

The Fluid Universe: A Concept of Local Action Reality

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FORWARD

The Foreword presents the objectives and conclusions which will be logically verified by the following text. This verification eliminates inconceivable presumptions which have obfuscated conceivable physical understanding. The methodology explains and applies the concepts of Leibniz and Maxwell to current thermal and fluid mechanics.

The scientific empirical method is a pragmatic system of dealing with ignorance. A house of cards assembled from surface cause and effect relationships which do not require conceptual understanding. William James stated the pragmatic definition of truth: "The truth is what works.". Pragmatic truth is the basis for technology. It is not a valid basis for science. Scientific validity must include conceptual understanding of how and why dynamic actions occur and under what conditions. Current science does not always meet this mandatory criterion.

The fundamental mechanics of Newtonian physics has been tainted by the acceptance of immaterial forces. Sources of force are cited as reasons for action. However, how and why these reasons exert force is not explained. What is temperature? How and why does it exert force? We accept that temperature is the quantitation of energy. What is energy? How does it exert force?

Force is mass times acceleration. Energy is mass times velocity squared. Acceleration is the quantitation of velocity squared. It is the rate of change of motion. Velocity is the quantitation of motion. Energy transfer is defined by momentum. It is quantitated by the change in velocity. Energy exerted (force) is therefore proportional to motion times its rate of change. Force exerted is the integral mass times velocity squared.

Mathematics is the science of counting. Force is quantitated mathematically. The equations for temperature are identical to the equations of molecular force. Basically Ohm's Law. If the equations are correct, the force of temperature must be exerted by the energy of a countable digit.

Almost everything that can be measured has been measured. Any valid concept of the universe must provide conceivable understanding of the measurements. A fluid universe concept provides a conceivable explanation of energy consistent with all existing physical data. It eliminates pragmatic guesswork and cookbook fantasies offered to explain universal behavior. It is the most plausible interpretation of existing data and mechanics. It restores Newtonian causality.

Three dimensions define volumetric position. Additional mathematical orders are incorporated to deduce (past) or induce (future) position or express magnitude. Since position is established by three dimensions, time is not a dimension of space. Time can only be treated as a dimension if the rate of change of action is constant. Einstein based special relativity on the assumption that space was a void and

light traveled at universally constant velocity. This enabled the treatment of time as a dimension. Although light velocity is locally constant, constant universal velocity is an assumption. Electromagnetic wave transmission mechanics contradicts presence of a spatial void.

Current physical science relies on many assumptions. The prime example is action at a distance. To simply designate action at a distance forces as basic is avoiding the issue. Forces are effects of action. How these forces are generated or why they exist requires a conceivable cause. Einstein avoided the problem with field theory. However, the source of his field is not identified. The wave-particle controversy likewise has defied resolution because wave action can only be explained by the resistance of a resonant medium. The success of quantum mechanics without understanding how or why it works is not acceptable. Quantum Theory success requires an explanation.

Classical physics and its logical mechanical approach was abandoned because no overt physical reference frame was found for electromagnetic behavior. Non-inertial behavior of material waves was rejected because space appeared to be empty. The Michelson-Morley experiment seemingly confirmed that space was empty. Unfortunately the experiment failed to recognize that wave transmission velocity does not change with source velocity! It should have looked for a Doppler shift which would confirm the presence of an overtly invisible spatial fluid medium. Subsequent to the improper experiment, a Doppler shift has been measured.

Planck derived his constant h to avoid the "violet catastrophe". His empirical (h) corrected the radiation equations to agree with wave energy. His energy law is simply the number of h 's per unit time. (h) is a digital increment of energy. Quantum mechanics is an application of Ideal Gas Law and Fourier Analysis to (h). Electromagnetic wave behavior is analogous with sonic molecular wave behavior.

A model of light behavior analogous with sonic behavior reveals a concept of a fluid universe which behaves in accordance with classical physical mechanics. The chaotic action of an aethereal fluid provides a logical and conceivable concept of acting energy. Unfounded assumptions are not required. The application of classical fluid mechanics explains the nature and behavior of all electromagnetic radiation. Light speed is only constant locally.

Empirical tools simulate a conceivable reality. The conception of a fluid universe is consistent with digital formation of sensible mass accumulation. Digital cohesion is maintained by chaotic aethereal fluid particle impulse. The forces of nature are unified by the relation of force to scale. Digital aethereal fluid impulse provides the cohesive organization (negative entropy) which balances the diffusion of entropy.

Mass is cyclically concentrated in the universe. Formation of overt mass from protons displaces photons and electrons. Displaced electrons are the source of electrical energy and displaced photons produce the energy of electromagnetic radiation.

The Big Bang concept becomes a fable resulting from the failure to recognize red shift as a Doppler effect. Special and General relativity are superceded although some of their initial objectives are met. Einstein's fields are formed by the impulse of fluid particles. The pressure of aethereal fluid is temperature and the velocity of electromagnetic wave transmission is established by the local resistance of the aethereal medium.

The observable region of the universe becomes a conceivable entity in a pressure bounded state of overall equilibrium. Energy loss and gain are balanced in a continuing cycle of construction and destruction of cosmic entities. Universal energy balance is preserved by entropy which limits the regenerative formation of particulate mass concentration. Stable and overtly detectable mass increments are formed by resistance to penetration by disintegrating high energy particles. Phase changes on a cosmic scale account for the stellar cycle. The distribution of universal mass concentrations is determined by the interaction of immersed masses and their surrounding fields. Regenerative mass accumulation continues until containment limits are exceeded.

The aethereal fluid particle is the photon. The requisite for universal equilibrium is the local distribution of particle velocity in inverse proportion to the square root of particle mass. Mass is the resistance to acceleration. Since gross mass is proportional to fundamental integer concentration, equilibrium velocity is geometrically inversely proportional to size in a given concentration. Thus, particulate energy transfer (momentum) is proportional to the diameter ratio of solid particulate masses.

INTRODUCTION:

Contemporary Physics has a reality problem. It is generally accepted that it is more of an art than a science. The purpose of this manuscript is to offer a philosophically acceptable logical concept of the universe, consistent with accepted data, which restores causal scientific reality to Physics.

Science is defined as the state of knowing as distinguished from ignorance or misunderstanding. Knowing is conceptual recognition. Conceptual recognition is reality. Reality precludes the acceptance of anything which is artificial, fraudulent, illusory or apparent. Effects without cause are apparitions. Causality is the prime requisite for scientific validity. Conceptual understanding is achieved through the application of logic to causality. Therefore, science only has meaning when based on a homogenous and ordered universe. The universe can not be homogenous without a cause for every effect.

Since most of the universe lies outside of the realm of direct observation (either too small or too large), the logical tool is extrapolation of observable behavior to explain observed effects. No cause is valid unless it can be conceivably related to the effect it produces. Conceptual reality is the **ONLY** valid basis for science.

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MATHEMATICAL MODELS

APPENDIX 1: THE BEHAVIOR OF LIGHT

APPENDIX 2: CONTIGUOUS PROTON STRUCTURE BONDING

CHAPTER 1: AETHEREAL FLUID

"The electromagnetic field is that part of space which contains and surrounds bodies in electric or magnetic conditions.

It may be filled with any kind of matter, or we may endeavor to render it empty of all gross matter, as in the case of Geissler's tubes and other so-called vacua.

There is always, however, enough of matter left to receive and transmit the undulations of light and heat, and it is because the transmission of these radiations is not greatly altered when transparent bodies of measurable density are substituted for the so-called vacuum, that we are obliged to admit that the undulations are those of an aethereal substance, and not of gross matter, the presence of which merely modifies in some way the motion of the aether.

We have therefore some reason to believe, from the phenomena of light and heat, that there is an aethereal medium filling space and permeating bodies, capable of being set in motion and of transmitting that motion from one part to another, and of communicating that action to gross matter so as to heat it and effect it in various ways."

Excerpt from "A Dynamical Theory of the Electromagnetic Field" (1865), James Clerk Maxwell

Maxwell had insufficient information to define the medium he visualized. However, he conceived the elastic behavior of a medium to account for electromagnetic phenomena. His equations remain unchallenged to this day. If his equations are valid, how can their basis be dismissed? A vast quantity of scientific data has been accumulated since 1865. There is now sufficient data to define the presence of the media his equations were based on.

Gay-Lussac determined the coefficient of cubic thermal expansion for gaseous molecular fluids. The reciprocal of this coefficient is temperature. **What is temperature? How does it cause expansion? Can it transfer energy to Maxwell's "gross matter"? Is it related to Maxwell's medium?** Temperature is measured by expansion. Expansion must result from the exertion of internal force. Whatever exerts this force must permeate matter to separate its constituent parts. Force is mass times acceleration. Energy is momentum times velocity. The dimensions of force and energy are identical. The impulse of minute high velocity particles capable of permeating matter would act on constituent atoms and molecules to cause expansion. Internal pressure requires the presence of a permeating fluid which penetrates material interstices.

Avagadro's Number indicates that the same number of particles exert the same pressure at equilibrium conditions. Therefore, particles having different masses must have the same energy. Hence, the least massive particle has the highest velocity. The least massive particle transfers energy by impulse to slower moving more massive particles. The equilibrium pressure level is established by the particles having the least mass. Temperature is the reciprocal of the coefficient of volumetric expansion. Since temperature establishes particle pressure in a gaseous medium, it must be the pressure exerted by the least massive particles.

Since the action of temperature is consistent, a medium made up of homogenous particles must be universally present. Since the constituent particles are overtly undetectable, they must be infinitesimal. The action of temperature is not limited by the scale of larger particles and cohesive mass accumulations. Therefore the particulate density must approach infinity.

Einstein equated mass to energy. By definition, energy has mass. Electromagnetic waves are transmitted by the photon. If the photon has an infinitesimal mass and size, it would penetrate matter and produce temperature expansion.

Planck derived his constant (h) to bring radiation frequency calculations into agreement with observed data. His quantum (hf) is a tiny bundle of energy which is defined by the number of h 's (Planck's Law). Energy is transferred by mass in motion. Energy transfer conserves momentum. Momentum is transferred by impulse. Force is the rate of change of momentum. **What is h ?**

De Broglie's equation ($hf=mc^2$) equates quantum energy to mechanical energy. Electromagnetic energy is delivered by a digital particulate wave. It's energy would be proportional to the number of particles received per unit time. The mass in Einstein's equation is the summation of particle mass per unit time. Hence, the number of particles equals Planck's frequency. When Einstein's energy equation is applied to a gaseous fluid, mass is the summation of acting particulate mass. Frequency is the number of h 's received per unit time. Planck's frequency and Einstein's number of particles cancel in De Broglie's equation. h becomes the kinetic energy of a radiation particle. De Broglie won his Nobel Prize for equating hf to mc^2 to calculate wavelength (velocity/frequency). Dividing the empirically derived numerical value of h by the local velocity of light squared yields a particulate mass of **7.375×10^{-48} grams**. This is the mass of the photon which transmits the energy h at the local transmission velocity of light.

The velocity of a wave in a particulate medium is constant at a given particulate density. This is true because the average relative velocity of a media particle is equal and opposite to the average velocity of a wave particle. Light transmission velocity is reached when the resistance of the medium equals the pressure of the wave at transmission velocity. The resistance of the elastic photon medium is nmv^2 which is absolute temperature. Wave particle pressure equals $nmv^2/3$. Therefore, **$T=273.2=nmc^2$** at Standard Conditions. At these conditions the photon media particulate density (n) required to limit light velocity is **4.1245×10^{28} particles/cm³**. This is about 10^{10} times Avagadro's Number. The mass density is **6.83×10^{-15} grams per mol**. which is about 10^{-14} times the mass density of Hydrogen at Standard Conditions. This density is consistent with Maxwell's statement as to "so-called vacua" and the apparent emptiness of space.

There is no evidence that light waves behave differently than molecular waves. Wave velocity does not vary with source velocity. Since wave and media particle velocity are relatively equal, mean free

path is inversely proportional to frequency. Hence, only frequency varies with source velocity at constant media density. The frequency change with source velocity is the Doppler Effect. A wave is a sequence of inertial compressions which transmit energy without through-flow. The magnitude of the compressions is limited by the compressibility of the medium which is proportional to its particulate density. **Energy transfer results from the impulse of mass. Therefore, electromagnetic wave energy is transmitted in a particulate fluid medium.**

Einstein's hypothesis of the relativistic characteristics of light allows energy variation at a constant wave velocity. Mathematically it made no difference whether mass or velocity varied. The presence of an aethereal photon fluid which limits light velocity provides the missing cause for constant local velocity. Since frequency defines the number of mass units in a light wave per unit of time, wave energy varies proportional to quantum magnitude which is proportional to frequency. Since mean free path is not affected by particle velocity and particle velocity determines quantum magnitude, wave transmission velocity does not vary with particle velocity. **Thus wave energy can vary at constant transmission velocity.**

Einstein's assumption of constant velocity only applies to wave transmission velocity at local conditions. Particle velocity must exceed transmission velocity to produce wave action, Einstein's unsupportable assumption that light wave velocity has a universal maximum is incorrect. The atmospheric pressure at sea level is one atmosphere. The atmospheric molecular energy is in equilibrium with temperature which is photon fluid pressure. The atmospheric field is formed by the geometric focusing of photon impulse acting on the earth which interrupts and organizes random aethereal photon motion.

Because of its minuscule mass, the impulse of a photon is minimal since nearly all of its energy is reflected. Impulse momentum transfer is proportional to the ratio of projectile to target mass. The calculated photon pressure at sea level is about a tenth of a gram per square centimeter. The photon energy transfer to gaseous molecules is much greater than to macroscopic materials which explains the greater force exerted by the molecular atmosphere. The equilibrium of photon fluid pressure with molecular pressure results from the transfer of high velocity photon energy to lower velocity electrons, atoms and molecules. **Molecular fluid energy is established by local photon fluid pressure (temperature).**

The immense population of infinitesimal mass photons is confirmed by the detail and reflectivity required to produce the acuity of visual imaging. How many photon waves must pass through a camera pinhole to produce an image which retains its definition in a greatly enlarged projection? A picture can be taken from any angle at any visible distance and can still be greatly enlarged. Reflected light waves radiate from every visible object in all directions. **The photon population is virtually infinite.**

The Holographic Paradox arises from the fact that there are enough photons to produce an image at any scale or in any region of space so

that enlarging any significant increment of a holographic image reproduces the entire image. The resolution is reduced but still exceeds the criterion for clear visible discernment. The calculated resolution is $13.745E9$ or $37,074$ by $37,074$ pixels per square centimeter which is about $2.097E5$ times the resolution of the near infrared Hubble telescope camera (NICMOS).

Can temperature exist in a vacuum without the presence of matter?

The steady state temperature in a vacuum equals its surrounding temperature. The vacuum surrounding a Dewar container only reduces the rate of temperature transfer. Very simple experiments confirm the presence of photon fluid. Air compression adds more molecules per unit volume which reduces the volume available for photons. This increase in photon pressure produces the heat of compression. Photons flow through the interstices in containment walls as heat. Sub-luminal photon flow is non-radiant heat. An object in an oven expands when heated. When removed it returns to its initial volume by radiating and otherwise transferring heat. Additional photons increase the number of particulate collisions which in turn defines Boltzmann's thermal frequency. When individual photon velocity exceeds light transmission velocity sufficiently, energy is transmitted by wave action. When the wave frequency increases into the visual range, temperature can be determined by optical pyrometry. **The summation of individual photon velocities in a wave determines its frequency and energy. The relation of particle velocity to wave velocity is proportional to wave frequency.**

The change in void volume with pressure in a gaseous molecular fluid is proportional to the specific heat at constant volume (C_v). The added molecules reduce the volume available for aethereal fluid (heat). Specific heat at constant pressure is greater because the fluid expands maintaining the void volume. Gamma is the ratio of C_p to C_v which defines the compressibility of heat. Since heat determines temperature which defines energy, the definite integral of gamma minus 1 defines the fluid energy (quantity of heat [Q]) at a given temperature. Q times the absolute pressure defines the enthalpy at given conditions. The difference in enthalpy between conditions is the energy available or required to move from one condition to another. Combining component energy extraction efficiencies and the enthalpy map defines power generation cycles. The mechanics involved confirms the fluid behavior of heat and temperature, which supports the omnipresence of aethereal fluid.

CHAPTER 2: THE BEHAVIOR OF LIGHT

"We may therefore receive, as a datum derived from a branch of science independent of that with which we have to deal, the existence of a pervading medium of small but real density, capable of being set in motion, and of transmitting motion from one part to another with great but not infinite velocity.

Hence the parts of this medium must be so connected that the motion of one part depends in some way on the motion of the rest; and at the same time these connections must be capable of a certain kind of elastic yielding, since the communication of motion is not instantaneous but occupies time.

The medium is therefore capable of receiving and storing up two kinds of energy, namely, the "actual" energy depending on the motion of its parts, and "potential" energy, consisting of the work which the medium will do in recovering from displacement in virtue of its elasticity."

A Dynamical Theory of the Electromagnetic Field (1865)

James Clerk Maxwell

The medium for light transmission is photon fluid which fills the universe. The pressure of this fluid is temperature. **There is no other possible concept that can rationally explain the natural phenomena we experience locally or remotely.**

Consider the mechanics of vision. Think of sitting on a hillside looking at a house in the valley below. The image we are receiving is generated by the impulse of photons on the retina which is then interpreted by the brain. There are around 2 million connections between the retina and the brain in the optic nerve. A single photon has a specific energy and can only contribute that increment to the image. The house is reflecting and radiating the visible photons. It is also altering their energy to impart the visual characteristic of the area impacted. Every increment of the image requires a reflected or emitted photon. The retina sensitivity is limited by its molecular geometry which limits its unaided discernment. However, this limitation does not apply to the reflected image. Hence, optical devices can provide a many fold increase in observable detail. Consider that, if the hillside was completely covered with observation ports the size of the pupil of the eye, each port would receive a sufficient number of photons to provide the details of the house. The population of photons is astronomical.

Since the energy of each reflected photon is unique, the photons have different velocities which determine their impulse. However, all of the photons are received and their energies interpreted simultaneously. **The only way to transmit unique particulate energies at the same velocity is by wave action which requires the presence of a medium whose reaction equals wave particle action.**

The fluid medium can be thought of as being made up of minute volume increments. Each increment is filled with photons which exert pressure on the increment boundaries. Wave photons increase the pressure and the increment expands in all but the direction of pressure

application. As the increment expands in the direction of transmission the bounding lateral increments collapse and maintain increment pressure. The transverse displacement is the yielding envisioned by Maxwell and the lateral collapse is the work the media does in recovering from displacement. The volume increment is like a rubber ball except that it's elasticity results from the reaction of the surrounding increments rather than material integrity. The impulse energy is transmitted in the direction of propagation and the cycle is repeated. This is exactly the mechanics postulated by Maxwell in 1865. Although the wave propagates energy by impulse, mass flow is confined to the volume increment which accounts for the non-inertial behavior of the wave. **A coherent wave can ONLY be transmitted in a resonant medium.**

Temperature defines the elasticity of the photon medium. Light behaves like all other fluid waves. Pressure and flow (momentum) are always out of phase. Flow is maximum when the increment is expanding (media action) and pressure is maximum when the increment is compressed (media reaction). This action is graphically depicted by a sine wave for pressure and a cosine wave for flow. The sine wave sequence per 360 degree cycle is: 0=media pressure, 90=maximum compression, 180=midpoint, 270=maximum decompression, 360=media pressure.

The refutation of the presence of a spatial fluid by the Michelson-Morley experiment resulted from a faulty concept of wave behavior. The simple equation which added source velocity to wave transmission velocity ignored the fact that source velocity is algebraically added to particle velocity and that transmission velocity does not change with particle velocity. Any frequency change would cancel out in the experiment as conducted. The experiment proved that light waves behave like molecular waves i.e. **Wave velocity is not affected by source velocity.**

Experimental results from an experiment conducted by American Scientist E. W. Silvertooth were published in Applied Optics, 15 May 1976 and reported by William VanDeusen in the September/October issue of R&M Journal. R&M Journal is published by the Morphology Institute in Toronto, Ontario. The experiment utilized a laser beam split in opposing directions and fed to two interferometers normal to the split beam. The split beam frequency is compared with the laser input. A frequency shift was detected contingent on the orientation of the beam. This shift is a Doppler shift resulting from either the motion of the beam through absolute space or the motion of aetherial fluid relative to the beam. By reorienting the beam Silvertooth determined that the earth appeared to be moving in the direction of the constellation Leo at a velocity of 378 kilometers per second. However, this velocity must be corrected to account for rotational and orbital velocities, turbulence and all other effects that would be introduced by media motion relative to the source.

Frequency is the wave pressure ($\text{nm}V_p^2/3$) divided by the elasticity of the medium which is the volumetric pressure (T). Wave pressure is a function of particle velocity (V_p). Particle velocity can be calculated at local conditions from De Broglie's equation by substituting V_p for c ;

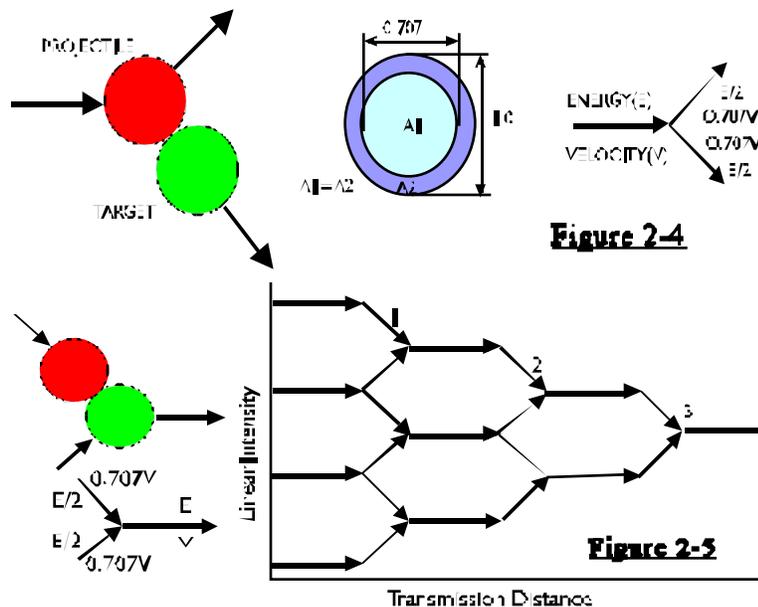
$(V_p = (hf/m)^{1/2})$. Wave particle velocity must exceed transmission velocity to propagate the wave. Gamma ray photons travel at about 10^{10} times the velocity of light. Wave pressure varies with both particle velocity and intensity squared. Intensity (wave amplitude (I)) is a linear quantity which is squared to give particles per unit frontal area. De Broglie's equation pertains to any number of photons. The corresponding equation for a wave is $hf = nmv^2$ and $f = n = I^2$. Wave frequency decreases with attenuation because a loss in particle energy reduces intensity within the fabric of an individual wave. The equal resistance of the media to wave pressure is the source of Einstein's conjugate "ghost" wave. Intensity (wave amplitude) squared is the number of photons received per unit area per unit time while frequency is the number of cycles per unit time. Hence amplitude equals the square root of frequency. Frequency is the total number of h 's per unit time.

The Kinetic Theory of Gases equation for wave velocity is $v = (\gamma * R * T / M)^{1/2}$. For photon fluid the specific heat at constant volume equals the specific heat at constant pressure since temperature is photon fluid pressure. Therefore, γ , the ratio of specific heats equals 1. The gas constant $R = P_0 V_0 / T_0$. Temperature = $T_0 = P_0 = nmv^2$. $M = nmV_0$. Therefore, $v = (V_0 nmv^2 / nmV_0)^{1/2} = v$.

The reason why the velocity of light is locally constant is explained by the structure of the earth's atmosphere. The earth and its atmosphere are immersed in photon fluid. Fluid impulse action produces a static pressure gradient whenever a fluid is materially bounded. The impulse of spatial fluid photons generates a static pressure gradient (field) surrounding the earth. The atmospheric molecules are in a state of energy equilibrium with the photons in the gravitational field. The static pressure is constant at any given altitude, as shown in Figure 2-1. Each altitude is a sphere surrounding the earth. Hence, the pressure decreases in inverse proportion to the spherical surface area (square law) forming a radial logarithmic gradient. The flow of heat along this gradient is entropy which maintains the field gradient. Since temperature is the number of particles times particle energy, the atmospheric photon pressure can result from either greater density or greater particle energy. Media density is proportional to Δ/θ where Δ is the absolute molecular pressure ratio and θ is the absolute temperature ratio. The photon pressure ratio is equal to the molecular pressure ratio at equilibrium conditions. The relative density is also shown in Figure 2-1. Pressure and density both diverge from logarithmic gradient in the tropopause where photon particle energy is increased through the impulse of incoming high frequency radiation. The energy transferred from photons to atmospheric molecules reduces the incoming radiation frequency.

Light velocity and Planck's Constant vary. A mathematical model of light behavior is presented in Appendix 1. The variation of h , particle velocity and wave velocity with pressure and temperature is shown in figures 2-2 and 2-3. Note that the values are generated at a specific frequency and that the particle velocity shown is at that frequency. Since frequency is wave pressure divided by media volumetric pressure,

it changes with source velocity and attenuation. Attenuation is energy loss from reduction of wave intensity and/or particle velocity. Doppler shift observations of rotating galaxies in space indicate the presence of a medium. **Since a Doppler shift is introduced by the change in**



relative wave particle velocity introduced by source motion, it can only transpire in a medium.

Wave transmission in two dimensions results from polarization. A polarizing filter acts like a series of louvers which channel light into a series of parallel slices. The average interaction between a wave particle is shown in Figure 2-4. The average interaction between the initial interaction products is shown in Figure 2-5 along with the wave matrix generated in each of the parallel slices.

Light can also be polarized radially as in the generation of the two slit wave interference pattern. Circular polarization produces the Airy pattern. The three polarizer paradox is easily explained. The intensity of polarized light is reduced in proportion to the cosine of the rotation angle of a second polarizer squared. The output of the second polarizer is polarized at the angle of its rotation. The third polarizer acts on the second polarizer output in the same way. Hence, insertion of a diagonal polarizer between two normal polarizers passes light through the previously opaque stack. At 45 degrees 50 percent of the second polarizer input enters the third polarizer and 50 percent of this input exits the third polarizer. The stack output is 25 percent of the first polarizer output. The output from a two polarizer stack is proportional to the area of the interstices formed by the relative rotation of one polarizer to the other which is proportional to the sine of the rotation angle squared.

Lasers produce high intensity light. High intensity increases the resistance of the wave to transverse expansion which reduces the elasticity of the medium normal to transmission and maintains wave transmission energy by decreasing diffusion. The molecular boundaries of transparent crystals form internal conduits through which photons flow easily. A crystal is an ordered stack of molecules which tend to retain characteristics of molecular shape. The orderly stacking minimizes the internal void volume maximizing hardness. Crystal transparency results from the linear sequence of molecular boundaries which preserve the order of input light. Transparent crystal color is the resonant frequency of its molecular structure. Exciting the crystal magnetically and confining its light output produces a high intensity

beam with molecular spacing between photons. A magnetic field is a directional high velocity flow of spinning photons. Concentration of this photon stream in the crystal core increases the photon pressure sufficiently to increase the particulate interaction rate to light frequencies. The laser output is the natural resonant frequency of the crystal core. High energy lasers exert force which produces thrust as measurable by recoil.

Omni-directional imaging results from light wave photons reflected from atmospheric molecules. Reflection is proportional to atmospheric molecular density. At high altitudes the atmosphere darkens and in space images become unidirectional relative to the light source as shown by the phases of the moon. The acuity of visual imaging demonstrates the very great photon population relative to the density of molecular fluids which transmit sound. The photon particulate density is about 100 billion times Avagadro's Number at standard conditions.

In addition to the Photoelectric and Compton Effects, optical phenomena and transparency provide insights into the corpuscular behavior of a light wave. Light penetration into a prism is proportional to photon velocity. The wave photons compress the photon fluid within the prisms molecular interstices. The compressed fluid expands in the direction of least resistance. The output face of the triangular prism is the direction of least resistance because it is the shortest path to the lower photon pressure of the atmosphere. The penetration of the photons into the prism determines the exit position in proportion to their velocity. Hence, the photons in the wave are segregated by frequency. The prism output segregation is proportional to the input photon penetration which produces the output spectrum.

The output spectrum is a transformation of the input wave. The attenuation introduced by the prism reduces the frequencies so that ultraviolet is shifted towards the violet and red towards the infrared. The input photons do not exit the prism. The exit photons are emitted in proportion to the internal photon pressure. Note that the bending of the input light beam would be in the opposite direction if it resulted from attenuation, since attenuation is equal is proportional to particle velocity. The output color spectrum would be reversed as produced by a lens or a gravitational field. The segregation of output photon velocity by the transparent prism disassembles any input image by stratifying the photons which form the image.

The same transformation occurs in all transparent materials. When the input and exit surfaces are parallel, the sequence of output photons normal to the wave retains the input sequence preserving the input imaging. The wavelength of light is far too short for photons to pass directly through transparent materials. The mechanics of reflection and filtering are a function of wave length segments chosen for pressure-momentum positioning at input surfaces.

Coloration of opaque materials is essentially a transformation of input frequency by material surface structure. The photons penetration of all materials transforms the material interstices into resonant cavities. The surface color we observe is the resonant frequency of these cavities except when the resonant frequency is outside of the

range of visible light. However we still observe the object as the absence of visible emission.

An interesting example of the effect of aethereal fluid density is provided by the gaseous lens telescope. The telescope consists of a rotating conductive tube heated externally. The rotation maintains a temperature gradient increasing radially outward from the axis of rotation. The photon fluid expands when heated at constant pressure which reduces its particulate density. The radial density gradient in the tube produces the gaseous lens.

The lens is equivalent to a double convex magnifying glass lens.

The abundance of data supporting aethereal photon fluid confirms its existence. No other explanation approaches the causal clarity provided. The presence of a light transmitting medium is logically imperative. The data supporting the existence and presence of aethereal fluid is overwhelming once its behavior is recognized. There is no logically acceptable option to the presence and existence of aethereal fluid.

CHAPTER 3: ACTION AT A DISTANCE FORCES

"The mechanical difficulties, however, which are involved in the assumption of particles acting at a distance with forces which depend on their velocities are such as to prevent me from considering this theory as an ultimate one, though it may have been, and may yet be useful in leading to the coordination of phenomena.

I have therefore preferred to seek an explanation of the facts in another direction, by supposing them to be produced by actions which go on in the surrounding medium as well as the excited bodies, and endeavoring to explain the action between distant bodies without assuming the existence of forces capable of acting directly at sensible distances."

James Clerk Maxwell (1865)

Maxwell's "mechanical difficulties" have been a problem recognized by all physical realists and are one source of the idealism concept which cites the agreement of mathematics with physics as proof that the universe is not physically real and only exists in the mind of god. The belief that widely separated inert objects exert mutually attractive force on each other with no detectable physical linkage is equivalent to believing that magicians saw people in half and then reattach the severed halves. Although Maxwell did not have sufficient data to establish the specific media characteristics, he induced the general mechanical relationships on which he based his electromagnetic equations. The recognition of aetherial fluid and its properties is consistent with his logical basis for those equations.

An object immersed in a fluid interferes with the free motion of fluid particles. The particles accumulate which increases the pressure surrounding the object. The accumulated particles form a pressure field. The field pressure gradient decreases outward from the object. Figure 3-1 shows the radial pressure inward to outward pressure ratio gradient variation with altitude of a field surrounding an object immersed in an ideal gas. A concentric containment sphere is formed at each altitude. The containment sphere is at a constant static fluid pressure. The molecular static pressure is contained by the inward acting impulse of surrounding photons acting on the contained electrons and molecules. Static pressure is the summation of particle energy per unit area. It is proportional to the number of particles which impact an object immersed in a fluid. The inward/outward pressure ratio is non-dimensional. It quantifies the energy balance between photon and molecular pressure at a given altitude. Dimensional magnitude is established by displacement of the immersed object. The radial pressure gradient decreases logarithmically outward which results from the square law increase in spherical surface area. $5.00E-4$ is a relative altitude equivalent to about 4 miles above the earth's surface.

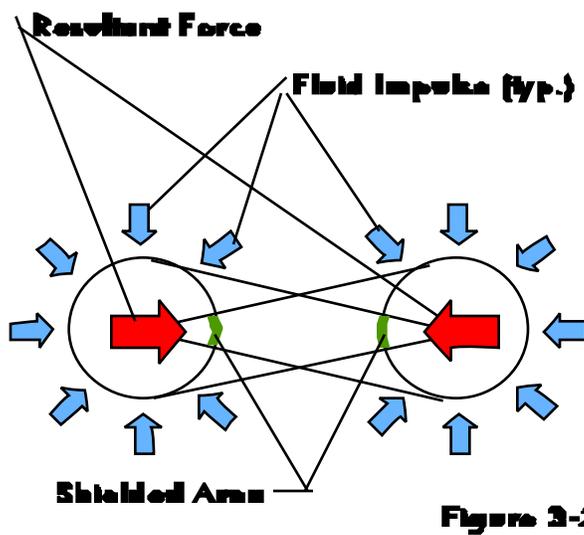
The geometric leverage of the field maintains maximum pressure at the surface of the immersed bodies. The surface pressure is proportional to the ratio of the immersed bodies displacement divided by its surface area which is its diameter times a constant. A spatial field is the equilibrium state between incoming radiation and molecular

diffusion.

Molecular pressure is in equilibrium with photon pressure. Hence, atmospheric pressure variation indicates the relative confinement force of the photon impulse field surrounding the earth. Particulate density is proportional to the absolute pressure ratio (δ) and inversely proportional to the absolute temperature ratio (θ). Figure 2-1 in Chapter 2 shows the logarithmic radial pressure distribution of the earth's field.

Two objects immersed in a fluid mutually shield each other from the impulse of surrounding fluid particles. This reduces the pressure between the objects as shown in Figure 3-2.

Radiation energy is the summation of photon impulse. Radiation shielding is resistance proportional to mass per unit distance. Newton's equation for gravitation is the product of the mutual shielding of two objects from surrounding radiation. The gravitational constant is an empirically derivable constant proportional to the displacement of the earth divided by its surface area.



Volume times density is the equation for object mass. Since the gravitational force acting between the earth and the moon is established. The average density of the moon and the earth can be calculated by substituting their

displacements and the force value into Newton's Equation and solving for density. The resulting specific gravity value is 4.49. The accepted specific gravity of the earth is 5.52 which is very close to the 5.48 value determined by Cavendish. However, Cavendish assumed no variation of gravitation with scale. Dr. Maskelyne determined a value of 4.5 which agrees more closely with the value obtained by substituting displacement times density for mass.

The Apollo missions revealed the moons gravitational field to be much stronger than expected. The magnitude was equal to the ratio of moon diameter to earth diameter. Since the density of the moon is believed to be much less than the density of the earth, this indicates that gravitation is a function of displacement instead of mass. Relative densities can not be calculated with Newton's equation. This is confirmed by objects of different mass which fall at the same rate. Action at a distance forces are not a property of mass.

Field pressure is defined by displacement. Since the gravitational constant is defined by the field pressure, the gravitational constant is proportional to the object diameter. The moons diameter is 27.3 percent of earth diameter. Therefore, the gravitational constant for the moon is 0.273 times 980.67. This calculated value was confirmed by the point the Apollo vehicle entered the moon's gravitational field.

The distinction between gravity and other attractive forces is a matter of scale. The high velocity and minute mass of the photon establishes unidirectional energy transfer. Energy is increased by acceleration. Acceleration requires the application of additional force. Force is applied to a fluid particles by the impulse of higher velocity particles. The energy transferred to a particle is proportional to the ratio of projectile particle mass to target particle mass. Thus, particles having the least mass receive the most energy from photon collisions. The photon retains nearly all of its energy when it collides with electrons, protons, atoms and molecules due to the minuscule mass ratio. The energy lost by a photon in a collision with an electron is about $1/E20$. Since energy is defined by velocity the change in photon energy is virtually undetectable. However, although this minuscule transfer is even less for heavier particles and conglomerate masses, it still accounts for all of the energy in the universe based on the derived distribution and energy of aetheral photon fluid.

The photon energy transferred to an electron is about 10^4 times the energy transferred to an atmospheric molecule. The energy transferred from an electron to an atmospheric molecule is about 10^8 times as great as the energy transferred from a photon to an atmospheric molecule. Mass at constant density varies in proportion to volume (diameter cubed). The number of particle collisions is proportional to surface area (diameter squared). Therefore, the energy transferred to particles of constant density varies in inverse proportion to their diameters. Although the atmospheric pressure at sea level is almost **15 psia**, the photon fluid pressure exerted directly on macroscopic objects at sea level is less than **0.01 psia** despite the fact that there are about a billion photons per molecule at standard conditions.

Gravitational force results from the imbalance in impulse force acting on astronomical bodies. This imbalance results from lower photon fluid pressure acting on the shielded surfaces between the bodies. If one or both bodies are radiating, the radiation will increase the pressure between them. This pressure increase will decrease the imbalance in impulse force. Hence, Newton's gravitational equation only applies exactly to non-radiating bodies. For radiating bodies the radiation pressure increase must be taken into account. The cosmological significance of this variation is evident in entities such as globular clusters where massive stars maintain and even increase their separation as their radiation pressure increases surrounding field pressure.

The difference in energy transfer with scale accounts for all action at a distance forces. Even the proposed fifth force is accounted for as a difference in density between like volumes. The mass per unit distance increases with density so that the shielding is greater and the force is greater. Since the total impulse is proportional to shielded surface area, the acceleration (force/mass) of the less massive object is greater. However, the deceleration of the resisting medium is also proportional to the object mass (buoyancy). Acceleration is balanced by buoyancy. Acceleration equals deceleration at terminal velocity. The 5th force is most detectable in a static situation where there is no media resistance. This explains the experiment by University of Washington physicists where the greatest density segment of a spherical

volume suspended proximate to a vertical cliff always rotated to face the cliff. This explains why objects of different mass fall at the same rate and the disparity of this action with common sense expectation!

Providing an explanation for action at a distance mechanics accounts for the absence of any tangible connection between mutually attracting objects. This makes the concept of innate attractive charge obsolete. The apparent repulsion of electrons as measured by Cavendish is the resistance of charged objects to an increase in electron pressure. The velocity of electrons in a state of equilibrium is 10^4 times greater than the velocity of gaseous molecules. Photon fluid pressure confines electrons to the surface and interior of matter. The confined electrons form an elastic fluid coating. The pressure within this coating, which is determined by electron velocity, is greater than the molecular pressure. This pressure resists the contiguity of charged objects and diffuses over any surface which is at a lower electron pressure. Electrical charge is only more or less on an absolute magnitude scale. Electrical attraction is an apparition resulting from an electron pressure decrement. It is analogous to suction on an absolute pressure scale. The force is generated by electron fluid expansion to eliminate the pressure decrement. The absence of innate charge explains cohesion of concentrated electrons. This cohesion is evident in bolt and ball lightning as well as other electrical spark discharges.

The pressure decrement established by the mutual shielding of the earth and the moon generates the ocean's major tidal motion. Although the pressure difference is small the area over which it acts is very large. The higher atmospheric pressure surrounding the less shielded area raises the water level in the region of reduced pressure. The resultant change in water pressure is much greater than the difference in atmospheric pressure because of the hydraulic leverage of the greater surrounding area relative to the shielded area. A recent study by Paul G. Silver and Shang Xing Gao of the Carnegie Institution in Washington, D.C. suggests that California earthquakes are triggered by seasonal changes in atmospheric pressure. These changes result from the shielding of cloud cover and the related storm systems.

Contemporary theory offers no explanation of innate charge. The concept has been accepted dogmatically without substantiation of the mechanics involved. Photon fluid impulse explains the invisible force apparition attributed to innate charge. External radiation pressure is the source of cohesive force and the accumulation of mass. The concentration of mass in turn displaces energy which is diffused by photon radiation. The limits of concentration and diffusion bound the resulting cyclic action. The cycles are regenerative within these limits which produces the structures that configure the universe.

The external pressure exerted on an immersed object by its surrounding aethereal fluid field is not limited to its material surface. Aethereal particles penetrate and permeate all materials. Temperature continues to increase radially inward and is maximum at the objects center. The rate of increase is much greater within the object than in its surrounding field. This produces very high core temperatures in large objects.

The virtually infinite population of photons and their infinitesimal

size produces fields around even the smallest detectable material entities. The force acting on like proximate immersed spherical objects is proportional to their surface area and inversely proportional to their volume. Hence, the relative force magnitude is inversely proportional to their diameter. This increase in material bonding with decreasing ingredient size unifies the forces of nature and accounts for the formation and integrity of all material structures.

CHAPTER 4: ATOMIC STRUCTURE

"In experimental philosophy we are to look upon propositions collected by general induction from phaenomena as accurately or very nearly true, not withstanding any contrary hypotheses that may be imagined, till such time as other phaenomena occur, by which they may be made more accurate, or liable to exceptions.

This rule we must follow, that the argument of induction may not be evaded by hypotheses...."

Mathematical Principles of Natural Philosophy (1685-1686)

Sir Isaac Newton

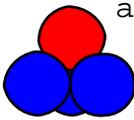
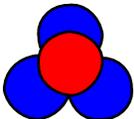
With the demise of innate charge, the electrical theory of matter is no longer a valid concept. In the middle of the 19th century British chemist William Prout hypothesized that "The atoms of all different chemical substances have a common nature representing only various degrees of concentration of hydrogen atoms.". He based his hypothesis on the fact that the mass of many larger atoms is approximately an integer multiple of the mass of a hydrogen atom. The main barrier to his hypothesis has been innate charge. The assumed proton repulsion requires a very strong nuclear binding force and neutral particles to achieve a stable atom. The criteria for stability was a balanced charge to hold the specific number of electrons in place. The formation of structures was explained by electrical charge and relatively quantitated by the abstract concept of valence. When simple valence failed to account for structures, additional valences were assigned to balance the books. Valence is an empirical system of structural classification without conceivable basis.

Since photon fluid pressure is the source of action at a distance forces, Prout's hypothesis warrants further consideration. Researchers at Harvard University and the Rowland Institute in Cambridge discovered a way light can bind matter into molecule like structures. Laser light focused on tiny plastic spheres caused them to move towards each other and bond. Dr. Jene Golovchenko of Harvard expressed surprise and stated: " I don't think that anyone suspected that you could organize random matter into material structures using light". The low mass of the plastic spheres and high intensity of the laser light produced bonding on a macroscopic scale which would have only occurred naturally in the microcosm.

Since innate charge is an apparition, a Hydrogen atom becomes a single proton coated with electrons. The electrons are held in place by surrounding photon pressure. Without the resistance of proton charge, strong stable structures form from contiguous protons acted on by surrounding fluid impulse. The interrupted integer sequence of periodic table atomic weights indicates that structure defines the formation of stable elements. The electron becomes an unnecessary part of atomic structure. Both electrons and photons are present within the atom and its surrounding field. They contribute mass to the atom but do not define structure. Atoms are formed by contiguous protons held in place by the pressure of photon and electron impulse. The number of protons in the most stable structures correlate with the interrupted atomic weight mass sequence in the periodic table.

HELIUM 4

Assuming that a proton is spherical, two contiguous protons would shield about 11.5 percent of the surface area of each proton from inward acting photon fluid impulse. The resulting pressure decrement bonds the protons together. The force is very small because of the very minute masses involved. The strength of the bonding is better illustrated as the acceleration resisting separation. The acceleration resisting separation of two contiguous protons is about 5.6×10^6 gravities at standard conditions. A mathematical model for calculating the approximate acceleration is provided in Appendix 2.



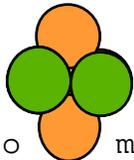
Contiguous proton structures larger than the **Deuteron** form multiple bonds. The strength of the bond is contingent on the

LITHIUM 6

number of contiguous protons. For simplicity the bonds are referred to as 2-bond, 3-bond.... The minimum bond in a structure limits its integrity. The atomic shapes are crystalline. The faces are formed from single or combined equilateral triangles. The stable crystalline structures have minimum surface area per unit mass.



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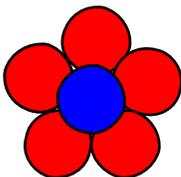
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The **Triteron** is a plane equilateral array of three protons with minimum 2-bond integrity.

Helium 4 is a regular tetrahedron formed from 4 identical equilateral triangular faces

LITHIUM 7

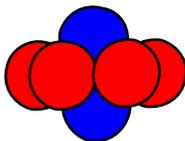
Triteron as shown. It is the smallest stable multiple contiguous proton structure. It has minimum 3-bond integrity.



formed from 2

Deuterons or a Proton and a

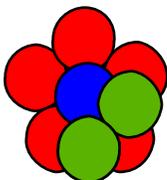
As the contiguous proton structures increases in size, a minimum 4-bond becomes the criterion for a stable configuration with the exception of the inert gases which will be covered later.



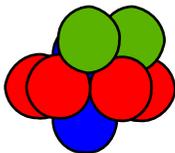
Lithium 6 is a regular octahedron with 8 identical equilateral faces. It is the smallest structure with minimum 4-bond integrity. It is the weakest 4-bond structure because pressure on the terminal protons (gold) tends to separate the four protons forming the square cross-section(green).

BERYLLIUM 9

equilateral triangular faces. It is formed from 5 protons in a pentagonal ring surrounding a proton pair. Since the terminal protons (blue) are contiguous, terminal pressure does not exert any separating force on the pentagonal ring.



There is no stable 8 proton structure because the minimum 4-bond criterion can not be met. The

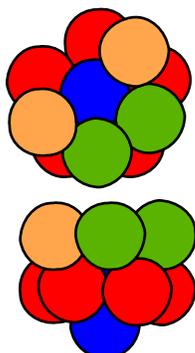


Lithium 7 decahedron is the smallest structure meeting the 4-bond criterion.

Beryllium 9 is a twinning of the **Lithium 7** decahedron formed by the addition of 2 contiguous protons (green).

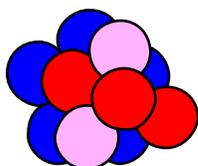
Boron 10 and **11** are the triple and quadruple formation of the **Lithium 7** decahedron by addition of 3 or 4 protons (green and gold).

BORON 10 & 11

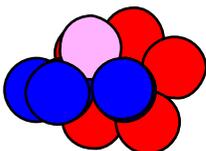


The **Carbon** isotopes are formed from **Carbon 10** by twinning of **Lithium 7** normal to its pentagonal cross-section. The principle isotope, **Carbon 12**, is formed from **Carbon 10** by adding 2 protons. The 2 protons form angular decahedrons with the **Carbon 10** base. **Carbon 12** has 6 open 4-bonds and each proton added forms an additional open 4-bond. This explains Carbons proclivity to form organic chain molecules and its affinity for **Hydrogen** which is the heart of organic chemistry. This clarifies the basis for the empirical concept of valence which is discussed in the subsequent chapter on molecules.

CARBON 12

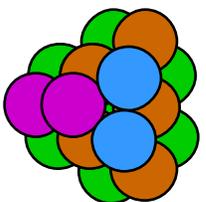


Nitrogen 14 and **15** and **Oxygen 16** are similar atoms. **Oxygen 16** is a minimum 5-bond structure. It is a regular truncated tetrahedron with four identical hexagonal surfaces as shown. The hexagonal faces are very reflective which facilitates the diffusion of light in the atmosphere.



Nitrogen 14 and **15** are incomplete versions of the **Oxygen 16** structure without one or two of the Protons (purple) which form the hexagonal faces of the **Oxygen 16** structures two adjacent faces. **Nitrogen 15** has an open 5-bond which reduces its stability in the direction of mass increase. In plants Nitrogen steals protons from Carbon Dioxide forming Carbon and free Oxygen.

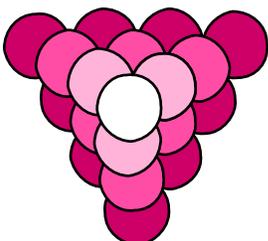
OXYGEN 16



Fluorine 19 is formed by adding three contiguous protons to any hexagonal face of **Oxygen 16** to form a minimum 5-bond structure.

NITROGEN 14 & 15

NEON 20



Neon 20 is a perfect tetrahedron with 4 identical triangular faces and no open 4 or greater bonds. It is a larger version of **Helium 4** and can be formed by stacking 5 Helium atoms. The inert gases appear to be complete structures with no open 4 or greater bonds. This limits the integrity of structures they form with other atoms so that stable molecules are not formed.

Sodium 23 is a larger version of the **Lithium 7** decahedron with 10 equilateral triangular faces formed by 6 protons. It is interesting to note that **Potassium 39** also is formed as a similar decahedral structure. The lenticular shape of the alkaline metal atoms suggests the ability of the atoms to slip when expanded by temperature and achieve a liquid state at relatively low temperatures. Atomic model structures show that molecules are not always formed by the minimum number of atoms. The number varies as required to form a stable structure. The molecular structure of water is an example. Its

actual chemical formula is H_4O_2 . The atomic components form a triangular somewhat acicular molecule that accounts for the hexagonal structure of snowflakes and frost crystals as well as the expansion of water when it freezes. Water partially solidifies slightly above its freezing point due to the porosity and elasticity of its acicular structure but is not totally solid above zero degrees C.

Contiguous proton structures form passages and internal volumes large enough to pass electrons and offering very little restriction to photon fluid. These passages are the cooling network of the atom. The impulse energy from surrounding photon fluid is dispelled by emitting photon pulses. The capacity of this cooling network limits atomic size. If the atom is unable to dissipate the impulse energy it fissions. Luminescence and radioactivity indicate a cooling network approaching an overloaded state. When larger atoms, such as Uranium 235...., are grouped together, the central atoms may fission. Fission releases their internal energy. A sufficient number of fissions will overload the cooling systems of surrounding atoms producing a chain reaction. Containment of the fission energy increases the number of fissions in a critical mass and produces the atomic explosion.

The output of the cooling network of an atom produces its spectral signature. The internal pressure increases until a pulse of high energy radiation is emitted. These high frequency pulses appear as dark lines on a spectrogram. Atoms of different elements are unique so that their pulse frequency signatures identify them. Since Hydrogen has a spectral signature, the proton is a composite structure with an internal cooling network penetrated by photons's.

When the table of isotopes is arranged in a matrix showing the isotopes versus the probable number of protons from which they are formed, patterns are revealed which provide clues to their structures. Highlighting those isotopes which are stable and have some natural abundance clearly shows structure consistent with contiguous proton formations. Sequential stable isotopes are predominantly formed by addition of a proton pair. A proton pair forms a 4-bond with any plane proton surface. Many elements have a central group of isotopes formed by addition of a single proton which indicates the presence of a plane surface. Any proton added to a group on a plane surface forms a 4-bond. Figure 4-1 shows the variation in proton resistance to separation versus temperature for the lighter atoms. Figure 4-2 illustrates some of the basic surface shapes formed by contiguous proton stacking and how added protons are bonded to smaller atoms. The plane surfaces formed are the source of crystalline boundaries. Many elements exhibit crystal structure at solid state conditions. Atomic structure is reflected in the macroscopic crystals formed by stacking the atoms. The following table is taken from the Table of Isotopes. The patterns of atomic structuring are made evident by the separation between stable elements and the size of the groups. Stable isotopes are shown in bold and underlined. The isotopes are arranged by the probable number of protons which form them.

Number of Protons

the integrity of molecules. Atoms are stronger than molecules, molecules are stronger than crystals, crystals are stronger than alloys and non-crystalline materials. Lenticular shapes form malleable solids while spherical shapes tend to be brittle. The difference is in contiguity and porosity. The adhesion of microcosmic entities under photon pressure is much like the adhesion of glued together objects under atmospheric pressure. The adhesion results from the external impulse of fluid particles. Innate attractive forces are not necessary to explain the cohesive integrity of atomic structure.

The cohesive force resulting from molecular fluid impulse was clearly demonstrated by the opposing teams of 8 horses pulling on the famous Magdeburg hemispheres in 1625.

The universal characteristic of all stable atomic and molecular structures is the presence of equilateral triangular faces. Buckminster Fuller developed his geodesic concept by stacking equal diameter balls. The great integrity of geodesic structures has been well established. The only difference between these structures and their microscopic counterparts is that atomic structure tensile strength results from external pressure acting on contiguous protons instead of the resistance of integrated tensile members. A complex geodesic structure has been built in Las Vegas, Nevada over downtown Freemont Street which has been transformed into an open air park. Looking at the structure from above reveals a spiral pattern extending along its entire length. The pattern is a macroscopic rendition of organic, RNA and DNA molecular structures when the triangular elements are replaced by contiguous spheres with their centers at the vertices.

Prevailing opinion is that molecules are loosely connected structures with a significant portion of empty space separating their component atoms. This opinion has arisen from the failure to recognize how molecular structures effect light. An example is a photograph of a hexamethylbenzene molecule magnified 175,000,000 times taken by Dr. M. L. Huggins at Eastman Kodak Laboratory which is included in George Gamow's book "One, Two, Three Infinity". The molecular weight of the molecule is 162.27 and its formula is $C_6(CH_3)_6$. The photograph shows six carbon atoms forming a hexagon surrounded by a second hexagon of six more carbon atoms. The hydrogen atoms are not detected because they cast no shadow. Since the hydrogen atoms are present, the light source is intense enough to diffuse after passing through the molecule. The diffusion greatly exaggerates the empty space between the carbon atoms. It can be concluded from this that the carbon atoms are much larger than shown and hence much closer together and that the hydrogen atoms occupy most of the empty space. The molecular constituents are probably contiguous, although the internal void volume appears to be much greater than within contiguous proton atomic structures. The term nucleon has been avoided since there is no distinction

between a proton and neutron due to the demise of the concept of innate charge.

The correlation of material properties and behavior of contiguous proton structures confirms the validity of their logical derivation.

CHAPTER 5: THE ELECTRON

"If ordinary electrons represent free charges of negative electricity, why cant we also have free charges of positive electricity, that is, positive electrons?"

Also, if a neutron, which apparently represents the basic unit of matter, can acquire a positive charge, thus becoming a proton, why cannot it also become negatively charged, forming a negative proton?

George Gamow - One, Two, Three....Infinity

Despite Professor Gamow's question, he accepts the atomic model hypothesis from the Electrical Theory of Matter in the absence of a credible alternative. Charge is not required to understand sub atomic behavior. Subatomic particles have no innate charge. They only have energy which is momentum times velocity. Particles may behave as though they have a negative, positive or neutral charge. However, their behavior results from the distribution of their energy between the 5 degrees of particle freedom and their interaction with media particles and other material objects. The only difference between protons, neutrons and anti-protons is distribution of energy and direction of travel. The annihilation of protons by anti-protons is the fragmentation of their structures resulting from a high energy impact. Neutrons appear to be protons with high levels of spin energy. Neutrinos are probably photons with high spin energy which would account for their increased material penetration.

The larger size and mass of protons and atomic proton structures shield surrounding electrons from photon impulse so that they cluster around the structures. This is why the proton structure of the atom has been considered as a nucleus. The electron is not a component of atomic structure. The electrons are very active relative to a proton since a photon impulse transfers about 10^4 times as much energy to an electron. Rutherford's miniature solar system was merely a proton structure surrounded by electrons in motion.

The reaction of particles passing through a magnetic or electrostatic field is determined by their mass, the distribution of particle energy between their 5 degrees of freedom (3 orthogonal and 2 rotational) and the field particles that they encounter. An electrostatic field is made up of electrons displaced by electron pressure. The displaced electrons are confined by the photon field surrounding a charged object producing a radial electron pressure gradient. A magnetic field is formed by spinning photons displaced by electron pressure which produces a photon pressure gradient. The high spin energy of the magnetic field photons exerts a directional influence on the particles moving through it. The reaction of a particle in either field is defined by energy distribution between the degrees of freedom and the field particulate density gradient. The smaller the traversing particle

mass the greater the reaction to field particle encounters.

Charge is the absolute pressure of a particulate fluid. In the case of electrons pressure is voltage. Voltage is a difference in absolute electron pressure relative to a reference pressure which is usually ground. The electron is not penetrated by a photon as confirmed by its high reflectivity relative to larger mass structures.

The electrostatic unit of charge is defined by repulsion. The behavior of electron fluid explains this repulsion. When the electron pressure is increased on an object the electron field expands. The electron fields of two proximate charged objects mutually interfere. The impulse of the electrons between the object fields oppose each other exerting a separating force between the objects. The repulsion is about 10^8 times the force of gravity because the kinetic energy of the electron is 10^4 times that of an atmospheric molecule and the electron impulse is 10^4 times that of a photon. The force direction is opposite to gravitation because the electron pressure is exerted outwardly from charged objects. The electron fluid forms an elastic layer on object surfaces.

The population of electrons in our environment has not been determined. There are probably many more electrons than protons but many less electrons than photons. The mass of an electron is too great for an electron wave to travel at the velocity of light. Electric current must therefore be transmitted through the intermediate action of photon fluid. This will be discussed in more detail in the chapter on electromagnetism.

The behavior of the electron explains many natural phenomena. Evaporation of a liquid increases the molecular surface area available for electrons which decreases the electron pressure. Electrons flow onto the vapor molecules from the surrounding liquid. When the vapor condenses the electron pressure increases. When water vapor condenses into the droplets which form a cloud, the cloud becomes charged with electrons. When the droplets coalesce sufficiently to produce virga the cloud charge increases. When the virga evaporates it adsorbs electrons from the surrounding atmospheric molecules. The water vapor rises and again forms droplets which further increase the charge on the cloud. This is how a thunderstorm cell is formed. The electron depleted atmospheric molecules adsorb electrons from the earth. This accounts for corona discharge from conducting and extended surface objects. An example is the raising of your hair when in the region of a thunderstorm cell. When condensation increases and produces rain, the thunderhead charge increases and produces lightning. The electrons in the lightning bolt cohere due to the confinement of photon pressure forming the concentrated electron stream. The bolt is made visible by the photons displaced by the electron stream. Electrical discharge velocity is much less than the velocity of light. The photon wave frequencies generated by the displacement

of the electron discharge produce electrical interference. The off shoots from the lightning bolt are discharges to atmospheric regions where molecules are depleted of electrons.

Other examples of electron behavior are static cling produced by the depletion of electrons in a dryer as the water evaporates. Cling results from the pressure of ambient electrons acting on the surface of a nonconductive clothing material to equalize electron pressure. Likewise, a thin plastic film does not conduct electrons. Pressing the film against an object displaces electrons from the object surface which flow onto the film's exterior surface. The electrons on the film surface press it against the object. A conductive film will not adhere. Compression of a carpet decreases the surface area available for electrons which increases electron pressure. Electrons flow to the compressing object producing a charge on the object. Addition of a conductive network to the carpet dissipates the pressure and alleviates the charge buildup. Rubbing a non-conducting rod with a compressed extended surface such as fur builds an electron charge on the rod.

The point of this chapter is to address electron behavior. The essential element is that surfaces are covered with electrons at some ambient pressure level. The action and presence of electrons on atomic surfaces reduces the contiguity of atomic proton structures when molecules are formed. This separation reduces the integrity of molecules relative to atoms and establishes a conduit which transmits photon pressure. The molecular interstices formed between atoms by contiguous electrons reduce resistance to photon flow. The electrons between molecules which form laser crystals are the conductive photon paths which organize the output beam.

The electron is the link in the energy chain which transfers the greatest amount of photon energy to macroscopic material entities. The increased level of electron energy enables the concentration and utilization of electrical energy.

CHAPTER 6: THE MOLECULE

Chemistry is defined as "The Science dealing with the composition and properties of substances, and with reactions by which substances are produced from or converted into other substances." Chemistry deals with molecules.

Molecules have less integrity than atoms and can be altered more easily with less departure from ambient conditions. As the scientists at Los Alamos discovered, electrons separate protons and interfere with proton fusion. The fields of electrons which surround atoms introduce an intermediate layer which interferes with contiguous proton contact. This layer is a conduit for photons. Photon pressure is transmitted through this conduit and acts directly on the individual atoms forming the molecule. The separation introduced by the electrons limits the structural integrity of the molecular bond. The weaker bond is the difference between the cohesion of atoms and molecules.

Molecules are held together by the total surrounding containment field. Stable molecules are best fit structures. They are atoms assembled with the minimum ratio of surface area to mass. The minimum surface area to mass ratio assures the lowest photon impulse energy input. This in turn produces the lowest internal pressure. Molecular formation is a trial and error process equivalent to natural selection. Evolution at an accelerated pace. Only the more durable assemblies survive.

As atoms are assembled into larger structures and the surface area reduced, the surrounding field pressure increases. Energy flows to the surrounding ambient pressure environment. Reduction of surface area increases both the electron and photon field pressure and is dissipated as electrical and thermal energy. Chemical reactions which produce larger molecules release energy. Separation of the molecule into its atomic components requires energy.

Larger more massive atoms tend to displace smaller atom segments of molecular structures. The fundamental direction of chemical reaction is toward increased molecular size. Molecular cohesion increases with mutual shielding which is a function of molecular shape and displacement.

The common lead-acid automobile battery is a good example of the interactions of photons, electrons, atoms, molecules and shielding mass. The sulfuric acid molecules have greater displacement than water molecules. The lead plates directionally shield the fluid particles from battery fluid impulse. The less massive water molecules have the same energy as the acid molecules. Hence, their velocity is greater and their impulse concentrates the sulfuric acid molecules around the plates. The sulfuric acid molecule reacts with the lead plates by breaking down the acid molecule into water and the SO_3 radical to form lead sulfite. The reduction in molecular surface area increases the photon and

electron pressure on the plates. The electron pressure on the lead anode is greater than the water immersed cathode. When the electron pressure is great enough, the electrons separate the lead from the acid interrupting the reaction. The water molecules are displaced to the cathode. Flow of electrons through an external load reduces the pressure on the lead plates. The reaction continues until the sulfuric acid is depleted.

The battery is charged by connecting a high pressure electron source between the poles opposite to the direction of discharge. The high electron pressure breaks down the lead sulfite molecules and reforms the original constituents of lead and sulfuric acid. The fundamental energy source is photon fluid pressure which defines the fluid particle energy levels. Batteries don't work well at low temperatures because the photon pressure is too low to maintain the concentration of acid molecules around the lead plates.

The shielding action of the lead plates in the storage battery illustrates the mechanism of catalysis and crystal formation in supersaturated solutions. A catalyst is a non-reactive component larger than the atomic and molecular participants in the chemical reaction. It shields the reacting elements which organizes the direction of fluid action. The fluid impulse action concentrates the reacting components around the catalytic entities which increases the rate of reaction. The formation of rock candy exemplifies the action of a fluid pressure organizing element (a string or a seed crystal) in concentrating molecules in a supersaturated solution.

The typical steps in producing chemical reactions are to distribute the constituents by grinding and then dissolving them in a fluid followed by heating to increase the fluid pressure action. This maximizes the number of constituent cohesive conjunctions which form molecules. The introduction of catalysts concentrates the constituents which accelerates the reaction. The resultant compounds are formed by trial and error to assemble the strongest best fit structures commensurate with the reaction environment. This is fundamental evolution at a highly accelerated rate.

Increasing the photon and electron pressure in the atomic and molecular boundaries is the mechanism of phase change. The heats of fusion and vaporization occurs at the point where internal pressure equals confinement pressure and the fluid particles separate to form the subsequent phase matrix. Temperature does not increase during a phase change because the heat added only maintains the pressure that makes up for the void volume increase required to maintain the atomic or molecular density in the expanded phase.

Fluid energy climbs a particulate ladder from the microcosm to the macrocosm. The gas turbine is an example of how this energy ladder is utilized. A Hydrocarbon fuel is atomized and burned

forming the larger molecules of carbon dioxide and water. The reduction of molecular surface area increases the photon pressure. The turbine nozzle is sized to maintain a molecular pressure slightly greater than is generated by the compressor. The increased photon pressure only increases the molecular pressure slightly at the turbine nozzle. However, the photons transfer their energy to the gas molecules as they flow through the turbine stages. The molecules transfer their increased energy by either impulse or reaction to the turbine rotor. The added photon energy produces a surplus rotational torque beyond what is required to drive the compressor and sustain rotation. This surplus can be utilized as mechanical, pneumatic or thrust output. Without the energy ladder the gas turbine engine would not function.

The refrigeration unit is essentially a photon pump. It utilizes the increase in refrigerant particle surface area with atomization and/or evaporation to absorb photons through an input heat exchanger. The refrigerant is then compressed and the photons are rejected to ambient through an exhaust heat exchanger.

Crystals are ordered assemblies of molecules which tend to reproduce the molecular shape. Crystals are formed in a fluid which allows the repeated trial and error assembly of molecules into their most compact matrix. Rock candy formed in a supersaturated sugar solution is an example. The same process is used in the manufacture of directionally stratified or single crystal turbine blades. Reducing mold temperature slowly allows the metal molecules time to find the most compact position which produces maximum integrity at high temperatures and when subjected to high centrifugal force. Geodes are inclusions of very hot liquid in magma which cool slowly forming their crystalline linings from dissolved minerals.

An example of trial and error is the formation of complex molecules in the human bloodstream. The building blocks are derived from the breakdown of organic foods. Although minerals are utilized by the body, human cells are formed with discreet molecular segments of ingested organisms. Complex human biology is enabled by the life forms we consume. Without this organic food chain we would perish. Persistence and formation of maximum integrity organic structures in their environment is the basis for evolution as observed by Darwin.

The blood temperature and pressure are controlled within narrow limits to enable the human bodies trial and error molecular assembly process. The subassemblies included in DNA and RNA molecules are found in other living organisms. Replication of these molecules and all the other complex molecules and cells is necessary to sustain life. The bloodstream is like a cloning fluid. It is a pharmaceutical manufacturing facility for complex molecules from the materials available. Poisons, bacteria and viruses all interfere with the process. The body reacts by

increasing blood temperature and activating its immune system to limit the formation of renegade molecules and overcome the infestation. Life depends on the temperature and pressure of the blood. Any significant departure from body temperature interferes with the molecular replication process. The process is slowed with reduced temperature while high temperature leads to cellular breakdown.

Molecular formation and the proportion of molecular constituents is limited by the size and shape of the individual atoms, molecular segments and molecules. Contiguity, available surface area and surface configuration define the structure to meet the ambient requirements for structural integrity. It is much like crystal formation except that the best fit requirements are only met by specific subassemblies. The complex organic molecules that form human beings can only be formed and persist in a closely controlled environment as provided by the human organism. The evolution of man results from the ability to maintain the conditions under which his biological environment can be maintained.

Valence is defined by atomic and molecular shape which determines the volume to surface ratio of molecular assemblies. Hydrogen has the smallest spherical shape of all atoms and hence is the most chemically active element because it can form a strong bond with most atomic and molecular structures. Hydrocarbons form the basis of Organic Chemistry. Their prevalence results from the number of open 4-bonds in the Carbon atom which form strong unions with Hydrogen. The hexagonal matrix diagrams of organic compounds result from the 6 open 4-bonds of Carbon 12 and the formation of 2 additional 4-bonds by the capture of each Hydrogen atom. The smaller the atomic structure the more compatible is its shape to the formation of large molecules. Small atoms cohere to larger more massive atoms and molecules. Since the structural formations of atoms are unique stable proton structures, their shapes and valences are unique. However since they are all formed from protons they have mutual structural consistencies which result in the same valence for different structures. Principle valence values are limited by the number of best fit situations.

The compatibility of molecules with minimum volume stacking accounts for the integrity of crystals and the increase in integrity of alloys. Elasticity, malleability and stability all are defined by the fit of atomic and molecular building blocks and their resistance to disassembly by high energy particle penetration. The recognition that temperature results from aetheral fluid photon pressure which acts on all larger material particles accounts for all chemical behavior.

CHAPTER 7: ELECTROMAGNETISM

"The theory I propose may therefore be called a theory of the ELECTROMAGNETIC FIELD, because it has to do with the space in the neighbourhood of the electric or magnetic bodies, and it may be called a DYNAMICAL Theory, because it assumes that in that space there is matter in motion, by which the observed electromagnetic phenomena are produced."

James Clerk Maxwell - (1865)

Maxwell's Equations were formulated about 140 years ago. Despite their undisputed validity, no one seems to have discovered what makes them work. The interaction of photons with electrons provides an explanation of the fluid mechanics that correlates with the equations. The high reflectivity of the electron indicates its resistance to penetration. Hence, electron population density (voltage) defines the resistance to photon impulse.

Since all particles in a compound fluid have the same energy in a state of equilibrium, electrons have much lower velocity than photons. The particle velocity necessary to generate a wave must always exceed wave velocity. Therefore, electron waves can not travel at the velocity of light. Since electrical energy is transmitted at the velocity of light, it must be transferred by photon fluid. Electron pressure acts on photons just as molecular fluid pressure acts on atoms.

A magnetic field is made up of photons. Photons permeate and fill the interstices of atoms and molecules. External photon impulse confines electrons to shielded atomic and molecular surfaces and interstices producing electron fluid behavior analogous with a contained fluid. When electron pressure is applied to a conductor, spinning photons are displaced forming a photon field around the conductor. The field is confined by the impulse of surrounding photon field. When the electron pressure is removed the field collapses as the photons flow back into the conductor. The increase in photon pressure transmits energy to electrons within the conductor. This is the compound wave action that transmits electrical energy. It makes no difference which direction of current flow is assumed or if the direction alternates because only cyclic mass flow is required for the compound wave to transmit energy. The application and maintenance of electron pressure is the only criterion for energy transmission.

When a conductor coil is wound around an iron core and voltage is applied, a photon field forms around the coil and is highly concentrated in the core. Photon pressure increases producing photon core flow away from the voltage application. Spinning photons are emitted from the core termination. The spinning photons interact with the surrounding ambient photons. Their high spin energy produces a curved path back around the electromagnet coil. The photon pressure opposite the emitting pole is depleted. The recirculating emitted photons increase the ambient pressure

which increases the photon flow into the low pressure pole. The emitted photon circulation forms the lines of force surrounding the electromagnet. The separation and stratification of the lines of force results from the turbulent circulation vortices generated between proximate photons spinning in the same direction.

The principle magnetic material is iron. The necessary characteristics of a magnetic material are large open internal volumes and passages which provide conduits for electron and photon flow. The conduit network must have transverse channels with the passages separated by shielding mass. Iron would seem to be made up of atoms which form a regular open matrix but have sufficient contiguity to maintain structural integrity. The principle magnetic materials (Fe, Co, Ni) are grouped together in the Periodic Table and have stable isotopes formed from 54 to 64 protons. This proximity suggests some structural similarity.

The magnetic material properties are made evident by the permanent magnet. A permanent magnet is formed by initiating photon flow in a magnetic material. The photon flow establishes electron eddy currents in the material. The electrons are confined by the photon pressure to the core and the external surfaces of the iron atoms. Electrons roll along these surfaces which increases their spin energy. The electron spin is transferred to photons through a very high gear ratio. This is the source of the spinning photons that exit the magnet pole and generate the surrounding lines of force. The magnetic field surrounding a bar magnet is a doughnut shaped 3 dimensional vortex. The vortex is sustained by the confining pressure of external photon impulse the electron eddy current inertia within the magnetic material. Bending the bar into a horseshoe modifies the vortex and concentrates field between the poles. The magnetic field vortex persists until its energy is depleted or its action is disrupted.

Demagnetization methods disrupt the eddy currents and magnetic flux. Heating increases the internal photon pressure. Alternating current and vibration interfere with the continuity of sustaining energy transmission. Demagnetization methods confirm the mechanics of magnetism.

An alternator in its simplest form is only a conductive loop rotating in a magnetic field. The photon energy in a magnetic field is directional from the emitting pole to the receiving pole. Like poles repel and unlike poles attract! The photon pressure of the field increases the electron pressure in the loop. The electron pressure in the loop is greatest when the loop motion opposes the field energy transmission direction. One side of the loop travels in the field direction while the other side travels opposing it. This generates an electron pressure difference at the open ends of the loop. The direction of voltage and energy transmission (current) is defined by the direction of photon flow within the field and the loop rotation. The output voltage is

sinusoidal changing direction at the frequency of loop rotation.

A generator is only an alternator with a commutator added to maintain a single direction of output pressure.

The important thing to note is that the changes in direction of flux, current and motion used to depict the mechanics of Maxwell's Equations (left or right hand rule) only result from the arrangement of the acting elements. The forces involved result from non-directional generation of pressure and are consistent with the direction of the expansion path of photon and electron fluid.

Electric motors reverse the role of generators and alternators by utilizing the pressure of magnetic flux to impel a rotor and produce an output torque. Pressure (voltage) is applied to the rotor and stator coils. The photon pressure surrounding the rotor coil opposes the pressure of the photon emitting stator pole and is adsorbed by the non-emitting pole. The photon pressure is established by the electron pressure. The rotor turns in the direction of decreasing pressure. A single conductor rotor loop does not turn when centered between two opposing stator poles. Rotation is sustained by inertia when rotation is initiated. Multiple pole geometry, capacitance phase shift or shaded pole configurations provide starting torque at all relative positions of the rotor and stator of typical motors.

The magnetic field surrounding a conductor transmitting alternating current collapses and reverses with each change of transmission direction. This action is the essence of the transformer. A continuous core of magnetic material transmits the output magnetic flux from the primary coil to the secondary coil. The photon pressure exerted by a single conductor of the input coil is the same as the pressure exerted on a single conductor of the output coil. The output pressure is proportional to the ratio of the number of input coil conductors to the number of output coil conductors. Transformer cores are usually laminated to reduce the energy losses from eddy currents.

An electromagnetic wave is only a photon wave modulated to carry information. The modulation is a pressure change which can be detected by electron reaction in a remote conductor and amplified to reproduce the transmitted signal. Any form of modulation (amplitude, frequency or pulse) can be deciphered by a suitable receiver. The lower the wave frequency, which is established by particle velocity, the greater the transmission range. This is because collision frequency is proportional to the particle velocity and attenuation is proportional to the number of collisions. The modulation of the wave is introduced by the displacement of photons and electron pressure variation. High photon spin energy accounts for the polarization and nodal character of antenna transmission patterns.

Conception of electricity as electron flow instead of electron force does not reflect electrical mechanics. Electrons in a

conductor are like pistons in a porous cylinder. Electrical energy is defined by electrical force, which is electron pressure (voltage), but is not transmitted by electron flow. Electrons do flow, but only as required to maintain electron pressure. However, only conception is changed by the depiction of electrical energy as current flow. Ohm's Law is a form of the Ideal Pressure Equation. Voltage (pressure) = Current (momentum) times Resistance (particle density) times relative velocity. It makes no functional difference whether there is mass flow or momentum transfer.

The distinction between electron flow and electron force more clearly explains a number of clouded electrical phenomena. The thermocouple is a junction of two unlike materials. The atoms or molecules of these materials have different surface areas. Hence, the electron pressure varies at a different rate with temperature. The voltage difference is proportional to the temperature. By comparing the difference with the difference at a second junction at known temperature, the temperature at the first junction can be determined.

The transistor is basically a thermocouple where the donor and acceptor materials are altered to control conductivity. The material has a moderately high resistance which can be reduced by the introduction of larger atoms. The larger atoms produce larger conductive passages which increase conductivity. The resistance is greatest in the acceptor material. Temperature produces a voltage difference in the donor-acceptor materials which is measurable at their junction. The leverage in the moderately resistive parent material blocks current flow in the acceptor to donor direction. This thermocouple action accounts for the temperature sensitivity of the transistor.

Photons are displaced by larger fluid particles. In the case of molecular particles the displaced fluid is the heat of compression. The fluid displaced by electrons is magnetic flux. The distinction between heat and magnetic flux is the energy level and its distribution between the degrees of particulate freedom. Magnetic flux particles have more energy and high spin component levels. There is no physical entity that can account for the mechanics of heat, light, electricity and magnetism other than Maxwell's Aethereal Fluid.

The behavior of inductances, capacitors and transformers clearly demonstrate the interaction of photon fluid with electrons. A transformer is essentially a generator where magnetic flux modulation replaces armature rotation. The confinement of electrons in and proximate to matter enables the organization and utilization of photon energy to accomplish useful functions. It demonstrates the energy ladder from the least massive particle to the more massive particle when the particles are in a state of energy equilibrium.

There is very much more to be said about electromagnetism.

The important point is that the concept of photon fluid does not conflict with established electromagnetic data and provides an explanation of the electromagnetic mechanics expressed by Maxwell's equations.

CHAPTER 8: WORK AND ENERGY

Force is energy exerted or brought to bear. Work is force times distance. Force is the cause and work is the effect.

All forces result from temperature which is the pressure of photon fluid. There is no other source of energy. The categories of energy only designate the origination of the energy or the utilization of the force. The first cause of all of these force categories is temperature.

Mechanical energy is most often exerted by expansion of a molecular fluid. The expansion is quantitated by the change in temperature from the input to the output. The machines involved are open and closed cycle turbines, pistons and internal combustion engines.

Mechanical energy can be electrically generated. The source of electrical power is electron pressure. The displacement of photons by electrons increases the photon pressure which is the temperature within the conductor. Since electron pressure is transmitted from electron to electron by a photon wave at light velocity, the temperature increase is quickly dispelled. The average temperature in the conductor is relatively low. The average photon pressure in an ideal (zero resistance) conductor would approach the ambient value. This is analogous with the average pressure of a wave on a liquid surface.

Hydroelectric power is generated by the potential energy stored in an elevated water source. The potential energy is extracted by aetherial fluid generated gravitational force action on water initially evaporated directly or indirectly by the impulse of high energy solar radiation.

Chemical energy is generated by molecular formation. Chemical energy may be in the form of either photon or electron pressure. Formation of molecules from atoms, or smaller molecules decreases the structural surface area available. This increases surface confined electron pressure and photon field pressure surrounding the molecule. Volumetric pressure is the summation of fluid particle energy per unit volume and, hence, Hydrogen has the greatest heating value of any chemical fuel. It has the greatest void volume which increases the number of photons per mol at the same pressure and temperature conditions. In addition the surface area to volume ratio change per unit mass is greater when it forms molecules than in any other chemical reaction.

Atomic fusion energy is generated by the formation of larger atoms from smaller atoms or protons. Fusion is the assembly of atoms by photon impulse acting on large concentrations of lighter atoms or protons. Hydrogen is also the best fuel for a fusion reaction. Fusion is facilitated by the absence of electrons which interfere with the contiguity required to form atomic proton structures. The physicists at Los Alamos found that stripping the electrons helped to achieve fusion. Protons do not have an innate

charge and do not repel each other. Stripping the electrons allows the proton contiguity to form a fusion bond. If you consider the field as a thick shell around the fusing protons, the energy surplus is defined by summation of the shell energy less the total field energy surrounding the fused mass. The mutual shielding between two contiguous protons produces a bond which reduces the effective surface area by 23.2 percent relative to their separated fields. The bonding strength of atomic structures can be approximated by the mathematical model in Appendix 2.

Fission energy is the release of the internal energy of the atom. This energy is the internal photon pressure generated by the impulse of the surrounding photon field. Fission occurs when the internal cooling network of a large atom is overloaded. When internal pressure exceeds the structural containment pressure, the atoms structure separates and releases its core energy. The amount of energy released is the difference between the internal energy of the large atom and the total internal energy of the fission fragments. The containment of the released fission energy slows the rate of energy release and overloads surrounding fissionable atoms perpetuating the overloading which generates the chain reaction explosion. The internal temperature of the large atoms that fission is very high. This accounts for high energy gamma radiation produced by fission reactions. The internal temperature of atoms can be estimated from the highest frequency line in their spectra.

All forces in our earthly environment result directly or indirectly from temperature. Since science is based on the precept of a homogeneous universe where every effect has a cause, inductive logic provides a reason to believe that all universal forces result from temperature. Force is the summation of photon impulse energy per unit volume. Work is simply the mass motion produced by photon impulse generated forces.

CHAPTER 9: THERMODYNAMICS and CHAOS

"A relation between the second law of thermodynamics and the theory of probabilities was first shown when I proved that an analytical proof of the law can be erected only on a foundation which is taken from the theory of probabilities. This relation is further confirmed by the proof that an exact proof of the laws of equilibrium of heat is most easily obtained by showing that a certain quantity, which I will again designate by E , can only diminish by the exchange of kinetic energy between the molecules of the gas, and therefore will have a minimum value in the condition of equilibrium of heat."

Ludwig Boltzmann (1877)

The pressure lapse rate of the atmosphere is consistent with the equilibrium of heat. The particle of heat is the photon. The fact that the inward impulse to outward pressure ratio is constant at all altitudes demonstrates the stable configuration of earth's gravitational field. This stability in turn indicates the condition of equilibrium. Atmospheric structure conforms with the second law of thermodynamics. The heat loss to space is an entropic process.

Erection of a field around an immersed object suggests a fourth law of thermodynamics. If entropy is considered as disorganization, the erection of a field is its antithesis and can be considered to be negative entropy. The interaction of the fields generated by negative entropy produces the coalescence which balances diffusion. Coalescent force acts on all materials immersed in a fluid. The balance between negative entropy and entropy enables the conception of a stable steady state universe where the assembly of mass concentrates energy and its disassembly adsorbs energy.

The Stephen-Boltzman equation for radiant heat transfer is the triple definite integration of the equation for gaseous diffusion ($Q=dc/dxdydz$) when concentration is replaced by temperature and quantity is multiplied by pressure to yield energy instead of flow ($TQ=Tdt/dxdydz$). Radiation is an electromagnetic wave and energy is transmitted without mass through-flow. The experimental validation of this equation is additional support for the existence of a particulate spatial fluid throughout the universe. Since the equation applies to gaseous particles which have mass, it supports mass as a property of the photon.

The equations for coalescence have not been defined. However, they will be similar to Newton's gravitational equation and include the effects of scale and innate radiation pressure. Mass density will be replaced by displacement. Cosmically, the photon pressure exerted by radiating bodies reduces or exceeds the gravitational force acting. The equations for atomic bonding in Appendix 2 approximate the magnitude of the strong force in the microcosm.

Thermodynamic processes are all consistent with photon fluid. Heat transfer equations are a form of Ohms' Law. The Ideal Gas Law pressure equation is pressure ($p=t$) = resistance ($nv/3$) times momentum (mv). Dividing pressure by 3 designates a unidirectional wave action. Media fluid pressure acts in all directions. The equation for photon fluid is $t=nmv^2$. All heat transfer equations are based on the change in temperature which results from either the inertial flow of photon fluid or the wave transmission of photon fluid energy.

The organization of Chaos is the natural consequence of photon fluid interaction when mass interferes with random motion. The fact that the energy of a collection of particles traveling in all directions at various velocities exerts a consistent and predictable pressure demonstrates organization of random action. Imposing any condition or limitation introduces organization into a random process. Organization generates the patterns of Chaos. The presence of these patterns in natural phenomena demonstrates the imposition of limitations. The nature of the limitations imposed can be deduced from the chaos patterns produced. An orderly series of conditions and limitations categorized by chaos patterns would produce a correlation catalogue. The fact that these patterns occur naturally is another proof of the existence of the spatial fluid which produces them.

The erection of fluid pressure fields around masses results from the limitation of random fluid action by the displacement of the mass. Field structure is formed by the organization of chaotic particulate action resulting from the restriction of immersed mass displacement.

Another example of the organization of chaos by imposition of a restriction is the generation of a light wave. A wave is a sequence of compressions and expansions. A single compression-expansion sequence is the cycle and the number of cycles per unit time is the frequency. The compression results from the resistance of the aether medium to expansion resulting from the impulse of a directional emission of high energy photons. Momentum is transferred from emitted photon to media photon. Collision frequency defines the probability of interaction between a media particle and a wave particle which is proportional to media density and wave particle velocity. The compression is defined by the collision frequency times the number of particles emitted. The expansion is the action of the medium to restore equilibrium. Particle velocity determines the energy input while media particulate density determines the mean free path. The restriction imposed on the random chaos of the medium was the directional input of radiated photons. The chaotic action was organized to produce the orderly and detectable sequence of inertial events which form the wave. Order evolves through restriction of chaotic action.

A medium resonates at the frequency of the wave. This is

because the elasticity of its boundaries is proportional to the square root of the rate of particulate addition which defines wave frequency. The natural frequency of an unconfined medium is a variable as opposed to the fixed value established by the solidity of material objects. The frequency of a wave results from chaotic organization of expansion which imposes a flexible fluid boundary.

CHAPTER 10: MATTER

"Substance is being, capable of action. It is simple or compound. Simple substance is that which has no parts. Compound substance is a collection of simple substances or monads. Monas is a greek word which signifies unity, or that which is one.

Compounds, or bodies, are multitudes; and simple substances, lives, souls, spirits are unities. And there must be simple substance everywhere, because without simple substance there would be no compounds; and consequently all nature is full of life."

THE PRINCIPLES OF NATURE AND OF GRACE

Gottfried Wilhelm Leibniz (1714)

What is Leibniz talking about? Does it have physical significance? Leibniz was a mathematician, philosopher and theologian. He was the inventor of the infinitesimal calculus. His scientific philosophy embraced strict causality. His religious background equated action to life. He recognized what later philosophers failed to see. The agreement of mathematics with physical laws dictates a digital universe. He further states:

"Monads, having no parts, cannot be formed or decomposed. They cannot begin or end naturally; and consequently last as long as the universe, which will indeed be changed but will not be destroyed. They cannot have shapes; otherwise they would have parts. And consequently a monad, in itself and at a given moment could not be distinguished from another except by its internal qualities and actions, which can be nothing else than its perceptions (that is, representations of the compound, or what is external, in the simple), and its appetition (that is, its tendencies from one perception to another), which are the principles of change. For the simplicity of substance, does not prevent multiplicity of modifications which must be found together in the same simple substance, and must consist in the variety of relations to things which are external."

What Leibniz has described in his archaic idiom is a fluid of basic infinitesimal particles having random position and random energy. These particles are the fundamental universal digits. They are assembled to create macroscopic complex matter which exhibits the characteristic of shape. This is consistent with Maxwell's distinction between aethereal fluid and gross matter.

Everyday experience extrapolated into the microcosm provides the mechanics of material structure formation. Two panes of glass separated by a film of water adhere and can only be separated by sliding them apart sideways. They are held together by molecular impulse pressure acting on their exposed surfaces because the water film does not allow air molecules to penetrate between them. All material structures are bonded together in a similar manner by fluid impulse. The bonding agent may be glue, solder, welding or any other material or structural characteristic which maintains the

separation force level below the compressing impulse force level. In the microcosm atoms are held together by the same aethereal fluid impulse which produces the apparition of gravity.

The force generated by impulse is proportional to the area on which it acts. In the case of an immersed object impulse acts on its surface area. The reaction to the impulse pressure is the displacement of the immersed object. Displacement defines mass. Since density does not define displacement, gravitational force is only approximated with Newton's gravitational equation. The magnitude of a field surrounding an immersed object is proportional to its displacement divided by its surface area. The omnidirectional compression of an object acts to confine its constituents to the minimum surface area of containment. The geometric shape which contains the greatest volume per unit surface area is a sphere. The ratio of confining impulse to mass, which forms the field around an immersed object, is the ratio of surface area to displacement. The variation of gravity is inversely proportional to the equivalent diameter of a body or object times a constant. The scalar change with diameter is confirmed by the relation of moon gravity to earth gravity.

The behavior of infinitesimal aethereal fluid particles in the microcosm is analogous to their behavior in the macrocosm. The photon is far smaller than any discernible particle. Its minuscule dimensions coupled with high particulate density generates a compression field around all larger particles. The fact that displacement decreases more than surface area with decreasing scale accounts for the both strong and weak forces that bond atoms and molecules. Field formation in the microcosm was confirmed by French physical chemist, Jean Perrin, in his studies of Brownian motion in colloidal suspensions. He determined that distribution of colloidal particles with height correlated with the distribution of atmospheric molecules with altitude. His studies led to the first reasonably accurate determination of Avagadro's Number.

Since the proton can be fragmented and possesses a spectral signature, it is a compound particle with an internal cooling network that is penetrated by photons. Although many different proton fragments have been detected, nearly all of them are unstable. Without the assumption of positive and negative charge, the only of stable consistent mass fragment is the electron.

Ideal gas law hypothesizes equipartition of energy between the degrees of motional freedom. Although most elementary physics texts cite 6 degrees of freedom, there are actually only five. One degree of freedom is eliminated by applying polar coordinates. There are only 2 degrees spin energy freedom because particle diameter is not a variable. This is consistent with the dynamic attributes of quantum mechanics and confirmed by the agreement of calculated and measured values of the ratio of specific heats.

The electron has no spectral signature and reflects radiation.

This high reflectivity was misconstrued as evidence that the electron was much larger than the proton. This assumption is rejected by the electrons penetration of protons, atoms and molecular structures as evidenced by electrical phenomena. The reflectivity indicates that the electron isn't significantly penetrated by the photon. The electron is the largest particle not penetrated by aethereal fluid. Penetration could only be precluded by a particulate assembly of contiguous photons. This would make the electron a composite structure of photons with no internal cooling system. It would be a coherent concentration of contiguous photons that would withstand the bombardment of high energy radiation and larger high energy particles. Radiation energy would be rejected by reflection exerting maximum impulse force on the electrons. This accounts for adhesion of electrons to more massive structures which shield them directionally from radiation and their high energy level. It is interesting to note that Meson and Hyperon mass is expressed in electron multiples which correlates with the expression of atomic mass in proton multiples.

The photon must be the fundamental detectable building block. The electron is the next stable detectable material assembly. Since the proton is a composite particle with a spectral signature which is penetrated by photons, it must be an assembly of electrons. Atoms are assemblies of protons which are penetrated by both photons and electrons. Molecules are even more porous assemblies of atoms. Matter is the assembly of molecules and/or atoms. The structural integrity of these stable particulate entities decreases with physical size.

Chemistry deals with the assembly of molecules and atoms. The manner in which protons and electrons are assembled is unknown. Their likely source would be a stellar core which could exert the high compression required. Since protons and electrons have essentially uniform mass, there must be boundary restrictions that limit and define their uniform size. These imposed limits must produce the fundamental particle structures that survive in the stellar core. A logical stellar scenario is offered in the subsequent chapter on cosmology.

Gross matter, as we perceive it, begins with the proton. Its spectral signature reveals its composite nature. A spectral line is a high frequency pulse emitted by the internal cooling system of an atom. The spectral pulse dissipates the energy of aethereal fluid external impulse on an atom. It differs from reflection in that a spectral signature is formed by a number of resonant frequencies within the atomic structure. Impulse energy increases internal temperature which will separate the constituents of the atom unless relieved. The pulses emit internal energy from the atomic core.

The proton is stable at all natural ambient conditions. However, high velocity collisions in a particle accelerator break

it down into fragments. Since none of the fragments larger than an electron are not stable, the proton must be the minimum stable mass at ambient conditions. The fragments are all categorized by electron mass multiples. There must also be a limit on maximum proton size. This limit is enforced by the cooling capacity of its inner cooling network interstices. The interstices are too small to pass electrons. This suggests that protons are formed from contiguous electrons. Only compound (multiple proton) atoms are penetrated by both electrons and photons.

Mass is the displacement of aethereal fluid. As Ernst Mach stated; **" The motion of a particle is only meaningful when referred to the rest of the mass in the universe; this motion is thus determined by the distribution of this matter and is not an intrinsic property of an absolute space"**. The volume of cosmic objects made up of gross matter is virtually infinitesimal relative to the volume of essentially empty space. However, the summation of the mass of infinitesimal aethereal fluid particles that occupy space and permeate gross matter is virtually infinite. This is consistent with Mach's conclusion. Mass is the quantitation of inertia. Matter is the assembly of basic photon digits and energy is the summation of the action of individual photon digits. It is therefore logical to conclude that the resistance of mass to a change in energy is proportional to the number of energy digits which produce the change. Mach must have accepted the presence of an aethereal fluid of infinitesimal mass particles to have stated his principle. His "absolute space" must refer to a space devoid of matter. It is surprising that the inability of physicists to define mass has not led them to recognize the logic of Mach's Principle. It attests to their dogmatic acceptance of the emptiness of space without understanding that the emptiness was assumed based on the ignorance of wave properties and behavior.

CHAPTER 11: QUANTUM THEORY

"We now know how completely the quantum permeates all existence. With the physicist it has become almost an obsession, haunting his every equation, dictating his every experiment, and leading him into long and not always fruitful argument with philosopher and priest on god and free will."

"THE STRANGE STORY OF THE QUANTUM" Banesh Hoffmann (1959)

Max Planck discovered that the addition of a minute constant to the radiation equation for frequency was required to agree with the data. His constant averted what was referred to as "The violet Catastrophe". Violet is the highest visible frequency. The catastrophe was that the calculated light frequencies were all too high. Planck's law equates wave energy to frequency times his constant. The amount of wave energy was described as a bundle and called a quantum. Quantum Mechanics is based on equating Planck's energy to Einstein's inertial energy and applying Ideal Gas Law to compute radiation energy and its effect on mass entities. The five dynamic attributes are position, momentum, translational energy, spin energy and spin orientation. The dynamic attributes are treated as waveforms. The static attributes are the mass, charge, spin ...of quantum entities. The fundamental quantum entities are the electron, proton and photon.

The methodology is to calculate a wave function and then find the corresponding proxy wave in a waveform dictionary. Next the dynamic attributes are correlated with waveform properties. The properties may have any number of values. The properties are then broken up into their waveform components. Each component has an amplitude. Quantum wave intensity is amplitude squared. Squaring the amplitude of each component defines the probability of each possible wave event which concludes the description of the quantum measurement process and provides the requirements for experimental verification.

No one seems to understand why this abstract methodology works. However, it is accepted without understanding because it does work. Unfortunately the abstractness of the method leads to equally abstract explanations of the results which are treated as realities despite the absence of conceptual meaning.

Quantum mechanics uses wave effects as a substitute for causal understanding of wave action. Light behavior is predicted using an abstract synthesis of reality. When h is recognized as the energy of a photon all of the attributes are converted to real mechanical values. Energy is mc^2 . Momentum is mc . Position is position. Spin energy is a function of spherical rotation. Spin orientation is a function of the 2 polar degrees of rotational freedom.

The greatest insight is provided by the mechanical transformation of Schroedinger's Wave Equation (S.W.E.). The equation is: $E = n^2h^2/8Ma^2$ n =an integer eigenvalue. h =Planck's Constant. M =quantum entity mass. a =the width of a one dimensional

box with infinitely high sides. m =photon mass. The width of the one dimensional box is one half the wavelength of the frequency of a moving particle trapped in the box which defines its resonant frequency. When mc^2 is substituted for h , S.W.E. can be broken down into its mechanical constituents. $E = mc^2/2 \times m/M \times (nf)^2$. f = linear frequency = quantum intensity. The first term is the kinetic energy of a photon. The second term is the mass ratio which defines momentum transfer and the third term is the wave energy variation with harmonic multiple. Wave energy is proportional to receiving area. Particles per unit area is linear frequency squared. S.W.E. is the summation of photon energy transmitted by interaction with mass M !

This breakdown confirms the reality of DeBroglie's Equation and that h is the energy of a light wave particle traveling at the local light velocity. A mathematical model of the mechanics of corporeal light behavior (Appendix 1) correlates with observed light properties. The model reveals that velocity varies with media temperature. Since light velocity establishes the value of Planck's Constant h , h is only constant at the local media conditions established by the earth's field. Hence, quantum calculations are only accurate at local conditions. This dramatically illustrates the hazards of not recognizing the meaning of Planck's constant.

Waves are non-inertial and their energy is the summation of a myriad of diverse events. The large number and diversity of events is a statistical matter of probability. A conjugate probability wave is the reaction of the medium to a light wave. Wave energy is the summation of its frequency component energies. A frequency component is produced at each specific particle velocity. Particle velocity establishes the energy of the wave. Hence, the combination of frequencies which produce a waveform is proportional to wave energy. Using analytical wave breakdowns reveals the effective particle velocity components of the wave which have mechanical inertial equivalents. S.W.E. defines the summation of light particle energy received per unit time.

The variation of a waveform shape with its constituent particle velocities (frequencies) is the essence of quantum mechanics. Simple examples are the sawtooth wave which is the sum of the even harmonics and the square wave which is the summation of the odd harmonics. A wave is a media resonance initiated by an energy input resulting from the elasticity of the transmitting medium. The wavelength is the transmission distance per cycle which is determined by the elastic response of the medium to the input energy producing displacement. Wave transmission velocity is established when media resistance equals wave emission pressure. The number of media particles encountered per unit time is the source of media resistance. Frequency is proportional to ratio of input pressure to media resistance at transmission velocity. It is

simplistic to picture a wave at a single frequency because the products of the particulate interactions which transmit energy have an infinite number of possible velocities. All of these velocities are transmitted simultaneously because mean free path does not change with particle velocity. This enables the transmission of color which is detected by particle impulses which are discerned as the frequencies of visible light. Individual photon impulses are identified by the multi pixel sensing of the retina or other visual receiving sensor. The reception is a purely digital process.

Quantum mechanics is a valid cookbook system which surmounts the ignorance of those who accepted the Michelson-Morely results as proving space to be empty. However, there is no logical reason to continue to treat it as magic. It is simply the equating of the inertial formulae of Ideal Gas Law to the non-inertial behavior of waves. Knowing why the various analytical steps are taken, how they are taken and the significance of taking them provides conceptual reality. There is no doubt that the methodology of quantum analysis will benefit from this understanding.

An example of an analogous mechanical process is the acceptance testing of a gas turbine engine. A gas turbine requires very high rotational speeds which are reduced to usable values by complex gearing to drive its control components or/and provide shaft power output. Every component has a natural resonant frequency and every component interaction or reaction produces a vibration frequency. The vibration magnitude is measured by accelerometers and fed into a panoramic frequency analyzer which segregates the frequency components. Each frequency identifies a component action or reaction. Vibration is destructive and limits the turbine life cycle. The vibration frequencies correlate with a dictionary of component actions. Frequency magnitudes define acceptability or the areas where corrective action is required. Most of the vibration frequencies are within the sonic range. The turbine engine is accoustically referred to as a white noise generator.

Quantum wave energy is amplitude squared. What is amplitude? It is intensity. What is intensity? It is the number of particulate impulses per unit time. What is intensity squared? It is number of impulses per unit area which defines energy received. What is frequency? It is the number of impulses per unit time. What is frequency squared? It is the energy of the wave. The application of these terms assumes an average unilateral spacing of wave particles. It establishes that frequency and intensity are synonymous and provides the meaning of Planck's frequency. Had this equality been recognized, Einstein's mass would have been treated as the summation of particle mass and the dimensions of h would have been corrected. h would have then been recognized as the energy of a light transmitting particle.

Quantum theory was developed by proponents who believed space

to be empty but accepted the wave behavior of light. They ignored the requisites for wave energy transmission and synthesized an ideal wave. The result was a working recipe without logical conception. The only reason it worked was the ability to translate the wave behavior into mechanical values hidden by the mysterious constant h . Quantum mechanics is locally valid but adjustments are required to justify its universal application.

CHAPTER 12 METEOROLOGY AND GEOLOGY

More than 99 percent of the molecular mass of the earth's atmosphere is contained within an altitude of 50 miles. The percentage contained at a given altitude is 1 minus altitude pressure ratio (Δ). The atmosphere is divided into zones. The troposphere extends from 0 to 10 miles, the stratosphere from 10 to 30 miles, and the thermosphere from 50 to 400 miles. Beyond this is the exosphere which includes the magnetosphere 400 to 40,000 miles. The Van Allen Radiation Belts are the outermost concentrations of gross (electron or greater) mass in the atmosphere.

The troposphere contains dust, molecules, atoms, protons, electrons and photons. The stratosphere is nearly free of dust and heavier molecules. The exosphere is nearly free of molecules. The thermosphere is a concentration of photons and electrons organized in the earth's detectable magnetic field along with the Van Allen belts. The sum of contained particle mass decreases radially outward from the earth's surface. The containment limits are established by the impulse of the confining atmospheric constituents. Since momentum transfer is proportional to the ratio of projectile to target mass, the particle mass gradient results from square law decrease in the particulate aethereal field concentration.

The magnetosphere is distorted into a tear shape by the solar wind which is formed by the action of high energy solar radiation on lower energy atmospheric field pressure. The teardrop shape is symmetrical relative to the ecliptic plane. The solar wind acting on the magnetosphere exerts a force opposing gravitation. The exertion of this centripetal force balances the orbital drag which would impel degradation of the earth's orbit. Without orbital drag the earth would move away from the sun. This is another confirmation of aethereal presence.

Inside of the magnetosphere are the essentially toroidal (doughnut) shaped Van Allen belts. The outer (principally electron) belt and inner (principally proton) belt are concentric with the earth and symmetrical and normal to with the equatorial plane. Their concentricity results from the much greater photon population at the earth's poles which also forms the doughnut hole. This high photon concentration is the source of the auroras and accounts for the increased summer brightness when they have maximum solar energy input.

Other divisions of the atmosphere are made by electromagnetic reflection properties and composition. The Kennelly-Heaviside molecular layer of the ionosphere, which extends from an altitude of 50 to 100 miles, reflects low frequency radiation. Above that are the Appleton mainly Oxygen (100 to 150 miles) and mainly Nitrogen (above 150 miles) layers. The composition consistency is divided into the homosphere (below 65 miles) where the constituents are mixed by turbulence and the heterosphere where the constituents

tend to be stratified. The radial pressure and particle mass gradient with altitude prevails throughout.

The turbulence in the homosphere indicates the action of vortices generated by resistance of the atmosphere to the earth's rotation and passage through space. The resistance to rotation is the source of the Coriolis forces which result from the surface rotational velocity gradient from the equator to the poles. The resistance of the aether to spatial passage is greatest in opposition to direction of rotation which produces stronger vortices. These vortices produce the Jetstream counter flow. The greatest difference in resistance to orbital passage resulting from rotation is in the ecliptic plane which accounts for Jetstream seasonal migration. The rotational turbulence gradient accounts for the fact that the tropical atmosphere is nearly 40 degrees F. colder than the polar atmosphere at 54,000 feet altitude. This cold temperature (-110 degrees F.) is the source of high altitude aircraft system icing problems in tropical regions such as the Bermuda Triangle.

Clouds shield the earth's surface from containing aetheral fluid impulse reducing the surface atmospheric pressure. This reduced pressure reverses the pressure gradient which generates the Coriolis forces producing counter rotation around the cloud shielded region. The eye of a storm is the center of this rotation which may be cloud free because of the separation induced by centrifugal force. In areas free from obstacles there is less resistance to rotation so that the clouds separate more easily and the surrounding winds can reach hurricane velocities. When the clouds are denser and form massive Thunderheads the circulation is maximized at the center producing whirlwinds and tornadoes.

The structural properties of the atmosphere and weather phenomena are entirely consistent with aetheral fluid formation of fields and the interaction of these fields with surrounding space. The most significant conclusion is that an atmospheric pressure decrease results from the weather instead of the weather resulting from the decrease.

Geology is addressed in this chapter because its dynamics result from the confining focus of the atmospheric field. The temperature lapse rate in the lower atmosphere is about 2 or 3 degrees F. per thousand feet. The temperature lapse rate in the outer region of the earth's mantle is about 1 degree F per 92 feet. This order of magnitude difference results from the increased resistance of the solid surface to penetration with the consequent increase in expended energy. If the surface temperature lapse rate is extrapolated to the earth's center, the temperature would be 219,235 degrees F. Temperatures in deep mines suggest that the gradient increases significantly with depth which makes the extrapolated value quite conservative. Speculation that the high core temperature results from radioactivity is unnecessary.

The earth is a liquid ball with a solid skin confined by the impulse of aethereal fluid. The isogeotherms in the liquid core are spherical. The ocean penetrates the solid mantle reducing its thickness. The reduction in structural integrity allows the continuous emission of liquid core material. Heat is rejected to the ocean as this material solidifies which maintains containable core pressure. The continuous solidification of core material forms the rift valleys and provides the impetus for plate tectonics while dissipating the solar impulse energy input of aethereal fluid. Vulcanism and seismic activity occur when cooling capacity is exceeded. Seismic activity is also increased at lower atmospheric pressure by tidal forces.

Aethereal fluid impulse confinement of matter is confirmed by the spherical shape of the earth and its surrounding field. The spherical shapes can only result from the geometric summation and focusing of fluid impulse energy by the interference of immersed mass. The resultant logarithmic pressure gradient agrees with ideal gas law predictions based on the external compression of a gaseous fluid. The application of aethereal fluid mechanics which help solve the ecological puzzle.

CHAPTER 13: COSMOLOGY

"The universe enfolds us. We are made of its basic material. The hidden forces which control it are those which animate us. Matter and energy evolve in space and time. Life adds to these the power of thought which enables us to analyze and understand a little of what we perceive."

Preface to "The Universe of Science" by Charles-Noel Martin

The satellite era has yielded data which disagrees with accepted cosmogony. Galaxies that predate the Big Bang. Radiated spectra of unknown origin. Increased spatial density surrounding high energy X-ray stars. The very hot atmosphere of distant Jupiter. The continuous vulcanism on Jupiter's moon Io. Gamma ray pulses of undetected origin. All of these discoveries are rationally explained by the concept of a fluid universe.

Cosmology requires a great deal of speculation since its scale exceeds the limits of our experience and conception. We can only extrapolate our direct experience on the basis that the universe is a homogenous entity to which the same local scientific laws pertain. Otherwise its pursuit would be as meaningless as the gods of ancient cultures. The advent of an omnipresent aethereal fluid energy source and the presence of an overall stable universe provides a conceptual tool capable of explaining cosmic action. Stability requires the basic equation that $\text{Entropy} = \text{Negative Entropy}$. Hence, every stable cosmic object can only exist in a state of energy balance where input equals output. Energy is the pressure of aethereal fluid which is temperature. It is accumulated by the interference of a mass immersed in space and diffused by radiation to space. Mass is the static summation of energy.

A whole new set of criteria are established for the astronomer. Light velocity is no longer constant which deletes the concept of time as a dimension. Force is a matter of compression and no longer attributable to action at a distance. Tensile forces can only be applied to entities within the limit of the cohesive forces which form them. Surprisingly, these changes do not conflict with astronomical data.

The stars are the acknowledged source of cosmic energy distribution. The most accessible example is our sun. The sun is confined as a sphere by the impulse of aether. Its confinement is defined by its effective displacement which defines the input energy. Its equilibrium is preserved by its radiation. Whatever transpires internally maintains the energy balance commensurate with the geometry of concentration and diffusion. Concentration is the 3 dimensional focusing of random fluid action by immersed mass. Detectable displacement is its visible surface. The corona is formed by the rejection of energy to maintain structural stability.

Stars are formed from clouds of Hydrogen which transform the low level confinement of aethereal fluid impulse into high energy

radiation by squeezing protons into contiguous assemblies and emitting the energy surplus produced by reduced external displacement. The cosmic process is equivalent to condensation. Inside the suns visible shell the temperature is many million degrees. The normal states of matter have no meaning. The most probable material state is a plasma like very dense turbulent liquid formed from atoms, protons, electrons, and photons.

In particulate structures made up from identical spherical building blocks the density of the structure is inversely proportional to the displacement of the individual block. Hence, assemblies of the largest blocks are the least dense. The largest block is the proton and the lowest density structures are atoms. These atoms are impelled outward by the turbulent plasma and form the solar surface. Sunspots are equivalent to vulcanism on earth. Their energy is rejected at frequencies far above the range of visible light so that they appear be voids. They are actually breaches in the surface which increase the rejection of internal energy to space at increased radiation frequencies.

Accumulation of atoms at the surface increases opacity. Energy rejection frequencies decrease and internal pressure increases. The shell expands decreasing its opacity. Expansion increases the confining aethereal impulse energy input as well as the energy rejection rate. The process is self destructive. The rate of input increases faster than the rate of output. The shell expands and the output frequency is shifted toward the red. The pressure within the shell has increased immeasurably. When the shell can no longer contain the internal pressure it ruptures producing an expanding unconfined nova. A solid material core remains at the center. Its very high temperature rejects heat at high frequencies. Radiation frequency decreases as it cools.

The reduced core confinement pressure allows the compressed core to expand. As it expands its density decreases and it adsorbs heat. It is ablating, melting and evaporating. Again the process is self destructive. The energy adsorption maintains a very low confinement pressure. As the expansion continues the core cools. It becomes a black hole radiating matter and adsorbing energy. Energy adsorption forms an inverse pressure gradient. This gradient exerts a strong gravitational influence on proximate bodies analogous with the shielding influence of a very large mass.

When expansion ceases, mass coalition begins. Confinement pressure increases as central mass is accumulated. The central mass is a proton cloud surrounded by nebular atomic debris. The action is essentially cosmic condensation. Electromagnetic radiation emission begins as solidity increases and displaces photons. The core mass controls the action of the nebular debris coalition. Nebular fragments are captured within the surrounding field. Captured nebular masses orbit and converge as the central mass accumulation increases. As the debris coalesces it shields

more distant debris from the central mass. Debris accumulates at the most shielded positions forming an ecliptic plane. The debris coalesces forming coherent masses which sweep the vicinity of their orbits.

As mass accumulates temperature increases. When core temperature reaches the melting point, solidified magma forms a spherical surface shell. This action is consistent with observations of Jupiter's moon Io which is in a state of continuous vulcanism due to the strength of the surrounding field and its proximity to Jupiter. The logarithmic distribution of our solar system planets versus the logarithmic variance of their orbital velocity is shown in Figure 13-1. The central question mark is the asteroid zone.

The end product of the nova is a sun surrounded by planets. The random chaotic action of aethereal fluid and its focusing by the displacement of immersed mass concentrations provides a logical mechanical cause consistent with solar system evolution. A solar system may be a cyclic entity where the destruction of the nova plants the seeds for its rebirth.

Matter is formed from basic particles of uniform and stable mass. The universal prevalence of these fundamental particles in a stable steady state universe requires a mass formation process which can account for their discrete homogeneity. The fundamental particles are the proton, the electron and the photon.

The proton is the largest of these stable particles. A proton has a spectral signature and can be fragmented. Therefore it is a compound particle made up of smaller particles. None of fragments of a smashed proton are stable with the exception of the electron. Since it is not necessary to attribute a magical innate repulsive charge to account for electron behavior, a proton can be composed of electrons and electron subassemblies. The mass of unstable proton fragments (nucleons) is expressed in electron mass units.

The high reflectivity of electrons suggests that they are not penetrated by photons. The lack of penetration indicates that it must either be a fundamental particle or made up of contiguous photons. Causality in a universe fueled by the action of aethereal fluid on immersed mass proscribes that the electron is a compound particle assembled from the smallest detectable stable particle which is the photon.

The only available potential electron and proton manufacturing facility is a star. The radiation that contains a star also penetrates any material assembly larger than the electron. The star maintains its size by the radiation of containment impulse and atomic fusion energy. The radiation pressure (temperature) is greatest in the core. The outer layer of the core is formed from Hydrogen atoms and their fusion products. As the protons fuse into larger atoms electron pressure increases. The less massive atomic structures are impelled outward by the radiation pressure and

turbulence. They form the solar surface at the point where radiation pressure equals confinement impulse. The region between the surface and the outer core is a turbulent strata filled with electrons, protons and atomic gases. Moving radially inward through the core, the temperature and concentration of protons increases. The containment pressure exceeds the internal pressure which separates proton subassemblies forming an essentially contiguous proton region. The photon pressure at the center star is greatest and must be equal to the summation of spatial fluid containment pressure acting on its surface to prevent collapse. When the pressure exceeds the structural integrity of protons, it is made up of electrons and proton fragments. The center of the star is made up of contiguous photons. The star must radiate energy to prevent explosion. Stability is maintained by the radiation of contiguous photon masses.

These contiguous photon masses must pass through the interstices of the contiguous proton layer. The photon masses can not penetrate the electrons which form the protons. Therefore their size is limited by the maximum opening of the interstices. The exuded masses are eroded as they pass through the contiguous proton matrix interstices. The erosion of the solid photon emission produces the spherical structure of the electron which has sufficient mutual photon shielding and low enough mass to remain a stable particle under reduced pressure conditions. Free photons or other particles do not cohere to the impenetrable and very active electron. The large number of contiguous constituent photons that form the electron surface make it impervious to penetration. The electron mass reacts to photon impulse as an impervious entity. This explains the high reflectivity of the electron which has been erroneously attributed to its displacement. The energy transmitted to an electron by a photon is about 10 to the 4th times the amount transmitted to a small atom because of its lesser mass. In turn the energy transmitted by electron is 10 to the 4th times the amount that would be transferred to a small atom by a photon mass with the same energy. Hence, electrical energy is about 10 to the 8th times photon energy relative to atomic masses.

Protons are produced in the later phases of the stellar life cycle. The greatly compressed post nebular core remnant expands as it cools and the pressure within the nebula decreases. The pressure within the core drops rapidly as the expansion continues. There is insufficient pressure to retain contiguous proton assemblies so that the black hole is radiating protons which is the greatest unit of coherent mass at the very low surface pressure of the cooled core remnant. The process is analogous with the ablation of a solid and the evaporation of a liquid. The discovery of a radiation source with spectral signatures that do not correlate with known atoms can be attributed to the last radiation cooling stage of a stellar core remnant. This is

consistent with high frequency radiation which would produce the greatest reaction to expansion.

The preceding scenarios which hypothesize a solar cycle and a particle factory can not be dismissed lightly as speculation. They agree with the data and provide a logical rational explanation for that data. Such phenomena as the electron storms observed in the suns corona, the electromagnetic radiation storms created by sunspots, the phases of solar structure and the existence of non-visible gravitational influences support these hypotheses.

The Popular Big Bang Theory validity is not substantiated by the data. All data cited as supporting BB also supports a fluid universe without radical assumptions like a point mass. Mass is displacement and a point has no displacement. Generating mass from nothing is magical creation and can be only be considered as poetry, fantasy or religion. If Hubble's Constant is radially symmetrical, BB originated at the earth's center. The correlation of Hubble's Constant with distance has been established. However, only relating it to attenuation can account for its symmetry relative to the earth. The balloon surface analogy is geocentric and does not apply to any other point of origin. Frequency does change with attenuation as is apparent in everyday phenomena such as sunsets, distant campfires, the action of the tropopause or any other electromagnetic wave frequency reduction with distance traveled or media density. Hubble's Constant supports the universal presence of aethereal fluid and variable light velocity.

Variation of electromagnetic wave velocity destroys the accepted unit of universal scale and the application of time as a dimension. The light year measuring stick has the properties of rubber. The recognition of photon mass makes it subject to gravitational influence. This influence coupled with the existence of non-visible gravitational influences potentially introduces distortion into visually accumulated positional data. However gravitational distortion offers keys to the explanation of some phenomena such as pulsars and gamma ray bursts.

A news article reported; "Two gamma ray bursts mystify experts. The gamma ray bursts came from Mararkarian 421, which is estimated to be 400 million light years away, on May 7, 1996. Scientists think a spinning black hole in these galaxies somehow sends out jets of matter and radiation. These jets bump into energy packets called photons changing them to gamma rays scientists theorize." This causality explanation is fluid mechanical nonsense. The fact that the wave energy was received is very remarkable from such a far distant source. The burst origination frequency must have been much higher than the received frequency. An emission at the necessary energy level could only come from a supernova fission of a stellar core where the emission occurred at the initial time of fission releasing central core energy. The burst may have come from some other source and arrived

at a coincident location. There is significant potential error in observations taken at the reported range due to the intervening field and non-visible radiation directional influences. Although radiation energy is diffused with distance traveled it can also be focused by the intervening fields. Figure 13-2 shows how a binary system focuses radiation on an extension of the system centerline. Each binary member field acts like a double convex magnifying lens. A black hole would act like a double concave lens.

The preceding cosmological hypotheses are speculative. However, this speculation offers logical potential explanations of the cosmic entities observed, the ingredients which form them and their behavior relative to each other. A conceivable universe that does not conflict with available accepted data.

CHAPTER 14: SUMMATION, CORRELATION AND REFLECTION

In his book "QUANTUM REALITY" Nick Herbert states: "One of the best kept secrets of science is that physicists have lost their grip on reality." He goes on to summarize seven possible philosophical viewpoints. "1) There is no deep reality. 2) Reality is created by observation. 3) Reality is an undivided wholeness. 3) Reality is an undivided wholeness. 4) Reality consists of a steadily increasing number of parallel universes. 5) The world obeys a non-human kind of reasoning. 6) The world is made of ordinary objects. 7) Consciousness creates reality." Only number 6 is philosophically acceptable. The remainder must be characterized as rationalizations to excuses for being irrational

A quote from the introduction of the late Richard P. Feynman's book "QED" illustrates the reality dilemma: "What I am going to tell you about is what we teach our physics students in the third or fourth year of graduate school-and you think I'm going to explain it to you so you can understand it? No, You're not going to be able to understand it. Why, then, am I going to bother you with all this? Why are you going to sit here all this time, when you won't be able to understand what I am going to say? It is my task to convince you *not* to turn away because you don't understand it. You see, my physics students don't understand it either. That is because I don't understand it. Nobody does." I respect Richard Feynman and believe his sum of histories approach to quantum theory a rational approach considering the unsubstantiated hypotheses with which he was programmed. His entreaty to the reader is authoritarian and contrary to the criteria for validity.

Einstein stated in his autobiography: "I still believe in the possibility of a model of reality-that is, a theory which represents things themselves and not merely the probability of their occurrence." Einstein was unable to accept statistics and probability as a scientific basis. This led to his postulation of field theory and his dismissal of the presence of an aethereal fluid. It was the dawn of the digital age. Digits were only toes, fingers and mathematical units. He failed to recognize the limits of physical certainty.

The infinitesimal calculus of Leibniz teaches us that the summation of infinitesimals is a certainty. The fluid universe concept is a model that represents things themselves. It is based on an infinite number of infinitesimals which form the observable universe.

Maxwell developed his electromagnetic equations on the basis of an unknown fluid medium. He arrived logically at the fluid properties required to produce the behavior of electricity and magnetic fields. His theory exemplifies the role of logical extrapolation of established fluid behavior to explain effects

without discernable cause.

Extrapolation was Newton's tool. His gravitational equation was empirically derived with no concept of the physical entities and forces which produce the apparition of action at a distance forces.

All of these men believed in causality and were able to develop empirical explanations without the capability to discern the specific physical characteristics of the entities which produced the effects they were explaining.

The reality problem arose as a consequence of not recognizing the distinction between a cause and an effect. The mechanics of wave action were not understood well enough to extrapolate their application or to define the criteria for periodic non-inertial energy transmission. Experimental data was misconstrued and physical idealism was born. The progress in fluid mechanical behavior made in the engineering sciences was not applied by physicists. Philosophers weren't able to understand the abstract physical concepts. Reality could not be recovered because no one determined how or where it had been lost. The problem was promulgated by the application of the empirical method to theory. As long as a process worked, it was not considered necessary to know why or how it worked. The paradigmatic adherence to pseudo reality did not allow reiteration. Logic was abandoned as a criterion for scientific validity. The resultant status is a rote process without conceptual understanding.

The solution to the reality problem is to reiterate by going back and correcting the mistakes which have led to the loss of reality. Cosmic objects form as spherical entities because they are contained by external pressure. This is confirmed by the structure of the pressure distribution in their fields. Space appears to be empty because it is transparent and exerts no apparent influence on material objects. The only unseen physical entity which can exert a uniform compressive force is a gaseous fluid. Light energy is transmitted as a non-inertial wave. Energy is transmitted by mass. A wave requires a medium of inertial particles to transmit energy. A medium which accounts for the wave behavior of light and the apparent emptiness of space can be derived from existing and accepted physical data. The derivation applies fluid mechanical equations which account for the transmission and behavior of sound in a gaseous molecular fluid. This solution restores causality to science without conflict with the accepted data.

The solution impacts every scientific discipline. Its greatest value is the conceptual causality provided for many unexplained phenomena. The greatest problem is that it obsoletes many long accepted physical hypotheses and restructures physical science from the very beginning. All current scientific texts require significant revision and all physical scientists need to be reprogrammed. The only thing which remains unchanged is the data

and the empirical experimental method. The scientific techniques and technology are still valid but the reasons for their validity are changed. All that is gained is conceivable scientific reality. However, this gain is the most important of all because it forms the basis for extrapolation and the direction of scientific progress.

Our conception is limited by our experience. Historically every theory outside of the range of our direct perception has been challenged. Although atoms were conceived by the early Grecians, a long battle raged in Newtonian times over whether they existed. A similar problem exists with the fluid universe concept. We have problems with extrapolating our thinking to the realm of the inconceivable. E28 particles with a mass of E-45 grams per cubic centimeter is inconceivable. Even the number of atoms per cubic centimeter at standard conditions is inconceivable. We solve the conceptual problem by treating the particles as a fluid and learning how a fluid works. The same is true of a gaseous wave. We are amazed to find that grotesque indiscernible creatures live in our eyelids. The problem is dealt with by extrapolation and averaging. Taoism refers to the universe as the great oneness of which we are all a part. If scientific laws are universally applicable, extrapolation has no limit. If these laws are not universally applicable, then science is meaningless and a waste of time.

A major conceptual hurdle is action at a distance and the apparition of attraction without any tensile connection. The accepted solution that attraction is an innate property of mass does not agree with confirmed physical behavior. The apparition is only the effect produced. It is an assumption which attempts to explain what's happening. Molecular fluid mechanics deals with an analogous problem. Suction appears to be an attractive force. However, the reality is that air is pushed into a vacuum cleaner and air pushes water up a shallow well. Suction is only the direction of compression. Tensile forces are limited by the cohesion of the tensile members. Cohesion results from compression. The repulsion of electrons (charge) is only the expansion of electron pressure as is demonstrated by static electricity.

There are many instances of phenomena which scientists have found and attempted to explain with little success which confirm the fluid universe concept. The following are some examples:

LIGHT SHOWN TO BIND MATTER

Researchers at Harvard university and the Roland Institute, a private research center in Cambridge, have discovered a way that light can bind matter into molecules.

The scientists formed the "optical molecules" by using a previously unknown interaction detected accidentally while conducting other experiments. Dr. Jene Golovchenko, a professor of

applied physics at Harvard said the finding was a surprise.

"I don't think that anyone suspected that you could organize random matter into structures using light", he said.

Previously the only way to bind matter was by atoms exchanging electrons, giving rise to forces that stabilize the matter in everything from pencils to planets.

In the new work, however, laser light focused on tiny plastic spheres caused them to move toward each other and bond.

In explaining the "binding force", the scientists said "The spheres act like miniature antennas that pick up and reradiate light. The scattered light combines with that coming from the laser giving rise to force fields that bond the small spheres together. This article appeared 11/5/89 in the Arizona Republic newspaper and was described in an issue of Physical Revue.

BALLS O' FIRE CREATED

The following excerpt from a New York Times article was published in the Arizona Republic on 3/19/91.

"Two Japanese physicists have reported that they have created glowing discharges suggestive of natural lightning balls and that these balls can now be studied in the laboratory.

The two, Yoshi-hiko Ohtsuki of Waseda University and H. Ofuruton of Tokyo Metropolitan College of Aeronautical Engineering, said they built a microwave device that creates glowing, lightning like, balls that float in the air and exhibit many of the properties attributed to ball lightning. They described their research in the current Journal "NATURE".

In some of the experiments they described, the fireballs persisted for a second or two, floating in air, after the power that created them was switched off. These artificial lightning balls also proved capable of passing through sheets of ceramic material seemingly unchanged and without damaging the material....

If ball lightning does consist of plasma, as many scientists believe, it remains to be shown what force or forces hold the plasma together in spherical form...."

Electrons without the assumed property of innate charge are only diffused by their high energy level. When concentrated to exert sufficient mutual shielding, they would be compressed into a spherical shape by aetheral fluid impulse. The fragile electron structures would have some capability of penetrating solid materials.

ATOMS MOVED 1 BY 1 IN "FASCINATING" STEP

An article in the Arizona Republic reprinted from the British journal NATURE reported the assembly of xenon atoms on a Nickel plate to form the letters IBM. "It took 22 hours to arrange the 35 Xenon atoms. The formation was accomplished under a scanning tunneling electron microscope at a temperature of -452 degrees Fahrenheit (4 degrees Kelvin). The arrangement was done using a needle which magnetically attracted the Xenon atoms so they could

be moved over the microscopically rough Nickel surface. The process was described as comparable to dragging ping pong balls across the surface of an egg carton."

Xenon is the heaviest of the inert gases and is an assembly of 131 protons. Assuming a spherical shape its diameter is about 6.3 times the diameter of a proton. Nickel atoms are made up of 58 protons which is a spherical diameter of 4.8 diameters. These values are consistent with the ping pong ball-egg carton analogy. The magnetic needle adsorbs photons. This distorts the Xenon atoms compressive field so that it adheres to the needle.

SONOLUMINESCENCE

Sonoluminescence is the observation of picosecond flashes of light observed in a sonically excited fluid. It is similar to the luminescence of a ships wake in tropical waters. The light flashes are produced by the collapse of cavitation bubbles. The bubbles are water vapor formed by the energy of the agitation and the ships propellers. The evaporation which forms the bubbles adsorbs photons from the surrounding liquid. When the bubbles cool and collapse. the adsorbed photons are diffused producing the light flashes. The mechanics accounts for the destructive temperature induced erosion of cavitation in hydraulic water and fuel pumps.

It is interesting to note that the ancient Grecians may have come closer to the concept of the universe than the physicists and astronomers of today. Alchemy has been dismissed as an invalid explanation of chemical behavior. However, if we consider the available data in that time period, it describes the tenets of the fluid universe concept. Earth is solid, water is liquid, air is gaseous and fire is energy. The three states of matter and energy. Precisely the cyclic states of the cosmic universe and the causes and effects of those states.

CONCLUSION

The concept of a spatial fluid provides a superior basis for all physical relationships and entities. It is both scientifically and logically consistent. This manuscript is an attempt to present the concept and its significance to the major physical disciplines as briefly as possible without preaching or recriminations. As the work of a generalist, it may err from accepted idiom in many areas. However, within the reasonable bounds of semantic meaning, it presents a concept of a logical and conceivable universe without conflict with available data. In addition it eliminates many suppositions which have been accepted without a causal foundation and explains many mysterious phenomena. It provides the reality which is the philosophical basis for science. It has been prepared with the knowledge that it will be protested, ignored, disputed, torn apart and suppressed despite its inductive derivation. It conflicts with the predominant beliefs of the establishment. However, it does concur with direct experience without resort to fantasy or superstition. Although painful to those who may have

jumped on the wrong wagon and distressing to the current academic physical establishment it must be considered if we want to understand the universe and progress beyond the scope of technology.