A New Mechanism for Matter Increase within the Earth

A plausible new argument suggests that, based on known physical phenomena, particles from the Sun may account for Earth expansion.

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According to Expansion Tectonics, geological data support the claim that the Earth has been gaining matter over geological time. The source of this new matter and the specific manner of how the Earth gains it remain a mystery which affects the viability of Expansion Tectonics. This article proposes a new mechanism for matter gain. In summary, based on the electric nature of our universe, it is suggested that this gain is primarily fed by solar particles that are transferred to the Earth's interior by electron and proton conduction. It is argued that such a process is plausible and has support based on theoretical and empirical studies appearing in existing scientific literature.

Expansion Tectonics

For over a century, many professional geologists have speculated on the possibility that the Earth has undergone a steadily increasing expansion. In the past 60 years, the two names most notable in this regard are Professor Samuel Warren Carey and his successor Dr James Maxlow, both geologists from Australia. These and other scientists have arrived at the conclusion that, based on sound empirical evidence, the observed geology of the Earth can only be explained if the Earth has been increasing its radius substantially over a time period of several billion years.

In the 1990s, Maxlow in his graduate research pursued the Earth expansion hypothesis in much greater detail. Maxlow initiated his studies soon after the Commission for the Geological Map of the World and UNESCO had completed worldwide geological mapping of the surface of the Earth, both on land and under the oceans, assembling extensive ageing data of the entire crust. This mapping then formed the basis for Maxlow's research.

Maxlow determined that the Earth has undergone an exponential increase in radius since the beginning of Earth history some 4,000 million years ago. What this means is that, for over 90 per cent of its existence, the increase in Earth radius was much less than the thickness of a human hair per year, and then, about 200 million years ago, this rapidly increased to its present rate of 22 millimetres per year.

By systematically taking away the area represented by the oceans and constructing progressively smaller-radius Earth models, Maxlow demonstrated that it is possible to reduce the Earth's radius and fit all of the present continents together at about 55 per cent of the current Earth radius at the beginning of the Jurassic Period some 200 million years ago. Similarly, by investigation of ancient interior continental basins, Maxlow found that it was possible to extend this value downwards to approximately 27 per cent of the current value at the beginning of the Archaean Aeon some 4,000 million years ago. From the beginning of the Archaean to the present day, this represents about a 50-fold increase in volume. In all cases, Maxlow was able to achieve a better than 99 per cent land-mass fit as he progressed

stepwise back in time, providing conclusive evidence for Expansion Tectonics.

A detailed technical discussion of the geological and other evidence supporting this expansion process, termed by Maxlow as Expansion Tectonics, is beyond the scope of this article but is covered extensively elsewhere (Carey, 1996; Maxlow, 2005; Scalera & Jacob, 2003).

Carey considered and subsequently rejected a number of possible causes of expansion such as (1) a pulsating Earth, (2) meteoric and asteroidal accretion, (3) a constant Earth matter with phase changes of an originally superdense core, (4) continual reduction of the universal gravitational constant, and (5) a cosmological cause involving a continual increase in matter. The problem with each of these possible causes is that none seemed to account for the proposed magnitude of expansion. Furthermore, most of these possible causes involve only theoretical speculation. Clearly, if the Earth has been gaining matter at the levels required (from what geological evidence suggests), there must be some other mechanism underlying this matter increase. Such a mechanism is suggested here, based on electron and proton conduction in solids, which is consistent with known empirically determined characteristics of matter.

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A Proposed New Mechanism

Dr Hannes Alfvén, Nobel laureate and recognised plasma physics expert who is considered the father of the field, has said that our universe is one where over 99 per cent of the matter present is in the form of plasma. Plasma currents consist of charged particles, both electrons and negatively or positively charged ions, which move in unison (although in opposite directions) under the influence of electric and magnetic fields. Subsequent exploration of space by artificial satellites and space probes has verified that such currents do exist. Even though these charged particles are widely separated, as is the case in the relative void of space, the sheer number of particles is so large that currents in the billions of amps or more are created by their motion (Lerner, 1992). This subject matter has been analysed in detail in many technical books and papers (e.g., Alfvén, 1986; Peratt, 1990, 1995). For our purposes, what is important here is that vast numbers of charged particles do indeed exist in space.

What is suggested here is that the constant bombardment of the Earth by charged particles, primarily from our Sun, provides a source for the matter necessary to account for the increase in matter within the Earth without the necessity of invoking esoteric theoretical processes. More importantly, all this occurs within the confines of known physics.

The Global Electric Circuit

Our Earth is very active, both from an electric and a magnetic standpoint. In a similar manner as to how a current flowing through a coil of wire produces a magnetic field, the Earth's magnetic field is inferred to be generated by currents of electricity within the Earth. Additionally, there is a large amount of electrical activity below, on and above the surface of our planet.

The ionosphere ranges from 50 to more than 400 kilometres above the Earth's surface. It is characterised by a mixture of free electrons and ions of various elements including hydrogen (whose ion is a single proton), thus creating a plasma current due to the Earth's magnetic field. From an electric point of view, there exists a voltage potential which ranges from 200,000 to 300,000 volts or more between the ionosphere and the surface of the Earth (Markson & Muir, 1980). The atmosphere acts as an insulator, making it difficult for electric current to travel to and from the Earth's surface to the ionosphere except under special conditions. This also has been extensively studied by others. In effect, we live between the plates of a huge capacitor where one plate is the ionosphere and the other the surface of the Earth.

In thunderstorms, clouds build up large static charges in a similar way to how you might build up a charge on your body in cold weather by walking across a rug; when you reach for a door knob or other metallic device, a spark is generated between your hand and the device. Nature does the same thing, in essence, only it is called "lightning" and is vastly more intense. The potential between a cloud and the ground may extend upwards to several million volts, and the current that is discharged averages about a trillion watts (Christian & McCook). It's not surprising that this amount of power is generated, considering that a lightning strike has such a high voltage together with estimated currents of up to 50,000 amperes. This means that there is a huge number of negatively charged electrons travelling between a cloud and the Earth's surface, conducted via an ionised path consisting of plasma.

With the advent of artificial satellites capable of recording lightning discharges with a high degree of accuracy, it has been estimated that about 45 to 50 lightning flashes occur every second worldwide from more than 1,500 to 2,000 thunderstorms in progress

during that second. This means that every day approximately 4,000,000 lightning discharges take place, resulting in about 1.4 billion occurrences each year. About 80 per cent of the lightning flashes are between clouds, while the remaining 20 per cent are between clouds and the surface of the Earth.

Nature abhors with a vengeance an imbalance in electric charge distribution. After the lightning strike, the cloud has an unbalanced charge. It experiences an interaction with the ionosphere above it to try to become neutral again by the transfer of electrons to the cloud. But each lightning strike creates a more negative Earth by passing electrons to it. In an attempt to restore balance, some means must exist to transfer current back to the ionosphere to complete what is known as the "global electric circuit" (Bering *et al.*, 1998) or the "global atmospheric electrical circuit" (Harrison, 2004).

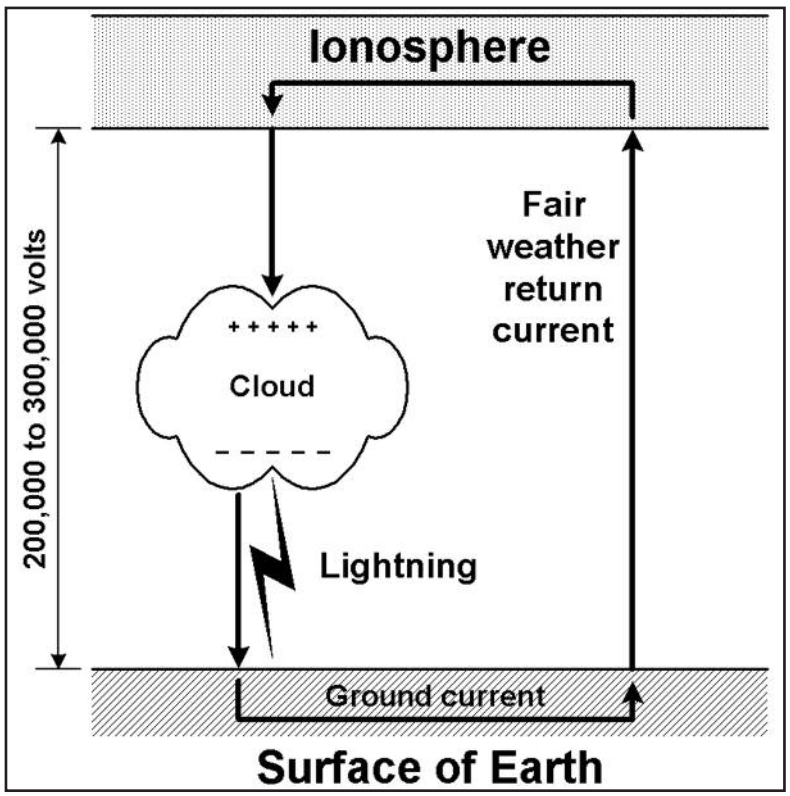

Figure 1: The Global Electric Circuit

Figure 1 represents a simplified complete circuit. Lightning sends electrons to the ground where the charge spreads, since the surface layers of the Earth are good conductors of electricity. In what is referred to as the "fair-weather return current", the high potential between the ground and the ionosphere drives current flow through the air to the ionosphere to close the circuit.

It must be appreciated that in any electrical transfer, the large potential difference between the ground and the ionosphere also will drive positively charged ions down towards the ground because the Earth has a negative electrostatic charge. Any time there is a potential difference and there are charged particles present, these particles will move. And the ionosphere, under the influence of the magnetic field lines of the Earth, has all kinds of ionised particles as well as electrons moving primarily in a north–south direction. In addition, there are continual streams of electrons and ions from the Sun which serve as a potentially vast supply of available charged particles to account for the hypothesised matter gain within the Earth.

In summary, ours is a world where ionised particles abound whether from plasmas formed by the electric discharge in a bolt of lightning or plasmas present in the ionosphere due to particle bombardment from the Sun.

New Matter Requires Protons and Electrons

We are all familiar with electric conduction when it comes to the electric currents that we use every day to power devices around us. We know, for example, that copper and aluminium are excellent conductors of electricity. But current conduction is not limited to just metals. The Earth itself is an excellent conductor, which is why when you touch an electrical outlet while standing on the earth you feel a zap as electricity travels through your body between the outlet and the ground. We even know through this often accidental, simple experiment that the body itself is a good conductor of electricity.

Most discussions about the flow of electricity focus on the movement of electrons under conditions of voltage potential difference, since it is so common. Not so obvious in everyday life is the recognition that magnetic fields are also prime movers of electrons and other charged particles, and nowhere is this truer than within the magnetic field generated by the Earth itself.

The Earth is continually being bombarded by charged particles, both electrons and ions, from our Sun. These particles become entrapped in the Earth's magnetic flux lines in space, forming plasma sheaths which channel these particles away from most of the Earth—with the exception of at its poles, where the magnetic lines of force converge. The beautiful aurora borealis and aurora australis (northern and southern lights) are ribbons of plasma where incoming charged particles enter our atmosphere, driven by the magnetic field of the Earth. But a magnet has two poles and each pole acts on particles of the same charge, be it negative or positive.

In a plasma, electrons and negative ions (atoms which have gained an extra electron, making them negative)

flow in one direction, whereas protons (ionised hydrogen) and other positively charged ions flow in the opposite direction to that of the negatively charged particles. From a particle standpoint, there are differences to be noted. Electrons, being lightweight, as opposed to protons and other positive ions (made up of protons and neutrons in ionised atoms), travel with a higher velocity than do ions. But particles of each charge come under the same force provided in a magnetic field, only they have different movement characteristics.

When a thunder cloud moves over an area of land, the potential difference between the cloud and the ground creates a current flow of electrons to or from the ground directly below the cloud. This is a local effect. However, disregarding local effects, there is a component of magnetic force from the Earth which acts on charged particles. We know that currents flow within the Earth, so why shouldn't there be a similar flow of individual protons within the Earth?

It is good to reiterate at this point that new matter, in the form of atoms, requires both electrons and protons; either alone is not enough. When we are talking about matter increase within the Earth, we therefore must have both types of particles present. Is there such a phenomenon as proton flow within a liquid or solid?

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Proton Conduction

There is a large amount of both theoretical and experimental evidence for proton conduction. Much of the recent research effort in this field has been motivated by the desire to find substances which can effectively separate charged particles in materials having practical applications, particularly in areas such as fuel cells, electrochemical sensors, electrochemical reactors and electrochromic devices (Kreuer, 1996).

What has been made clear from this research is that the mechanism of proton conduction is much different than that of electron conduction. Whereas electron current flow is generally based on freely mobile electrons as found in metals, protons don't move in a similar manner because free protons don't behave like free electrons. Protons tend to bind to the electrons in outer orbit around the atoms in a liquid or solid. Then the protons migrate in a molecule-to-molecule fashion when acted upon by a magnetic force field.

A couple of points to keep in mind are that protons are the same order of magnitude in size as electrons, and hence individual protons conduct in liquids and solids better than other heavier positively charged ions. The reason for this is that the smallest atom is roughly 10,000 to 100,000 times larger than either an electron or a proton. The theory behind proton conduction is complex, so only highlights will be discussed here. Individual protons are extremely active and tend to bind easily whenever atoms are present with outer-orbit electrons which may be shared.

There are two primary modes of proton conduction discussed in the literature (although others have been considered). The first mode is where the proton forms a bond with an existing atom. For example, the oxygen in a water molecule (H_2O) may temporarily gain an extra proton (H_3O). If the molecule is capable of rotation, the extra proton (whose bond is relatively weak) can create a bond with a nearby water molecule and then break loose from its existing bond with the first water molecule. In this manner, the proton is passed from molecule to molecule, which essentially provides a method for proton conduction (Poulsen, 1980). Water (liquid or solid) is not the only type of molecule in which this effect has been studied (Glasser, 1975).

The second mode of conduction is where a larger molecule exists which contains a number of tightly bound atoms. Of particular interest here is that materials exhibiting the structure of perovskite (a mineral with the same type of crystal structure as calcium titanium oxide, $CaTiO_3$) have oxygen atoms which create an interactive electric-potential field where a proton finds a resting spot between such atoms (Kreuer, 1996). Assuming that these molecules are in a matrix structure, as is frequently the case with solids, a virtual path is created that is analogous to a virtual proton-carrying wire, so that protons can travel almost unimpeded from molecule to molecule.

The point being made here is that proton conduction in both liquids and solids has been observed experimentally and has been intensively studied. Proton conduction is not just a theoretical phenomenon; it is empirically based.

Within the interior of the Earth, several well-defined layers have been found by using a variety of techniques, primarily by recording and analysing seismic waves. Furthermore, studies have been conducted with regard to proton conduction in the materials of which these layers are composed (Yoshino, 2010). The lower mantle, which constitutes the bulk of the material of the Earth, is believed to be composed primarily of perovskite, which, as mentioned above, has been found to be a conductor of protons. Consequently, it is argued here that there exists a probable pathway for likely conduction of protons deep within the Earth under the

influence of the Earth's magnetic field, thus providing a viable method of proton transport. But what happens to this concentration of protons within the Earth?

Nucleosynthesis and Transmutation within the Earth from Protons and Electrons

Protons, being of like charge, normally repel each other with a vengeance. However, quantum and other effects come into play. The problem with nuclear fusion is trying to keep a group of charged particles together for sufficient enough time for fusion to occur, thus liberating energy. Protons in close proximity encounter what is known as the "Coulomb barrier". As the protons get closer together, the force of repulsion between them becomes exponentially greater. Theoretically this force should reach a near infinite level, making it impossible for nuclear fusion to occur.

Nucleosynthesis is the formation of atoms more complex than the hydrogen atom. It is generally believed that nucleosynthesis of the heavier elements only occurs in interiors of stars where extremely high temperatures and pressures are thought to occur, leading to the conclusion that most of the heavier elements found in the universe have been created in this manner.

To assume that the Earth is gaining matter and that this may be due to nucleosynthesis within the Earth seems to fly in the face of conventional wisdom—and it does. However, if the geological evidence strongly suggests that the Earth's radius is getting larger with time (due to the Earth's gain of new matter), as Expansion Tectonics advocates maintain, then some mechanism must be at play to account for this additional matter. Clearly, the solid nature of the crust of the Earth is relatively impervious to the infusion of most matter, with the exception being electrons and the nuclei of the lightest elements, most likely hydrogen or an isotope of hydrogen.

Transmutation is the changing of one element into another by radioactive decay, nuclear bombardment or similar processes. New matter introduced into the Earth would require transmutation as well as nucleosynthesis. According to conventional physics, both processes normally occur when high energy levels of the interacting particles are present. The question here is whether or not these processes could happen should high-energy particles not be present. Over the last two decades, work has been going on in this area of research. To understand this better, we turn our attention to the subject of what is generally referred to as "cold fusion". The research into this subject is complex, with many unanswered questions remaining.

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In 1989, two researchers, Dr Martin Fleischmann and Dr Stanley Pons at the University of Utah, announced that they had achieved nuclear fusion in their laboratory. They claimed that this was done by electrolysis, using a palladium cathode with heavy water (deuterium oxide), with the result being that the energy output, based on measured heat, was greater than the energy input. They hypothesised that two atoms of deuterium (a stable isotype of hydrogen) fuse, creating a helium atom and liberating heat in the process. For them to have done this in a laboratory at low energies was thought to have been impossible. Since the 1950s, billions of dollars had been spent trying to accomplish fusion through expensive atom-smashing-type machines with very limited success. The hope had been to provide a cheap source of energy. Absent in Fleischmann and Pons's experiment were all the exotic by-products normally expected when high-energy fusion occurs under thermonuclear conditions with temperatures in the millions of degrees.

Below are the important points relevant to the discussion here. The best source of current information about cold fusion, i.e., low-energy nuclear reactions, is http://www.lenr-canr.org. I encourage interested readers to check out this website.

• Cold fusion has been experimentally verified in a number of laboratories around the world, including in the USA. Because of the nature of the experimentation, the most difficult part of this effort is in carrying out the extensive instrumentation procedures required to obtain definitive results. However, scientists working with cold fusion generally agree that there is no question about its working. Excess energy is released through the fusion process, as predicted by nuclear physics, and has been measured.

• Various theoretical analysis models have been proposed to explain the process, and headway is being made in this regard according to a number of investigators (e.g., Fleischmann, Pons & Preparata, 1994; Beaudette, 2002). Although cold fusion of deuterium to create helium (and other atomic nuclei) ends with the same final result as hot fusion, the

process by which this occurs is much different, primarily in the absence of high-energy by-products including radiation. Clearly, a new physical process seems to be at work that begs more theoretical attention.

• It has been reported in many instances that once the electrolysis current was turned off, the heat generation process continued for extended durations, i.e., hours and/or days afterwards (Beaudette, 2002). Presumably this is due to the palladium becoming saturated with deuterium, allowing continuation of the fusion effect independently of additional power input.

• Some researchers have reported that atomic transmutation occurred in cathodes made of various materials. For example, one researcher using high-purity nickel-coated beads as the cathode found that after five weeks about 40 per cent of the nickel had been transmuted into a mixture of other elements including chromium, iron, copper, selenium, silver, cadmium, antimony and lead (Beaudette, 2002).

• Over two decades ago, it was proposed that nucleosynthesis has perhaps been occurring in condensed matter within planets, moons, etc. Some research was done over that period in an attempt to prove or disprove this hypothesis (Bockris & Mallove, 1999). This research involved looking for fusion by-products, primarily isotopes of hydrogen and helium. The principal radioactive isotope of hydrogen looked for is tritium, which has a half-life of 12.32 years. Because of this short half-life, tritium in nature doesn't remain present for long and hence is quite rare. With helium, there are two stable isotopes (^{3}He, ^{4}He) which allow for a ratio of one to another to be calculated. The ratio of naturally occurring isotopes of helium is much different than the ratio produced in fusion reactions, allowing detection of these reactions. Gas analysis searches were conducted in two primary areas.

The first area included so-called "hot spot" volcanoes, like Kilauea in Hawai'i and Alcedo in the Galápagos, which produce magma from plumes which supposedly rise hundreds of kilometres from the core–mantle boundary, as opposed to crustal volcanoes which are regarded as rather shallow in comparison (Jones & Ellsworth, 2003; Tebbe, 1980). The deeper volcanoes have yielded tritium presence and helium ratios (^{3}He/^{4}He) much higher, by factors of tens to hundreds, than do the shallower crustal volcanoes, indicating the possible by-products of fusion.

The second area is that of volcanic crater lakes (Jiang *et al.*, 2007). Towards the bottom of many such lakes, the water does not mix with the upper-layer water so gases trapped in the bottom layers typically remain unaffected for thousands of years. Research has shown that the presence of tritium (with its short half-life) and high helium ratios strongly indicates that the source of these isotopes is from mantle degassing rather than from the Earth's surface. This unusually abnormal finding has led the researchers to the tentative conclusion that it fits with the hypothesis of what would be expected if fusion were occurring deep within the Earth.

Conclusions and Comments

For over a century, many professional scientists have maintained that expansion of the Earth has occurred. Numerous technical articles and books have expressed this hypothesis as a viable and indeed necessary one to explain the observed empirical geological facts known about our planet. Expansion Tectonics, as it is known today, alleviates the reliance on other theories that have been put forth, such as Continental Drift and Plate Tectonics.

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However, Expansion Tectonics, in and of itself, has not inspired a paradigm shift away from the currently held paradigm of Plate Tectonics. When one asks why this is true, the response which most frequently comes back is the question, "If the Earth has undergone expansion, where did the increase in matter come from?" Carey, for one, spent the majority of his lifetime trying to provide an answer to this question. Time and again he considered possible mechanisms, mostly theoretical, to explain this question of increase in matter, only to reject such mechanisms for one reason or another. Any mechanism should have a foundation in the area of experimental physics rather than in purely theoretical physics abstractions.

This article proposes and examines what is considered a plausible answer to this question based upon physical processes that have been experimentally observed. It has never been observed, for example, that matter just pops into being where nothing was before. What is required is (1) a source for new matter, (2) a means whereby this matter can penetrate into the Earth's interior, and (3) a mechanism by which heavier elements may be formed.

Empirical geological evidence strongly indicates that Expansion Tectonics is indeed valid, so the task confronted has always been to formulate a viable mechanism whereby this expansion occurs. In a plasma universe, the Earth is under constant bombardment with all the necessary components to reconstitute matter from its constituent parts deep within the Earth.

Continued on page 82

A New Mechanism for Matter Increase within the Earth

Continued from page 48

Theoretical constructs that have never been experimentally observed are not required. The Earth, having a magnetic field strong enough to interact with impinging particles, gathers more than sufficient fundamental particles, namely electrons and protons, to account for a slow increase in matter internally over hundreds of millions of years. There is, therefore, no lack of component particles to create new matter deep within the body of the Earth. The exact process by which this occurs is complex in nature and, like the interior of the Earth itself, involves speculation as to its dynamics. It is argued that the avenue of approach proposed here is plausible and warrants further serious scientific investigation. If new matter has been added to the interior of the Earth, there must be an answer to the riddle of the dynamics of the process.

At the level of human perception it may seem that the Earth is an impenetrable solid, and this perception gives rise to the notion that it is impossible for new matter somehow, as if by magic, to make its way to the Earth's deep interior. But, as argued here, there are mechanisms which have an empirical basis whereby this may occur on a subatomic level. It is extremely doubtful that humans will ever penetrate much below the Earth's crust (the deepest hole depth obtained to date is approximately 0.1 per cent of the Earth's radius), so it is a near certainty that the best we will ever achieve are very-small-scale, time-limited experimental laboratory simulations based upon what we can only speculate is going on within the deep interior of the Earth.

Perhaps the time has come to stop ignoring the growing geological and other evidence against Plate Tectonics and in favour of Expansion Tectonics and begin to consider that we may, in fact, have an element-synthesising factory right beneath the ground on which we walk. ∞

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John B. Eichler graduated from the Illinois Institute of Technology with majors in physics and mathematics. Under a contract from the US Atomic Energy Commission, he worked on computer analysis of blast shields for nuclear reactors and other government research activities at the IIT Research Institute. Later, his efforts were in the design and implementation of new computer systems. After retiring, he went back to graduate school at the University of Arkansas in Little Rock, where he's been working on the manuscript for his forthcoming book *An Infinite Universe*. He's currently working on a thesis titled "An investigation of a scientific paradigm shift: the rhetoric of an uphill battle". John Eichler's interest in Expansion Tectonics began in 1958 when he arrived at the conclusion that the Earth had undergone a significant expansion over time. His search for a viable mechanism to explain the matter gain utilising empirical evidence has led to the writing of this article.

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References

- Alfvén, H., "Model of the Plasma Universe", IEEE *Transactions on Plasma Science* 1986; 14:629-638
- Beaudette, C.G., *Excess Heat: Why Cold Fusion Research Prevailed*, Oak Grove Press, LLC, 2002, 2nd ed.
- Bering, E.A., A.A. Few and J. R. Benbrook, "The Global Electric Circuit", *Physics Today* 1998 Oct; 51:24-30
- Bockris, J.O'M. and E.F. Mallove, "Is the Occurrence of Cold Nuclear Reactions Widespread throughout Nature?", *Infinite Energy* 1999; 27:29-38
- Carey, S.W., *Earth, Universe, Cosmos* (published for the Fiftieth Anniversary of the Geology Department), University of Tasmania, Hobart, Australia, 1996
- Christian, H. J. and M. A. McCook,"Lightning & Atmospheric Electricity Research at the GHCC: A Lightning Primer", http://thunder.msfc.nasa.gov/primer/index.html
- Fleischmann, M., S. Pons and G. Preparata, "Possible Theories of Cold Fusion", *Il Nuovo Cimento* A 1994; 107(1):143-156
- Glasser, L., "Proton conduction and injection in solids", *Chemical Reviews* 1975; 75(1):21-65
- Harrison, R.G., "The global atmospheric electrical circuit and climate", *Surveys in Geophysics* 2004; 25(5-6):441-484
- Jiang, S. et al., "Observation of ^{3}He and ^{3}H in the volcanic crater lakes: possible evidence for natural nuclear fusion in deep Earth", 8th International Workshop on Anomalies in Hydrogen/Deuterium Loaded Metals, Sicily, Italy, 2007
- Jones, S.E. with J.E. Ellsworth, "Geo-fusion and Cold Nucleosynthesis", Tenth International Conference on Cold Fusion, Cambridge, 2003, http://www.lenr-canr.org/acrobat/JonesSEgeofusiona.pdf
- Kreuer, K.-D., "Proton Conductivity: Materials and Applications", *Chemistry of Materials* 1996; 8(3):610-641
- Lerner, E.J., *The Big Bang Never Happened*, Vintage Books, N ew York 1992
- Markson, R. and M. Muir, "Solar Wind Control of the Earth's Electric Field", *Science* 1980 May 30; 208(4447):979-990
- Maxlow, J., *Terra Non Firma Earth: Plate Tectonics is a Myth*, Terrella Press, Australia, 2005
- Peratt, A.L., "The Evidence for Electrical Currents in Cosmic Plasma", IEEE *Transactions on Plasma Science* 1990; 18(1):26-32
- Peratt, A.L., "Introduction to Plasma Astrophysics and Cosmology", *Astrophysics and Space Science* 1995; 227(1):3-11
- Poulsen, F.W., *An Introduction to Proton Conduction in Solids*, Risø National Laboratory, Roskilde, Denmark, 1980
- Scalera, G. and K.-H. Jacob (eds), *Why Expanding Earth? A book in honour of Ott Christoph Hilgenberg*, Istituto Nazionale di Geofisica e Vulcanologia, Roma, Italy, 2003
- Tebbe, J., "Print and American Culture", *American Quarterly* 1980; 32(3):259-279
- Yoshino, T., "Laboratory Electrical Conductivity Measurement of Mantle Minerals", *Surveys in Geophysics* 2010; 31(2):163-206