

Reasons to Reconsider the Aether of Classical Physics.

Paul E. Rowe

Abstract

This essay has two sections. Section one includes evidence from the scientific literature that surprisingly large quantities of hydrogen gas have been produced from vacuum and suggests that the knowable universe may be permeated with a matrix of protons and unpaired electrons. If this is the case, vacuum may not be void, as Einstein believed and convinced the physics community, but rather a matrix of protons and unpaired electrons. The matrix might it be Bose Einstein Condensed hydrogen or some other combination of protons and unpaired electrons. Unpaired electrons are required to explain the dielectric and magnetic properties of vacuum employed by Maxwell in developing his wave equations. The presence of such a matrix, in vacuum, permits simple explanations for many observed physical phenomena.

Most of the quotes are from highly respected scientists. All quotes in section one are from the Scientific literature.

Section two includes this author's preliminary efforts to explain many other observed physical Phenomena based on the existence of such a matrix. The following phenomena are included: Magnetic properties of vacuum, Dielectric properties of vacuum, Electromagnetic radiation, Gravity, The Nature of the chemical bond, Super collider experiments, Dark matter, Stellar Aberration, Einstein's Twin Paradox, and Star formation.

Section One

All quotes from the scientific literature are between quotation marks.

Christiaan Huygens (1678) "Treatise on Light"

"And it must be known that although the particles of the ether are not ranged thus in straight lines,

as in our row of spheres, but confusedly, so that one of them touches several others. This does not hinder them from transmitting their movement and spreading it always forward.”^{A 1}

^A Based on these assumptions, Huygens developed formulas which predict observed diffraction patterns. Would these formulas work if vacuum was a void?

“And this last point it is demonstrated even more clearly by the celebrated experiment of Torricelli, in which the tube of glass from which the quicksilver has withdrawn itself, the remaining void of air transmits light just the same as when air was in it. For this proves that a matter different from air exists in this tube and that this matter must have penetrated the glass or the quicksilver, either one or the other, though they are impenetrable to the air. And when, in the same experiment, one makes the vacuum after putting a little water above the quicksilver, one concludes equally that said matter passes through glass or water, or through both.”^{B 2}

^B Huygens’ particles must be extremely tiny to easily pass through such materials. Torricelli was a contemporary of Galileo and a fellow resident of Pisa.

Michael Faraday and Isaac Newton

“The strong conviction expressed by Sir Isaac Newton, that even gravity cannot be carried on to produce a given effect except by some interposed agent filling the conditions of a physical line of force.”³

“Newton says, ‘That gravity should be innate and essential to matter, so that one body may act upon another at a distance through a vacuum, without the mediation of anything else, by and through which their action and force may be conveyed from one to another, is to me so great an absurdity, that I believe no man who has in philosophical matters a competent faculty of thinking can ever fall into it. Gravity must be caused by an agent acting constantly according to certain laws; but whether this agent be material or immaterial I have left to the consideration of my readers.’ See the third letter to Bentley.”^{C 4}

^C Newton believed that an agent in vacuum was required to explain gravity.

James Clerk Maxwell (1891)

“In several parts of this treatise an attempt has been made to explain electromagnetic phenomena by means of mechanical action transmitted from one body to another by means of a medium occupying the space between them. The undulatory theory of light also assumes the existence of a medium.”⁵

“According to the theory of undulation there is a material medium which fills the space between the two bodies and it is by the action of contiguous parts of this medium that the energy is passed from one portion to the next, til it reaches the illuminated body.”⁶

“Let us determine the conditions of the propagation of an electromagnetic disturbance through a uniform medium which we shall suppose to be at rest, that is, to have no motion except that which may be involved in electromagnetic disturbances. Let C be the specific conductivity of the medium, K its specific capacity and μ its magnetic permeability.”⁷

^D Based on the above three quotes, Maxwell developed his wave equations, which predict properties of electromagnetic frequencies that Maxwell knew existed and many frequencies he didn't know existed.

Clarence A. Skinner (1905)

Clarence Skinner performed electrical discharge experiments in low-pressure helium. He reported that hydrogen gas was produced at the cathode and the initial rate of production followed Faraday's laws of electrolysis. He obtained thousands of times more hydrogen from a silver cathode than it could have originally contained and stated, “It shows no sign of having its supply of hydrogen reduced in the least.”⁸

Skinner reported that most cathodes tarnish during electrical discharge in pure helium. The introduction to his excellent article follows:

“While making an experimental study of the cathode fall of various metals in helium it was observed that no matter how carefully the gas was purified the hydrogen radiation, tested spectroscopically

persistently appeared in the cathode glow. Simultaneously with this appearance there was also a continuous increase in the gas pressure with time of discharge. This change in gas pressure was remarkable because of its being much greater than that which had been observed under the same conditions with nitrogen, oxygen or hydrogen. Now the variation in the cathode fall, with current density and with gas pressure in helium, was found to be so like that obtained earlier with hydrogen that it appeared necessary to maintain the helium free of the latter in order to make sure that the hydrogen present was not the factor causing this similarity in the results. Futile endeavors to attain this condition led to the present investigation, which locates the source of hydrogen in the cathode, shows that the quantity of hydrogen evolved by a fresh cathode obeys Faraday's law for electrolysis, and that a fresh anode absorbs hydrogen according to the same law." ^{E 9} .

^E *In this author's book* ¹⁰ . , *a different mechanism for the apparent reduction in the rate of hydrogen production as the electrical discharge continued.* ^F

^F *Some of the monatomic hydrogen atoms produced at the cathode react with diatomic hydrogen to form triatomic hydrogen which has a life of about one minute. Triatomic hydrogen is the best electrical conductor in the gas. In order to keep the current constant the voltage must be reduced. This results in a reduction in rate hydrogen production.*

"Helium was then admitted to the electrode tube and connecting chambers at a pressure of about three millimeters of mercury. In order to remove the last trace of foreign gases a discharge was passed for some time through the second Na,K tube. The pressure of the gas under this discharge remained unchanged, showing that the spectroscopic test made in the first Na,K tube was reliable. An electric current of 2 ma. was now passed from one of the electrodes as cathode and immediately the spectrum of hydrogen appeared in the cathode glow. The gas pressure also increased continuously with the time the current was maintained. After running about three quarters of an hour the rate of evolution of gas became very small. This extra gas evolved (for silver about .2 c.c. at atmospheric pressure) could be absorbed by the Na,K discharge in about an hour. If at the end

of this time a current was passed through the tube as before the gas pressure began to increase as at first, but dropped within a very short time to a low rate of evolution. If now at this time a new metal were used as cathode there took place as usual a continuous increase in gas pressure- the rate of evolution of gas being the same for all fresh cathodes. This experiment: repeated at various times and with different metals showed beyond doubt that the source of gas was solely in the cathode.” ^{G 11}

^G *Na/K Indicates that a low melting point Sodium-Potassium cathode was activated to remove hydrogen from the system .*

“While studying the electrode fall in hydrogen, oxygen and nitrogen the gas pressure was found to change very differently with the different gases. Nitrogen increases slowly with the time the current has been passing: oxygen, open to a drying chamber, decreases at a marked rate; while hydrogen was seldom found to change appreciably though there were occasions where a slight increase was recorded even with hydrogen. If now hydrogen is liberated from the cathode in all gasses we should expect in nitrogen an increase in gas pressure arising from the formation of ammonia, which takes place when a discharge passes through a mixture of nitrogen and hydrogen. In this case the rate of increase in gas pressure, compared with that in helium, is small since six atoms of hydrogen would be required to change one molecule of nitrogen into two molecules of ammonia, while in chemically inactive helium one new molecule of gas is formed from two atoms of hydrogen. Likewise with oxygen water vapor would be formed and absorbed by the dryer, in which case four atoms of hydrogen would cause a decrease of one molecule of the gas filling. Of vital interest therefore must be the fact that in hydrogen there is practically no change in the gas pressure when a current passes through it.” ^{H 12}

^H *These observations are strong evidence that the gas produced was hydrogen.*

“Thus it has been noted that those metals, like silver, which tend to keep clean by the process of dusting off onto surrounding bodies will completely recover with rest, while aluminum for example, which under first usage gives off hydrogen with remarkable freedom, but which does not dust off appreciably, recovers, but slightly after its surface becomes once tarnished.” ^{I 13}

^I Since the monatomic hydrogen initially produced by the electrolysis is very highly active it would be expected to combine with other hydrogen atoms to form diatomic hydrogen, and with cathode surfaces to form metal hydrides. Silver hydride is not stable and slowly decomposes into silver and diatomic hydrogen.

“With a freshly polished metal as cathode the gas pressure increases at a constant rate, but after a time this rate begins to drop off until the pressure appears to have reached a constant maximum value. Silver was depleted in this way giving off about two tenths of a cubic centimeter (measured at atmospheric pressure) of hydrogen. After standing in the helium over night then tested again the next morning it was found to have a new supply equal to the one given up the day before. Without allowing it any chance of regaining hydrogen from an external source it was thus depleted six or eight times during the course of two weeks and found to give the same amount of gas. With an hour’s rest only a slight recovery was noticed. After this series the silver was removed from the tube, repolished, then tested again with the same results. Altogether about two cubic centimeters of gas have been given off by this silver disk, which is 15 mm. in diameter and about one millimeter thick. It shows no sign of having its supply of hydrogen reduced in the least.” ^J ¹⁴ .

^J Based on reported measurements of the solubility of hydrogen in silver, more than a thousand times as much hydrogen was produced than the silver cathode could have originally contained.

Sir J.J. Thomson (1914)

In experiments leading to the development of the mass spectrograph, Sir J.J. Thomson was unable get his discharge tubes free of hydrogen.

“I would like to direct attention to the analogy between the effect just described and an everyday experience with discharge tubes. I mean the difficulty of getting these tubes free from hydrogen when the test is made by a sensitive method like that of positive rays. Though you may heat the glass tube to the melting point, may dry the gases by liquid air or cooled charcoal and free gases you let into the tube as carefully as you will from hydrogen, you will get hydrogen lines by the positive ray method, even

when the bulb has been running several hours a day for nearly a year.”^{k 15}

^k Since the gases tested by Thomson were subjected to electrical discharge prior to test, he may have produced hydrogen by the same mechanism as Skinner. If the medium proposed by Maxwell is actually a matrix of protons and unpaired electrons, atomic hydrogen might be produced from the medium by electrolysis. If so, atomic hydrogen would be produced at a fresh cathode at the rate predicted by Faraday's Laws. Atomic hydrogen is extremely reactive and would be expected to tarnish metal cathodes as noted by Skinner.

George Winchester (1914)

George Winchester performed electrical discharge experiments at pressures as low as one millionth of a millimeter. He employed aluminum electrodes, with a minimum gap and about 100,000 DC volts. His article includes graphs showing the rate of pressure increase under various conditions. He obtained hydrogen, helium and neon. Eventually the production of helium and neon ceased.

“The case of hydrogen is different; I have sparked tubes until the electrodes were entirely wasted away and this gas can be obtained as long as any metal remains.”^{L 16}

^L This is further indication that hydrogen was produced by electrolysis.

Preliminary Conclusions

1. The medium for light transfer has definite magnetic and dielectric properties. Dielectric properties suggest that the medium contains positive and negative particles. Magnetic properties suggest that the negative particles are, likely, unpaired electrons.
2. Hydrogen gas appears to be formed by electrolysis of the medium. This suggests that the positive particles may be protons.

Linus Pauling (1945)

“The most stable orbit in every atom is the 1s orbit of the K shell. In the normal hydrogen atom this is occupied by one electron, the spin magnetic moment of which makes monatomic hydrogen gas paramagnetic.”^{M 17}

^M Monatomic hydrogen is paramagnetic because it includes an unpaired electron. The proposed matrix would contain multiple unpaired electrons.

“It is customary to refer to electrons with opposed spins as paired, whether they occupy the same orbit of one atom or are involved in the formation of a bond.” ^{N 18}

^N Diatomic hydrogen molecules are not paramagnetic. They contain no unpaired electrons.

Second Conclusions

The magnetic properties of vacuum suggest that vacuum contains unpaired electrons and is, therefore, paramagnetic. This leads to a simple explanation for the forces between two separated permanent magnets. The medium may be a matrix of protons and unpaired electrons, much as in molten salt, where no sodium ion touches *a neighboring sodium ion and no chloride ion touches a neighboring chloride ion*.

Weidner and Sells (1969)

“These deviations from the Coulomb force are crucial in our considerations of nuclear physics; at the moment, we shall be content to note that the mass and the positive electric charge in any atom are located within a region no larger than 10^{-14} m. It is certainly proper to assume that in a typical atom, having a size of approximately 10^{-10} m. the electrons are subject to a strictly electrostatic Coulomb force of attraction originating from a point charge, the nucleus.” ^{O 19}

^O Note the size factor of 10000. Every nucleus includes at least one proton. The size of the nucleus appears be less than 10^{-14} m. The classical radius of the electron is about 10^{-15} m. The space between nuclei of materials is a wide-open gate to a matrix of protons and electrons. Glass transmits light. Likely, it contains the medium for light transmission. The medium may permeate all materials. According to Maxwell’s wave equations, whether a material transfers light depends on its dielectric and magnetic properties, at the frequency concerned.

Silvera and Walreven (1982)

“The statistical theory that describes atoms was first studied by the Indian physicist, S.N. Bose and is

called Bose-Einstein statistics. The phenomenon predicted by Einstein is a mathematical consequence of Bose Statistics, but it was so contrary to the intuition of physicists in the 1920s that it was then regarded as a mathematical oddity that would never be found in a real system. It is now thought, however, that the phenomenon is observable in the laboratory. It is called Bose-Einstein condensation.”^{P 20}

“The critical temperature for the condensation is proportional to the density raised to the 2/3 power.”^{P 21}

^P Based on the masses and sizes of protons and electrons a Bose-Einstein Condensed matrix of protons and unpaired electrons might be stable at extremely high temperatures.

“Liquid helium 4 at or below 2.18 degrees is therefore called a superfluid. If it is set flowing in a tube closed on itself the liquid continues to flow without friction, never coming to a stop as a normal fluid would. It flows into the smallest passages of its containing vessel and has the remarkable ability to flow through a densely packed powder as if the barrier was not present. A vessel with microscopic holes that would be impenetrable to a normal fluid can be a leaky sieve to a superfluid. Such a vessel is said to have a superleak.”^{Q 22}

^Q This suggests that materials might pass through the proposed matrix without losing energy.

Daniel Kleppner and Thomas Greytak (1998)

“When his former students were making their spectacular condensates of rubidium, sodium and lithium (alkali metals), Kleppner was battling his career-long atom of choice; hydrogen. He has been studying hydrogen since he was a graduate student and postdoc at Harvard University in the late 1950s.”^{R 23}

^R Their experiments toward producing Bose-Einstein condensed hydrogen appeared to be unsuccessful until they employed spin-polarized hydrogen. Perhaps, they had produced Bose-Einstein condensed hydrogen earlier, but couldn't detect it. It is difficult to detect water you have produced in a summer lake. Ice is much easier to detect.

“In spin-polarized hydrogen, all the atoms have their spins aligned the same way (think of the spin as a

tiny magnet compass needle that each atom carries around). Such a gas is as inert as helium because two hydrogen atoms must have oppositely aligned spins to form a molecule. Alone among all the elements, this form of hydrogen should remain a gas all the way down to absolute zero.”²⁴

Final Conclusions:

Assuming knowable space is permeated with a concentrated matrix of protons and unpaired electrons (possibly Bose-Einstein condensed hydrogen) permits simple explanations for many observed physical phenomena including: the stability of galaxies, the formation of hydrogen in low-pressure gases, the values of dielectric constants and the magnetic permeability of vacuum required by Maxwell's equations, The forces between separated permanent magnets, the formation of hydrogen in space, and if the transmission of light is less than 100.0000000...% efficient, the “red shift” might be caused by the lost energy. (Energy = Planck's constant X frequency).

Albert Einstein (1940s)

“Thus to Solovine he also wrote , ' You seem to think that I look back upon my life's work with serene satisfaction. Viewed more closely, however, things are not so bright. There is not an idea of which I can be certain. I am not even sure that I am on the right road.”^{5 24}

⁵ Maurice Solovine was a friend with whom Einstein often corresponded.

Section two

Much of Albert Einstein's work is based on Maxwell's equations and, therefore, on Maxwell's assumptions. The rest of this essay is the author's attempt to explain various observed physical phenomena assuming that the knowable universe is permeated with concentrated matrix of protons and unpaired electrons. The author hopes that readers will improve on or disprove some of these speculations.

Magnetic Properties of Vacuum

The forces encountered when manipulating separated bar magnets, are strong evidence that the space

between the magnets is paramagnetic. This suggests that space contains unpaired electrons.

Dielectric Constant of Vacuum

Vacuum has a definite dielectric constant. The proposed matrix between separated, oppositely charged metal plates would be distorted because matrix unpaired electrons would be attracted toward the positive plate and matrix protons toward the negative plate. Void cannot have a dielectric constant.

Electromagnetic Radiation

When a DC current passes through a straight wire, a compass needle near the wire points perpendicular to the wire. It remains so oriented until the current is stopped. This suggests that moving electrons on wire cause unpaired matrix electrons in the vicinity of the wire to orient. When the current is reversed, the needle points in the opposite direction. At extremely low frequencies, the orientation of the needle changes with frequency. At higher frequencies, the needle of the compass cannot reorient fast enough, because of its inertia. Matrix electrons have very little inertia and continue to orient with changing current direction, even at extremely high frequencies. (Could Planck's constant be related to the inertia of the electrons to the type of rotation required?) . Let us consider a half-wave dipole antenna operating at an FM frequency. The current moves along the surface of such an antenna at the speed of light. According to Huygens' principle, each orienting matrix electron passes all of its energy to a neighboring matrix electron, etc. This effect moves away from the antenna at the speed of light. As the direction of the current changes, a line of energy starts forming at one end of the antenna. Just as the direction of the current changes again, this line of energy leaves the other end of the antenna. This results in a line of energy moving through the matrix at the speed of light (a photon?). This line is in a plane of the antenna and at an angle of 45 degrees to the antenna. When the direction of the current changes again, a similar line of energy (photon?) is produced. This line is also in a plane of the antenna,

but at an angle of 135 degrees to the antenna. Its matrix electrons are orienting oppositely. What we consider one wave in the antenna may produce a pair of photons. Each photon might be considered a mirror image of the previous photon. At any instant, an integer number of active electrons are involved in a photon. There are no fractional electrons. For this reason, only specific amounts of energy can be carried as photons. This may be the basis for quantum mechanics. Vibrating chemical bonds produce a similar effect. A photon is produced as a chemical bond vibrates. As the bond stretches, a photon is produced. A mirror image photon is produced as the separation decreases.

Gravity

Addition of the masses of any material's protons and neutrons yields values close to the mass of that material. If one assumes that a neutron is a combination of a proton and an electron, the mass of any material is very close to the masses of the protons it contains. Perhaps, there is an attraction between protons that becomes dominant when the electrical forces of the protons are cancelled by electrons.

Could this force be gravity?

Lord Rutherford's group passed alpha particles (helium nuclei) through gold leaf and, based on scattering of alpha particles, he concluded that the nucleus of gold was extremely tiny compared to the spaces between the gold nuclei in the gold leaf. More recent experiments indicate that the diameter of any nucleus is about 1/10000 times the diameter of its atom. Since a nucleus contains protons and neutrons, their diameters are much smaller than that of all atoms.

Bose-Einstein condensed atoms are predicted to have zero viscosity. Condensates of elements heavier than hydrogen (lithium, sodium, potassium and rubidium) transfer light at slower velocities than space. Bose-Einstein condensed hydrogen might be expected to transfer light much faster than condensates of heavier atoms.

The distance between nuclei in solids and liquids are vast gaps to Bose-Einstein condensed hydrogen.

Any material would be expected to move through the proposed matrix with no resistance. A sieve moves through water similarly, but with some resistance.

Picture a nucleus as a positively charged sphere. Such a sphere in the proposed matrix would attract electrons of the matrix and repel protons of the matrix. Since the atom is electrically neutral the distortion of the matrix must balance the charge of the nucleus. If so, the exterior of the atom has a positive charge. Could the distorted matrix, in the vicinity of the nucleus, be required to give the atom a neutral charge and help stabilize the nucleus?

Rutherford's calculations were based on the size of the helium nucleus. A helium atom is vastly larger. Perhaps, as nuclei move through the matrix, the matrix adapts as the nucleus moves through it. The matrix may have a problem reacting fast enough, when the speed of a nucleus approaches the speed of light.

The Nature of the Chemical Bond?

The spaces between nuclei in molecules are vast gaps compared to the diameter of each nucleus. The spaces are filled with the proposed matrix, as are all spaces in the knowable universe. Picture two widely separated atoms. As the atoms approach each other, the gravitational attraction increases. At some distance, the electrical repulsion of the positive outer surfaces of the atoms balances the gravitational attraction. Could this define the chemical bond length?

Super Collider Experiments

Scientists perform extremely high energy experiments at very low pressures. In interpreting their observations, they assume the presence of a void. Could the extremely short lived particles they observe be very short lived combinations of matrix particles?

Dark Matter

In order to explain the stability of galaxies, scientists require much more matter than they observe. They are searching for "Dark Matter". Could this Dark Matter be a matrix of protons and electrons and the missing mass for which they are searching?

Stellar Aberration

When astronomers on earth try to fix the position of stars in space, they correct their measurements

for known effects like bending of light as it enters the earth atmosphere. In spite of these corrections, the position of any star seems to change slightly as the earth rotates around the sun. In the northern hemisphere, the North Star appears to move in a small circle. The apparent position depends on the date of the year on earth. No one believes the North Star's actual position is affected by the date on the earth. This effect is called stellar aberration.

When a light beam passes close to a massive object, the beam is bent towards that object. According to Maxwell's equations, this indicates that the matrix in the vicinity of the object has a higher dielectric constant and/or magnetic permeability than the matrix of free space. This suggests the matrix in the vicinity of the object is denser than the matrix of free space. Since air tends to move along with the surface of the earth, we expect the matrix near the surface of the earth to tend to move with the surface of the earth, as the earth moves. If so, the results of the Michelson- Morley interferometer experiments are just as should be expected. Should we consider the Coriolis effect?

If the portion of the matrix, in the vicinity of the earth, moves with the earth as it orbits around the sun, light from a star bends as it approaches the earth. A similar effect occurs when a sound wave encounters wind. In the case of starlight, the direction of bending, relative to the star, reverses every six months. In the case of the North Star, one would expect the deviation to be nearly circular. The observed position should be about the same on the same date each year.

Einstein's Twin Paradox

As an airplane approaches the sound barrier, more and more energy is required to impart a given acceleration. The mass of the airplane is believed to remain constant. A greater force is required because the air through which the airplane is traveling increases its resistance to increased velocity. The medium for light may produce similar effects, as a rocket ship approaches the "light barrier". This is possible if the energy increase is in the material and not transferred to the matrix. Huygens believed that matter is an open mesh through which the matrix easily passes. However, as a nucleus approaches the speed of light, matrix particles may have increasing difficulty adapting to the nucleus. If so, the energy required for imparting a given acceleration may increase with increasing velocity.

If one defines a unit of mass based on a standard that is at rest, relative to the matrix, in its vicinity, one expects greater energy to be required to accelerate an object as the object approaches the speed of

light. By this definition of mass, the force required to accelerate an object increases as the object approaches the speed of light, its mass may not change as Einstein has proposed.

If materials that make up a rocket ship are porous to the ether, a pendulum clock in a rocket ship moves through the ether at a similar rate as the rocket ship, itself. As the clock approached the speed of light, the period of the pendulum would decrease and time, as measured by the clock, would decrease. The same effect would occur with modern time devices that are based on the periods of certain bond vibrations.

In the twin paradox, one twin remains on earth while the other twin rockets away at close to the speed of light, turns around and then returns at a similar speed. The speeding twin's clock would run slower in both directions of flight, since in each case, it is moving rapidly through the matrix. The earthbound twin's clock is comparatively still, relative to the matrix in its vicinity, and would indicate the passage of more time. At the speed of light, the pendulum and the vibration might stop.

This author prefers a definition of time based on a clock that is stationary, relative to the matrix, in its vicinity. In order to determine the correct time, a factor, based on the speed at which a clock is moving through the matrix (or, if you prefer, the matrix is moving through the clock) would be applied to the time it registers. Time would, then, be more nearly universal and independent of velocity.

If this is correct, the vibrations of the chemical bonds in the speeding twin's body would be slowed dramatically. This would slow all the chemical reactions in his body. If he survives, he may well appear younger than the stationary twin.

Star Formation

There is considerable evidence that hydrogen gas is being formed in various parts of the universe. The Hydrogen gas may be pulled together by gravity until the agglomeration attains sufficient size, density and temperature to initiate a fusion reaction and turn the agglomeration into a star. Where does all this hydrogen come from? If experimenters can convert the matrix into hydrogen in their laboratories, should one be surprised that nature performs the same conversion in deep space?

Astronomy

This author has no clue as to whether the quantity of ether is finite. If it is finite, the knowable universe

might be a sphere surrounded by void. The ether- void interface would be a nearly perfect mirror and there may be no way of knowing whether observed radiation had been reflected from that interface. Perhaps, some of the radiation believed to be from great distances originated in our own galaxy and has been reflected back to us.”

The Red Shift

Spectral lines in light from distant stars are shifted toward lower frequencies, that is, to lower energy. The greater the distance light has travelled, the greater the shift in frequency. It is assumed that the stars are moving away from us and the farther they are from us, the faster they are moving relative to the earth. Most astronomers conclude that the universe is expanding and that there was a “Big Bang” that initiated the expansion. If the volume of the matrix is the volume of the universe, expansion requires an increase in the separation between matrix particles or a great increase in the number of matrix particles. Either prospect seems unlikely. An alternate conclusion is that objects in space are, on the average, moving away from each other and filling more and more of the matrix. The shift in light to lower frequencies can be explained, just as readily, if one assumes that light slowly loses energy as it travels great distances through the matrix, or if some energy is lost when light is reflected from the matrix –void barrier, of a less than infinite universe. If, as this author proposes, hydrogen is produced in space, the energy required may be removed from photons traveling through space. The hydrogen and other particles may remove energy from photons resulting in the observed red shift. If this is the case, the universe may not be expanding.

Summary

Section one Includes considerable evidence, from the scientific literature that hydrogen gas has been produced in and from vacuum. Under electrical discharge, the initial rate of pressure increase obeys Faraday’s laws of electrolysis. This suggests that vacuum may not be a void, but rather, a matrix of

protons and unpaired electrons. Maxwell's wave equations require that vacuum has magnetic properties. This suggests that vacuum contains unpaired electrons.

Section two includes the author's best guesses as to the mechanism of many observed physical phenomena. The guesses are based on the assumption that knowable space is permeated with a concentrated matrix of protons and unpaired electrons. The author will not be surprised if many of these guesses are proven incorrect.

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