New Energy News

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THREE ENERGY TECHNOLOGIES FOR THE TWENTY-FIRST

By Hal Fox, Editor

Three new energy technologies will provide the power generating systems for the 21st century.

Cold fusion, high-density charge clusters, and super-motors using supermagnets are the prime candidates to provide unlimited power for ourselves, our children, and our grandchildren. **These three new technologies have one attribute in common: all three are unexplained by currently-accepted scientific models.**

The first public announcement of the discovery of cold fusion was arranged by the University of Utah staff on March 23, 1989 where Professors Martin Fleischmann and Stanley Pons reluctantly appeared. After over six years of controversy and development, the leading contender for commercialization is the light-water, lithium electrolyte, nickel/palladium catalyst, **Patterson Power Cell**™ (PPC). Late in 1995, the first million-dollar license for commercialization of the PPC has been negotiated with a U.S. Fortune 500 company.

High-density charge cluster (HDCC) technology has been under development by the world's greatest inventor since the 1980s. The possibility of power generation by this technology became publicly accessible when U.S. Patent 5,018,180 was issued in 1991. This is the first U.S. patent (that I know about) in which it is explained that the device obtains its energy from the vacuum field zero-point energy source. **Space energy** is one of the energy sources of the future and is characterized by an essentially unlimited source of power [1].

Supermotors using supermagnets are capable of providing two to four times as much power output as input power. The latest development, the Takahashi supermagnet supermotor (SMSM) has been delivered to highly-qualified scientists and engineers in the U.K. for independent verification [2]. This motor, installed in an electric vehicle, has the capability of climbing hills where its full power is demanded, or traveling on level roadways and charging the batteries when its load demand is lessened. This type of motor will be the transportation prime mover of the 21st century.

DEFIES CONSERVATION OF ENERGY?

The first level of complaint, and immediate dismissal of HDCC and SMSM technologies, will come as, "That is against the **Law of Conservation of Energy**." In this case, it is not the law that is broken, it is the underlying, currently accepted scientific concept of an empty aether [3]. Immediately when one accepts the concept of an energetic aether, then the HDDC and SMSM devices are seen as **energy transformers**. Energy transformers are a perfectly acceptable concept.

> We merely need to update the 1800s and early 1900s concept of an energetic aether and none of the rest of our cherished scientific models are disturbed.

THE CRIME OF THE CENTURY?

A similar dismissal of strong criticism against cold fusion is easily handled. The **hot fusioneers** have made a fundamental error in judgement. Because they are so thoroughly skilled in gas plasma physics, where light-element fusion can and does occur, they have expected that any fusion in an electrochemical cell, on or near the surface of a metal lattice, **must be similar to fusion in a gas plasma**. The only way these scientists could have been more seriously in error would be to condemn the discovery of cold fusion, which some did! To compound the error, some so-called scientists turned their skills to political lobbying and worse. In their misguided attempt to prevent error from creeping into the august halls of government, these lobbyists used their skills to prevent government funds from being used for cold fusion research. They publicly condemned the successful scientists, wrote and funded books about "Bad Science," "Too Hot to Handle," and "Scientific Fiasco of the Century," and showed up at many cold fusion conferences to harvest chaff and discard grain. **The greatest crime perpetrated against the inventors, engineers, and scientists working with cold fusion, was to instigate action to deny the rights bestowed**

by the Constitution of the Unites States upon its citizens -- the rights to intellectual property.

FORECAST FOR 1996

This new year brings enormous opportunities for all of us. The artificial barrier to the protection of intellectual property in the U.S. Office of Patents will be removed. The first cold fusion products will be marketed. The concept of **Energy Transformers** tapping and transforming power from an energetic aether will be independently verified. The venture capitalists will discover enhanced energy devices and systems. Investors will soon have the opportunity to invest in the modern-day equivalents of growth companies like the historic examples of IBM, XEROX, and 3M.

On the academic front, there will be a few conversions, many retirements, and the paving of the way for a new generation of scientists to shift the paradigms that have stayed the progress of new energy development. Inventors, engineers, and scientists working on cold fusion (or new hydrogen energy), HDCC, or "over-unity" magnetic motors will no longer be the lunatic fringe but will become the respectable far-sighted developers of a wave of new energy devices and systems. The old peer-review system, which has historic roots in the Inquisition where the names of reviewers were kept secret, will be replaced by democratic processes. The new peer-review system will allow for an exchange of views among peers who will post their name and dates on reviewed papers. **It will be recognized that where fundamental new discoveries are made, there are no peers.**

Institutions such as the **Institute for New Energy**, the **International Association for New Science**, and especially the timely financial assistance of Bill and Lynda Beierwaltes (who funded the first two International Retreats and Symposia on New Energy) must be credited for some of the successes. These groups and many other groups and publications have kept the light of knowledge burning. All of you, from scientists to subscribers can take credit for helping institute the **New Energy Age**. It is not only you, but your children and your grandchildren who will enormously benefit. Therefore, **HAPPY NEW YEAR!**

References

[1] The Correa "Energy conversion system," patents (US 5,449,989, ect.) on plasma arcs are considered to be a part of this technology.

[2] "Accident in Lab Creates Super Motor," *The Sunday Times*, London, December 10, 1995. [see also page 8]

[3] This publication has adopted the English spelling, aether, and leaves ether to be used as an anesthetic.

A thought to go with the cartoon: The old adage, "It is hard to drain the swamp when you're up to your arse in alligators," has a new wrinkle. First you must apply to the federal government because the bureaucrats are protecting the wetlands. And keep your torch lit so you can see where you are.

Fusion Briefings

THE BASIC FACTS OF OUR FIELD

By Peter Glück

"Facts are stupid things until brought in connection with some general law" (Louis Agassiz)

The aim of this paper is to increase significantly the IQ of the facts of our scientific field. In other words, I consider both necessary and perfectly possible to now display a coherent, complete, and logically continuous vision comprising all the "excess heat" systems and devices known.

Using a positive approach to the problems of reproducibility encountered in all the "cold fusion" systems to date, I hypothesized in 1992 that cold fusion is actually a form of hyper-catalysis and that both the solution of the scientific puzzle and the way to technological development critically depend on some prosaic aspects of materials science. Quite specifically: THE QUANTITY OF EXCESS HEAT IS PROPORTIONAL TO THE NUMBER OF CATALYTIC CENTERS PRESENT AND TO THE TURNOVER OF THESE. [Turnover is used in the sense of reuse or again available.] In the case of electrochemical cells (electrochemistry was the cradle of the new energy systems), extended surface cathodes, such as those developed by Arata and Zhang or Patterson, are intrinsically catalytic and therefore reliable and productive, while compact cathodes are bound to serious problems of reproducibility. For example:

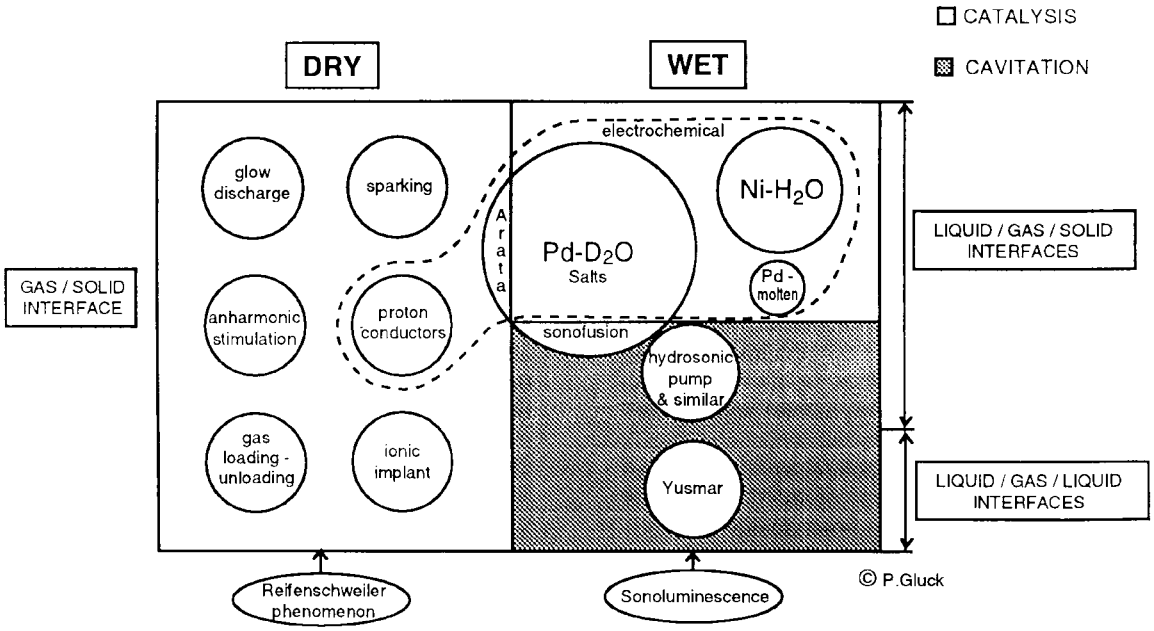
- The McKubre cell, having a Pd rod as cathode, needs weeks to trigger the reaction; typically 2 W excess heat are obtained for a cathode of 2.5 grams;
- The Patterson Cell (displayed in October 1995) needs a few hours to start and delivers 5 W excess for 40 milligrams of metal coated on the "metal plated microsphere catalyst." Productivity of the Pd rod is 5/2 compared to 2500/40 = 156 times greater for the catalytic cathode of plated beads.

[On December 4, 1995, an improved version of the Patterson Power Cell™ produced >1200 watts with total power into system & control being 84 watts. Ed.]

As well known, the limits of electrochemistry have been surpassed and a great variety of other type of excess heat devices have been described (Fig. 1). More unexpectedly, completely new systems have been developed based on cavitation instead of catalysis. It seems the cavitation bubbles can play the same energy capturing role as the catalytic centers. The Griggs device is the best known of this category; here cavitation takes place between a solid and a liquid surface. Potapov's YUSMAR, a device widely commercialized, uses liquid/liquid cavitation. Continuity and congruity of our classification is attested by the existence of intermediate/combined cases. The sonofusion system is based on a combined process, cavitation generates catalytic centers. (I have never considered the forced diffusion of deuterium in the palladium as plausible in this case). The Arata Cell connects "wet" and "dry" systems. The proton conductors do the same in the realm of electro-chemistry.

Two strange related processes support this vision:
-The Reifenschweiler phenomenon a 'negative' nuclear process, shows a decrease of radioactivity of tritium embedded in nanometric (i.e. catalytic!) titanium.
-Sonoluminescence -- light emission from cavitation

Fig. 1 CLASSIFICATION OF EXCESS ENERGY SYSTEMS AND DEVICES



bubbles -- is a phenomenon in great part unexplored and lacking a theory.

This classification of the experimental facts can be used for prediction of the technological future of excess energy systems developed to date.

In 1989 our *NEN* Editor predicted commercialization within two years, considering the devices resulting from Fleischmann and Pons's revolutionary idea; and, if we take in account Peter Drucker's correction (any action takes three times longer than was planned), his forecasting is correct. However, it seems that some devices/systems have failed at the test of scale-up and remained in the laboratory. Our classification method and its basic principles can provide an explanation for what has happened in these cases and why. In the same time, for other systems the technological future is bright with a high degree of certainty.

According to our ideas, generation of heat takes place in active sites of nanometric dimensions -- catalytic centers and cavitation bubbles. The heat released is proportional to the number of these entities present in the system. Ergo, a system able to generate many active sites in a controlled manner is "good" and has chances to become a technologically commercial device, and one which is not able to do this is not viable technologically. The process of generation of heat, as well as some associated nuclear phenomena, can have some negative side-effects and, in some cases, can be self-destructive. This is a second possibility for lack of technological viability. Good engineering is needed to limit such effects. Referring to Fig. 1, we have to start the analysis with the electrochemical systems, where this great field actually originated.

Electrochemical systems.

1) There are troubles with the "classical" Pd/D_2O system -- the devices with compact cathodes are not good at generating catalytic centers and are not predictable or reliable. It's more an art than a science to work with them and, in my opinion, nothing can be changed. The systems are too sensitive and vulnerable to be used commercially as such. I think that it is a great loss that so much effort is focused on this subfield (e.g. the Japanese NHE program, at least the visible part of it). These devices have scientific potential but no technological perspective. It is now obvious that the very high value of the D/Pd ratio is not an asset ***per se*** but a requirement for the birth of active sites; the more engineered systems do not need it.

2) Improved Pd/D_2O systems -- the Arata Cell is a fine combination of a wet system with a complex double-cathode inside which deuterium is in contact with dry, hyperfine palladium. It is efficient and reliable. I dare to suggest that it would work even better with Pd-based catalysts protected by very thin Pd membranes. The Patterson Power Cell™ has a variant with Pd as active metal but it seems that the cheaper Ni/H_2O variant is preferred.

3) Ni/H_2O systems -- there is no new data regarding the Mills/Hydrocatalysis Power Corp. developments. It seems they have used cathodes made from extremely long Ni wires, obviously not the best choice when the number of catalytic centers is the critical factor. A more complex, extended, developed surface would be better. According to this criterium, the Patterson Cell is "good." As seen from Hal Fox's analysis, published in *Fusion Facts*, Oct. 1995, if current density is increased above a limit, the performance is decreased -- that's because the number of energy generating points is constant and is the limiting factor. Increasing the temperature is beneficial for productivity -- the turnover of the catalytic centers is increased.

This cell is a certainty and should be used for researching other certainties:

a) The cell has to be tested with deuterium depleted water; if it works, the H + D reaction cannot be a source of energy.

b) It was repeatedly suggested that lithium is a part of the fuel. If it is true, significant differences have to be shown when working with isotopically pure Li^7 vs. Li^6. The fundamental question: NUCLEAR or NOT NUCLEAR will get an answer and this may happen very soon!

4) Pd/LiD in molten salts, the system of Liaw & Liebert at the University of Hawaii, has difficult problems: the breeding of catalytic sites is not easy, and the side effect (corrosion) is dreadful.

5) The proton conductors have reached an obstacle in development; their basic idea -- the use of the enormous internal surface, is spectacular and promising. However, they are plagued by an important side-effect, the destruction of the material due to the heat generated. For the moment their technological future is not predictable.

Non-electrochemical systems.

6) The Stringham-George sonofusion system combines cavitation and catalysis -- the ultrasound activates the surface of the Pd target. Obviously, it is an interesting and apparently efficient system if the destructive side

effects are under control. The information available about the functional parameters and performances is scarce.

7 & 8) Two from the six gas/solid devices are *ab ovo* eliminated from the technological competition:

-the gas loading/ unloading system of Yamaguchi and Nishioka (N.T.T),

-the ionic implant system of Kamada.

Both are "one-shot" systems characterized by ephemeral functionality due to a very limited reserve of gaseous fuel which is suddenly discharged/used and after that the system is 'dead'. The scientific aspects are important, e.g. Kamada has demonstrated the very local character of these heat-generating processes.

9 & 10) Glow discharge (Kucherov, Karabut, & Savvatimova) and Sparking (Dufour) -- these systems are generating active sites continuously and in a controlled manner. The obvious problem is the number (density) of these sites. Is it sufficiently high? Much development work appears necessary, as the devices are technologically immature.

11) The system of anharmonic stimulation of Piantelli et al. -- it appears to be a kind of technological optimum, based on the controlled generation of copious active sites. The mechanism described in their recent patent (see page 6) is in perfect accord with our surface dynamics.

Cavitation Systems.
Two devices, those of Griggs and of Potapov **are** a technological reality.

An important remark at the end of this paper: the effects are not material-specific. CATALYSIS IS MORE IMPORTANT THAN THE CATALYSTS AND CAVITATION IS MORE IMPORTANT THAN THE CAVITATING LIQUID. Water is not a "must," both Griggs and Potapov claim they can work with oil too, for example. The field is in a marvelously dynamic evolution and has a great future.

Note: For a complete bibliography and exhaustive discussion of all the systems, please write to the author: Dr. Peter Glück, Institute of Isotopic and Molecular Technology, P.O. Box 700 Cluj-Napoca, Romania Fax 40-64-420042 E-mail <itimc@utcluj.ro> or <itimc@imar.ro>

MAJOR DEVELOPMENTS IN COLD FUSION
Dana Richard Rotegard, MCFA
December 7, 1995.

Major European Patent Grant
The European patent office has issued a Notice of Intent to grant the Pons-Fleischmann patent for cold fusion. Filed by the University of Utah in 1989, this cold fusion patent (and over 200 others) has been denied by the U.S. patent office. The University of Utah has licensed this patent to ENECO (formerly Fusion Energy Applied Technology Inc.) of Salt Lake City. ENECO's science board includes several prominent cold fusion scientists, including Dr. Richard Oriani of the University of Minnesota and Dr. Ed Storms formerly of LANL. The late Minoru Toyoda, founder of Toyota Motors tried to acquire this patent filing from the University of Utah. Beside being another vindication for Drs. Fleischmann and Pons, this patent grant signals a change in official attitudes toward cold fusion science in Europe.

Italian Industrial Backing
FIAT sponsored a small cold fusion gathering from October 11-13 in Asti, Italy, of about 40 internationally prominent cold fusion researchers including Dr. Storms of ENECO. After the conference FIAT announced sponsorship of Dr. Piantelli's cold fusion research.

Japanese MITI Increases Cold Fusion Commitment
The Japanese government announced an increase from $30 million to $100 million of its cold fusion R&D budget. The program is administered through MITI with labs based in Sapporo near the Toyota R&D effort and at the University of Hokkaido. According to Dr. Hal Fox, editor of *Fusion Facts* and *NEN*, over 100 cold fusion patents have been granted in Japan, including the "ceramic" cold fusion patent of Dr. Mizuno (sponsored by Mitsubishi). Dr. Mizuno lectured at the University of Minnesota in June where ceramic cold fusion research continues under the direction of Dr. Oriani.

Prototype Demonstrated at University of Illinois
The University of Illinois and the American Nuclear Society convention witnessed a major demonstration when Clean Energy Technology Inc. unveiled a 20 watt light-water cold fusion cell operating at a 70 to 1 energy profit. C.E.T.I's Drs. Cravens and Patterson had demonstrated the same technology in Monte Carlo in April. Dr. George Miley, the editor of the respected *Fusion Technology* and several University of Illinois graduate assistants monitored the experiment's calorimetry and setup. Dr. Cravens hopes to upscale this heat source to near a kilowatt and prototype an electric car battery recharger in early 1996.

The Media Sleeps

Despite mainstream front-page coverage of these developments in Italy and Japan, there has been little coverage, either printed or electronic, of these developments in the United States. "Science on Friday"'s Ira Flato on NPR covered the CETI demonstration. Otherwise, little science news on these major developments has appeared outside specialized American cold fusion newsletters such as *Cold Fusion Times*, Ed. Dr. M. Swartz; *Fusion Facts*, Ed. Dr. H. Fox; and *Infinite Energy*, Ed. Dr. E. Mallove.

The Cold Fusion Electric Car

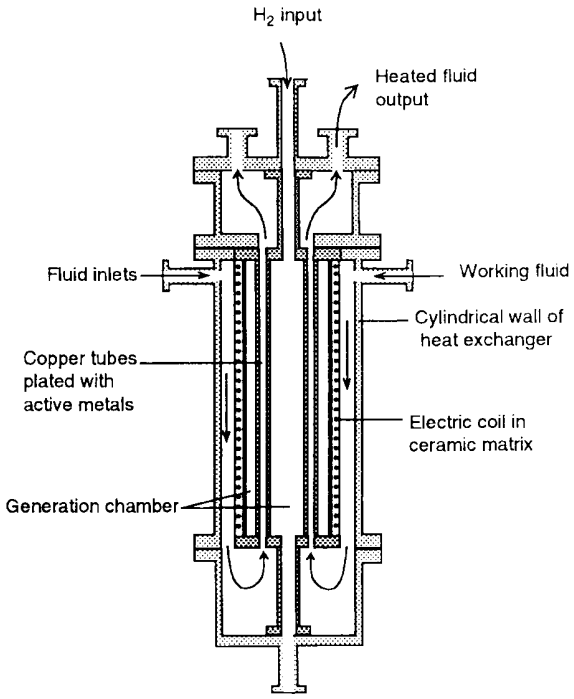
Major work on Cold Fusion as a power source for electric cars is underway in the R&D labs of several major international auto manufacturers led by Toyota, the sponsors of Dr. Fleischmann and Pons lab near Nice, France. The American "Big Three" of GM, Ford, and Chrysler continue to fight electric car mandates in Massachusetts, New York, and California. Quite clearly, the executives of American auto companies are ignoring the example of their overseas competition and the cutting edge scientific developments that could make internal combustion technology economically obsolete.

Third Wave Energy Activism

Under the provisions of the Massachusetts Clean Air Act, by 1998, 2% of Massachusetts' new cars must be emissionless. A variety of small companies have emerged in the so called "platinum perimeter" outside Boston to capture this market. I visited the labs of Jet Technology, in Wellesley Hills last November, for close talks on this subject with Dr. Mitchell Swartz. This summer a coalition of entrepreneurs, economic futurists, environmental groups such as MASSPIRG, and medical lobbies such as the American Lung Association successfully defended the electric car mandates from an attempted rollback by Detroit. Cold fusion and breakthroughs in zero point energy technology make it possible that market forces will soon end the age of fossil fuel.

ANHARMONIC FUSION PATENT
Courtesy of ENECO

WO 95 20816 "Energy generation and generator by means of anharmonic stimulated fusion;" Francesco Piantelli; 3 Aug 1995, 27 Jan 1994. Abstract: A process of energy generation and an energy generator by means of anharmonic stimulated fusion of hydrogen isotopes absorbed on metal comprising a charging step on a metallic core of a quantity of hydrogen isotopes H and D; a heating step in which said core is heated to reach a temperature higher than Debye's temperature of the material composing the core; a startup step wherein a vibrational stress is produced with a rise time less than 0.1 seconds which activates a nuclear fusion of said hydrogen isotopes; a stationary step during which is exchanged the heat produced by the H+D nuclear fusion reaction which occurs in the core because of a steady keeping of a coherent multimodal system of stationary oscillations.



Piantelli Energy Generator
using Anharmonic Stimulated Fusion

RE: THE PIANTELLI PATENT
A letter from Dr. Collis, Italy
12 November 1995

The long awaited international patent WO 95/20816, relating to Piantelli's energy generator has finally been published. In the absence of detail in the original paper (S. Focardi, R. Habel, and F. Piantelli, "Anomalous Heat Production in Ni-H Systems", *Il Nuovo Cimento*, vol 107, p 103, January 1994), the patent contains fascinating specifications of how to duplicate the phenomenon.

The energy generating process is based on 4 steps. The charging step loads the active core (for example pure nickel, nickel plated on copper, nickel alloy etc.) with natural hydrogen containing the usual 150 ppm

deuterium. The heating step raises the temperature above the critical Debye temperature. The patent lists these Debye temperatures for a range of pure metals and alloys. The startup step induces vibrational stress and activates Cold Fusion of the hydrogen isotopes. Six startup methods are documented - thermal stress, mechanical impulse, electric striction, laser pulse, radio-frequency, ultrasonic-vibration. If the active core is ferromagnetic, for example nickel or steel, a 100 millisecond pulse can be applied to the heating coil to initiate fusion. Once fusion is underway, the ultrasonic vibrations of the core sustain themselves without external stimulation forming stationary waves in the core. This forms the heat exchange step. The shutdown step can be brought about by either reducing the temperature to below the critical Debye value or by disorganizing the oscillations in some way. The reaction would also cease if the temperature were raised sufficiently to destroy the crystalline structure of the core. The patent vaguely notes that unspecified radio-active isotopes result from shutting down the reaction.

Yours sincerely
/s/ W.J.M.F. Collis

Space Energy

BREAKTHROUGH IN VACUUM ENERGY?

Andrei Samokhin (Novosti Press Agency, Moscow), "Vacuum Energy - A Breakthrough?" from a press release by the Novosti Press Agency, No 03NTO-890717CM04.

AUTHOR'S ABSTRACT

A design model of the plasma generator which can convert physical-vacuum energy into electricity has been developed under Professor Aleksandr V. Chernetskii at the Moscow Gerogi Plekhanov Institute of the National Economy. Such generators could lay the groundwork for a future environmentally-benign power industry.

FREE POWER GENERATION

Parahamsa Tewari (Kaiga Project, Nuclear Power Corp. of India Ltd., India), "Genesis of Free Power Generation," *Explore!*, vol 6, no 3, 1995, 7 figs, 1 ref.

AUTHOR'S INTRODUCTION

As per Lenz's law, the electromotive force (EMF) induced in a conductor has such a direction that the current produced by it opposes any flux change. More precisely, in a specific case of a conductor moving relative to magnetic field, the magnetic field produced by the current due to the induced EMF in the conductor interacts with the external magnetic field that initially induced the EMF, and thereby produces a net force on the conductor opposing its movement across the magnetic field. If the configuration of the conductor through which the current flows is made in such a way that the magnetic fields produced by the currents in the above two conductors cancel each other partially (if not fully), then there is a way to beat the Lenz's law due to which mechanical power required to move the conductor across the magnetic field to generate electrical power will get proportionally reduced.

The design of the modern DC generator has difficulties in achieving the above configuration of the conductors since the generating element is the rotating conductor within the generator; whereas, the entire outer circuit is a stationary loop connected to the loads. It is shown how the physical constraints in achieving the desired relative dispositions of the conductors can be overcome, and Lenz's law can be partly made ineffective. With the efficiency increase to higher than unity in the above scheme, the question arises on the source of additional power. Through brief discussion, it is shown that only with an alternate theory, which postulates generation of matter from space medium, satisfactory explanations for over-unity machines can be had.

EDITOR'S COMMENTS

If we adopt the concept of an energetic aether, then a device that creates more output energy than input energy is just an **energy transformer**. The Law of Conservation of Energy is still intact.

PATENT OF HISTORIC INTEREST

US 4,772,816 "Energy Conversion System;" Geoffrey M. Spence; 20 Sept. 1988, 07 Feb. 1986. Abstract: The apparatus uses a magnetic field to accelerate a charged particle radially towards a target electrode. The increased kinetic energy of the particles enables the particle to give up more electrical energy to the target electrode than was initially given to it. This charges the target electrode, and the increased energy is extracted from the apparatus by connecting an electrical load

between the target electrode and a point of lower or higher potential.

Rotating Space-Energy Devices

ELECTROMAGNETIC EUREKA
Courtesy of Mark Goldes

Tony Edwards, "`Accident' in Lab Creates Super Motor," London *Sunday Times*, 10 December 1995.

SUMMARY

Serendipity came in the form of a mistaken "d" for a "b." A few years ago, a laboratory technician misread his instructions and added neodymium (Nd) instead of niobium (Nb) to an experiment. The result was astounding, producing one of the most powerful magnetic substances ever seen.

Yasunori Takahashi, the scientist who designed the experiment, knows a good thing when he sees it. He has subsequently developed a system to manufacture a magnetic powder that can be formed into products from ultra-thin coatings to large permanent magnets. Takahashi, of the Sciex Corporation of Japan, has a good record in commercial innovation. While at Sony, he developed the Beta videotape technology, which became the standard system until it was overtaken by VHS.

Takahashi now claims to have produced a magnet that has the world's highest Megagauss Oersted rating (MgOe - the unit by which magnetism is measured). "Before my discovery, 55 MgOe was the maximum anyone had achieved, but my magnet can reach 120+ MgOe," he said.

One use of the Takahashi magnet is to extend the life of rechargeable batteries. The magnets, when formed into thin inch-wide squares and attached to mobile-phone batteries, double the amount of charge retained and so makes it last twice as long. This "battery-doubler" is already on sale in Japan where one phone company, the Japanese equivalent of Bell Telephone, ordered 100,000 of them.

Redesigning a conventional electric motor, Takahashi has fitted it with his super-powerful "YT" magnets, and claims that his engine will produce 15 horsepower from a few amperes of electricity. Takahashi has installed the motor in an electric scooter, which provides a top speed of 50 mph and a range of more than 500 miles. Takahashi says that when the scooter is throttled back and free wheeling, the engine becomes a generator and partly recharges the batteries while moving, which in turn gives the scooter its high range.

Michael Laughton, a London University professor of electrical engineering is impressed, saying "It is an incredible machine. Takahashi seems to have developed an extraordinarily efficient electric motor and control system which in principle, could be scaled up for an electric car."

Summary by D.Torres

TAKAHASHI MOTOR RELEASED

THE TAKAHASHI MAGNETS AND MOTOR
By Mark Goldes (CEO, Magnetic Power Inc.)

I had the honor to meet in London with Yasunori Takahashi, CEO of Sciex Corp. in early November 1995. Takahashi has invented new magnets with by far the highest energy values ever announced, as well as other desirable characteristics.

Using the latest versions of his extraordinary magnets, which data indicates are rated at 144.7 MegaGauss Oersteds (MGOe) - he has built a second, improved prototype of a motor scooter using his permanent magnet Self-Generating Motor (SGM). Once started using a battery, it appears to require no further input energy. The magnets and SGM are the subject of patent applications world-wide.

The September '94 issue of the British Broadcasting Company's *Top Gear* magazine described the earlier version of a similarly modified electric scooter that used less powerful, bonded magnets (44.4 MGOe). The 144.7 MGOe magnets are sintered.

Once started, using a battery, the motor appears to require no further input energy.

The BBC's magazine article describing the first scooter prototype stated: "The motor was retrofitted with the magnets and the original batteries were replaced with

four small 12 volt batteries (a 48 volt starting system). The scooter arrived in London with its batteries almost discharged. It was driven on a freeway at an estimated 50 mph. It was also reported that acceleration from zero to 30 mph took about 4 seconds.

The earlier scooter was demonstrated to a Senior Engineer at Nissan's European Technical Center who said that this invention: "If it checks out in our own tests, has huge implications for everything which uses a motor -- it could revolutionize the world." He was given to understand that the batteries were only used to spin the motor up to a speed where it would continue to run without input. A video was shown by the inventor during my London visit **which showed a prototype with a drive belt turning an alternator. The motor was connected to a battery for starting and the battery was then disconnected. Two headlights remained illuminated after the battery was disconnected.**

Another invention demonstrated by Takahashi was an extremely powerful small capacitor. This unit, rated at 20 Farads at 25 volts, has a volume of about one cubic centimeter. Panasonic and three other companies have licensed this invention in Japan. A hot water thermos incorporating one of these capacitors was connected to the grid until the water boiled. For the next 24 hours, Takahashi stated it would bring the water to a boil again by pressing a button that released energy stored in the capacitor. It was on the table for several hours and boiling water was produced for tea a number of times.

Takahashi has also invented a magnetic device Sciex calls a Battery Doubler™. Attached to a battery used for a cellular telephone, laptop computer, or a camcorder, during the charging process the data supplied indicates it will extend running time by a multiple of between 1.5 and 2.5. Magnetic Power Inc. will introduce the Battery Doubler™ into the U.S. market as the initial stage of a Joint-Venture between the two firms. Magnetic Power Inc. can be contacted at 707-829-9391, Fax 707-829-1002.

EXPERT OPINION

"The concept is interesting and well-formed, but in order to earn better than a 'C,' the idea must be feasible." -- A Yale University management professor in response to Fred Smith's paper proposing a reliable overnight delivery service. **Smith went on to found Federal Express Corp.**

Miscellaneous

ELECTRONS VERSUS PHOTONS
CyberDyne, 1995

CyberDyne Computer Corporation has patents (8 filed, 5 in process for filing, and two issued) covering the Photonic (Light) Transistor and its full usage in both analog and digital technologies.

Historically, **the ability to execute both linear (analog) and computational (digital) functions at the speed of light has been the primary objective of the most intensive R&D efforts since the development of nuclear fission**. More than $3 billion will be expended by private and government-sponsored research organizations during FY-95 alone to accomplish this objective. The major players in this international arena are the United States, Japan and Israel. Unfortunately for them, the focus of this research has been centered primarily on the development of non-linear optical crystals and Self Electro-optic Effect Devices (SEEDs). These have inherent physical limitations that have proven insurmountable. They are relatively large, slow, cost prohibitive and grossly energy inefficient. Large numbers of separate, energy intensive components simply cannot be packed into computer-chip-sized units because of the tremendous amount of waste heat and the physical engineering needs.

CDCC's Photonic Transistors have none of these problems.

Higher speed (than Silicon based electronic computer chips)"Bio-Technology" based computers are being investigated but the best estimates of practicality are many years away. These units rely upon getting their speed from being very small and therefore not having to move the electrons very far. The problem with electron based technology is that **this Universe has an internally imposed speed limit**, the speed of light.

The fastest possible computers will eventually have to utilize **the fundamental carriers of light information, the photon**. The photon has none of the inherent problems of the electron. The photon has no mass and carries no electric or magnetic charge. It is not reacted upon by surrounding photons nor does it act upon them.

The electron, the fundamental carrier of electric charge, has both mass and charge. **These problems** constantly baffle computer engineers. The electron's mass requires significant amounts of electrical energy to accelerate it to high speeds, and then gives up this energy as it is decelerated (mostly as heat). In fact, it would take all of the energy in the Universe just to accelerate one electron up to the speed of light. This type of energy inefficiency, which increases as the square of the speed (frequency) of the chip, is not tolerable in portable equipment. The electron's electric charge gives rise to **three additional problems**, which are already giving fits to computer designers.

The first problem arises when an attempt is made to accelerate the electron to a high speed. Because the mass of the electron is a fixed value, the only way to make it accelerate faster is to use a higher voltage. Due to the tiny 4 ten-millionths of an inch internal spacing required to make the current crop of chips, high voltage cannot be used. It would cause the electrons to jump the gap (arc) over to the next conductor, causing total data confusion, if not total destruction of the chip itself. In addition, a high electrical current would be the result of using the high voltage. This, even momentary, high current would cause the chip to generate more heat than the tiny one-chip conductors could dissipate. The chip would be partially destroyed by self-evaporation.

The second problem arises due to the fact that when a charged object (the electron in this case) moves in space and time, it generates a magnetic field. This magnetic field affects the electron, trying to slow it down (reverse its direction). Additionally, as this magnetic field moves through space and crosses (cuts through) any electrical conductor (including itself), it will accelerate any electrons in that conductor. This "induction" of electron movement will tend to slow or speed (depending on their direction relative to the direction of the field) time critical electron movement in adjacent conductors. This causes a confusion of and in the logic/data streams. This phenomena is already causing major design problems in chips and in printed circuit board design. Modern Printed circuit "mother boards" require at least six to eight layers of circuitry to be laid down, in sandwich fashion, each layer at an increasingly higher and higher cost.

The third problem is caused by the combination of the electric and magnetic fields (The electromagnetic field) at high frequencies. The electromagnetic field surrounding conductors at modern computer frequencies gives rise to a radio wave. This field "flies" away from the originating conductor (which is now acting as an antenna) off into space. It will leave part of its energy within any electrically conductive material in its path. This energy is left behind in the form of accelerated electrons (and heat). If these electrons are part of another circuit within the computer, data is confused again, resulting in even more computational errors. Additionally, this electromagnetic field escapes from your computer case and causes interference to nearby radio and television sets.

Many countries have done research showing biological damage by some of the stronger of these radiating fields. [More damage is from monitor electronics than computer electronics.] This has prompted them to pass stringent laws governing allowable radiation levels. All computer equipment (including printers, monitors, modems, etc.) made in or imported into the United States is required to be certified, for all intents and purposes, radiation free by the Federal Communications Commission. This certification is quite expensive and many times requires equipment redesign and special case and connector design.

Photons offer none of these problems which so plague modern (high frequency) devices. They exhibit no mass, no charge, and no magnetism. CDCC's Photonic Transistor integrates three important technologies: (1) optical interference, (2)low-level laser light and (3) computer generated holograms. They require about the same levels of light energy as is required for a person to see at twilight. The company's photonic technology provides all the needed Boolean logic and other computing functions using only a handful of photons per logic event. The Photonic Transistor has already demonstrated its ability to do what was heretofore thought to be "impossible" -- the controlling of one beam of light with another beam of light -- essential for light-speed data processing. **Photonic Transistor switching and/or amplification occurs at the universal maximum speed (of light) using energy levels comparable to human night vision**.

Analog Amplification: The company's photonic transistor may also be used in a linear mode to amplify and process analog signals such as audio, video, radio, telephone, radar, imaging, fuzzy logic, neural networks, and a variety of other functions intrinsic to both multi-media and high level performance of switching operations.

Photonic Transistors will replace electrons with photons of laser light, **and silicon** with plastic holograms. The photonic strategic development plan is to supplant the bulk (65% has been proffered as the probable amount) of silicon-based electronic technology with holographic-based Photonic Technology.

Photonics is only one of the areas of CyberDyne's technological leadership position. Other areas include absolute digital data security, allowing fully secure monetary and business, legal, and technology data communication; a microprocessor architecture technology that is already nearly an order of magnitude ahead of the current technology in speed and an order of magnitude lower in cost; high speed data compression that can revolutionize all forms of data communication and storage; and linear parallel digital processing which can offer the power of a Cray computer for less than 1/200 of the cost, today!

CyberDyne's NovaMotiv division can offer practical electrically powered, hybrid (diesel or gas), and electric commuter vehicles; low friction lubricants; and induction/ignition technologies that have proven to save an average of 10 to 15% in fuel savings and more in pollution reduction. They also offer an energy saving, heretofore unavailable, 2/3 size long haul truck/ tractor-trailer for intermediate loads.

CyberDyne Computer Corporation is now in the final stages of securing four major strategic partners. One to wield the necessary lobbying and political power in Washington; one to provide Wall Street wisdom and appropriate alliances there; one to assure the strong legal position of both the technology and the business; and one, with major business and political force in the Pacific Rim, to represent the company and its technology and products in the international arena.

It is the intent of the company to find appropriate strong, seasoned business teams who can form the finished products of CyberDynes research efforts into individual, subsidiary, publicly traded stock corporations, through IPO's, and bring these products to market. Several ideal teams have been identified, notified, have shown enthusiastic interest, and are currently in negotiation.

NOT HASENÖHRL BUT MAXWELL WAS THE INVENTOR OF THE FORMULA $e=mc^2$

By Stefan Marinov (Inst. for Fundamental Phys., Graz, Austria), originally pub. in *Deutsche Physik*, vol 5, no 17, p 41.

Perusing recently Maxwell's "Treatise" (no. 793) [1], I read the following lines:

> Thus, if in strong sunlight the energy of the light which falls on one square foot is 83.4 foot pounds

per second (i.e., 124.1 kg m^2 s^{-2} or J, or Nm), the mean energy in one cubic foot of sunlight is about 0.0000000882 of a foot pound (i.e., 4.14×10^{-7} kg m^{-1} s^{-2}, or J/m^3, or N/m^2) and the mean pressure on a square foot is 0.0000000882 of a pound weight (i.e., 4.14×10^{-7} kg m^{-1} s^{-2} or N/m^2)...

> It is probable that a much greater energy of radiation might be obtained by means of the concentrated rays of the electric lamp. Such rays falling on thin metal disk, delicately suspended in a vacuum, might perhaps produce an observable mechanical effect. (The effect was observed by Lebedev [2] - S.M.)

Maxwell accepted (as every clever child will do) that the energy e absorbed in a second by 1 m^2 placed at right angles to the incident Sun's light, at no availability of reflection, was

$$e = \varepsilon c, \qquad (1)$$

where ε is the light energy density (i.e., the energy in 1 m^3) and c is the velocity of light.

Assuming that light is a medium moving with a velocity c, Maxwell realized (as every clever child will do) that ε was equal to the pressure p exerted by the light flow, as the pressure exerted by a medium's flow multiplied by its velocity gives the energy which the flow transfers in a second through 1 m^2 placed at right angles to the flow's velocity.

But every clever child knows that the pressure exerted by a medium flowing with a velocity c is

$$p = mc, \qquad (2)$$

where $m = \mu c$ is the medium's mass which crosses in a second 1 m^2 placed at right angles to the flow, and μ is the mass density of the medium.

If Maxwell had substituted (2) into (1) (this operation will be done by every child who knows some algebra), Maxwell would have obtained the relation

$$e = mc^2, \qquad (3)$$

and dividing this equality by c

$$\varepsilon = \mu c^2. \qquad (4)$$

Thus, if the people who generally are called "special relativists" assert that formulas (3) and (4) have been obtained by Einstein proceeding from the "theory of relativity", the only conclusion to be had is: either these gentlemen think that we are fools, or they themselves are fools.

I have to note that formulas (3) and (4) are to be written generally in the form [3]

$$e_0 = m_0c^2, \qquad \varepsilon_0 = \mu_0c^2, \qquad (5)$$

where

$$e_0 = e(1 - v^2/c^2)^{-1/2}, \qquad m_0 = m(1 - v^2/c^2)^{-1/2} \qquad (6)$$

are the proper energy and proper masses. By e and m I denote the respective universal (i.e., rest) energy and universal (i.e., rest) mass. The universal energy and mass density of light are equal to zero.

Let me finally note that my friend, Prof. U. Bartocci, who is an expert in the history of science, established that formula (3) was published in the year 1904, independently of Hasenöhrl, by the Italian scientist Olinto de Pretto [4]. Bartocci et al. present the "case Olinto de Pretto" in a beautiful documentation [5]. Every man interested in the fundamentals of physics needs to read Bartocci's excellent historical investigation. Hasenöhrl obtained (3) with the coefficient 3/8 on the right [6].

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DUALING THEORIES

Courtesy Dr. Sam Faile

Madhusree Mukerjee (Staff writer), "Explaining Everything," *Scientific American*, January 1996, pg 88-94.

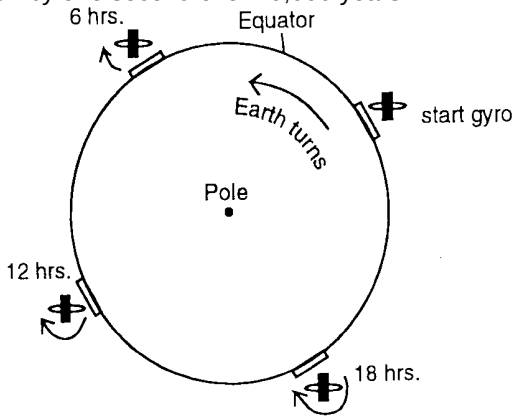
INTRODUCTION

The word "dual" -- fast replacing "super" as the most overused word in particle theory -- has many different connotations for physicists. Broadly, two theories are said to be dual if they are apparently dissimilar but make the same physical predictions. For example, if all the electrical and magnetic quantities in Maxwell's equations for electro-magnetism are interchanged, one nominally obtains a different theory. But if in addition to electrical charges, the world is presumed to contain magnetic charges (such as the isolated north pole of a bar magnet), the two theories become exactly the same -- or dual.

ROTATIONAL EARTH POWER?

"As the World Turns, Free Energy?" *Business Week*, August 28, 1995, p 77.

The NuEnergy Associates, a handful of retired engineers and physicists, have produced and patented a so-called gyro-power machine that's basically a gyroscope connected to a generator. The gyro stays fixed in space while the Earth turns under it. In 24 hours, the gyro has made one revolution with respect to Earth. Therefore, if the gyro could be geared to a Earth-connected machine, it could generate energy. It would only slow the Earth's rotation by one second over 10,000 years.



Gyro stays fixed in space. Earth turns under it. In 24 hours gyro has made one revolution with respect to the Earth. Therefore, if I could gear the gyro to a machine, I could generate energy.

Although it's therotically possible to generate all of the electrical power needed in the world with this method, there is one small problem: the working model, which is only two inches in diameter, actually consumes more energy than it produces. NuEnergy is seeking $2 million for a three year project to scale up the gyroscope to a four foot wide rotor, which would reach the energy break-even point so that it would not fall apart at high speeds; and find efficient gearboxes to translate the once-a-day wobble rotation of the gyroscope into the high rotational speeds a generator requires. The required gear ratio is about 1 million to 1. NuEnergy Director Roger C. Finvold says he is sending skeptics videotapes of their creation in action. "Once you see it actually working", says Finvold, "it makes sense."

CHARACTERIZING THE PERFORMANCE OF NON-CONVENTIONAL ELECTRICAL MACHINES BASED ON POWER AND ENERGY MEASUREMENTS

Part 2, continued from NEN, September 1995

By George D. Hathaway,
Hathaway Consulting Services, Canada
27 November 1995

Non-conventional Energy Technology (NCET) Efficiency

The ultimate engineering test of an invention's viability is whether it outperforms currently available conventional devices, or will do so in the near future given reasonable time and funding. The only way to determine the extent of this performance is by making comparisons in terms applicable to conventional systems. Therefore, new systems must also be investigated and promoted using conventional engineering language and test protocols. This means performing tests and publishing results using ohms, watts, volts, amps, etc. Since the goal of all of the NCET discussed in this series is the provision of rotational, electrical or thermal energy, energy and its time derivative, power, must be measured and calculated carefully, accurately and consistently.

Although it is possible and even desirable to measure such factors as transient, frequency and phase response, these are not required when determining first-order energy or power production or efficiency. These factors enable the researcher to obtain a clearer understanding of the operation and mathematical modelling of the system but are usually beyond the capabilities of most experimenters. They are important, of course, when optimizing or improving the design and especially when matching device to load.

It is claimed by many researchers in NCET that their device is "over efficient," "super efficient," or "over unity," meaning that the total output energy exceeds input energy. This implies that there is a definable input and output to begin with. It follows that the device must have either four electrical terminals (at least) or two terminals plus rotating shaft. (Thermal converters such as Cold Fusion devices are treated elsewhere.) One of the usual pitfalls into which researchers stumble is their imprecise definition of output and input, especially if their designs incorporate storage batteries and/or are essentially two terminal devices. Great care must attend the claim that energy flows both ways over the same two wires of such a two terminal device when it is presumed that the device is taking some energy from a battery, amplifying it, and then returning it to recharge the battery.

It is a given, however, that those two-terminal devices devoid of batteries or input rotating shafts which produce energy above a certain amount are true free-energy devices provided their energy outputs are measured correctly. If one wishes to measure in detail their input/output energy conversion efficiencies, however, one must have considerable knowledge of the true source of the driving energy, something which, as of this writing, very few researchers possess. Therefore, if a device is to be called over-unity efficient, its input and its output must be well-defined and available for measurement.

Conventional power electrical engineering, when measuring rotating machines such as generators and meters, uses a method of calculating overall operating efficiency which involves measured electrical output and calculated and measured losses within the machine. This is due to the inherent difficulties in measuring, for large electric generators for instance, the driving shaft torque and therefore the input power. Because of the generally detailed knowledge of the nature and size of the losses in such machines, this method of efficiency calculating has been found to match very closely the calculation of true percent efficiency:

LARGE ROTATING MACHINES

$$\eta = \frac{output}{output + losses} \times 100\%$$

EFFICIENCY STRICTLY DEFINED

$$\eta = \frac{output}{input} \times 100\%$$

Some researchers attempt to modify the first equation above and adapt it to their NCET invention by such means as subtracting the assumed driving motor losses and internal energy losses due to internal resistances. Unfortunately, more often than not these losses are estimated rather than measured and the highest possible value is assumed, thus unjustifiably favoring the device's performance.

Measuring the input shaft to output electrical efficiency of conventional motor-driven rotary NCET generators demonstrates another difficulty insofar as the efficiency of the drive motor must usually be defined as it is easier to measure the input electrical energy to the drive motor than to measure the motor efficiency itself. It is highly unusual to find an off-the-shelf motor with efficiency curves as function of speed or torque. Most researchers will simply guess at an efficiency or assume a published efficiency specification a being valid throughout the test range of speed or torque. As motor efficiency can vary markedly with torque and speed, it is essential to obtain these curves beforehand, or else only operate at a known point on the torque-speed curve at which the efficiency is well established. For instance, most motors operate at approximately 1/4 of their rated efficiency when lightly loaded (less than 10% of rated power). As

well, all motors of a particular horsepower rating from the same manufacturer do not have identical efficiencies. When dealing with putative efficiencies of a few percent over unity, for example, this can have a significant effect on the viability of the design. For instance, 1978 NEMA standards allow a minimum actual efficiency of 46% even though the rating for a particular class of motors is published as 50.5%.

To add to this problem, there is even variation between international efficiency testing methods. For example, IEEE 112 Method B and Japan's JEC37 standard can give up to a 3% difference for 15 hp motors and a larger deviation as sizes become smaller.

Some NCET designs borrow a term from heat pump technology, COP, or Coefficient of Performance. The heat pump uses electricity to extract heat from the natural environment (eg. ambient air or groundwater). Thus the new energy efficiency, COP (thermal energy output/electrical energy input) is often over unity and reflects the additional free energy obtained from nature. If true free energy devices of the types discussed herein are ever constructed, COP may be a better term to use until the precise nature of the additional energy source is known. By then we might be able to calculate the inherent power of the new source(s) and thus lower the efficiency figures to below 100% again. As an analogy, ask yourself: what is the true energy efficiency of a water turbine?

Common Misconceptions

Before discussing the basic engineering measurements necessary for the assessment of performance (in Part 3), it is instructive to examine some common misconceptions held by free energy researchers. Unfortunately, most literature concerning free energy measurements and calculations abounds in misunderstandings of principals and characteristics or misapplication of technique. These can range from simple to complex depending on the system and generally indicate a failure to investigate or apply the proper technique or calculation. **It is most often caused by the researcher's over-enthusiasm at the excitement of having made an apparent breakthrough, although on rare occasions it is pre-meditated intent to deceive.** The eagerness to publish should never be given greater importance than the integrity of the contents.

Many NCET devices incorporate storage batteries. Such systems must be characterized using energy measurements and calculations rather than power only. This is especially true in any system that alternately charges and loads a set of storage batteries such as lead-acid or nickel-cadmium and is claimed to act like self-powered battery charger. Without adding the essential time component, no direct comparison with conventional systems is valid. This must be done on an energy-to-energy basis.

Coupled with this is the chronic underestimation of current lead-acid batteries' energy storage capabilities and tendency to self-recharge after heavy loading. The researcher is urged most strongly, therefore, to perform simple load tests on the storage batteries to be used to make sure they understand the batteries' capabilities in conventional circuits.

It is also well known that enhanced recharging of storage as well as, to a lesser extent, primary batteries is possible by high frequency resonant and non-resonant reverse-current pulsing. There are several systems on the market that use exactly this technique in a precisely controlled manner to extend discharge cycle life. While this technique allows more efficient use of the battery, it operates at less than unity efficiency when properly measured. It is important to note, however, that measurement of the energy content of such pulses, except in the cases of simple zero DC-offset waveforms, can be complex and difficult without proper equipment. Enhanced lead-acid cell charging at high currents is possible but battery life will be severely foreshortened and it is a dangerous practice due to excess hydrogen devolution and plate buckling causing internal shorts.

Another popular misunderstanding regarding storage batteries is the measurement of their state of charge. For a few NCET devices involving battery charging this is the main performance criteria that is "measured" to demonstrate over-unity efficiency. It is apparent that they are really trying to show how much energy is left in the battery after a particular charging or loading operation. Unfortunately, virtually all NCET researcher experiencing with these types of devices equate charge state with terminal voltage only. Many other factors are required to adequately determine the true state of charge including temperature, age and, most importantly, slope at the point on the discharge current curve. These additional factors must be compared to the battery manufacturer's data to determine actual charge state and thus remaining capacity (energy). It must constantly be kept in mind also that batteries' discharge curves are non-linear and exhibit knees and breakpoint so that comparing two batteries' "state of charge" (measured solely by voltage) whose voltage is the same does not mean they have the same remaining capacity stored within, measured as (instantaneous watts/unit time) multiplied by (total time until charge reaches a certain

minimum value). Capacity also varies with discharge rate.

It is claimed that for some two-terminal NCET devices connected to batteries, power flows both ways simultaneously into wires only: from device to battery and from battery to device, thus keeping the battery charged while powering the device. Unless these two wires can be characterized as a high frequency, multi-mode transmission line with sophisticated multiplexing capabilities at either end, stating that these systems allow simultaneous power flow in both directions at the frequencies specified must be unequivocally demonstrated as being so before this claim is acceptable.

With regard to rotating NCET devices, it is often observed that the shaft speed of NCET generators occasionally increases when an electrical load (usually a short circuit) is placed across their output terminals. This, it is stated, is totally unheard of in conventional physics. This statement embodies two incorrect assumptions, namely that a decrease in RPM always means a decrease in power transmitted by the shaft, and that placing an arbitrary load, usually a short circuit, across the output terminals constitutes "loading" the generator.

The first of these assumptions can be simply examined. Mechanical power in a rotating shaft is equal to the torque times the angular velocity as defined above, namely $P_{mech} = M\omega$. If the torque is constant, then the power will be proportional to the rotational speed. However, varying the torque while keeping the speed constant will vary the power. In a simple shunt connected motor, for instance, an armature current increases, torque rises rapidly while RPM falls slightly, demonstrating the variability in the two parameters M and ω.

The second of these assumptions results from researchers not doing their homework. If the researchers scanned any electrical machines text they would discover that in many instances and depending on the wiring of the machine, decreasing the resistance in a certain part of the circuit (sometimes used as the output/input terminals) will inevitably result in a shaft speed increase. This is shown by applying simple laws of conventional electrical engineering. In the example of the fractional horsepower shunt-wound motor used above, decreasing the total armature resistance increases the speed. Therefore, the internal circuit diagram of the NET generators or motors must be known and examined if such speed vs. load claims are to be made.

A corollary misconception related to the foregoing is the assumption that zero resistance equals " maximum load". **The term "maximum load" as used by most NCET researchers means that condition which allows maximum power to flow from the source to the load. In electrical technology, that condition means the electrical impedance of both source and load must be equal**. The most general case has these impedances broken into the resistive or active (real) part and the inductive or capacitive reactive (imaginary) part. When the load comprises a purely resistive element, or nearly pure, the imaginary part is negligible and the impedance of the load can be measured in ohms by an ohmmeter. Loads such as resistors, light bulbs and heaters can effectively be treated as purely resistive up to moderate frequencies. Motors, etc., when used as loads, exhibit generally high inductive impedance along with the purely resistive and should only be used in power measurements by those who are conversant with the calculations involved. This latter only applies to loads handling AC. However, caution must always be exercised when measuring the impedance of the load.

In general, the same applies to characterizing the output impedance of the source. If it contains inductive or capacitive components and its AC output power is to be measured, it will usually show a significant phase shift between current and voltage waveforms. More about this in the section on measurement to follow.

Returning to the maximum load problem above, it is easily shown that maximum power is transferred to the load when the impedances of the load and source are equal. If the currents alternate and reactive elements appear in the source or load, maximum power transfer occurs when the source impedance is the complex conjugate of the load impedance - with the real (purely resistive) part of the impedances equal. In the purely resistive case, or the DC case, these impedances can be measured as pure resistances by an ohmmeter. All NCET devices have non-zero real output impedances, usually ranging from several tens to several thousand ohms. Applying a short circuit across the output terminal, i.e. a near-zero ohm load, therefore does not represent a "maximum load" since the impedances are different.

Some NCET researchers claim their devices produce an excess of output to input of 2-5 watts and it can be shown that the measurement of output power is sound. These researchers should keep in mind that with tuned low-frequency circuits, it is possible to "extract" by induction, several watts of continuous AC power from nearby 60 Hz mains or powerlines.

Several NCET devices have been operated in so-called Faraday Cages or screen rooms. This is ostensibly to show that ordinary ambient electromagnetic radiation cannot be the energy source and that some other energy form must be contributing which is apparently unshieldable by nature. Researchers must be exceedingly careful, even with well-grounded cages, when they state that the interior of the cage is thus free of ambient EM radiation. Frequencies in the ELF and VLF range up to several tens of kilohertz can easily penetrate the walls of all but the most perfectly made cage. Faraday Cages are almost totally transparent to wavelengths of the magnetic component of an EM wave. Screening the electrical wave component properly requires a completely seamless and multi-shelled design if penetration and inner surface properly requires multi-shelled enclosures of high-permeability material such as mu-metal and can easily cost tens of thousands of dollars for a small (eg. 6" cube) enclosure. It is the magnetic component that is usually responsible for erroneous oscilloscope readings.

Frequently, NCET researchers use a comparison of the apparent brightness of a light bulb or bulbs powered by a free energy device versus bulbs powered by conventional means, usually household AC mains. This comparison assumes that when two bulbs glow with approximately equal apparent brightness, the power they consume is the same. Worse, they consider that half apparent brightness means half power consumed. First, the perception of apparent brightness between two bulbs is extremely difficult with the unaided eye. Secondly, since commonly available bulbs and lamps have non-linear light output vs. power consumption curves, half apparent brightness does not mean half power. Commercial light bulbs are power rated by the manufacturer for a specific current, frequency and waveform (eg. 60 Hz sinusoidal). As Tesla repeatedly showed, it is possible to bring a filament (or even a much bulkier piece of material) to white incandescence using a high frequency AC current of very small average power, which, therefore, hardly gave off any heat. He was simply using a different, much more efficient form of lighting. T. Henry Moray's machine also demonstrated this capability. **Therefore, if there are any arcs or other high-frequency generators in the NCET circuit, the comparison of power using light bulbs is useless**. Joseph Newman had a much better and more reliable method: connect the outputs to two identical motors with identical fans in the same ambient air regime and compare RPMS over time.

COSMOLOGY NOTE
By Greg Hodowanec
26 November 1995

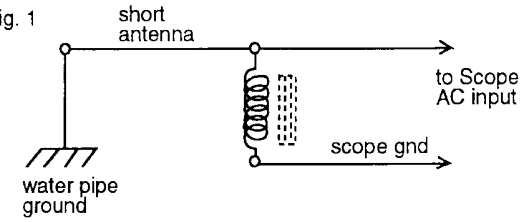
Dear colleague: This may be of interest to you.

I. Do simple coils interact with space energy?

The simple experiment shown below shows some interesting effects which can be observed on any oscilloscope, vintage-type or modern. Some effects appear to be strong resonances which may be at the coils natural resonance frequency. The coils tested were small windings salvaged from old relays, transformers, solenoids, etc., which used many turns of rather small size wire. The coils I used ranged from about 300 to 1500 ohms of resistance. The scope was used at an AC input and generally with internal synch.

A. Circuit

Fig. 1

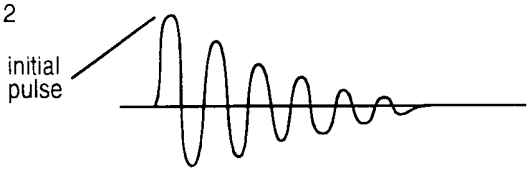


The coil used alone develops low-level signals at some resonant frequency points. These types of responses were seen many times in the past and were attributed to the GW signal detection capabilities of coils. However, a short 'antenna' of 3 to 10 feet in length increased the responses substantially. Connecting the coil to the home water pipes-system pipes increased the responses to several volts peak-to-peak.

B. Responses

There are many different types of responses to be seen. The most pronounced is a possible coil resonance response (which ranged from about 5 kHz to l MHz, depending on the coil used) as shown here:

Fig. 2



This appears to be a pulse-type excitation of the coil which then decays exponentially. Some coils (and frequencies) decay much more slowly and thus look like

wave packets. If the initial pulse is expanded, then varying multiple pulses are seen, suggesting that the coil excitation is from a continous process. Similar type responses were seen in double-shielded GW (gravity wave) signal detectors which were known to be interacting with space gravitational impulses. Some ferrites placed in the cores of these coils increase response (and tune it), but some others actually seem to degrade the performance. Magnets seemed to have but very little effect on performance and coil orientation did not appear to be critical. Shielding of the coil in a steel 'cookie tin' appeared to have no affect.

II. Conclusions

This is a most simple experiment which can be performed by most of you. Perhaps it might be just a way to 'cohere' the aether and thus extract energy from it in a most simple way? **Perhaps from it we can learn the secret of many free energy devices, including the VTA, MRA, Swiss M-L-C, and the various motor-generator devices?** My present speculation is that a small amount of 'leakage' 60 Hz (with harmonics) may be 'pumping' the coils in a parametric mode and thus extracting energy from the many scalar-type signals present in space; but there is a strong possibility that it may be extracting energy directly from the aether itself(?). There is also the possibility that the pulses are from strong LF radio stations, but I can't imagine seeing several volt signals (3 to 10 volts pk-pk) coming from radio stations at a great distance. However, I can understand the possibility that 'weak' EM signals could possibly serve as 'pumps' as speculated above. However, local AC feeder lines in a neighborhood could possibly develop such levels at low frequencies (say 60 hz and the immediate harmonics), but such higher levels at 5 KHz and up seem to be out of the question at this time.

As usual, these speculations are intended to let you look a bit further into these aspects. I look forward to your remarks. Perhaps some of you may come up with alternate explanations?

Regards, /s/ Greg Hodowanec

POWER-GEN '95 CONFERENCE

CETI Demonstrates 1,300 Watt Cold Fusion Reactor Produces 1000 to 4000 Times Input
By Jed Rothwell

Last week at the Power-Gen '95 Americas power industry trade show in Anaheim (December 5-7, 1995), a 1-kilowatt cold fusion reactor was demonstrated by Clean Energy Technologies, Inc. (CETI) of Dallas, Texas. The cathode is composed of thousands of 1 mm diameter co-polymer beads with a flash coat of copper and multiple layers of electrolytically deposited thin film nickel and palladium. CETI holds three U.S. Patents on the beads, with additional patents pending. During the demonstration, between 0.1 and 1.5 watts of electricity was input, and the cell output 450 to 1,300 watts of heat. In April 1995, at the Fifth International Conference on Cold Fusion (ICCF5), CETI demonstrated a cell with input of 0.14 watts and a peak excess of 2.5 watts, a ratio of 1:18. In October 1995, at the 16th biannual Symposium on Fusion Engineering (SOFE '95) the University of Illinois showed a CETI cell with 0.06 watts input and 5 watts peak output, a ratio of 1:83. Ratios at Power-Gen ranged from 1:1000 to 1:4000.

The ICCF5 and Power-Gen calorimeters were designed and constructed by Dennis Cravens. The SOFE '95 calorimeter was constructed by George Miley's group at the University of Illinois.

The Power-Gen cell and calorimeter are much larger than CETI's previous cold fusion demonstration devices. The cell is 10 cm long, 2.5 cm in diameter, containing roughly 40 ml of beads. Previous cells had about 1 ml of beads. The cell itself is wrapped in opaque foam plastic because the cell geometry has been improved and the improvements are not yet covered by patent applications. Other components in the calorimeter are made of clear Lucite plastic. (Photographs of the device can be seen on the World Wide Web address below.)

The flow calorimeter reservoir holds 2.5 liters and the flow rate is set between 1.0 and 1.5 liters per minute. A control cell is mounted parallel to the hot cell. The flow to both cells is regulated with precision valves. The reservoir and pump consist of a Magnum 220 aquarium pump with a micron filter attachment, with an additional Lucite cylinder built on top of the pump unit to hold a cooling coil, gas trap, and a 3.5 watt computer cooling fan. Water is circulated by a magnetic impeller pump, driven by a 50-watt motor mounted underneath. Static in-line mixers ensure mixing. (These are plastic objects about an inch long with vanes to stir the flow.) A few weeks before the conference, Cravens decided to increase the flow rate in order to keep the temperature below 50 degrees C. The new flow rates exceeded the capacity of his flowmeters. He was not able to procure a bigger flowmeter in time for the conference, so no flowmeter was installed. Flow was measured by turning stopcocks to redirect fluid from the cell outlet tube into a graduated cylinder for 15 seconds. This test was performed many times, and the flow rate was not

observed to change measurable, except when it was deliberately adjusted between runs. The water hose from the pump is coiled in an air cooled box on top of the reservoir. Air is drawn through the box by the cooling fan. The pump, cooling fan and DC power supplies electrolysis all have one common AC cord, which is monitored by a Radio Shack analog AC voltmeter and a multimeter. Total power consumption by all components is 85 watts.

The Delta T temperatures and reservoir temperatures are measured with K-Type thermocouples, with Omega Model HH22 Microprocessor Thermometers. Power is measured with Metex M 3800 series multimeters.

The first test was marred by a malfunction in the control cell. The control cell consisted of tin plated shot, arranged as an electrochemical cathode, in the same configuration as the smaller CETI thin film beads. During tests at the lab leading up to the conference, this produced no excess heat, as expected. However, during the first test at one point produced a Delta T temperature as high as 2.6 deg. C. Cravens suspected that the flow was blocked and the cell short circuited. Later that evening he confirmed both suspicions. When he opened the cell he found that some of shot had corroded after weeks of electrolysis in warm water. The tin plating had peeled off. When they set up the cell in the afternoon, they made the flow rate in the control cell 300 ml per minute, the same as the live cell. Later on, the flow slowed down and the cell was shorted out by loose tin and debris and power consumption went up. In retrospect, this was a poor choice of materials for the control cell. The control cell was replaced with a joule heater for the remainder of the conference, which raised the water temperature the normal, expected amount.

Later on, in subsequent tests, I was able to observe the machine closely, and to make direct measurements of its performance with my own instruments. I tested the flow rate on the cold fusion cell side several times. As noted above, I did not see any measurable variation except when the flow was deliberately changed from 1,300 ml to 1,000 ml per minute by closing the valves. I checked the thermocouple readings in the reservoir, inlet and outlet with two thermistors and a thermometer. They agreed closely with the thermocouple readings. The reservoir temperature can be taken by removing the cooling loop section on top and inserting the thermistor probe directly into the water. Measuring inlet and outlet temperature required a little more ingenuity. I confirmed the outlet thermocouple reading by taking a 250 ml sample of water from the outlet pipe during a flow test and immediately measuring the temperature before the sample cooled significantly. I confirmed the cold fusion inlet temperature by turning off the control side joule heater and taking a 250 ml sample from the control outlet pipe.

Here is some sample data:

Test 1, December 4, two hours

INPUT POWER
Measured AC: 0.7 A * 120 V = 84 W
Electrolysis: 0.18 A * 8 V = 1.4 W

OUTPUT POWER
Flow rate 1200 ml/minute (300 ml/15 seconds)
Delta T Temperature 16 to 17 deg. C
1200 ml * 16 deg. C * 4.2 = 80,640 j/min = 1,344 W

Test 2, December 5, afternoon, 30 minutes

INPUT POWER
Measured AC: 0.7 A * 140 V = 98 W
Electrolysis: 0.02 A * 3.0 V = 0.1 W

OUTPUT POWER
Flow rate 1000 ml/min (250 ml/15 seconds)
Delta T Temperature 6.7 deg. C
1000 ml * 6.7 * 4.2 = 28,140 j/min = 469 W

CETI plans to follow up on this with demonstrations of prototype consumer products, including larger cells for space heating and heat engines. They are working to develop these devices as rapidly as they can. They estimate that it will take six months to one year to make suitable prototypes. CETI is now engaged in joint R&D projects with five corporate and university strategic partners, including the University of Illinois and the University of Missouri. All five have independently verified the excess heat. The University of Illinois group has fabricated beads from scratch using a sputtering technique rather than electrolytic deposition. They have observed excess heat from their own beads as well as beads provided to them by CETI.

Akira Kawasaki and I took many photographs of the calorimeter. I scanned four of them, and John Logajan uploaded them in his home page on the World-Wide Web:
WWW URL =
http://www.skypoint.com/members/jlogajan

LETTERS

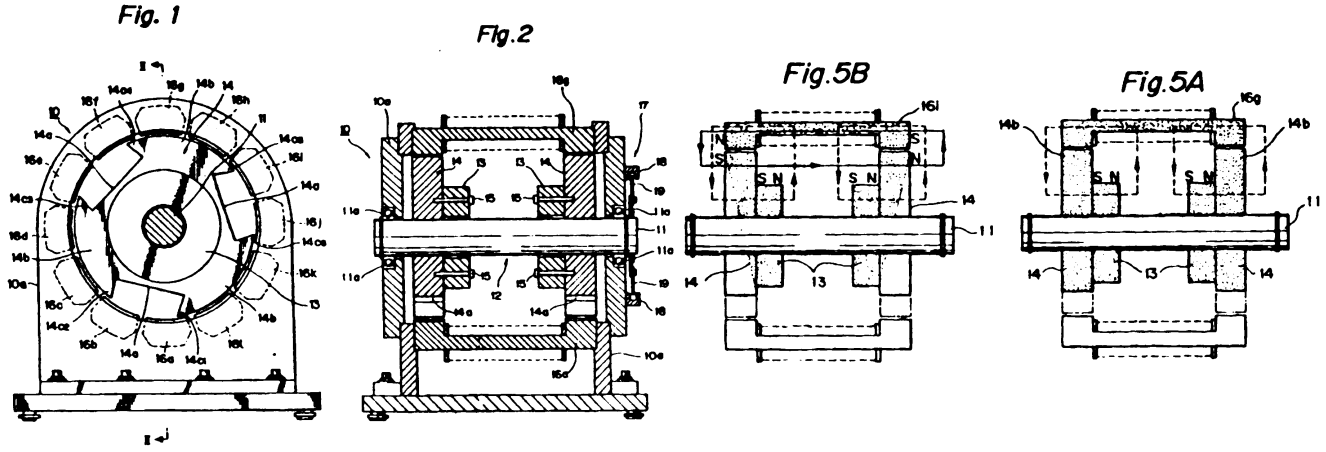
LETTER FROM DR. HAROLD ASPDEN
11 December 1995
Subject: The Japanese Motor

The only thing I can do at this moment is to send you three sheets from the patent drawings of the Nihon Riken Co. Ltd., European Patent Application. Inventor: Teruo Kawai.

The 317% efficiency related to the motor of Fig. 1 and 2, but Figs. 5A and 5B show the functional features -- Two ring magnets with sequentially excited magnetizing windings on the yoke bridging members. Note that the three-pole rotor is pulled forward by encouraging magnetic flux to pass selectively through the front (leading) tips of the rotor poles. Commutation control is by an optical sensor arrangement (18 + 19) in Fig. 2.

This is very similar to the machines I am testing but there are interesting differences. The essential feature common to both, the one needed for the over-unity operation, is the provision of magnetizing sources (the magnets and the coils) in the machine core structure with their axis of magnetization at right angles (i.e. notin line with) the air gaps between and stator poles. This ensures that the magnetomotive force across the gap is augmented by that generated by the forced alignment of the domain flux within the ferromagneticcore adjacent the pole faces. Conventional motors usually put the magnetizing coils on the poles directly, which is good design practice to avoid leakage effects, but no good for over-unity operation because it provides close inductive coupling so that the back EMF absorbs all its input power from the windings and takes none from the free source provided by the electron activity in the iron.

Best regards, /s/ Harold Aspden



Figures from the Kawai patent.

LETTER FROM SWITZERLAND
HoloTec, 25 November 1995

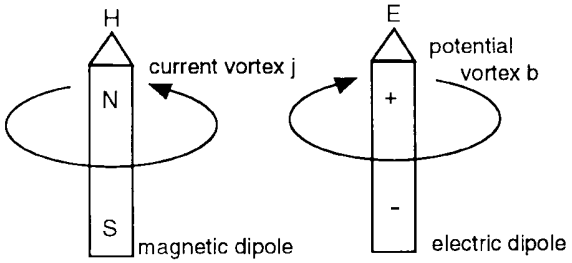
Thank you for the prompt answer to my recent letter. Of course, I agree with you about the aether and its implications on energy transformations. By the way, in Germany a well known scientist published a new and revolutionary electromagnetic theory (privately of course). It's the so long awaited "Theory of Everything." Because of its importance for our clean energy research and exactly to understand the cold fusion process, this theory may be of great interest for you. Because there are not English papers available until now, I try to give you a short summary:

The basics in Maxwell's theory about electricity are first the single electric charged particles (div E ≠ O), known as electrons, protons or positrons etc., and second, the non-existence of single charged magnetic particles (monopoles). This seems to be quite correct for electric conducting materials.

According to the new theory, there exists a prior field called Hydro-Magnetic Field (HM-field), which may be similar to the aether field. This HE-field can be divided

into the well known Electro-Magnetic Field (EM-field) and into the newly discovered Hydro-Gravitation Field (HG-field). The summation of EM-field and HG-field forms the also well known Electro-Gravitational Field as Niels Bor used it to explain his atom model.

The basic assumption of this theory is the total duality of electric and magnetic fields. This has been done mathematically and leads, for example, to the following explanation:



This easy drawing has very, very many implications on physical, medical and even chemical science. I can't explain all details here. We all know the current vortex and its applications. But we don't know the potential vortex, which is only possible in a non-conducting environment with a high dielectric constant (i.e. water!).

The term "hydro" is deduced from the Greek word of water. The Hydro-Magnetic (HMF) Field has an existence without mass and charge (as the aether). This field can be studied similar to the fluid technology. It's behavior is like an ideal liquid, such as supercooled Helium.

According to this theory, there is no electric charge as there is no magnetic charge. So you're asking what is an electron? An electron, (and also a position), is an electric dipole. But the positive electric pole is in the center of the electron formed by potential vortexes, and can't be seen from outside. Also, all other "elementary" particles can be deduced from this single electron-positron vortexes.

There's no room here to give you all information about this theory. This would fill a book. But what has been done with this theory until now? I will give you some highlights:

- Easy to understand and to visualize (no ultra-high mathematics required)
- Deduced the Schrödinger Equation without quantum mechanics.
- Deduced (not measured!) all "elementary particles" with its mass, charge spin, etc.
- Explains why the general relativity is a misconception. The speed of light isn't a constant, but depends on the HMF field strength of the vacuum or the media where the light passes through.
- Explains what gravity is.
- Explains what electric charge is.
- Explains what antimatter is.
- Explains what superconducting is.
- Explains why we do not need strong and weak nuclear forces to understand an atomic nucleus.
- Explains what light (photon) and its so-called duality is.
- Gives some information on how matter and the vacuum is structured. (The fields are not caused by matter but matter is caused by fields)
- Gives some information how the zero-point-energy can be tapped (is my opinion only).

Why am I writing you this stuff? Because there is an obvious similarity with so many things observed or supposed in the free energy community. Rotating electric fields has been done by Seike and probably Searl. Water experiments have been done by Schauberger or Keely. Especially Schauberger and Keely have a much better understanding concerning this new theory.

So I suppose that cold fusion can also be explained mathematically with this theory. If so, there is not only an experimental approach, but also a theoretical approach to cold fusion and other clean energy technologies.

Thank you very much. André Waser

LETTER FROM DON KELLY
25 November 1995, Florida

Here are two expired patents (U.S. Patent #3,861,149, Modular Closed Cycle Turbine System, filed Feb. 8, 1972, and U.S. Patent #4,036,290, Helical Expansion Condenser, filed Jan. 24, 1972), that could still be useful today. Since the patents are expired, they are in the public domain, and anyone can use them. If you know of any solar energy company who may benefit from this technology, please advise them.

An industrial friend of mine in Orlando, Florida, was involved about 5-6 years ago with a company that was marketing Rankine type solar systems. The solar systems were doing ok for awhile, until some of the expander-turbines began burning out due to the excessive back pressure/resistance from the cooling/condensers. The described helical expansion condenser could have solved their problem. The value

in the expansion condenser is that it cools the hot vapor in two ways, i.e.: 1) through normal conduction, as in regular condensers, and 2) by expanding the gas/vapor which also provides a tangible temperature reduction in the gas/vapor.

Presently, the SERI (Solar Energy Res. Institute) in Colorado has a Stirling cycle solar project going, while most commercial utilities, including the Israel Solar Pond System, use the Rankine cycle turbine. The Rankine cycle is a high mass-flow rate phase change cycle, as opposed to the twin-piston expander, with a low mass flow rate at high torque output in the Stirling cycle. As quoted by the author, "Why do the government geeks use the Stirling cycle, which is yet another example of incompetence within a government agency?"

LETTER FROM ENGLAND
Donald P. Walton, 22 November 1995

I refer to the October 1994 issue of *NEN* (vol 2, no 6), page 13, "Remarkable Magnetic Effects," by A. Berikhin.

The magnetic treatment of fuel has been in existence for many years and products have been available not only in the U.K. but also from a company at Turin, Italy.

A local group in Bournemouth is marketing devices imported from Spain and can confirm that improvements in fuel consumption in cars exist; that thermal efficiency in oil fired domestic heating is improved, and that magnetic treatment of water used in the house reduces the build up of lime scale in pipes and kettles.

What is not so apparent is that carrying a pair of these magnets in the pocket has produced an almost miraculous treatment for Arthritis and illnesses involving calcification of joints and spinal vertebrae. We have reports of genuine improvements, in that persons in great pain and sometimes doubled up with locked joints are back to normal within an average 7-14 days.

Whether or not ceramic magnets are as good as rare earth magnets is not known, but a cheaper alternative may be to bond two magnets of the slab variety to a piece of plastic separated by about 1/4" with both poles uppermost. When set, just carry them in your pocket or secured by medical tape to the afflicted area.

This may just be a cheap alternative to replacement joints and painful medications. For the minimal cost involved, I would suggest that it is worth a try.

I would like to hear about the success or failure from anyone who may care to write.

Yours sincerely

Donald P.Walton
12 Chatsworth Road
Bournemouth
Dorset, England BH8 8SW
Tel: 44 1202 302213

LETTER FROM INDIA
21 November 1995

I am enclosing herewith a copy of my recent article entitled, "Genesis of Free Power Generation." Further to this, recent tests on a Space Power Generator have shown that electrical power of about 7.5 kw can be produced with total electrical input of less than 7 kw and in addition, about 2 kw of windage and frictional heat is produced. I have sent these results for publication in *Explore!*. It now gets very evident that the Law of Energy Conservation as applicable in its present form can be violated within the domain of electro-magnetic induction through Space Power Generators. [cited in this issue on page 7]

Yours Sincerely, /s/ P. Tewari

MEETINGS

COLD FUSION
and
NEW ENERGY SYMPOSIUM

Saturday, 20 January 1996
8:00 am to 5:30 pm
Cambridge Marriott Hotel
Cambridge, Massachusetts

Sponsored by *Infinite Energy* magazine
The meeting will feature speakers, video presentations, and discussions about the science, technology, and commercial developments in the rapidly growing cold fusion and new energy field. The meeting is open to the general public. A highlight will be a presentation of the latest research on the U.S. patented Patterson Power

Cell, which has achieved record excess power production levels for a cold fusion process.

A nominal registration fee of $15 will be charged (in advance or at the door). There is a limit of 200 on attendees, due to space considerations. Please RSVP your attention to attend. The Cambridge Marriott Hotel is near MIT at the Kendall Square "Red Line" MTA station, and just 15 minutes form Boston's Logan International Airport.

For information or to attend please contact Cold Fusion Technology, P.O. Box 2816, Concord, NH 03302-2816. Phone 603/228-4516, Fax 603/224-5975, or by e-mail <76570.2270@compuserve.com>.

ICCF6
Sixth International Conference on Cold Fusion
will be held 13-18 October 1996
Hotel Apex Toya, Hokkaido, Japan
sponsored by
Japanese National Institute for Fusion Science
Tel: +81-3-3508-8901
Fax: +81-3-3508-8902
e-mail: mac@iae.or.jp

Send abstracts before May 1996 to:
Mr. K. Matsui / NHE-Center, IAE
Nishi-Shinbashi TS Building
1-22-5 Nichi-Shinbashi, Minato-ku,
Tokyo 105, JAPAN

CALL FOR PAPERS
International Association of Science and Technology of Development (IASTED)
International Conference on
HIGH TECHNOLOGY IN THE POWER INDUSTRY
4-8 June 1996, Banff, Alberta, Canada

The aim of this conference is to act as a forum for the exchange of information and experience on all aspects of high technology and advances in the power field.

Submission of papers
The full manuscript (max. four pages) and three copies are to be received by Feb. 1, 1996, for review by the International Program Committee. Full manuscripts must be in the format specified. (Contact IASTED at (403) 288-1195 or Fax (403) 247-6851, e-mail iasted@istd.cuug.ab.ca for specific paper instructions.) Include a statement in your cover letter confirming that if the paper is accepted, one of the authors will attend the conference to present it and pay the registration fee of $400 by 1 April 1996. Notification of acceptance will be mailed by March 1, 1996.

Commercial Column

The following companies (listed alphabetically) are commercializing cold fusion or other enhanced energy devices:

COMPANY: PRODUCT

American Cold Fusion Engineering and Supply: Information and troubleshooting for the fusion research and development industry. Sacramento, California. The president, Warren Cooley, can be reached at 916-736-0104.

CETI (Clean Energy Technologies, Inc.): Developers of the Patterson Power Cell™. Dallas, Texas. Voice (214) 458-7620, FAX (214) 458-7690.

ENECO: Portfolio of intellectual property including over thirty patents issued or pending in cold nuclear fusion and other enhanced energy devices. Salt Lake City, Utah. Contact Fred Jaeger, Voice 801/583-2000, Fax 801/583-6245.

E-Quest Sciences: Exploring The Micro-Fusion™ process. Seeking qualified research partners for their sonoluminesence program. Contact Russ George, FAX (415) 851-8489.

Holotec AG, Clean Energy Technology, contact André Waser, Gen. Mgr., Bireggstrasse 14, CH-6003, Luzern, Switzerland. Phone 011 41-41 /360 4485, or Fax 011 41-41 /360 4486.

Hydro Dynamics, Inc.: Hydrosonic Pump, heat-producing systems using electrical input with thermal efficiencies of 110 to 125 percent. Rome, Georgia. Contact James Griggs, Voice 706/234-4111 Fax 706/234-0702.

Magnetic Power Inc.: Introducing the Takahashi Battery Doubler™, which extends the charge release 1.5 to 2.5 times battery normal, to the U.S. market. Sebastapol, CA. Contact Mark Goldes, Voice 707/829-9391, Fax 707/829-1002.

Nova Resources Group, Inc.: Design and manufacture ETC (Electrolytic Thermal Cell); EG (commercial power cogeneration module); and IE (integrated electrolytic system). Denver, Colorado. Call Chip Ransford, Phone (303) 433-5582.

UV Enhanced Ultrasound: Cold Fusion Principle being used for an ultrasonic water purifier. Hong Kong. FAX (852) 2338-3057.

Note: The Fusion Information Center has been acting as an information source to many of these companies. We expect to augment our international service to provide contacts, information, and business opportunities to companies considering an entry into the enhanced energy market.

INFORMATION SOURCES

Fusion Facts monthly newsletter: Salt Lake City, UT 801/583-6232, also publishes Cold Fusion Impact and Cold Fusion Source Book. Plans on-line database access for later in 1995.

New Energy News monthly newsletter, edited by Hal Fox, Salt Lake City, UT 801/583-6232

Cold Fusion Times, quarterly newsletter published by Dr. Mitchell Swartz, P.O. Box 81135, Wellesley Hills MA 02181.

Infinite Energy, new bi-monthly newsletter edited by Dr. Eugene Mallove (author of **Fire from Ice**), P.O. Box 2816, Concord, NH 03302-2816. 603-228-4516.

Fusion Technology, Journal of the American Nuclear Society publishes journal articles on cold nuclear fusion. 555 N. Kensington Ave., La Grange Park, IL 60525.

21st Century Science & Technology, P.O. Box 16285, Washington, D.C., 20041. Includes cold fusion developments.

Planetary Association for Clean Energy Newsletter, quarterly, edited by Dr. Andrew Michrowski. 100 Bronson Ave, # 1001, Ottawa, Ontario K1R 6G8, Canada.

Now available: *Clean Energy Review*, a technical and scientific discussion prepared for the Canadian Environmental Assessment Agency's panel reviewing nuclear fuel wastes disposal. Discusses transmutation as a possible solution for nuclear waste disposal. $5 U.S. and Canadian, $7.50 other countries.

Electric Spacecraft Journal, quarterly, edited by Charles A. Yost, 73 Sunlight Drive, Leicester, NC 28748.

Space Energy Journal, edited by Jim Kettner & Don Kelly, P.O. Box 11422, Clearwater, FL 34616.

"Cold Fusion", monthly newsletter, edited by Wayne Green, 70 Route 202N, Petersborough, NH 03458.

The above list of commercial and information sources will be growing. New listings will be added as information is received. Send information to *FF*, P.O. Box 58639, Salt Lake City, UT, 84158.

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Scholarly papers are invited on any topic related to New Energy as defined herein. These papers should include one or more of the following: theories, designs, inventions, and research results. Abstracts of not more than 400 words must be sent as soon as possible to the address below. Consideration of abstracts cannot be assured if received after March 15, 1996 Authors will be notified as soon as possible if the paper is accepted for presentation. Copy-ready manuscripts for proceedings are due April 1, 1996

SYMPOSIUM ON NEW ENERGY
INTERNATIONAL ASSOCIATION OF NEW SCIENCE
1304 S. COLLEGE AVE
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