with plus. should be minus on one side.
3. Not error but a question. i don't understand Para 2 on page 185 about rotation of storms in the northern and southern hemisphere. From space the direction is not the same.
- 4, figure 60 page 251 in secret of light. directional arrows are wrong. Has anyone else done a computerized interactive Periodic table for russell ?

While we haven't focused on it and tested in detail; Octave 4 in the large charts of the periodic table has some problems.

also in Octave 9 the two missing isotopes ; only one is between lead and bismuth.

the following is attached as a guide that may be helpful to others in understanding russell science.

If you have a fax or e-mail, would be interested in communicating with

Editor's comments -

Frank Hartman's letter states that he too found the lens system as proposed in the *HSC* does not work and suggests alternatives to the way the Russells' conceived

using the lenses for power production. These are being investigated by the Russell Science Research and Mr. Hartman. The cover for this edition of *Fulcrum* also suggests to me additional ways to conceive of using lenses to increase energy potential.

Update on citizens radiation monitoring project

RADWATCH.xls

RADWATCH.xls

	PAONIA CO	NEW YORK NY	AFTON VA	NORTHER NJ	TUCSON AZ
JUNE	NO RPT	NO RPT	NO RPT		NO RPT
1ST					
2ND					
3RD					
4TH					
5TH					
6TH					
7TH					
8TH					
9TH					
10TH					
11TH					
12TH					
13TH					
14TH					
15TH					
16TH					
17TH					
18TH				16.61	
19TH					
20TH					
21ST					
22ND					
23RD					
24TH					
25TH				17.19	
26TH					
27TH				16.2	
28TH					
29TH				16.71	
30TH					

	PAONIA CO	NEW YORK NY	AFTON VA	NORTHER NJ	TUCSON AZ
JULY					NO RPT
1ST			16		
2ND			16		
3RD			16		
4TH			16		
5TH		16	16		
6TH		20	16		
7TH		19.9	16		
8TH		18.2	16		
9TH			16		15.24
10TH			16		14.08
11TH			16		
12TH			16		
13TH			16		15
14TH			16		15.64
15TH			16	10	16.27
16TH					
17TH					
18TH					
19TH					
20TH					
21ST					
22ND					
23RD					17.2
24TH					
25TH					
26TH					
27TH					
28TH					
29TH					14.4
30TH					
31ST					

RADWATCH.xls

RADWATCH.xls

	PAONIA CO	NEW YORK NY	AFTON VA	NORTHER NJ	TUCSON AZ
AUGUST	NO RPT	NO RPT			
1ST					
2ND			12.9		20
3RD			13.3		20
4TH			11.8		20
5TH			12.5		20
6TH			12.1	15.3	20
7TH			12.7	15.47	20
8TH			13.8	15.12	20
9TH			13.1	14.11	20
10TH			12.6		20
11TH			11.2		20
12TH			10.8	15.66	20
13TH			11.5		20
14TH			12.4	14.8	20
15TH			11.9	15.7	20
16TH			9.8	14.57	20
17TH			10.4		20
18TH			10.9	15.8	20
19TH			11.6	17	20
20TH			11.9	20.36	20
21ST			12.5		20
22ND			13.6		20
23RD			14.1		20
24TH			13.8		20
25TH			13.3	17.1	20
26TH			12.8		20
27TH			12.2		20
28TH			11.8		20
29TH			11.1		20
30TH			10.6		20
31ST			11.5		20
			11.9		20

	PAONIA CO	NEW YORK NY	AFTON VA	NORTHER NJ	TUCSON AZ
SEPT.	NO RPT	NO RPT			
1ST					
2ND			13.7		20.4
3RD			12.6		20.4
4TH			14.8		20.4
5TH			11.9		20.4
6TH			12.1		20.4
7TH			12.7		20.4
8TH			13.2		20.4
9TH			12.1		20.4
10TH			13.6		20.4
11TH			11.9		20.4
12TH			12.1		20.4
13TH			14.7		20.4
14TH			12.6		20.4
15TH			11.1		20.4
16TH			12.9		20.4
17TH			13.4		20.4
18TH			12.6		20.4
19TH			12.5		20.4
20TH			13.1		20.4
21ST			12.5		20.4
22ND			13.6		20.4
23RD			14.1		20.4
24TH			13.9		20.4
25TH			12.9		20.4
26TH			13.5		20.4
27TH			12.9		20.4
28TH			13.3		20.4
29TH			11.1		20.4
30TH			12.9		20.4
31ST			13.1		20.4

AVERAGE

AVERAGE

Health Physics

Janet Raloff reports from Washington, D.C., at the annual meeting of the Health Physics Society

What makes nuclear shipping casks weep?

Highly radioactive wastes are shipped by truck and rail in thick, carefully sealed stainless steel casks. Federal regulations allow these casks to travel with trace quantities of removable external contamination. But about 10 years ago, cask recipients began documenting a puzzling phenomenon: Even meticulously cleaned casks, shipped out with only one-tenth the allowed level of external contamination, would sometimes arrive with up to 10 times the federal limit.

Tests at the University of Missouri in Columbia now indicate that the surface of a newly cleaned cask typically carries 100 times more chemically bound ("fixed") contamination than removable contamination. And while most of the removable contaminants wash off, some of the fixed cesium and cobalt becomes unfixed, or "weeps," during transport, notes program director Phil C. Bennett of Sandia National Laboratories in Albuquerque, N.M.

The new tests also show that soaking the steel casks at a low pH tends to cause cobalt to free itself from the surface and go into solution, Bennett says. Although casks are routinely soaked during and after loading in storage pools of spent fuel, these pools are not acidic enough to cause weeping. But Bennett suspects that acid rain or wet, acidic road dirt might trigger cobalt weeping on traveling casks.

The weeping detected on one dry sample of cask material stored for five months suggests that diffusion may act as a slower release process, he adds. However, the major factor behind cesium weeping, which accounts for half to two-thirds of the transit-induced removable contamination, "remains elusive," Bennett says. "We're attacking this problem with all the vigor we've got."

Editor's comments

There is an interesting note that I would like to report about the readings I have gotten from my radalert while flying. The higher one flies the higher the readings and they can be really high. I have gotten consistent readings of over 400 CPM at 40,000 feet and around 200 to 300 CPM in the 20,000 to 30,000 foot elevations. It appears that flying is a hazardous occupation and the high radiation counts explain much of jet lag phenomena. The Russells said that the radioactivity from atomic testing

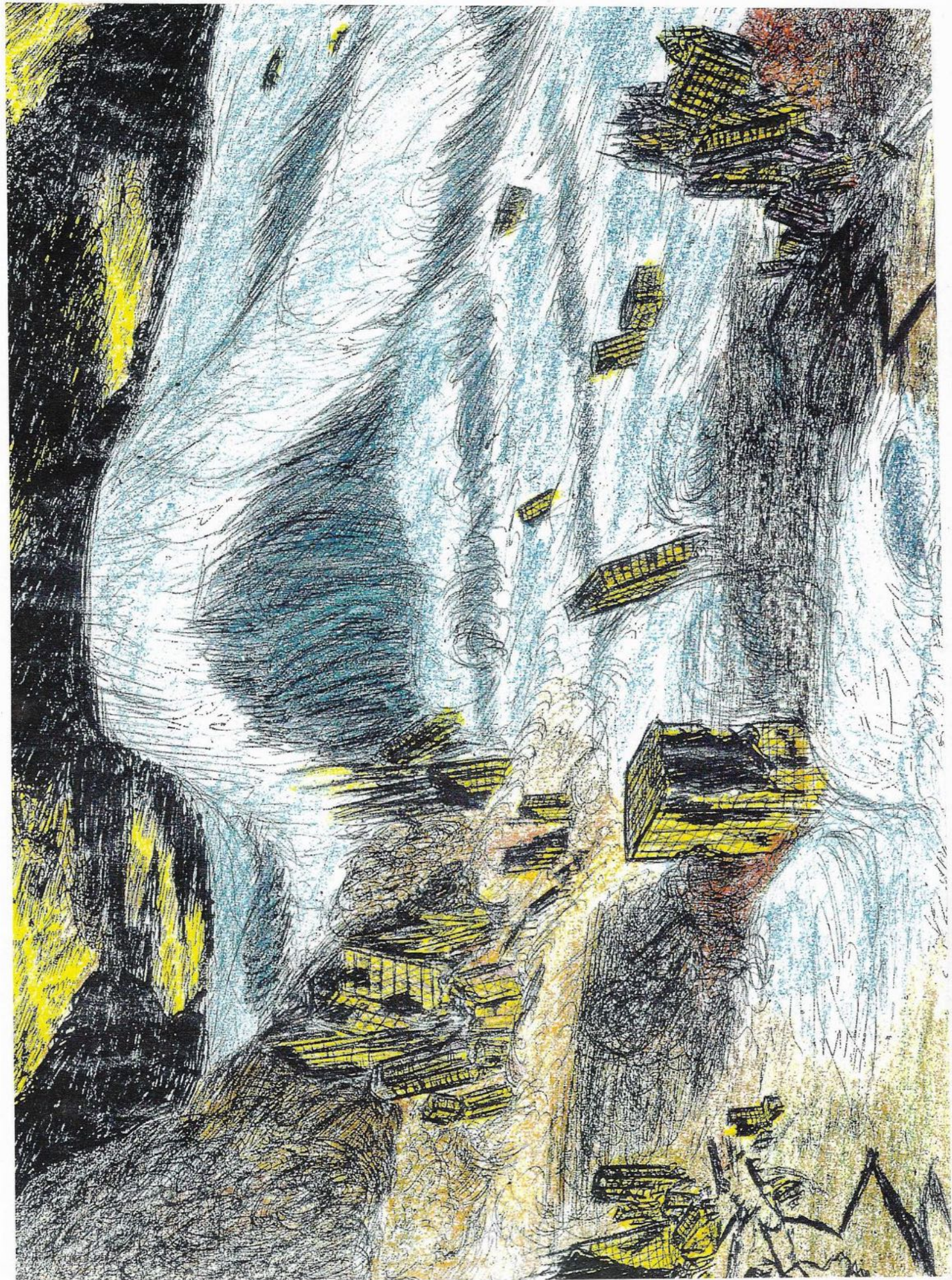
Wood ash: The unregulated radwaste

While cleaning ashes from his fireplace two years ago, Stewart A. Farber mused that if trees filter and store airborne pollutants, they might also harbor fallout from the nuclear weapons tests of the 1950s and 1960s. On a whim, he brought some of his fireplace ash to Yankee Atomic Electric Co.'s environmental lab in Bolton, Mass., where he manages environmental monitoring. Farber says he was amazed to discover that his sample showed the distinctive cesium and strontium "signatures" of nuclear fallout — and that the concentration of radioactivity "was easily 100 times greater than anything [our lab] had ever seen in an environmental sample."

Since then, he has obtained wood-ash radioactivity assays from 16 other scientists across the nation. These 47 data sets, representing trees in 14 states, suggest that fallout in wood ash "is a major source of radioactivity released into the environment," Farber says. With the exception of some very low California readings, all measurements of ash with fallout-cesium exceeded — some by 100 times or more — the levels of radioactive cesium that may be released from nuclear plants (about 100 picocuries per kilogram of sludge). Ash-cesium levels were especially high in the Northeast — probably because naturally high levels of nonradioactive cesium in the soil discourage trees from releasing fallout-derived cesium through their roots, he says.

Industrial wood burning in the United States generates an estimated 900,000 tons of ash each year; residential and utility wood burning generates another 543,000 tons. Already, many companies are recycling this unregulated ash in fertilizers. The irony, Farber says, is that federal regulations require releases from nuclear plants to be disposed of as radioactive wastes if they contain even 1 percent of the cesium and strontium levels detected in the ash samples from New England. If ash were subject to the same regulations, he says, its disposal would cost U.S. wood burners more than \$30 billion annually.

and nuclear accidents and everyday releases would hang out in the upper atmosphere where it destroys oxygen. The radalert readings I get while flying suggest this is true; although the higher one goes the more cosmic radiation that one receives from higher altitudes also is a factor. It will be interesting to record the readings in a forest fire area from what the health physics article from *Science News* claims.



Featured Articles

Visions of the Future by Timothy A Binder

History is replete with examples of prophesy as from those in ancient religious books like the bible to the hoary prognostications of Nostradamus. In more recent times we can find examples such as Edgar Cayce and the Russells; and those of Gordon Michael Scallion and others in our immediate present. In this article I want to examine some of the *raisons d'etre* for prophesy while also presenting some notions on how to cultivate it as well as a simple ancient method of divination.

The closest we can say the Russells came to publishing prophesy was in some of their books such as *The World Crisis* and *Atomic Suicide?* It is here and there where we see unfolding much of what they said would happen to our civilization if we did not change our human relations practices and our science and technology. Their prediction of the ozone hole in *Atomic Suicide?* and their *1954 newsletter* is an especially compelling example of their overall farsight ability.

I thought it would be of interest to share with *Fulcrum* readers first and second hand stories regarding other predictions they made as well as to consider the subject of prophesy and divination or farsight in general.

Many predictions I am aware of for our present time are calamitous in nature. The crayon drawing accompanying this article sums up the general nature of them. This drawing was made by an acquaintance of mine in Montana, Billy Angus, who I thank for allowing me to reproduce it here.

A Russell student told me that Walter Russell told her and other members of a class she was in that he had a terribly distressing vision of California breaking in two and disappearing in the ocean as well as all of Japan sliding beneath the waves. Lao told me and many students that the weather would "bring man to his knees". While California and Japan are still here, the weather there and everywhere has been literally bringing many people to their knees in prayer.

I am sure that many *Fulcrum* Readers are aware of most of these prophesies of impending global geologic and other calamities. The question that occurs to me is how do they influence you and me if at all? I have been aware

of these predictions for most of my life and must confess that I let them influence my life much more than I now let them. And yet I still use my own farsight ability and intuitive judgment to guide my life as well as my intellect and reason. I also feel there is no real separation between my intellect and my intuition or farsight ability. They are One.

How much of the future is predictable by anyone? Even the weather appears pretty unpredictable to me now. Subjectively it seems that in the last 10 years or thereabouts that weather forecasting has become more chancy. I think this is because the Earth is going through a period of increasing imbalance and that when patterns fluctuate wildly they are more difficult to predict.

One of the goals of science is to predict patterns of all types, ie:: economic, geologic, psychologic, etc. To be able to predict patterns requires not only data, but insight or wisdom as to how Universe works in order to interpret the pattern. I believe the Russells made virtually all of the published predictions they did based on such wisdom and insight. We all possess varying degrees of this. Through study, meditation, reflection and awareness we can refine our judgment and become better prognosticators.

Is there insight into the future that goes beyond this? Do some people have experiences that go beyond this wisdom/insight type of prognostication ability that we might think of as a gift from the divine? Some people appear to have insight thrust upon them from outside their consciousness or intention while others seem to be able to cultivate an ability to see into the future such as Alfred Lord Tennyson did by repeating his own name over and over like a mantra until he entered an altered state and then 'dipped into the future as far as man's (inner) eyes could see...' and appeared to write of many of humanity's coming technological inventions and so on from this consciously created state. Then there are cases like Walter Russells' where he appears to have been transported to and transformed by an altered state that seized him many times throughout his life without his conscious intention. Gordon Michael Scallion says he had his far sight abilities come to him in such an unbidden form when he lost his voice and then started having distressing visions of future calamities. In the case of the Russells and Scallion they all were conscious of the visions as they came to them. In contrast to this conscious visioning, Edgar Cayce, a contemporary of Russell,

appeared to have his visions come to him while in trance and he was only aware of what came through him after he awoke from the trance and read or was told what he had said in the trance state.

The visions of Walter and Lao that have not been put into print before now as well as those printed appear to have come to them while in an altered conscious state and yet as if thrust upon them from the divine rather than consciously created such as Tennyson's. Indeed they stated they felt that all of their work was inspired in a similar way such as Walter's original *Divine Iliad* poem that he wrote in a state of illumination with no changes made from start to finish. They did acknowledge that being alone and absorbed in creative work set the stage for such visitations and so in that I see a continuous link between all these various forms of farsight. In other words, prophesy or divination is linked together with an individual's ability to access their inner being through prior deep study, creative work or other centering and meditative practice, whether it is conscious or while in trance and thus "unconscious", whether it is intentionally sought as in Tennyson's self absorbed mantra, or if it appears to come spontaneously from "outside" the self, from the divine.

How are we to know if some individuals or our selves are gifted with a divine visitation and vision into the future that we should heed? One way I know of is to be in harmony with the order of the Universe, or more simply said to be in harmony. If I refine my judgment I hope to be able to recognize real prophesy and heed it.

Most visions for immediate future I am aware of be they from refined judgment or divine visitation are calamitous such as Billy's drawing depicts. They are visions of short term but massive destruction. The other side of the destruction is long term journey into greater light, love, peace and prosperity. I see that if I refine my judgment now I can move into that future now.

So, how do I refine my judgment? My experience is that judgment is born from several wombs including but not necessarily limited to the following: 1) My programming and information from culture, parents, education etc. (my belief systems) 2) The health and balance of my body; the balance in my nervous system; my diet, nutrition, physical yogic practices; (general health status) 3) my ability to decentrate, to meditate; to access my intuition (mental yogic practices) and 4) where I place my attention; my interests (my goals in life). To refine my

judgment I need to examine my belief systems and be open to change, if I sense they may be limiting my judgment. When I am in good health by eating whole natural foods in quantities that I digest well and assimilation and elimination are good and my autonomic nervous system is balanced so the vegetative parasympathetic is not overcome by the fight or flight sympathetic system, then I can more easily enter deeper states of concentration /decentration and access my intuition. When I practice simply being aware and some style of regular meditation then I am more able to enter into those deeper states of consciousness where keen judgment, intuition and prophesy live. If my intention is to live to see reality, the truth and to know my Creator and purpose for being, I will be more cognizant of and able to enter judgments' womb.

The Russells wrote their "prophesies" in their books and *The Home Study Course. In Atomic Suicide?* they prophesied that we would first notice the destruction of the oxygen of the planet in the upper atmosphere which we have observed come true in the ozone layer deterioration. In the *HSC* and their many books they prophesied the disintegration of our world civilization, if we did not change our human killing, enslaving and degrading human relations; and we have witnessed this occur too. The Russells said they got their vision, their prophesy through "Illumination" from and of the "Universal One" or God by any name. They believed that this ability to see and understand, or the "illumination", was available to anyone if anyone will meet the requirements. A description of the requirements is given throughout their works and is revealed as the five laws of success in the book titled "*The Man Who Tapped The Secrets Of The Universe*" A biography by Glenn Clark on Dr. Russell's life.

There are claims that the Mayan calendar, the *Bible*, the Great Pyramid, and other books or structures from the past have prophesy for our future encoded within them. The *I Ching*, an ancient Chinese book of philosophy is also used as an oracle or book of divination. I think that Walter Russell gave the principle for all prophetic operations by explaining how every thing is in everything or through his description of a holographic universe. My understanding of this allows me to intuit how I can "read" about or intuit everything in anything and anything in everything. The *I Ching* is based on this idea and that the seeming unrelated act of say throwing yarrow stalks or coins are related to everything in existence; past, present and future. I want to end this article by a

description of how to use this ancient book of divination by an example of its use.

There are several methods to cast the *I Ching*. The method I describe here is one of the simplest I know and yet as effective as any. Throw three coins down and give heads (yang or masculine) a value of three and tails (yin or feminine) a value of two. Add the value of all three coins up. If the number is odd draw an unbroken line with the numerical value after it. If the number is even draw a broken line with the numerical value after it. If the numerical value is 6 (extreme yin) or 9 (extreme yang) they represent changing lines. This is because if the coins are all heads or all tails they represent extreme yang or extreme yin. All heads or extreme yang adds up to 9 and all tails or extreme yin adds up to 6. Yin and yang in extreme change to their opposite (lines). Throw the coins down again and repeat the same procedure to get another line with a numerical value after it. Start drawing your lines from the bottom and put each successive line on top of the last line. After three throws you will have a lower trigram and when you complete the next three you will have the upper trigram. Both trigrams complete the hexagram. So you should now have six lines stacked on top of each other, each line a solid or a broken line and each with a number after it. I am casting a hexagram in reference to the following question for this article: What is the *I Chings'* response to the question and predictions of major earth changes for our lifetimes?

The hexagram comes out as follows: Ming I / Darkening Of The Light. Darkening reigns in the external world now. Disengage from negative feelings and maintain your innerlight.

As a quick reference to find out which hexagram in the *I Ching* this one is I am printing a chart that reveals it. Look at the lower trigram and the upper and see where they intersect and that intersection gives the hexagram. In my question the lower trigram is Li or fire and the upper trigram is Kun or earth, so the hexagram is # 36 or Ming I. We must now go to the text of this hexagram in the *I Ching* and read it up to the point to where the first line begins. From this point on read only the lines that are called changing lines and correspond in the hexagram thrown as changing lines. To reiterate, the changing lines are those extreme yin or extreme yang with the numerical values after them of 6 or 9 only. So in my hexagram this is lines 2 and 5 reading from the bottom of the hexagram to the top. After reading the text for the changing lines,

switch these to their opposites so that say in my hexagram line 2 now becomes solid or a yang line and line 5 also becomes a solid yang line. This gives a new hexagram which is Hsu / Waiting - nourishment. Now I read only the text and none of the lines for this hexagram. The answer to my question is given by my intuitive interpretation of the text material in the *I Ching*.

Here is the text for the hexagrams numbers 36 and 5; and the answer to my question. The text I am using is from *The I Ching or Book Of Changes* by Brian Browne Walker published by St Martins' Griffin NY Copyright 1992 ISBN 0-312-09828-6 (pbk,) whose text I chose over several others for its simplicity and clarity. I recommend that you consult other translations and interpretations of this ancient book for other nuances of meaning.

KEY FOR IDENTIFYING THE HEXAGRAMS

		TRIGRAMS							
UPPER ▶	CH'ÏEN	CH'ÏN	K'AN	K'ËN	K'UN	SUN	LI	TUI	
LOWER ▼	Heaven	Thunder	Water	Mountain	Earth	Wind	Fire	Lake	
CH'ÏEN Heaven	1	34	5	26	11	9	14	43	
CH'ÏN Thunder	25	51	3	27	24	42	21	17	
K'AN Water	6	40	29	4	7	59	64	47	
K'ËN Mountain	33	62	39	52	15	53	56	31	
K'UN Earth	12	16	8	23	2	20	35	45	
SUN Wind	44	32	48	18	46	57	50	28	
LI Fire	13	55	63	22	36	37	30	49	
TUI Lake	10	54	60	41	19	61	38	58	

明夷

EARTH
FIRE



36. MING I / DARKENING OF THE LIGHT

*Darkness reigns in the external world now.
Disengage from negative feelings and
maintain your inner light.*

This is a time when darkness and inferior energies surround you. The image is that of the sun completely swallowed by the earth. The only light left is that inside your own heart, and you are counseled to return to it, maintain it, and quietly nourish yourself with it.

It is in dark moments that a correct attitude is most important. If we fight against the darkness, we are swallowed by it and suffer great misfortune. If we react to the lack of visible progress with despair and negativity, we extinguish our own inner light and block the aid of the Creative. If we try to persuade others that they must return to the light, we exhaust ourselves in vain now.

In a time such as this, it is wise to adopt a stance of outer disengagement and inner perseverance. Do not focus on or interact with the negative influences around you; this only strengthens their grip on you. Step aside, yield, let go, allow people and events to pass without attachment. Direct your attention inside, to *your* inner light, *your* devotion to what is right, *your* conversation with the Higher Power.

Progress may be slow, but there will indeed be progress. Remember that much of the work of the Higher Power is hidden from us, and that we enable and assist it by remaining detached, accepting, and reserved in the face of negative influences.

FIRST LINE Your ego is unsatisfied with the path of correctness. However, to strive out of desire or despair will bring misfortune. Cling to what is calm and good no matter what others do, and allow the Creative to work in its own time.

SECOND LINE You have been wounded by a dark force. You can heal yourself by healing others around you who are in need. This brings good fortune.

THIRD LINE Just because we recognize the source of the problem does not mean that it will disappear immediately. Perseverance in truth and correctness dissolves the influence in time.

FOURTH LINE What you recognize to be inferior you must immediately leave behind. Lingering with negativity invites a disaster now.

FIFTH LINE An external darkness cannot be escaped now. You are wise to yield outwardly while maintaining strength and purpose within.

SIXTH LINE The darkness has reached a climax. If you are firm in holding to acceptance, balance, and correctness, you will emerge successful.

需

WATER
HEAVEN



5. HSÜ / WAITING (NOURISHMENT)

*To wait with a proper attitude
invites the assistance of the Higher Power.*

There is a situation at hand that cannot be corrected by force or external effort. The Creative will provide the solution to one who waits with a correct attitude. This is a time for patience and careful attention to inner truth.

Do not give in to doubt and agitation now. You are not meant to wait in a state of desperate longing but in one of patient inner strength. Without certainty in the power of truth, success is impossible. Attempts to force a change, rather than allowing it to mature naturally, will only cause misfortune.

You would be wise to strengthen and reaffirm your reliance on the Creative. When you indulge in fear and doubt, you flood the arena where the Higher Power is attempting to work. Your principal responsibility in life is to keep this arena—your own consciousness—free of negative influences.

By accepting things as they are and not making fruitless comparisons to the situations of others or some imagined ideal, one engages the power of the Creative. If one then remains balanced, modest, and independent, good fortune will come to hand.

FIRST LINE A challenge lies ahead. Ready yourself by deepening the stillness within. Anxious anticipation only weakens your abilities.

For me the *I Ching* says that this is clearly a time of short term pessimism and “Darkening of the Light”. And, that if I maintain my inner strength and recognize the source of my nourishment and being I will ‘invite the assistance of the higher power’ and have reason for long term optimism. I think the earth changes are here. They are bringing great short term darkness. Yet, ultimately I feel confident that we will see long term light and we will witness the birth of the “New Age In Human Relations” and the birth of the sustainable and non-polluting technology that Walter and Lao Russell spent the last 10 years of his life working to help bring to this planet.

Transmutations of Ores

Robert Nelson

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1. Introduction... 2. T. Moray... 3. Dunikovski... 4. A. Klobasa... 5. A. Conrad...
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1. Introduction

The synthesis of elements by high-energy bombardment of other elements is common knowledge and practice among nuclear physicists. In their fashion, modern physicists also have accomplished one of the goals of alchemy: the production of artificial gold. However, the yields are low and the product is unstable and very expensive. Such nuclides find only limited use in medicine and chemistry.

For example, R. Sherr, *et al.*, reported the "Transmutation of Mercury by Fast Neutrons" of lithium and deuterium. These formed three radioactive isotopes of gold by the n-p reaction, and three isotopes of platinum. (1)

In 1980, a group of researchers at Lawrence Berkeley Laboratory (Glen T. Seaborg, *et al.*) reported the production of a few billion atoms of gold as the "trivial result" of an experiment with a Bevalac accelerator. A bismuth target was bombarded with a "relativistic projectile" that chipped some protons from the Bi nuclei, forming gold. The experiment produced less than one-billionth of a cent worth of gold. (2-4)

In 1980, Andrew Melchanov, a Chicago publisher, reported that Soviet "physicists at a nuclear research facility near Lake Baikal in Siberia accidentally discovered a fusion reaction for turning lead into gold [in 1972] when they found the lead shielding of one of their experimental reactors had changed to gold." At that time, it was expected that Russia would be able to mass-produce gold for about \$600/oz.. (5)

Several researchers in the 20th century have reported their methods of producing profitable amounts of values from base metals and low-grade ores without the use of nuclear reactors. Some of the methods are genuine low-energy alchemical transmutations.

2. T. H. Moray

The Moray process is a prime example of what is possible. In 1950, Thomas H. Moray was approached with a request to investigate the possibility of improving the extraction of uranium ores. As a matter of course, the Moray Research Institute (MRI) proceeded by bombarding the ore in an "environment" with x-rays as high as 24 MeV before attempting to extract the values. The average ore contained 0.23% uranium oxide. After irradiation, the ore yielded from 7-75% uranium oxide!

In 1953 the MRI proposed that the Atomic Energy Commission (AEC) investigate such a project for the "aging" of atomic ores by a "breeding type reaction with high-energy particles or x-rays in the presence of a proper environment." The AEC declined to grant a contract. (6-8)

In 1958 MRI adapted its process to the augmentation of precious metal ores. the Moray process uses three main categories of ores, containing traces to a few hundredth of an ounce of gold and silver per ton: 1) low-grade unprocessed gold ore; 2) mill tailings --- especially advantageous; this material costs very little, is ground already, and yields excellent results. Higher grade ores seem to be less adaptable to this process; they yield much less of an increase in values than do low grade ores.

“Early tests gave yields of 50-100 oz.. gold/ton ore. While virtually no gold or silver values can be determined in the raw ore, after irradiation and drying the gold and silver can be identified by standard fire assay or any other normal determination methods...

“Metals not otherwise detected are freed for a separation by normal separating processes. This process does not purport to be a separation process in any way in that upon completion of irradiation the samples will have to be disposed of expediently.” (6)

The Moray process utilizes an “environmental solution, developed in 1949. Aging became a problem as chemical reactions continued to take place due to hydration and temperature changes. By 1961, the MRI had refined several formulas of solutions, one or more of which work well with most ore types and do not require any aging. They can be used immediately after mixing and can be stored without adverse effects. Their cost is approximately \$50/100 gallons (the volume of solution required to process one ton of ore). The solution is heated to an “elevated temperature” during irradiation.

In a telephone interview with John Moray (Ken Jones, September 1981), he said: “The environmental material consists of a combination of chemicals whose atomic numbers add up to the atomic number of silver or gold and yield silver and gold upon irradiation.” The formulas include arseno- and iron-pyrites in alkaline solution. Moray adds, “Antimony has peculiar properties --- it has floating electrons which come in very handy. It is believed that this environment furnishes particles similar to the cosmic ray reaction on the atmosphere. Research work indicates that the radiation must be composed of both high-speed electrons and x-rays. Consistent results under controlled methods were obtained with the addition of a catalyst (a flux or reduction agent, an environment) combined with bombardment of the material ... by an energy bombardment tube developed for the Research Institute.”

The “bombardment tube” may be a preferred embodiment of Dr. T.H. Moray’s “Electro-Therapeutic Apparatus (US Patent #2,460,707, Cl. 128-421; Feb. 1, 1949) In abstract, the invention is described as an “apparatus for applying radiant energy therapeutically, comprising means for producing high potential, high frequency electricity; a high capacity sparking condenser; and a treatment electrode connected in circuit with the foregoing...”

The patent states that “The invention has been described in the foregoing with sole reference to its use for therapeutic purposes. It should be noted, however, that inorganic matter may also be treated to advantage pursuant to the methods and with the apparatus... it has been found that metals, for example, lead, have changed physical properties after treatment in accordance with the above...”

According to an article by T.R. Dolph, published in *Fate* magazine, "Dr. Moray engaged my father-in-law, attorney Victor G. Sagers, Midvale, Utah, to represent him in offering the device to the US Government... Transmutation of metals (yes, turning lead into gold) was demonstrated several times; the government supplied the lead and kept the gold." (9)

John Moray responded (Jan. 18, 1982 to Ken Jones): "The article by T.R. Dolph, Garland, TX, is one of those articles written by a crackpot that has in fact mixed together a number of unrelated facts. There is no such device as described in *Fate* magazine... The bombardment tube does exist. However, this has nothing to do with the recovery of minerals from low grade ore. The bombardment tube is a part of the therapy device.

"The story of gold and lead supplied by the US Government is a complete fabrication. My father and I always detested liars, and this man Dolph is a compulsive liar. His father-in-law, Vick Sagers, would never have said anything similar to what this man has said.

In a later letter to Ken Jones (Feb. 11, 1982), John Moray added: "The bombardment tube is electrotherapy and does not apply to the mining or mineral recovery process, regardless of how you interpret the patent.

"The patent application is speaking of a 'method' and has to do with an individual trained in the art of that 'method' which is all the law requires, and therefore, changing the physical properties of lead, i.e., making it possible to be alloyed with copper or developing a lead semi-conductor has nothing to do with the mineral process again."

The services of the late eminent physicist W.J. Hooper (Prof. Emeritus, Principia College) and other scientists were solicited in an effort to discover what was producing such results. It appeared to be caused by "a rapid buildup of atoms of relatively low atomic weights to those of much higher atomic weights" such as silver, gold, and platinum.

In a progress report at the 68th National Western Mining Conference (Denver, CO; Feb. 4, 1965), Dr. Hooper announced:

"First of all, I will cite one of several tests carried out in an effort to ascertain whether the modus operandi was actually one of transmutation from elements of low atomic weights to those of the noble metals. A solution was prepared --- made up of Baker's reagent quality chemicals of the highest purity and water, distilled by boiling. These bottled chemicals list the trace materials which might be existent in them. Gold did not appear on any of these lists even in trace amounts. No atoms of higher atomic number than 19 (K) were present in quantity in this solution. Silver has the atomic number of 47, and gold 79. This prepared solution of pure chemicals in glass containers is irradiated by high energy photons for about one minute and then by evaporation the residue was dried and sent to an independent assayer for analysis... It reads 939.76 oz. gold/ton and 113.04 oz. silver per ton...

A point of great interest in the experimental test I have described is that the specks of gold found in the residue of the solutions reveal a marked crystal structure under microscopic examination. It is a coincidence that Miethe, back around 1925, found his formation of gold to be in small crystals also... The process we have described is in reality a crystal growing bath activated by irradiation. As the gold atoms come into being by transmutation, they become gregarious, which results in the crystal formation.

“From this observation there is every reason to suspect that low grade ores and mining tailings provide, not only the seed for crystal growth, but also a nuclei environment which is well advanced or uniquely favorable, for the formation of the precious metals by transmutation.”

Dr. Hooper contended that the process is one of nuclear reaction. Dr. Hans Frauenfelde (Univ. Illinois) opined that the energy levels were too much of a departure from the accepted standards to verify this point. Another theory proposes that colloidal gold, lost in the dilution of ore in the environmental solution, is concentrated by the bombardment. The MRI insists that is not the case.

In 1963, MRI conducted experiments with a linear accelerator at the Electronized Chemicals Corporation (Rockford, IL) at energy levels of 11.4-20 meV with doses of 1 megarad. The average yields were 8-9% gold! It was estimated that a production rate of 5 tons ore/day was possible with the available equipment. Computerized risk analysis indicated that yields over 11.5 oz. gold/ton ore could be expected with 99.5% certainty. A higher average (15 oz. Au/ton) could be expected in mass production under optimum conditions. Other experiments showed even more promise, yielding 100-200 oz. Au/ton (128 oz. Au/ton average). “The standard deviation of yields was rather high due to the constant modification of experimental conditions.”

MRI rented time on the Varian Associates 8 MeV LINAC in order to test parameters such as dose, dose rate, slurry depth, shield material, electron volt setting, shield height, and the distance of the target from the irradiation source. The shield was a thin sheet of unspecified material placed over the sample while irradiating it.

“In main effects, only electron-voltage setting showed up as significant, with high-voltage setting being better than the low. In addition, several interactions between variables showed up as being significant. An interaction between two variables means that when either variable is changed singly, a significant difference results. Some interactions between three variables, or perhaps even more may be present. The following interactions seemed to be significant ones and seem to indicate that a higher voltage would give much better results: 1) Shield height/Voltage; 2) Dose rate/Voltage; 3) Dose/Voltage; 4) Distance of sample from radiation source/Shield height; 5) Solution depth/Shield material; 6) Slurry depth/Voltage.

“X-rays perform photo-disintegration, and the electrons furnish the energy and amperage to the reaction. It is suspected that because the escaping electrons have a certain amount of energy, a certain amount of x-rays will be produced in the material by the electrons' reactions (Compton Effect). The ideal reaction, it is indicated, is for the x-ray to be produced at a target located somewhere outside the accelerator tube where losses of energy would be minimal. This reaction is dependent on the following factors:

“1) The isomers of the isotopes reacted upon must be present in the ore before the ore will react to the reaction; 2) These reactions are dependent upon the type target in order to control the frequency of the quantum energy level; 3) High-energy electrons must be present in the ore as well as x-rays; 4) The composition of the environmental solution furnishes other particles that are freed by the action of the resonant frequency of the x-rays and the electrons produced by the particle accelerator; 5) The reaction is a dose-rate reaction and not dependent upon velocity. The velocity of the original particles will

determine the depth and time of the reaction only. Over-radiation gives a deterioration rate and loss of values reported...

“As the size of the sample varies, the reaction varies on an inverse lineal level wherein doubling the size of the sample would cut the total reaction in half.”

Radiation dosages of 0.16, 0.5, and 2.0 Megarads/minute gave peaks on the dosage curve. Four Megarads/minute gives the highest yield. Irradiation lasted one minute.

The reaction also is wattage-dependent. The minimum wattage required is 200 watt-seconds per gram of ore.

“The process has to be adjusted to the characteristics of different ores. The chemical formulas and the resonant energy levels must be established for each ore.

“Consistency was achieved in 1970 by adding to the process a control resonant chamber (Magnetic Undulator) which acts to bring all variables into phase, or into a resonant relationship, with the radiation source, to a point where a consistency was obtained higher than any obtained prior to that time. There are definite peaks at which each ore that is of value with this process, releases the metals found within it. There are peaks for each metal ion within the ore.”

The Magnetic Undulator establishes non-propagating, resonant standing waves with the x-ray diffraction wavelength of gold (2.042 Angstroms) in the environmental solution. The chemicals (in copper pans) were bombarded from above. Each bombardment increased the amount of gold 9-fold, but the yield later diminished to only three times the original amount. Consistently high, stable yields were obtained by first irradiating the trays from below and then applying x-rays from overhead. The yields increased 9-fold and remained at that level without deteriorating. The process as developed produces little increase in platinum values, probably due to: a) the energy level of the irradiation source; b) the chemical composition of the environmental solution; c) target type. The silver produced in this process assayed as high as 426 oz/ton.

“The reaction is sensitive to interference from nearly every material other than glass or porcelain. Plastics cannot be used, nor stainless steel, and most varieties of rubber or brass. Copper can be used if it is in one continuous piece. Indications are that interference is due to electrostatic charge or particle position in the solution.”

Better results also would be obtained with suction pumping of the slurry in an all-glass system, rather than the makeshift conveyer belt/copper pan system used by MRI.

3. Dunikovski

In 1931, a Polish engineer named Dunikovski announced that he could produce artificial gold by the action of “Z-rays” on a mixture of silica and felspar melted in bronze crucibles under the influence of 110 kilovolts. Dunikovski claimed to have perfected a process he inherited from his father and grandfather who had developed it. Dunikovski theorized that all minerals contain “embryonal atoms” or “mineralites” that can be artificially matured in minutes.

Several French investors syndicated and subscribed 2,000,000 francs which Dunikovski used to build a laboratory in Paris. But no gold was produced, and he was charged with fraud. He demonstrated his process to the court, but the results were ambiguous and insufficient to prove his innocence. Dunikovski was sentenced to four

years imprisonment, but his attorney secured his release after two years. Dunikovski relocated to San Remo and renewed his experiments. He improved the process, gaining significant increases in yields.

His attorney (Jean Legrand) visited Dunikovski with the eminent chemist Albert Bonn to investigate the new situation. M. Bonn witnessed and replicated the process. One type of sand, which contained 11 grams Au/ton before treatment, assayed 859 grams/ton after treatment with the improved apparatus.

Subsequently, Dunikovski founded "Metallex, Societe Anonyme" with Belgian stockholders and established a factory on Lake Neuchatel. Nothing more is known about the affair, because all subsequent proceeding were kept secret. (10)

4. **Adalbert Klobasa**

About 1937, an Austrian chemist named Adalbert Klobasa claimed to have produced gold using an electromagnet and induction coil with which he treated a mixture of titanium-potassium-oxalate (36 gr.), ferrous sulfate (84 gr.), copper sulfate (50 gr.), sodium sulfide (50 gr.), ammonium chloride (100 gr.), ammonia (250 ml.), sodium silicate (20 cc.) and silica (440 gr.). The reaction was catalyzed with 100 mg. of silver. Two hours of treatment afforded a 1% yield of gold which appeared as brown-red scales. Klobasa claimed that gold is built up from iron, titanium, and sodium. He declined to enter into business with his synthesis because, he said, "I am too old, and not fit enough to worry myself chasing around after capitalists." (10)

5. **Arnold Conrad**

Another simple method which "ripens green ores" (volcanic sulfides, pyrites, or tellurides) was perfected by Arnold Conrad (Chico, CA). Conrad learned the process from a German scientist. The technique balances the ore's electropositive charge with 10-150 volts DC. The enhanced values are removed by electroplate refining (or in vacuo for Rh, Os, and Ir). (11)

"As all ores are different I may use from one to three additives... to assist in rejuvenating the chemicals and acids in ores. But any material eroded... by water is not amenable to this process."

Another similar method of transmutative enrichment was developed by some California alchemists in the 1970s:

Smelt 2 lb. lead with soda ash and/or soda-borax. Use this as the anode, and a stainless steel or carbon rod as the cathode. The reaction with the ore is contained in a carbon crucible with 10% nitric acid as the electrolyte. Add extra flux as needed. The process is repeated from 7-21 times.

6. **David Hudson/ORME**

In the 1980s, David Hudson discovered the existence of ORMEs (Orbitaly Rearranged Monoatomic Elements) which are virtually undetectable by conventional means (except for a distinguishing IR doublet located between about 1400 and 1600 cm^{-1}) because they lack a d-orbital electron. Hudson and associates developed a method to recover ORMEs and convert them into their metallic forms. While it is not a transmutation of one element into another (but rather, the conversion of an allotrope into

the common visible form of the elements), the extraction and conversion of ORMEs to metal may explain the claims of some other experimentors. Certain ores, particularly sodic and calcidic plagioclase, contain large amounts of ORMEs which can be extracted by Hudson's process, as described in his Australian patent for "Non-Metallic, Monoatomic Forms of Transitional Elements" (1989):

"300 gr of dried material assayed by conventional techniques to show no gold present, ground to less than 200 mesh, is placed in a 1-gallon vessel, fitted with electrodes, with 120 gr NaCl, 10 gr Kbr, and 2 liters of tap water.

"The anode consists of a pair of 3/8" x 12" carbon welding rods wrapped together with No.10 copper wire. The cathode consists of 1-5/8" ID x 14" glass tube with a medium porosity glass frit with a 1" x 14" x 1/16" stainless steel strip inside in a solution of 36 gr/liter NaCl (approx. 500 ml.). Both electrodes are placed into the sample vessel and supported by clamps extending about 5" into the sample solution.

"The sample is placed on a roller table at approx. 10 rpm. The electrodes are connected to a (120 V) power supply in conjunction with a 2-3 amp 400-600 PIV rectifier. A 100 W light bulb and the electrodes are hooked in series. The rectifier load is connected to the anode since the rectifier filters out all negative voltage and only passes positive voltage.

"The sample is kept under load for a period of 6-1/2 hours. The final pH is in the range of 3-6.5. The voltage across the electrode is 5 volts. After disconnecting the load, the sample is allowed to settle and the solution over the settled out material was removed by decantation...

"800 ml. of the sample was placed in a 1000 ml beaker and 20 ml concentrated sulfuric acid was added to the solution. With stirring, the solution was boiled down slowly on a hotplate until the solution was just dry (not baked). The just dry salt contains sodium gold chloride. The just dry salt was taken up in 400 ml deionized water and again boiled down to the just dry condition. There should be no discoloration at this point, i.e., a clear solution is formed.

"The just dry salt was then taken up in 400 ml. 6M HCl, and thereafter boiled down to the just dry condition. The dilution and boiling down step was repeated four times, alternating with a deionized water and a 6M HCl wash, with the sequence controlled to that the last washing was with 6M HCl. The purpose is to remove all traces of hypochlorite oxidant.

"The just dry salts are taken up in 400 ml anhydrous ethanol and stirred for approximately 10 minutes. This step is to dissolve the gold chloride salt, to remove the sodium chloride. After stirring, the slurry was filtered through #42 paper on a Buchner funnel.

"5 ml of concentrated sulfuric acid was slowly added to the filtrate, mixed, and the filtrate was then allowed to sit for approximately 1 hour. The filtrate was filtered through #42 paper on a Buchner funnel, and then passed through a filter of 0.5 micron Teflon. The sulfuric acid precipitates out any calcium. Filtration removes the precipitant and a light yellow filtrate is recovered, with all traces of calcium sulfate removed.

"The light yellow solution was again boiled down to just dry, taking care to avoid any charring. At this point there should be no further evaporation of ethanol and the just

dry residue should be free of color. The residue should have a sweet smell similar to burnt sugar. The occurrence of the sweet smell indicates the end point of the boil-down.

"The just dry residue is taken up in 600 ml deionized water to provide a water-soluble gold form which is the gold auride. If desired, the G-ORME can be recovered at this stage or converted into metallic gold. For gold recovery, the solution is put into a 1000 ml beaker and an electrolysis unit was set up... The anode is a gold electrode, 2 cm² in size, upon which gold solution will plate out. The cathode comprises a 6.8 cm² platinum electrode contained in a Nafion 117 chamber... Inside the Nafion chamber I 200 ml of electrolyte solution containing 5 ml sulfuric acid per 600 ml of electrolyte solution. It is important to keep the Nafion chamber wet at all times. The potential was measured across the electrodes and then an additional -2.2 volts potential was applied and maintained for a period of 2 hours.

"After the two hours, the potential was raised to 3.0 volts and maintained for approximately 18 hours. Bubbles formed on both the gold and platinum electrodes. A black material formed on the gold electrode after 3-4 hours. The gold electrode was removed from solution while voltage was still being applied. The electrode was dried in a vacuum oven overnight at 115° C. The electrode was weighed before and after the plating to determine the amount of gold collected.

"The metallic gold is, therefore, produced from a naturally-occurring ore which, when subjected to conventional assaying, does not test positive for gold."

The ORMEs are produced from sodium gold chloride, which is reduced to sodium auride. "Continued aqutation results in dissociation of the gold atom from the sodium and the eventual formation of a protonated auride of gold as a grey precipitate. Subsequent annealing produces the Gold-ORME. The G-ORME has an electron arrangement whereby it acquires d-orbital hole or holes which share energy with an electron or electrons. This pairing occurs under the influence of a magnetic field external to the field of the electron.

"G-ORMEs are stable [as] demonstrated by unique thermal and chemical properties. The white salt-like material that is formed when G-ORMES are treated with fuming HClO₄ or fuming H₂SO₄ are dissimilar from the transition (T) metal or its salts. The G-ORME will not react with cyanide, will not be dissolved by aqua regia, and will not wet or amalgamate with mercury... The G-ORMEs remain as a powder at 1200°C...

"G-ORMEs can be reconverted to metallic gold from which they were formed. This reversion is accomplished by an oxidative rearrangement which removes all paired valence electrons together with their vacancy pair electrons, with a subsequent refilling of the d and s orbitals with unpaired electrons until the proper configuration is reached for the T-metal.

"This oxidative rearrangement is effected by subjecting the G-ORME to a large negative potential in the presence of an electron-donating element, such as carbon, thus forming a metallic element-carbon chemical bond. For that metal-carbon bond to occur the carbon must provide for the horizontal removal of the d orbital vacancy of the ORME. The carbon acts as a chemical fulcrum. When the element-carbon bond is reduced by way of further decreasing the potential, the carbon receives a reducing electron and subsequently vertically inserts that reducing electron below the s orbitals of the element, thus forming metallic gold.

"The above description for the preparation of G-ORME from commercially available metallic gold is applicable equally for the preparation of the remaining ORMES, except for the specific potential energy required and the use of nascent nitrogen rather than carbon to convert the other ORMES to their constituent metallic forms. The specific energies range between -1.8 V and -2.5 V depending on the particular element. Alternatively this arrangement can be achieved chemically by reacting NO gas with the T-metal ORMES other than gold. Nitric oxide is unique in that it possesses the necessary chemical potential as well as the single unpaired electron."

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Part three and conclusion of dimensional equations detailing that all phenomena are the same phenomena: or a unification of Heat (temperature), Gravity, Electricity and Light with an accompanying geometry
by Timothy A Binder.

In the last two issues I have developed the vortex whirl as a model for all phenomena and we have seen how it applies to Gravity and Electricity/Magnetism. In this conclusion we will apply the model to Light, and Temperature. The essence of my thesis is that certain principles apply universally; and one is that all phenomena are expressed through movement (initiated by mind knowing expressed through mind thinking). All movement is vortexual in that every movement is resisted and deflected from straight line motion by other movement. As a consequence every phenomena must be expressed through vortex motion and all motion must express all dimensions simultaneously. Therefore whenever Gravity is expressed so too will Electricity, Light, Temperature, Tone and all other dimensions be expressed.

Sound is identical with Light except that sound is the vibrations (wave motion) of atoms or molecules

considered as continuous, instead of still smaller structures or ether cells considered as continuous. Sound is orthodoxly considered to be only longitudinal in direction whereas it as all phenomena must have three components of motion to it. We sense it differently as our senses of sight and hearing are designed by the Creator to respond to these different orders of vibration. If we were "wired" differently we could see sound and hear light. People under the influence of hallucinogenic drugs frequently experience this phenomena as the drug alters their senses abilities to respond to different vibrations.

Heat /Cold or Temperature is also the same thing as Sound, Light, Gravity and Electricity except that our senses register this sensation at the frequency that is more that of the less systematic current flows than those that we sense as Electricity, Light, or Sound. Those current flows that we conventionally recognize as eddy currents are more akin to those that we usually recognize as heat. In the same way what we call chemistry is that systematic part of any phenomena (vortex motion) that we recognize after we separate out the Electric, Gravity, Light and other systematized phenomena. We recognize that all these phenomena influence what we call chemistry and are a

part of that body of systematized knowledge and observation. It appears to me that the observation becomes knowledge when we recognize the Unity underlying all phenomena and the Cause behind it.

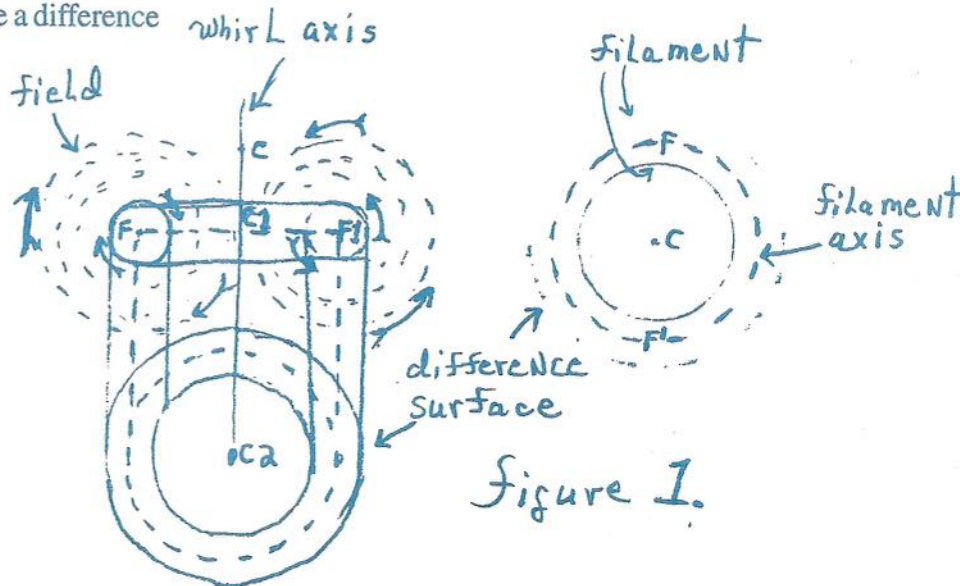
I have been describing all phenomena as being the giving off or taking in of secondary whirls by or from larger or smaller whirls depending on the point of view. Light is usually secondary whirl formation given off by ordinary atoms, electricity that given off by collections of atoms (which are greater collections of Light whirls), and X- and gamma rays that given off by parts of atoms or their parts.

Light is usually considered to be a wave or a particle. As a wave or a continuous fluid, Light is generally not considered as having any internal structure. As a particle or point it is also not generally considered to have internal structure. The photon or light wave particle has been generally considered to have zero mass which would be more or less consistent with having no internal structure. But, all things have mass and internal structure no matter what their size or where they occur in the scales of our senses. Let us consider Light as a vortex whirl wave/particle.

When we consider a wave as having internal structure it will be some form of a vortex whirl just as a particle considered as having internal structure will be. If we consider the "ether" to be either wave or particle it will have internal structure and be a whirl. Whether or not we recognize a thing as having internal structure or not are all points of view that we usually simply do not recognize. If we recognize any thing as having internal structure we can recognize it as a whirl if I am correct in my model for all phenomena. All whirls have a difference

surface as shown in the previous issues discussion. A difference surface is a layer of cells (or vortex whirls in infinite regress) that act/react with adjoining layers of cells or other whirls inside and outside of it at some spiral angle between 0 and 90 degrees to the difference surface layer. That difference surface layer and all layers of vortex whirls is and are in actual or virtual motion with all others at all times. Therefore Light waves are generated everywhere at all times though not necessarily ocularly visible ones. In this way Walter Russell was correct when he said the Universe was made up of Light.

As Light phenomena are whirls or secondary whirl formation then there must be three components of motion to light motion. As Light is given off at the difference surface of atoms, then at a given cell on a difference surface we need to recognize and remember three more or less conventional names used in light and electricity for the three directions of motion if we are to understand the mechanics of light phenomena. Here are the three directions of named motion: 1) the radial or normal direction is that perpendicular to the filiar axis, or roughly perpendicular to it, if the filament cross section is not more or less circular. 2) the filiar direction is that more or less parallel to the filiar axis. 3) the circumferential direction is that roughly at right angles to these other two; or it is that direction more or less parallel to the cross section circumference of the whirl or ether cell. These names are applicable to similar directions at any difference surface as say the field surface as well as the whirl or cell surface. See figure 1 illustrating these directions which is the same as the figure 2 diagram in the *Fulcrum* Vol. 5 No. 1. With this description and the diagram I believe you can visualize these directions.



Directions 2 and 3 together or the filiar and circumferential are the transverse directions. And it is obvious that the cell is supported more in these two directions than it is in the normal or radial direction and this means it has more freedom of motion in the radial direction which is the longitudinal direction. This radial direction is the direction that we usually recognize as the direction of light travel and also as the force of gravity. Thus light "travels" or "reproduces" itself mostly in the radial direction, as it is rather more enormously supported in the transverse directions. We can consider the cell to more easily elongate in the normal direction; or it more readily gives off secondary whirl formation in that direction, both ways being more or less wave and particle viewpoints respectively.

As there simply cannot be absolutely equal or unvarying supporting pressures or resistances in any of the three directions of travel the transverse directions must vary some as well. This varying in the transverse direction results in the "polarization" or the spiral rotation of light. In most of our experience with our senses, light rotation more or less cancels itself out and the polarization is unrecognizable; whereas in more uniform substances such as crystals it sums up in a recognizable left or right polarization. Other consequences of our model are that there can be no absolute speed of light anywhere as it will always be meeting varying resistances though these may be imperceptible to present instrumentation and our senses; or there are no "perfect" phenomena such as perfect harmonic simple or compound wave motions anywhere or perfect normal dispersion or perfect plane polarization anywhere - ever. All actual or experimental light phenomena are inseparable connected 3 dimensional vortex whirl motions as just described and as such none of the three components of motion ever become zero or infinity, even though some may become to present instruments instrumentally and sensibly imperceptible.

The transverse components of light wave motion mostly give us the intensity of the light whereas the longitudinal component gives us the color. In all light waves all ranges from the limits of zero to infinity are present. So, all light waves consist of all colors of all possible intensity whereas we only sense a singularity. This latter statement is a form of expression of Walter Russell's holographic universe although he did not use the word holographic. See page 25 of the last *Fulcrum* Vol 6 No. 1 where I quote one of his expressions of this idea.

So we can see in summation that our vortex whirl illustrates all phenomena. Gravity is Light waves and we sense Gravity in many ways but only recognize it as gravity in one or a few ways as that sense of "attraction" or "push" that occurs mostly in the longitudinal plane between two bodies or as matter formation.

If we compare the Vortex whirl diagrams for Gravity and Electricity in the last two issues with those in this issue we can see some of the following analogies: The less systematic vortex whirl formations that are conventionally recognized as eddy currents of some degree that we sense as Temperature manifests as heat as whirls synchronize and compress and manifests as cold as whirls separate and cool. Synchronization or compression inducts and conducts and thus heats. Friction or expansion deducts and non conducts and thus cools. As I quoted the Russell's on pages 25 and 26 of the last issue, both radiation and generation or induction and deduction create electric current and both create light waves. The longitudinal flow of light pressure gives us mostly the color which is analogous to what is mostly conventional gravity and the electric displacement flow. The transverse flows of light gives us mostly the intensity and polarization and is analogous to what is mostly conventional electric current and magnetic field flows. See figure 3 page 41 of Vol. 5 No. 3 and figure 2 page 27 Vol. 6 No. 1 of the last two *Fulcrums* to visualize these correspondences.

Gravity = radiation x generation = Light = Electricity = Temperature

Light = luminosity x darkness = Gravity = Temperature = Electricity

Electricity = electric current x magnetic field = Light = Temperature = Gravity

Temperature = heat x cold = Light (luminosity & darkness) = Electricity = Gravity

gravity = heat = generation/compression = luminosity = electric current = wave field center = whirl filament = centripetal motion

radiation = cold = expansion/degeneration = darkness = magnetic field = wave field boundary = whirl field = centrifugal motion

From the above I trust you can make all the other correspondences in possible dimensional equations yourself. In the last issue I took Kevin Mehan's lead and suggested that we could say $g = -1$ and therefore $l = -g$; if we say that g is darkness rather than if we see it as luminosity or the gravity center of the wave field, which is the way I think most Russell students see it. In this

usual way I would say that $G =$ luminosity and darkness; and $g =$ luminosity and therefore $g =$ luminosity as in a gravitational center and $-g$ then must = r or radiation as in the expansion away from the field center. Or, the black hole manifests the beginnings of matter formation and the blazing sun center manifests the end result of matter formation. Or, the black hole manifests the endings of matter dissolution and the gravitational hot sun center manifests the beginnings of matter dissolution.

With the vortex whirl model I feel we have the possibility to engineer more efficient and practical conversions of what is observably predominately one phenomena into another more predominate phenomena. For instance taking T.T. Brown's lead as shown in his antigravity patents published in the last *Fulcrum* and understanding of the correspondences between all vortex whirl phenomena; how might we orient mechanical motion, light or laser flows, or electro- static flows to achieve more efficient transportation and energy sources? See future issues for suggestions and breakthroughs.

From The Archives

L E C T U R E

by

WALTER RUSSELL

February 5, 1946

Caravan Hall

New York, N. Y.

I brought with me tonight a picture that I did for New York University, to explain to the Physics Department what the invisible universe would look like if you could see it. Dr. Sheldon, the head of the University there, said, "Well, if you are aware of the invisible universe, the wave universe, that we cannot see, why can't you paint a picture to make it possible for us to see the third dimensional effect and the wave effect?" So I did it and it was exhibited there for a long time, and then sent to the Museum of Arts and Sciences for a long time there.

You must become aware of the fact that there is another universe which we cannot see but which we can know. We live in two universes, we live in the universe of sensation, that which our senses detect, and that universe which our self-consciousness within us knows. Those are the two universes that we must be familiar with, not with the one; the one that the spirit within us, the consciousness within us, the inspiration and the intuition in us makes it possible for us to commune with the source of our very being, with the one living being whom we all manifest.

So, bear in mind and let it sink into your consciousness that space is filled, it is not empty anywhere, waves of light manifesting the creator everywhere. You know it is so because no matter where you put your radio you will pick it up; you will pick up the sound of things that are happening in London or Japan or anywhere. That thing is also happening here and you

can prove it, with your radio.

If you will move your radio here you can still prove it there, and down under the ocean and on the mountain top. It is happening everywhere. This universe is balanced with waves between every one of its masses. And so it is that a tossing of the ball by a child on this planet affects every star in the heavens; they all have to move to adjust themselves to the tossing of that child's ball.

Get that into your consciousness, that unity of all things, that fullness of the universe to waves of light, expressing the thinking of the creator.

... Mr. Russell then read questions that had been sent to him, and his answers to them; also using diagrams previously shown to illustrate his points ...

Now we come to the subject of the evening. These two drawings are for that purpose. This subject will have to be divided into three parts: the subject of the healing principle; the secrets of healing, the power that Jesus knew and used. As you will remember, he said, "What I do you can do when you understand it, when you know as I know."

As far as it is advisable at the present time I am going to unfold those secrets in this as a primary grade. Later they will go very much further when you have very much more of a knowledge of the true nature of the universe, but it would not be possible to so far as I will later until you have

a true knowledge of the universe, of the nature of the universe and more of a conception of what it is and what your relation to it is.

So the healing principle that is given in these three talks -- one is divided into the idea of balance; the next one into the idea of unity; and the next into the idea of extension. Those three principles are going to be interwoven through all three of the talks because they are all fundamental essentials. So watch for those three words and the sense conveyed by those three words: balance, extension, and unity, and put them together in your own consciousness as these three talks go on.

The purpose of them is greater comprehension of ourselves as extensions of God so that we may live through to the very last breath of life with full vitality, full vigor, mental and physical, and not only that but we may be able to extend that power that we have of ourselves to others, and that that may be extended to us.

Also, that we may know how to insulate ourselves from unrhythmic waves that would affect us if we did not know how to insulate ourselves against them or how to control unrhythmic waves in other peoples and other places distant by extension from ourselves.

I read very little to you from the Divine Iliad, but I must read this because words translated from the Universal

One and written in the Iliad are so much better words than I myself alone can write.

... Mr. Russell read from the Divine Iliad ...
"My immortality" etc ...

When Jesus said, "God is light, he meant just that." We think of it as being a figure of speech, a symbolic statement as though some one were holding a candle to guide man to the light. But he meant exactly that: that the universe, the fundamental principle of the universe is light at rest, in equilibrium, and that is God. Creation is light, divided into pairs of opposites, to manifest or express that light.

We have only one thing to deal with, light, light at rest and light in vibration, light in motion. We have a universe of waves of light, and we ourselves are composed of waves of light. Every corpuscle in our body is a wave of light or waves of light, countless waves of light in motion. The condition of these waves of light depends entirely upon the source of the mind universe of light that has created them and is creating them.

That is the basis of the whole healing principle. Light at rest, manifested in waves of light, balanced waves of light, rhythmic waves of light is the basis of all creation.

Balance is the major topic of the evening, then. I am going to read to you again from the Divine Iliad, for the Universal One has put the very basis of universal law for you

in three words. Man doing things alone is very complex in his thinking. I said to you at the second lecture, Whenever you do anything and you feel that you are alone doing it it isn't going right, and if you breathe a prayer almost without words -- "Let not this be mine alone, let it be mine and Thine," feeling that God is working through you -- there is an inspiration that comes to you at once, a power that you have never had.

It makes no difference whether you express it in sculpture or in writing or in the baking of a cake or a pie or the sweeping of the floor. Let my work be mine and Thine, not mine alone.

So in writing this this is mine and Thine and in better words than I can put it: "I have but one law for all my opposed pairs of things, and that one law needs but one word to spell it out. So hear me when I say that the one word of my own law is balance. And if man needs two words to aid him in his knowing of the workings of that law, those two words are balance, interchange. If man still needs more words to aid his knowing of my one law, give to him another one, and let those three words be rhythmic, balance, interchange."

That is all, three words. Nothing can be added to it. Upon those three words, no matter how far I go in these talks, no matter how many volumes I write in respect to it, they will never exceed those three words as descriptive of creation -- rhythmic, balance, interchange -- upon which man

can build his power, can build all his human relations in business, in government, in labor and capital, and I don't care what problem on earth there is if that law of rhythmic, balance, interchange is followed.

However, we are applying it tonight to one thing, not to industry or ethics or anything else. We are applying it to one thing, the healing principle.

(Showing Drawing). This drawing will explain very nicely what I mean. These waves are rhythmic and they are balanced. There is a change that is equal and opposite and rhythmic and balance. So are these (indicating) but they are more violent, much more expression of power; there is more potential in them, but they are just rhythmic and balance.

Now look at this one. (showing drawing). This is not rhythmic and it is not balance. Consider a person whose thinking is that. Think of the calm and the poise or the power of expression that is here, and think of the person who is thinking in waves like that. Think of the nervous condition. Think of a business transaction they are making, think of a man whose thinking is like that asking a job from another man, and the other man whose waves of thinking may be like this.

No, I don't want a man like that! And he says No before the man has said three words. One's thinking, the waves of thinking show themselves in every one's attitude, the way of walking, the way of talking. It is shown to everybody.



You can't hide it and you can't disguise it.

This thinking is extended to every cell in the body. You remember when I said, "A child can't throw a ball in the air without moving the whole universe." Well, how much more so if the waves of your body are affected by that kind of thinking, unbalanced wave thinking! Every corpuscle in the body is throwing off toxins. One becomes nervous, irritated, ill at ease, ill, cancers, ulcers of the stomach -- all sorts of things happen to people who are in this continuous state, making their own illnesses.

There is fatigue at 2:00 o'clock in the afternoon or even 11:00 in the morning. Go home and lie down to rest because they don't know what is the matter with them.

A man whose inspired thinking is like that (indicating), like a great genius, those looking for the motion of a symphony, whose thinking is wonderful and beautiful, he does not know such a thing as time. Time has gone, ours have gone. The person whose thinking is this way (indicating) is looking at the clock and wanting to go home. To the man who thinks this way time is real. To the genius or the inspired man who loves his work, time just does not exist.

(Showing drawing). Take the effect upon balance, rhythmic thinking, this way of looking at life, or that way, any transaction whatsoever, the person who is always thinking of himself, what he is going to get, what he is going to take



for himself instead of what he is going to give -- look at the unbalance of that. Whatever this man tries to take for himself is taken away from him eventually.

Balanced interchange in thinking, equal give and take in human relations, in industry, in business, in government, everywhere, the equality of give and take is the only thing that will make our eventual brotherhood and unity of man.

As long as the nation thinks this way -- unbalanced interchange -- there can be no peace. When they do think this way -- balanced interchange -- there can be no war. When each one of us thinks that way we can have perfect health, we can express great power, we can do wonderful things that we otherwise could not do.

When the ocean thinks that way, as in this other wave, things happen, ships are tossed on shore, damage is done, tremendous damage is done; whereas on the ships that sail on the calm seas of the calm ocean in rhythmic waves, a peaceful interchange is going on all of the time.

Now we will carry that idea of balance further. Actions and reactions then being equal and opposite instead of unequal and opposite, give us the basis of our power, give us the basis for a healthy body.

I am sorry I used up so much time on the questions that we have very little more time left, but will it be all right if I talk to a quarter of ten instead of half past nine?



... The members of the class indicated assent ...

Otherwise I have only seven minutes more and I have much to say on this particular subject.

Everything that God gives us in nature is balance, absolute balance. We who try to express balance with our free will upset that balance or at least we attempt to or try to, but we can't upset it because God doesn't allow it. But the moment we do anything, no matter what it is, the equal and opposite of that thing we do is registered immediately in its equal and opposite, and if the reaction is not balanced with the action, we have to pay for it sometime but we begin the paying for it right there and we continue the paying for it until we balance our actions with our reactions.

Let me explain what I mean. For example, if you squeeze a spiral spring together, as you do so it contracts and an equal and opposite force is developed to push it the other way, to open it. It's absolutely equal and opposite. That is what nature does. The pendulum in swinging, as it swings one way develops an equal and opposite force to swing it back the other way.

The falling rain falls into the ocean. The ocean lifts up to balance the amount that has fallen into the ocean to keep balance true all the time. The captain of a ship, for example, may say, "You have the run of this ship, to do just as you choose, a free will to do exactly as you please, as long as



you obey the laws of the ship."

However, suppose he does not want to obey the laws of the ship, he cracks his own head against this or that or the other thing and he hurts himself, but does he upset the balance of the ship? No, the ship is going right on to France, and it is taking him with it. His free will is limited to the ship that he is on only, and the ship is not affected but it is taking him to France.

We are on this planet in the same way. What little things we think we do to upset this balance of ourselves doesn't affect the planet whatsoever. The planet is right in its orbit, going around the sun so true to the balance that the universal source has extended to it that an astronomer can calculate its position to the split second at any moment.

Now what difference does it make to this man on this planet, you or I, how much we try to upset it? It doesn't upset the balance of the planet, it goes on just the same carrying us round and round the sun. We can't get off the planet, above it or below it. We are prisoners on the ship-planet earth that we are on. We are self-bound slaves here, and we can't get off of it.

And then we talk about free will! How much free will have we? We have free will to attempt to express something that upsets the balance of the universe, but as we do that thing that we think is expressing unbalance, something else is happening



over here to react against it and record it on the books of the universe against us until we balance it.

Supposing, for instance, a man goes up a mountain. That isn't a crime or sin. It is merely an example I am giving you. He goes up a mountain off the earth. In doing so he is less weight every inch that he goes up. The balance of the earth has not been affected in the slightest. He has left something there. He is charging space and discharging the planet from which he comes equally.

Now as he comes back down he keeps a record of that and restores that unbalance which he has taken from it. That is what I mean by equal and opposite reactions. It isn't God punishing a man for doing something now or later in life. It is the action and reaction of equals and opposites. There is nothing to punish a man for for going up a mountain. He is not committing a sin, but he is doing something which upsets the balance of the earth that he is upon without succeeding in doing so.

No matter what we do to attempt to upset that balance we will never succeed because the record is kept right at the central gravity of this earth; the record is kept there. And what we borrow that we are not entitled to, or return that is unequal to our giving and taking, is recorded, and the damage that is done is done to the person immediately by changing his wave length, changing the rhythmic balance, interchange of his



thinking. So that the punishment for that view -- I won't use the word punishment -- isn't something that comes after death in a purgatory or a hell or anywhere else; that effect immediately upon his thinking is registered right in the waves of his thinking, and every particle of his body pays the price for that the very moment, the second, the instant.

The only way that he can be forgiven for that sin -- if you want to use ecclesiastic terms -- or restore his balance is to desire it. I am not saying repent and believe. That is an ecclesiastic term. Realization of unbalance is repentance; it's the turning, the realization of unbalance and the desire for balance. O Lord, what have I done! Help me to the path again. That desire is the repentance, and the desire is also the return to balance.

Now let us consider some inanimate thing, not a person on the planet. The planet is divided into its zero and its 1 and 2, the center of gravity being the self or the soul, the representative of the source, and the two magnetic poles that extend from that are the 1 and the 2 that keep it in balance. That is unchanging. There is no motion there.

All the motion that takes place is around that extension of calm, that extension from the center of gravity to the two magnetic poles. The balance is there and it is absolute. As I say, the planet will follow its orbit come what will because of that balance of the magnetic poles reaching



through the center of gravity. Just the self of you is the center of gravity of you, reaching out to the two magnetic poles of you which keep you in balance.

Now then the surface of the earth is divided and it is changing because it is divided. The equator of the earth balanced and rhythmic, the North and South poles cold and heat, are two changing conditions exactly like the ice and the hot iron that I have described to you before, that upset an equilibrium and cause currents of wind and air to circulate all over this planet.

Well, that is a manifestation of the idea of motion. That is what God intends, that the planet shall manifest motion. But the planet wants to do a little sinning of its own and upset balance. The heat and the cold, or the currents of the air, get mixed up, become unbalanced. What is the result? Tornado, cyclone, storm, avalanche, until the waves subside, the tornado subsides and balance is again attained. But balance will be attained come what will.

These things which appear from the planet disappear, and they reappear as currents of wind and rain and cold and warm air which again upset the condition of it and cause such unbalance which must be straightened out. The balance of the planet -- again using an inanimate term rather than an animate term -- are the equators of the planet. As they or the sun extend, the poles flatten to balance. The planet becomes



oblique and the poles extend.

As water flows down hill to the ocean, the ocean flows uphill. There is a constant leavening process going on in the planet which attempts to make all things one, and there is an equal balancing polarization process that is attempting to make all things two. The condition of rest from which everything springs as motion desires is the fundamental principle for everything which springs from motion must find rest again.

So that in this universe of motion in matter we find three distinguishing qualities, three distinguishing desires -- the desire for rest from which we spring, the desire for motion, and the desire for balance. Everything we do springs from the condition of rest and returns to it. The wave itself that rises from the ocean rises to its trough or to its crest and sinks to its trough. That is a position of rest that is entertained. And it must return to the condition of rest, which is the calm ocean before it can repeat itself.

Man springs from the condition of rest into a wave of his entire life. At maturity, say 45 years of age, he has reached the crest; his power is maximum at that time. Then he goes toward what he calls death. But death has been born in the very cradle with him, following him up until at the crest where he stops to rest for just one brief time. Death and life are equal. Then down hill he goes toward old age, and death is then measured, and then when he has finally gotten to the



final resting place we say he is dead. He merely disappears.

All things in nature appear and disappear, to reappear. And when man has full maturity at the crest of his wave and then begins to expand it as he reaches the plane of rest from which he sprang, that part of the cycle, he still has the same power, but it is expanded and extended over a greater distance in volume. You don't see it any more; it has disappeared. But the immortality which centered that man is still there and will reappear.

(Showing painting of the invisible universe).

Even in the chemical elements this plane of zero here we call helium, neon, cripton and the gases which you see in your neon lights or the helium which you use in balloons. Those are the zero elements which record all of the other elements. They are the seed in which all of the other elements fold up into for reappearance, and they are all in this plane. (indicating).

So that if you translate this plane, this electric plane of matter to the ocean of the waves, you will think of the crest of the wave descending until it has found the plane surface of the ocean from which it sprang. Then it continues on and the other one, what is trough, continues to reach the crest. The power that was in the crest before has dissipated or disappeared, but has reappeared, and as trough it is still the same power. Our lives are being constantly repeated in that way, with consciousness all the time, the same consciousness, but



with different bodies, but we always have a body.

I have told you in the first talk that gradually I will explain what those other bodies are. I have given you a little hint of it when I have spoken of the vapor that rises from the ocean. The vapor, water vapor as water begins to disappear. You cannot wash your hands in the water vapor; you cannot drink it, and you don't, then, call it water. But it is water just the same. It disappears into gases and it reappears as water vapor.

That is just a slight indication of what happens to the cycle of everything that appears, disappears and reappears for everything in cyclic repetitions of an eternal life, eternal expression of life. Life in us is in the fulcrum; the expression of it is in the body. In the self of us it is eternal; in the body it is eternal, repetitive. That is the only difference. The expression in cycles forever and ever in growth in what you call evolution until this play of creation has started. I was going to say as an amoeba in the mud flats until it grows into what it is.

However, it goes farther back than that. It starts in the sun. Fairly soon we will get to the point where we will know what our relation is to the sun of this system, and what it has to do with our health, what it has to do with our creation and recreation and our power, and what it has to do with the very idea of us, because we are all there in the



sun -- we, ourselves, the apple and the tree. We start from there, we go back to there, and we repeat ourselves here.

The journey from life to life is from the center of our system to the planet on which we express ourselves and back to the center of our system over and over again until the journey is finished and the planet itself. Man has become cosmically conscious, he has expressed the purpose God has put him here for. The planet is then way out beyond where mars is, or farther out.

The play is finished, Venus is rolling up closer and closer and closer, getting ready for oxygen and getting ready for water and organic life. And the play will begin there again and go on all over again in the same way -- a play that has to do with light, the light of the sun representing the divided light of the creator in its system, which consists of a group of planets, a system of planets which have been melted in the crucible of the sun and put out to cool, so that they could get far enough away from it to express organic life, and then organic life is expressed upon it.

And over a period of a few million years we carry through that journey of organic life on the planet until the cosmic consciousness comes to all of us and we are thoroughly aware of our oneness with God and thoroughly aware of our power, there is no need of carrying the play on any more. The curtain comes down. Hamlet has finished, the play is finished, people



can go home.

That is pretty much what creation is. It is an expression, a manifestation of an idea of the creator, one idea. The creator has just one idea, and that is creation, to be expressed. You have one idea now, another one the next minute and the next tomorrow. You want a part of that idea, a part of that idea of the creator, a part of that idea of creation. You want to use it for a certain purpose.

If you use it rhythmically and in balance, in balanced waves, cease thinking, stop thinking, stop allowing your minds to become waves. Be calm, then be all at rest. I should have said this before, before I expressed the calm. Write the desire upon your heart, that which you wish to do. If it is a musician and he wants a motif for a symphony, he stops thinking, and the answer comes in an inspiration, in an ecstatic inspiration, he has his motif and he writes his symphony.

You may wish to invent something, you may wish to paint something. That is the only way you can do it. Go back to the source of stillness in the self that centers you, commune with self, which is God, the only difference being that the self that centers you, that is a pattern of your own individuality, that goes on down through the ages, a pattern in the soul of you that continues and continues as you and as extensions of you down through the ages until you have worked out

your own individual destiny, your own individual problem.

That pattern is recorded there in the inert gases that make a part of your body and is repeated whenever you wish, whether it is the next moment or the next life or a thousand lives hence. You express it because it is there; it is recorded in the memory of your soul and it is a part of you, a part of everything that you have ever done since you were an amoeba or since you were a savage animal in the jungle.

This talk is confined to the application of it, and so far as one's health is concerned the application of it is this: To be powerful, in order to express yourself, in order to express your desires, one must think all of the time of one's manner of thinking, one's waves of thinking, one's balance, one's emotions. Never let them be upset. Never give way to anger, hatred, fears, jealousies, worries. Those are the things which distort the waves and make them unbalanced and make it impossible to go through the day with joy and a vigorous, vital feeling and never a feeling of fatigue, and it makes one go through life in the same way to a ripe old age with the faculties still striking strong on every cylinder.

So with that we will conclude tonight. And the next time we will carry further by carrying this idea of balance into the principle of unity, of being only one thing in the universe, and from there we will carry both balance and unity into the principle of extension, so that you can carry the power,



extend the power that you have to others anywhere as this rapidly ripening intuition or inspirative sense is coming more and more into being with us, as cosmic consciousness is coming more and more into being and awareness with us.

Thank you. (Applause)

PATENT PAPERS

United States Patent [19]
Kindt

[11] **4,220,006**
[45] **Sep. 2, 1980**

[54] **POWER GENERATOR**

[76] Inventor: **Robert J. Kindt**, 100 Eastgate Dr., Rochester, N.Y. 14617

[21] Appl. No.: **961,942**

[22] Filed: **Nov. 20, 1978**

[51] Int. Cl.³ **F03G 7/06**

[52] U.S. Cl. **60/527; 60/325; 60/530; 92/98 R; 417/379**

[58] Field of Search **60/508, 509, 516, 527, 60/530, 325; 417/379, 394; 92/98 R**

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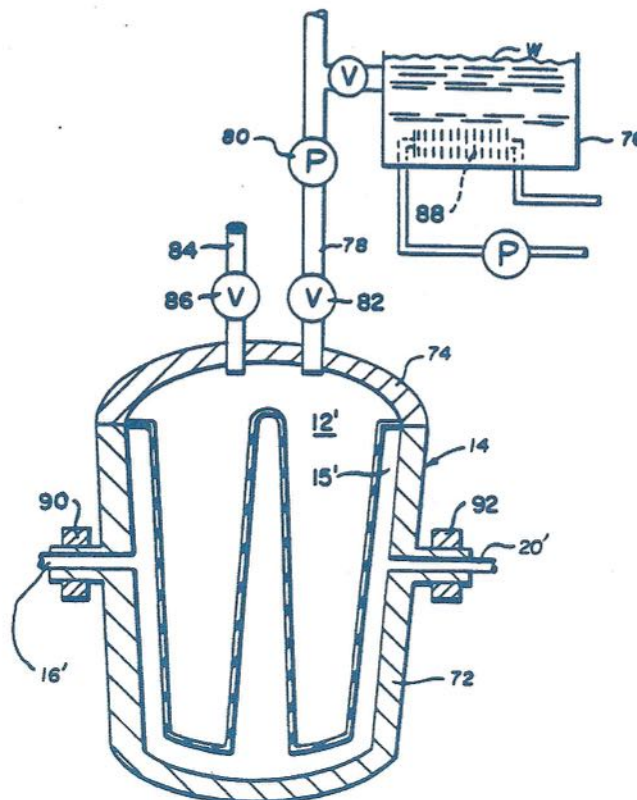
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Primary Examiner—Allen M. Ostrager
Attorney, Agent, or Firm—Lawrence P. Kessler

[57] **ABSTRACT**

A power generator utilizing the full volumetric expansion of water upon its change from the liquid phase to the solid phase (ice). The generator includes a chamber having heat transmitting, fluid impervious, flexible walls. The chamber is filled with water. A pressure-containing housing has an internal cavity in which the chamber is located in spaced relation to the housing. The space between the housing and the flexible walls of the chamber is filled with a fluid which is circulated through the cavity. A conduit connected to the housing provides flow communication between the cavity and means for utilizing moving fluid, such as a fluid driven motor. The phase of the water in the chamber is changed from liquid to solid so that the water expands in volume. Expansion of the water expands the flexible walls of the chamber to displace a proportional amount of fluid from the housing through the conduit, the moving displaced fluid serving as a power medium to drive the motor to do work.

10 Claims, 4 Drawing Figures



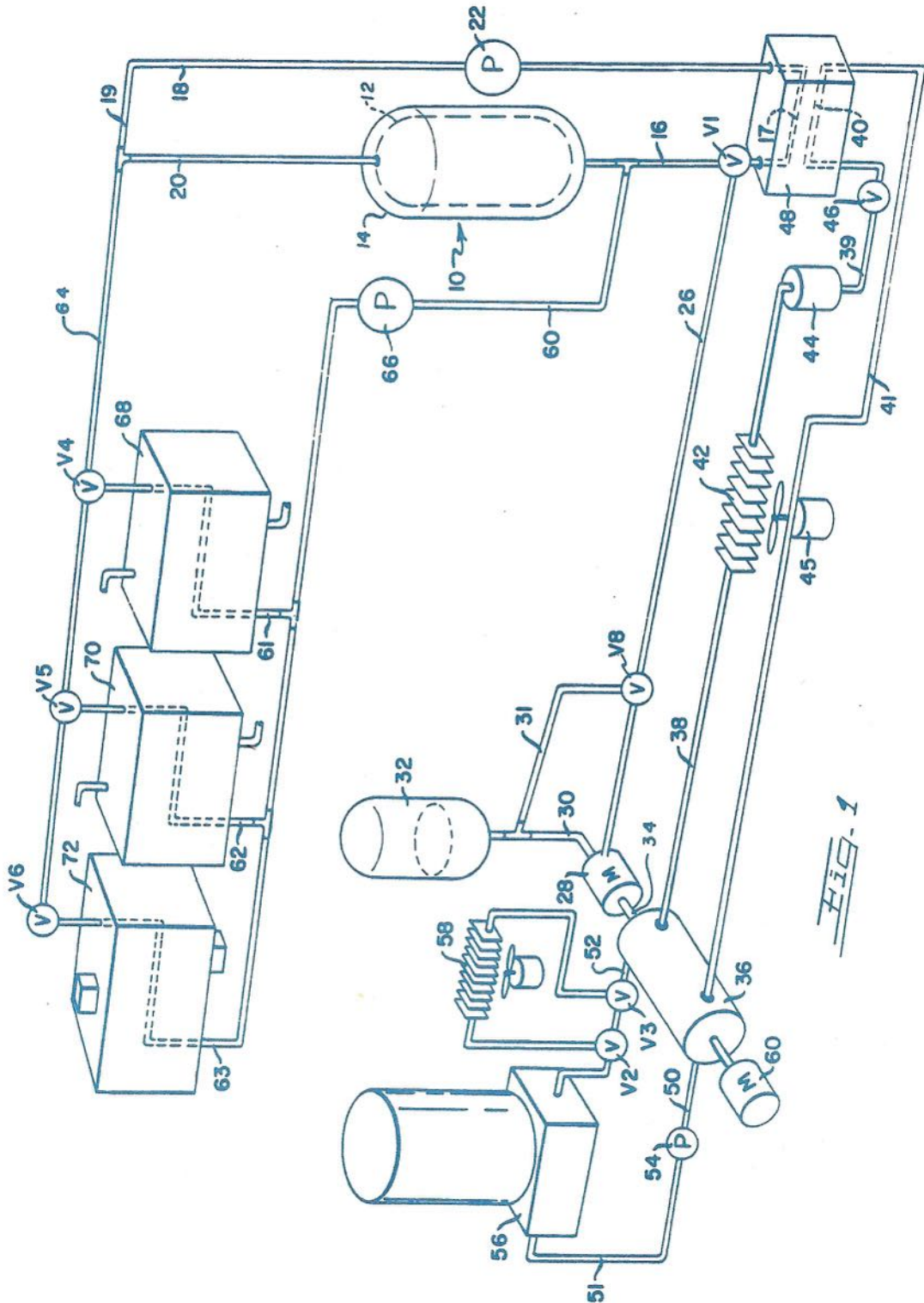


FIG. 1

Fig. 2

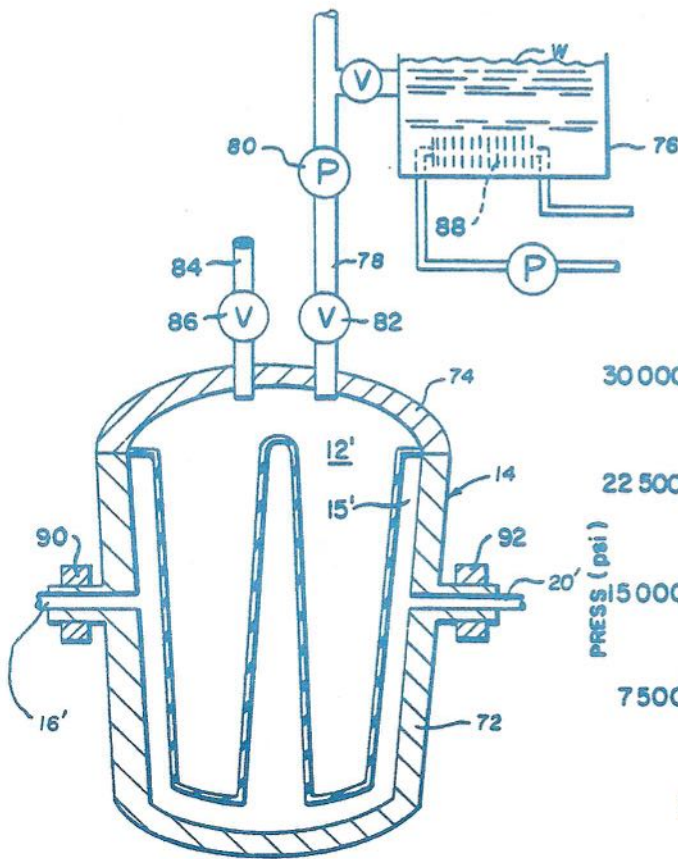
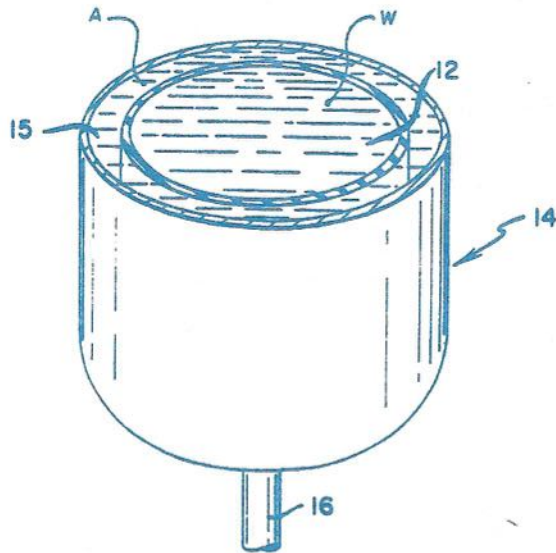


Fig. 3

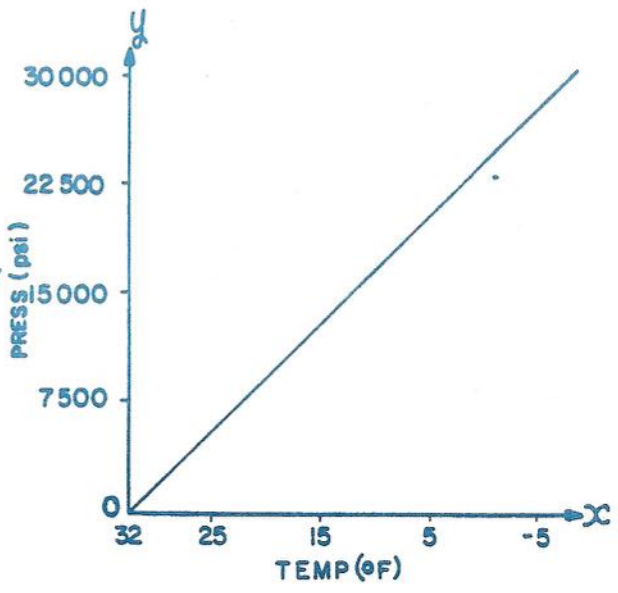


Fig. 4

POWER GENERATOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to power generating apparatus, and more particularly to a power generator utilizing the volumetric expansion of water upon its change of phase from liquid to solid for production of power.

2. Description of the Prior Art

It is a fundamental law of nature that when water changes phase from a liquid to a solid, there is a corresponding expansion in volume of about 10-15%, depending upon the pressure and temperature at which the phase change occurs. Over the years, many attempts have been made to develop apparatus for harnessing this volumetric expansion to do useful work such as driving a motor. In general, such apparatus utilize water confined in a chamber and initially chilled to its freezing point. Further chilling of the confined water results in the removal of the heat of fusion, which causes the water to begin its change of phase to ice. The volumetric expansion of that portion of water changing phase serves to force the remaining liquid water from the chamber into a piston-cylinder in fluid communication with the chamber. The water moves the piston in the cylinder with the rod of the piston being used to do work.

A typical example of a power generator of the type utilizing the volumetric expansion of water upon change of phase is shown in U.S. Pat. No. 989,044, issued Apr. 11, 1911, in the name of Pool. In the apparatus shown in such patent, parallel chilling chambers and piston-cylinders are employed. The rods of the pistons in the respective chambers are actuated by the volumetric expansion of water as it changes phase to provide unidirectional rotation of a gear motor. However, the power generated by apparatus of this type is limited due to the fact that the full volumetric expansion of the water cannot be utilized. This is because the configuration of the chamber permits the expansion to occur in only one direction; further, if the water completely changes phase to solid ice, the movement of the piston will be inhibited, and the ice must be remelted to enable the piston to complete its return stroke.

SUMMARY OF THE INVENTION

The power generator of this invention utilizes the full volumetric expansion of water upon its change from the liquid phase to the solid phase (ice). The generator includes a chamber having heat transmitting, fluid impervious, flexible walls. The chamber is filled with water. A pressure-containing housing has an internal cavity in which the chamber is located in spaced relation to the housing. The space between the housing and the flexible walls of the chamber is filled with a fluid which is circulated through the cavity. A conduit connected to the housing provides flow communication between the cavity and means for utilizing moving fluid, such as a fluid driven motor. The phase of the water in the chamber is changed from liquid to solid so that the water expands in volume. Expansion of the water expands the flexible walls of the chamber to displace a proportional amount of fluid from the housing through the conduit, the moving displaced fluid serving as a power medium to drive the motor to do work.

The work output of the fluid-driven motor can be used to drive a liquid-cooled refrigerant compressor. The compressor's liquid coolant absorbs at least a portion of the heat of compression to be used, for example, for heating interior living space or water for household use. The refrigerant gas, which is heated upon compression, is passed through a heat exchanger cooling the gas to a liquid. The heat extracted in such heat exchanger can also be used for heating interior living spaces. Further, when the liquid refrigerant is expanded to return it to its gaseous phase, it is cooled to a temperature which enables it to be used with (or instead of) outside air to cool the liquid in the housing and, in turn, to change the phase of the water in the chamber from liquid to solid. With the emphasis on ecologically compatible power generation, advantage can be taken of the naturally occurring below-freezing temperatures available in northern climates, sometimes twenty-four hours-a-day, to accomplish the change of phase of the water in the chamber by which power is generated.

The invention, and its objects and advantages, will become more apparent in the detailed description of the preferred embodiments presented below.

BRIEF DESCRIPTION OF THE DRAWINGS

In the detailed description of the preferred embodiments of the invention presented below, reference is made to the accompanying drawings, in which:

FIG. 1 is a schematic view of the power generator of this invention arranged to drive a fluid motor for a liquid cooled refrigerant compressor;

FIG. 2 is a cross-sectional view in perspective of a portion of the power generator housing and flexible-walled chamber of FIG. 1;

FIG. 3 is a schematic view of an alternative embodiment of the power generator of this invention; and

FIG. 4 is a graphical representation of the melting point of ice (in degrees Fahrenheit) plotted along the X axis vs. pressure (in psi) plotted along the Y axis.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, the power generator 10 of FIGS. 1 and 2 comprises a chamber 12 completely filled with water W. The chamber 12 is formed of a flexible material capable of conducting heat and impervious to fluids, such as ADIPRENE[®], a polyurethane elastomer. The chamber 12 is positioned within the interior cavity 15 of a pressure-containing housing 14 to define a space between the chamber and housing. The interior volume of the cavity 15 is selected to be of a size to enable the flexible-walled chamber 12 to fully expand in all directions as the volume of the water within the chamber expands upon change of phase from liquid to solid (ice). The space between the chamber 12 and the housing 14 is filled with an antifreeze fluid A, such as a mixture of ethylene glycol and water.

Conduits 16 through 20 (FIG. 1) are connected in flow communication with the housing of power generator 10, and provide a first flow path for the antifreeze fluid A. A pump 22 in the conduit 28 circulates the fluid in such flow path. A conduit 26, in flow communication with a fluid motor 28, is in flow communication with conduit 16 through a "T" valve V₁ located in conduit 16. When the valve V₁ is opened, antifreeze fluid A is free to flow in the conduit 26 to drive the fluid motor 28. The antifreeze fluid A is moved through conduit 26 by expansion of the chamber 12 to displace the anti-

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freeze from the cavity 15 into the conduit 26. The expansion is effected by utilizing the antifreeze fluid A to freeze the water in the chamber 12. When the water changes phase from liquid to ice, it increases in volume thus expanding the flexible walls of the chamber 12.

A conduit 30, connected in flow communication between the motor 28 and a pressurized storage tank 32, provides a flow path for the antifreeze fluid A exhausted from the motor. Conduit 31 is connected in flow communication with conduit 30 and with conduit 26 through a one-way valve V_8 . Valve V_8 can be opened to enable the antifreeze exhausted from the motor 28 to the tank 32 to be returned through the conduits 30, 31, and 26 to the cavity 15.

The fluid motor 28 has an output shaft 34 rotatably driven by the antifreeze fluid A in any well known manner. Shaft 34 drives a liquid cooled, refrigerant compressor 36. Conduits 38 through 41 are connected in flow communication with the compressor 36 and provide a flow path for the refrigerant. The refrigerant, which may be for example Freon, is delivered in its gaseous phase to the compressor by conduit 41. The compressor 36 compresses the refrigerant and, in the process, generates a quantity of heat, a portion of which is stored in the refrigerant being carried from the compressor by the conduit 38. Compressor 36 can also be driven by an auxiliary electric motor 60 to compress the refrigerant, for example, on start up. A heat exchanger 42 in the conduit 38 removes a portion of the stored heat from the compressed refrigerant. The removed heat can be used for space heating, such as heating the interior of a home. A fan 45 blows air over the heat exchanger, and the air is warmed; the warmed air is then directed into the space to be heated by any suitable ducting.

As the compressed refrigerant passes through the heat exchanger 42, it is cooled and changes phase from a gas to a liquid. The liquid is stored in a chamber 44 in flow communication with conduit 38 downstream of the heat exchanger. Conduit 39, in flow communication with the chamber 44, is connected to the input side of an expansion valve 46. The refrigerant is transported through the conduit 39 into the expansion valve 46 where it is expanded to change from its liquid phase to its gaseous phase, with an accompanying substantial lowering of the temperature of the refrigerant. Conduit 40, connected in flow communication with the exit side of the expansion valve 46, carries the lowered temperature refrigerant, in its gaseous phase, into a heat exchanger 48. In the heat exchanger 48, the refrigerant in conduit 40 passes in heat exchange relationship with antifreeze fluid A in conduit 17, and the temperature of the antifreeze fluid is lowered.

Conduits 50 through 52 are connected in flow communication with the compressor 36, and particularly the liquid coolant circuit for the compressor, to provide a flow path for the coolant. A pump 54, between the conduits 50 and 51, circulates the coolant about the flow path. The liquid coolant absorbs a substantial portion of the heat produced during compression of the refrigerant by the compressor 36. A portion of the absorbed heat in the circulating coolant is given up in a heat exchanger 56, located between conduits 51 and 52. The heat exchanger 56 can be used, for example, to transfer heat from the coolant to water for household use. The circulating coolant can be shunted from conduit 52 to a heat exchanger 58 by arranging valves V_2 and V_3 to divert the coolant from the conduit 52 through the heat exchanger 58. Any excess heat remaining in the coolant

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can be removed by the heat exchanger 58 and such heat can be used, for example, for warming of interior living space in the same manner as heat extracted from heat exchanger 42 described above.

A second flow path for the antifreeze fluid A is established by conduits 60 through 64. Conduits 60 and 64 are in flow communication with conduits 16 and 20 respectively. A pump 66 in the conduit 60 circulates the fluid in such flow path. Conduits 61, 62, and 63 are located in parallel between conduits 60 and 64, and pass through chambers 68, 70, and 72 respectively. Valves V_4 , V_5 , and V_6 regulate flow through respective conduits 61, 62, and 63. Chambers 68, 70, and 72 are heat exchangers for transferring heat to or from the antifreeze fluid A. For example, heat exchanger 68 may communicate with the outside (environmental) air, while heat exchangers 70 and 72 may communicate with water sources, such as household waste water.

In the alternative embodiment of FIG. 3, the housing 14' is constructed as a pressure-containing vessel 72 having a removable cover 74. The cover 74 is connected in fluid communication with a chill tank 76 by a conduit 78. The water in the chill tank 76 is cooled by exposure to outside air or by transfer of heat to a heat exchanger 88 located within the tank. A pump 80 directs the chilled water from the tank 76 into the flexible-walled chamber 12', within the vessel 72, through a one-way valve 82 in the cover 74. An air vent 84 with a one-way valve 86 in the cover 74 allows air within the chamber 12' to escape when the chamber is filled with water. The heat transmitting flexible walls of chamber 12' are spaced from the internal walls of the vessel 72 forming a cavity 15' which is filled with antifreeze. As described with reference to the embodiment of FIGS. 1 and 2, the antifreeze in the space between the chamber 12' and the vessel 72 causes the water in the chamber to change phase from liquid to solid (ice). Upon change of phase, the water expands in volume thus expanding the flexible walls of the chamber to displace an equivalent volume of antifreeze. The displaced antifreeze leaves the vessel 72 through conduit 16' where it is utilized to do work, such as driving a fluid motor. After the phase change has gone to completion, the cover 74 may be removed and the ice emptied from the chamber 12', as by rotating the vessel 72 about bearings 90, 92. The chamber is then available to receive a new supply of water so that the work-developing phase change cycle can be repeated.

While the power generator 10 has been described as having one chamber 12 within a pressure-containing housing 14, it is of course understood that there may be a plurality of power generators (housings and respective flexible-walled chambers) used together. When more than one power generator is used, the cycle of the individual generators is timed by appropriate valves to cause the generators to act in series to continuously supply power to the motor 28. That is, the water in one generator may be changing phase to ice and expanding, while water in the other generators is being changed back from ice to liquid.

The magnitude of the power which can be generated by the above described apparatus, may be illustrated by the following example, particularly for the embodiment of FIGS. 1 and 2. For this example, it is assumed that the outside air temperature is 12° F. Initially, the space between the flexible-walled chamber 12 and the housing 14, conduits 16 through 20, pump 22, conduits 26 and 30, motor 28, conduits 60 through 64, and pump 66 are

filled with antifreeze fluid A. At the same time, pressure tank 32 is also partially filled with the antifreeze fluid A, the remainder of the tank being filled with an inert gas under pressure to establish an initial pressure in the antifreeze fluid, as for example 2000 psi. Valve V₆ is opened so that the antifreeze fluid A being circulated by pumps 22 and 66 passes through heat exchanger 68 (communicating with the outside air). As such, the antifreeze fluid is chilled to about 12° F. and the cooled fluid is circulated in the space surrounding the flexible-walled chamber 12. The antifreeze fluid removes heat from the water within the chamber. Assuming the volume of water within the chamber 12 is one cubic foot, it is required that 8985 BTU's be extracted to remove the heat of fusion from the water. That is, since it takes 144 BTU's/pound of water at 32° F. to remove the heat of fusion from the water, and there are 62.4 pounds of water/cubic foot; therefore:

$$144 \text{ BTU's/pound} \times 62.4 \text{ pounds} = 8985 \text{ BTU's.}$$

Alternatively, the antifreeze fluid A can be cooled as it is circulated through heat exchanger 48 by the refrigerant in conduit 40 (at, for example, -30° F.). The fluid is then circulated about chamber 12 to remove the required 8985 BTU's.

As noted, the antifreeze fluid A is maintained at the initial minimum pressure of 2000 psi, by the inert gas in the pressure tank 32. The water in the chamber 12, with the heat of fusion removed, is prevented from changing phase to ice (with its resulting expansion) and remains in its liquid phase. The valve V₁ is then closed to isolate the circulating antifreeze fluid from the conduit 26 and contain the fluid within its closed path. Thus as the temperature of the water is further cooled by the antifreeze fluid A, the water wants to change phase from liquid to solid with the attendant volumetric expansion. However, the pressure of expansion is counteracted by pressure build-up in the contained antifreeze fluid. The pressure is permitted to build up to 30,000 psi. As can be seen in the graph of FIG. 4, the melting point of ice (freezing point of water) is related to pressure such that at 30,000 psi, the freezing point of the water has been lowered to -8° F. With the water lowered the additional 40° (i.e., 32° F. to -8° F.), an additional 2496 BTU's is required to be extracted from the water. That is, it takes 1 BTU to lower 1 pound of water 1° F.; therefore, to lower the one cubic foot of water 40°:

$$40 \times 62.4 = 2496 \text{ BTU's.}$$

When the pressure of the antifreeze fluid A has built up to 30,000 psi, valve V₁ is reopened to provide flow communication between conduit 26 and the cavity 15 of housing 14. With the valve V₁ open, the antifreeze fluid A can be forced from the cavity 15 as the water in chamber 12 is permitted to expand changing phase to ice. Because the walls of the chamber are flexible, the chamber expands uniformly and the phase change can go to completion. This represents about a 15% volume change at the particular temperature and pressure of this example. The expansion of the chamber 12 urges the antifreeze (at 30,000 psi) from the cavity 15 through the conduit 26 to drive the fluid motor 28.

The work available to the motor 28 enables the motor to drive the liquid cooled refrigerant compressor 36. As described above, the refrigerant compressed by the compressor is circulated in a path which provides for interior space heating through heat exchanger 42 and

cooling of the antifreeze fluid A in heat exchanger 48. Further, the liquid coolant is circulated in a path which provides for heating of household water through heat exchanger 56, and for interior space heating through heat exchanger 58.

The amount of work available in the pressurized antifreeze fluid is the amount of energy imparted to the fluid by the expansion of the water in chamber 12. That is, the volume of the antifreeze fluid displaced by the expanding water, times the pressure of that displaced medium, equals work available; therefore:

$$0.15 \times 144 \text{ sq.in./sq.ft.} \times 30,000 \text{ psi} = 648,000 \text{ ft.lbs.}$$

Since the pressure in the antifreeze fluid after driving the motor 28 is 2000 psi, the net work available to drive the motor 28 is:

$$0.15 \times 144 \text{ sq.in./sq.ft.} \times 28,000 \text{ psi} = 604,800 \text{ ft.lbs.}$$

As can be readily appreciated, such amount of work available from the expansion of the water upon change of phase to ice is sufficient to drive the motor 28 to accomplish desired refrigerant compression.

With the pressure in the antifreeze fluid A reduced to 2000 psi, the antifreeze fluid is circulated in conduits 16 through 20 by pump 22 and in conduits 60 through 64 by pump 66. Valves V₄, V₅, and V₆ regulate the flow of antifreeze through heat exchangers 68, 70, and 72 respectively. As noted above, heat exchanger 68 communicates with the outside air (at 12° F. in this example) and can impart heat to the antifreeze fluid to raise its temperature back to approximately 12° F. Heat exchangers 70 and 72 are in communication with water sources, such as household waste water. The water in the heat exchanger 70, for example, may be under pressure so as not to freeze when cooled below 32° F. Thus when the antifreeze fluid is passed through heat exchangers 70, 72, it is further warmed to 32° F. Preferably, the valves V₄, V₅, and V₆ are cycled open and closed so that the antifreeze fluid is first warmed to 12° F. in exchanger 68, then to slightly less than 32° F. in exchanger 70, and finally to slightly greater than 32° F. in exchanger 72. It can be appreciated that the water in heat exchangers 70 and 72, which is cooled upon warming the antifreeze fluid A, can be used in air conditioning apparatus to cool living, working, or commercial areas.

The warmed antifreeze fluid A circulating through the housing 14 warms the ice within the chamber 12 from -8° F. to 32° F. This requires the addition of 2496 BTU's (the reverse of cooling the water as calculated above). If the pressure has been reduced to 15 psi, a heat of fusion equal to 8965 BTU's must be additionally imparted to the 1.15 cu. ft. of ice to cause it to change phase to 1 cu. ft. of water at 32° F. (the reverse of the freezing of the water as calculated above). If the pressure is maintained at 2000 psi, the ice will change into water at about 29° F. (see FIG. 4) and not require the 8965 BTU's to be imparted to the water. The 0.15 cu. ft. of antifreeze fluid displaced into tank 32 upon expansion of the water to ice would be returned to housing 14 through valve V₈, conduit 26, valve V₁, and conduit 16. This will change the 1.15 cu. ft. of ice back to 1 cu. ft. of water. To accomplish the volume reduction would require 43,200 foot pounds of work. That is:

$$2000 \text{ psi} \times 0.15 \times 144 \text{ cu. in./cu. ft.} = 43,200 \text{ ft. lbs.}$$

This results in only a slight negative impact on the available work produced by the power generator 10. With the water in the flexible-walled chamber 12 thus returned to its liquid phase, the cycle is ready to be repeated in the described manner.

While the invention has been described in detail with respect to preferred embodiments thereof, it will be understood that variations and modifications can be made within the spirit and scope of the invention as set forth in the following claims.

I claim:

1. Apparatus utilizing the volumetric expansion of water upon its change of phase for generating power, said apparatus comprising:

a chamber having heat transmitting, fluid impervious, flexible walls, said chamber being filled with water; a housing having an internal cavity in which said chamber is located, said housing having pressure-containing walls spaced from said flexible walls of said chamber;

a fluid filling such space between said pressure-containing walls and said flexible walls;

means for circulating said fluid through said internal cavity in such space;

a conduit connected to said housing in fluid communication with said interior cavity;

means for changing the phase of the water in said chamber between its liquid phase and its solid phase, whereby when said water is changed to its solid phase, the volume of said water expands thereby expanding said flexible walls of said chamber to displace a proportional amount of fluid from said housing into said conduit; and

means associated with said conduit for utilizing said displace moving fluid as a power medium to do work.

2. The invention of claim 1 in which said fluid has a freezing point substantially below that of water; and wherein said means for changing the phase of water includes a heat exchange means through which said fluid is directed by said circulating means, said heat exchange means comprising a cooling member for cooling said fluid below the freezing point of the water, and a heating member for heating said fluid above the freezing point of the water, whereby when said fluid is cooled in said heat exchange means and circulated through said cavity, it cools the water to change the phase of the water to ice, and when said fluid is heated in said heat exchange means and circulated through said cavity, it heats the water to change the phase of the water to liquid.

3. The invention of claim 2 wherein said cooling member of said heat exchange means communicates

with air at its naturally occurring environmental temperature.

4. The invention of claim 2 wherein said housing includes:

a vessel having a removable cover, and means in said cover for filling said chamber with water in its liquid phase.

5. The invention of claim 2 wherein said means for utilizing said displaced fluid includes a fluid motor driven by said displaced fluid.

6. The invention of claim 5 wherein said fluid motor drives a liquid cooled refrigerant compressor, the heat developed upon compression of the refrigerant by said compressor being transferred to the liquid coolant for said compressor, and means for using such heat to warm an interior living space.

7. The invention of claim 6 including means for recirculating the compressed refrigerant to said cooling member of said heat exchange means.

8. Power generating apparatus, utilizing the volumetric expansion of water upon change of phase, comprising:

at least one housing having pressure-containing walls, said walls defining an internal cavity;

a water filled substantially cylindrical chamber having heat transmitting, fluid impervious, flexible walls capable of expanding outwardly in all directions, said chamber being supported within said housing in spaced relation from the walls thereof, a circulating fluid disposed within the space between said flexible walls of said chamber and said pressure-containing walls of said housing;

heat exchange means for selectively heating and cooling said circulating fluid to a degree for changing the phase of the water in said chamber between its liquid phase and its solid phase, the water expanding in volume when changed to its solid phase displacing an equal volume of said fluid;

means, connected to said internal cavity of said at least one housing, for receiving said displaced fluid and using said displaced fluid as a power medium to do work.

9. The invention of claim 8 wherein said heat exchange means communicates with air at its naturally occurring environmental temperature to heat and cool said circulating fluid.

10. The invention of claim 8 wherein said means for receiving and using said displaced fluid includes: a fluid motor, a liquid cooled refrigerant compressor driven by said fluid motor, a first flow path for said refrigerant, a second flow path for the compressor coolant, and first and second heat exchangers located in said first and second flow paths respectively, whereby when said compressor is driven by said fluid motor, the refrigerant and the liquid coolant can be used for heating and cooling interior living spaces.

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Editor's comment - This patent illustrates and demonstrates application to invention of the fundamental two way motion in universe that the Russell Cosmogony

reveals. It is extremely simple in concept and execution. It represents a model for how we can recreate all of our technology, institutions and our thinking.

Some Of Our Current State (+ & -) almost a half century after publication of The World Crisis, Atomic Suicide? Etc.

Health & Healing - Health & healing are simple. We must eat good food, move our bodies harmoniously and fully, think loving, balanced thoughts, eliminate the toxins, the death that always accompanies life, and think loving and "happy" or kind thoughts. So, eat natural organic pure food, breathe deeply of pure air, drink pure water, and think pure loving thoughts and demonstrate pure loving / giving actions. Once we recognize the truth and simplicity of this we must demonstrate it and thus teach it to everyone we know - or become sick - again and again.

Earth Changes - We are in the midst of it. It is mid October and we just had our first freeze in Montana. Twenty years ago when I first came here we had our first freeze at the end of August. Do you think the message in *Atomic Suicide?* was in error? Come on humanity - Wake Up! Do something to rectify it! Something, anything. I am! Some of you are. Are You? Talk to others, Call your representatives in government. Send them a copy of *Atomic Suicide?*

Government / Politics - America appears obsessed with Clinton's personal mote in the eye compared to the other inequities or beams in our world. This demonstrates that our political leaders reflect where we are; and you must know where they all are - not just Bill Clinton. The masses are missing the point, although you and I may be acutely aware of it; and, all of us are sitting right on it. Relationships of all types are strained to the change point at this point in time. We all must restructure virtually all of our relationships and our thinking, our beliefs that create the attitudes that create the relationships we experience. Walter Russell said government was the most out of balance of our institutions. I think relationships are the root of that unbalance.

Religion - There are literally hundreds of differing religions and religious sects. They mostly all preach and think that they have the Only direct line to GOD and SALVATION. I can find nothing of any real hope that the world's religions have realized anything about saving humanities souls any more than they have really done anything to save it from the world's inequities and travesties. Where is recognition of the Love nature of

Universe? It must be in you and me or it must not be.

Art - Thomas Kincaid, the artist who created the Media Arts Group, a mega business conglomerate, produces mass produced paintings that you can add a stroke to here or there to individualize it. His company has about a 100 million dollars a year in sales. This is congruent with our mass produced economy for virtually everything for the masses. I think this is great for the masses. I hope for more for art - and for the masses. At the same time I think it is wonderful that the masses appreciate his art and want it. They will pay over a \$1,000 for a mass produced slightly customized or not painting. This is some of art in the last of this millennium - not all of it - it is a huge porpouri. I think Kincaid's art is beautiful.

Science & Technology - The public and establishment media are all unaware, or do not want to be aware of the revolution going on in science. Transmutation and antigravity are the focus of most of the avant garde science journals, but you will see no articles about it in say "Physical Review" as an example such as when & where Chester Hatstat former Editor of *Fulcrum* submitted an article about the mass 5 transmutation that came out of the work that Toby Grotz, Ron Kovac and I had accomplished in 1994. It was submitted by Chester for publication. It was rejected. I told Chester beforehand that I believed it would be fruitless to submit an article to them about our research but he did it in spite of that and proved me correct. So, it appears the only place to publish new science research breakthroughs is in the avant garde press - those journals such as listed in the periodicals/ newsletters section of *Fulcrum* that will publish something that the establishment will not - because of - what? I think the what is because these are unaware and it is our work to simply ignore them, do not give them credibility and do our work and publish it in those journals and newsletters that are not controlled by fundamentalist ignorance and intransigence.

Business / Commerce - We have all witnessed the collapse of the global economy. How could it be otherwise given the premise - DEBT/DEATH - GRAB ALL YOU CAN WHILE YOU CAN - that it is based upon? Will we create a global economy based on equity/ balance? We will, if we are to survive. The real question is, how far do we have to fall before we realize that our present system is unworkable in the long run? And., really the long run is over, we are at the finish of this race - lets begin as we must , another. Let us base the next race on balance and caring for each other.

Agriculture - The 1998 drought in Texas has officially become the worst since the 1950's, with agricultural losses estimated at more than 2.1 billion. The heat in Texas has been blamed for at least 124 deaths. Now, its opposite has come and torrential rains have killed many and damaged lands too. China has had torrential rain and flooding. And so on and so on around the world. Do you get it? The Russells predicted the weather would bring man to his knees and it is doing it in Texas, China and all around the world. Atomic Suicide Anyone? Or, how about research and demonstration of the principles that will reveal to us non-polluting and sustainable energy sources? Or would you rather we all roll over and bury our heads in the sand and deny that we are going to hell in a hand basket while trying to get more than our share of the worlds resources with our present polluting and non-sustainable technology?

Education - The Clinton administration got 100,000 more teachers for our schools in a political posturing attempt to change our course and destiny. So, now we have 100,000 more "teachers" to "teach" what the establishment wants our children to "know" and become to keep the system going as it was and is. Do we need this? In vain we hire the teachers if we do not first enlighten the teachers and they have something worthwhile to teach.

Miscellaneous - Everyone you deal and communicate with has a need to hear, see and know that you care before they will care to hear, see or know what you know..So show me that you care and then tell me what you know. And, having to be "right" all the time is an obstacle to success in winning friends and influencing people. Whenever I feel I have the need to be "Right", or to "WIN", my intention is to remember to ask myself if winning or being "right" is worth the risk of hurting other people with differing opinions, views, and agendas? Maybe it is and maybe it is not. I need to recognize and value others' opinions and values, and to value my own too, as long as they are all true. I need to see, to know, the truth wherever it appears.

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NEW SCIENCE/TECHNOLOGY/FREE ENERGY

Electric Spacecraft Journal. Published quarterly, annual subscription rate \$24, Canada/Mexico \$29, other countries \$39. ESJ publishes research articles on new science, inventions and network notes from the ESJ network of individuals sharing ideas about these topics. Devoted especially to discovering the means/mechanisms for "electric" spacecraft and all that such understanding would mean for our civilization. I have known the editor Charles A. Yost the last few years and he spoke at our 1995 symposium. I find Charles' ESJ to be interesting and informative, and although most articles are very technical there are aspects of the journal that the average reader should find comprehensible and of interest. Charles A. Yost editor. ESJ, 73 Sunlight Drive, Leicester, North Carolina 28748. Phone 704-683-0313 Fax 683-3511.

The Space Energy Journal Published Quarterly. \$35 U.S., \$40 Canada & Mexico, \$50 elsewhere. Jim Kettner and Don Kelly editors. This journal publishes the positive and the negative results of testings of free energy machines and other new science experiments. The discussion of new science ideas is technical and yet also very down to earth so that the average reader should follow most of it. I have met Don Kelly through my association with the International. Assoc. for New Science/ International. Symposiums for New Energy and he is familiar with the Russell work too. Space Energy Association, P.O. Box 11422, Clearwater FL 34616. Phone/Fax 813-461-7119.

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The *Planetary Association for Clean Energy* newsletter publishes articles to facilitate the development of a wide range of clean energy technologies including free energy technologies. Usually quarterly \$35/yr. Canada, \$40 USA, \$45 elsewhere. Andrew Michrowski, editor, Planetary Assoc. for Clean Energy, Inc. 100 Bronson Ave. Suite 1001, Ottawa, Ontario, Canada K1R 6G8. Phone 613-236-6265 Fax 235-5876.

INVESTMENT/INTL. POLITICS/ ETC.

The Reaper. 36 issues per publishing year. I year- \$195. 10 issue trial - \$60. *The Reaper* is a no holds barred newsletter examining our current global and national economic/political status with an eye towards assisting investors in commodities, currencies, real estate, etc., etc. Publisher R.E. McMaster Jr. is an acquaintance of mine who I introduced to the Russell's work and I have subscribed to his NL off and on over many years - not because I am an investor (I should be and if I would have followed much of his advice would have made some cash, but I'm too involved in other work), but because I have been fascinated with R.E.'s analysis of our world situation. Called the Indiana Jones of the Christian economists by some he has a 'Christian' point of view but it is not conventional in my estimation. He is aware of new energy and natural health/healing practices and reports on these areas at times. P.O. Box 84901, Phoenix, AZ 85071. Phone 800-528-0559.

EARTH CHANGES/ESOTERIC

The Earth Changes Report 12 issues/yr. \$36; Canada, Mexico, Alaska & Hawaii \$46/yr.; \$56/yr. elsewhere. Published by futurist/psychic predictor Gordon Michael Scallion gives Gordon's psychic predictions and a review of his hits and misses as well as articles in the new age spiritual genre and a report of earthquake, climate changes, etc. worldwide. I have watched Gordon Michael's predictions for the last several years and while he is not 100% on target he has been close enough on enough times to be much more than just coincidence. Published in the spirit of better to be prepared for what does or does not happen than to be unprepared for what does happen, the ECR is a good monthly review of earth changes as they happen and of what might happen beyond most folks wildest dreams - both pro and con. Matrix Institute, P.O. Box 336, Chesterfield, NH 03443. Phone 1-800-628-7493.

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