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to honor the attendees at
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A CHALLENGE TO SUPPORTERS OF NEW ENERGY

By Pat Bailey, President of Institute for New Energy
and Hal Fox, Editor, *New Energy News*

ABSTRACT

Power for the future: Magnetic motors that will run without input power, solid-state circuits that provide more power out than power input, mechanical perpetual motion machines, methods of tapping the ZPE, and nuclear reactions from charge clusters. These concepts have been recently presented in various media and conferences. Various inventions and theories abound. However, most of these concepts have yet to be demonstrated or replicated. A few of these devices have been actually demonstrated to work! Funding and backing for commercialization are limited, scarce, and almost non-existent as is funding for research or development in these areas. The need to stop polluting the atmosphere by burning fossil fuels is evident. However, there are promising devices and systems! Among these are the works of living inventors and scientists that do show promise to become the power for the future. This paper discusses these concepts and issues a challenge to YOU!

A. THE NEED

Fifty years ago, the newly paved lower road through Vineyard, Utah had its annual spring migration of toads. The small streams were abundant with frogs. Today you can scarcely find a toad or a frog in the farms and pastures bordering the Utah Lake. The demise of life forms sensitive to environmental changes is being reported now in many countries.

In 1979, the atmosphere in November in Beijing was full of smoke from homes and factories. Today in China over 20 new coal-burning power plants are in the planning or building stage and each will provide power production of ten to twenty megawatts and further pollute the atmosphere. Flying over Europe can be a lesson in how to pollute a continent. Missionaries assigned to Poland are cycled to only a one-or two-months stay in the worst cities due to health-degrading pollution. The Atlantic Ocean is dying and this death on land and sea continues to spread.

Pollution can come from industrial chemicals, agricultural fertilizers, pesticides, but most of all it comes from the burning of fossil fuels in power plants, factories, homes, and transportation vehicles. It is absolutely clear that we need clean and abundant energy - NOW!

B. THE PROMISES

The readers of *NEN* and other newsletters, and the attendees at various new-energy conferences, have all heard about a variety of pending and promising new-energy devices and systems. Some of the more promising devices discussed in *NEN* include: The Testatika machines of the Methernitha community in Switzerland, the Reed magnetic motor, the DePalma

motor and N-Machines, the Searl generator, the Sinclaire generator, the Adams motor, the Pap engine, the GEET engine, the Hamel generator, the Newman motor, the RQM generator, the Davis tidal turbine, the Magnetic Resonance (MRA) Amplifier, Brown's nuclear battery, various cold fusion cells, the Zielinski discovery, the Aspden Effect, the Rowe Effect, Bearden's scalar energy fields, the Correa plasma system, Shoulders' EVs, the Neal-Gleeson Process, plasma-injected transmutation, etc. These are the exciting promises! Now - where are the delivered results and the actual devices that work repeatedly?

The devices that to date have really been publicly demonstrated and/or independently replicated are few. And they really do work! Here are some of the successes: the Correa plasma device, certain cold fusion cells, milli-watt versions of the MRA, the Neal-Gleeson Process, the Davis Tidal turbine, and the use of Shoulder's high-density charge clusters or plasma-injected transmutation.

The new-energy systems that we have expected to be commercialized and that have not yet been repeated, demonstrated or replicated are: the Swiss Testatika; commercial versions of the Pons-Fleischmann cold fusion reactors; commercial versions of over-unity magnetic motors; commercial versions of solid-state circuits; the Meyer water fuel cell; and Brown's nuclear battery. Many promising devices have been lost with the deaths of their inventors (e.g. Tesla, Moray, Henderschott, Papp, Russell, Sweet). Some devices are being held back until the inventor "gets enough money up-front" (e.g. Hyde, Mark). Several new devices in development were/are actively suppressed by the wanton destruction of the organization from greed or "outside" sources (e.g. Brown's nuclear battery, BECOCRAFAT in Germany, etc.). Other promising devices seem to become instantly "classified" during the normal U.S. Patent process and thus become "lost." If we want to actually develop and commercialize these devices, then clearly there is a better way to be doing it!

C. DIED FROM LACK OF FUNDING

Many products have died, and are not currently under development, due to lack of supportive funding. Brown's nuclear battery must be included in this group. In addition, there is almost no funding for any cold fusion work within this country! Many promising approaches to cold fusion by various investigators in the U.S. have been hampered by the grossly unfair and inaccurate OLD report of the ERAB subcommittee on cold fusion and the subsequent **arrangements within** the U.S. government and its agencies to prevent patents from being issued and to prevent DOE funds from being granted to cold fusion projects.

Many projects have not secured funds due to the lack of scientific support. The current EM models now taught for electricity and magnetism do not allow for any over-unity device. The predominant belief that there is no **energetic aether** (nor any outside **potential** sources of additional energy) ensures that funds for tapping space energy will be hard to obtain (just as in Tesla's time). The currently-accepted scientific dogma that low-energy nuclear reactions cannot exist is the basis for decisions against funding this type of research. The end result is that many promising projects have been abandoned because the inventor could not obtain funds through government or industry or private sources.

D. THE PURSUIT OF ARCANE TECHNOLOGY

There have existed intellectual giants who have developed devices that were so important to the developers that their secrets were not revealed. Some organizations and individual groups are dedicated to discovering the secrets of the past from ancient societies, to Tesla, Keeley, Coler, Sparky Sweet, and others. This search can make for fun research and interesting discoveries. **However, if we spent a similar amount of money and effort on understanding today's geniuses as we do on the past giants (e.g. Tesla), we would likely have already solved the world's energy problems.**

E. THE SUPPORT OF TODAY'S GENIUSES

In the "cold fusion" area, Martin Fleischmann and Stanley Pons are geniuses. They are also currently the only new-energy geniuses that have been adequately funded. Here is a partial (incomplete) list of genius-level work in the U.S. that should be adequately funded: Mitchell Swartz cold fusion work with light water and nickel; Randall Mills work with hydrogen gas and nickel; Bush and Eagleton's work on cold fusion and radioactive amelioration: Correa & Correa's work on plasmas; James Grigg's work with heat-producing pumps; Lambertson's solid-state work; Greg Hodowanec's work with mini-MRA type devices; the work of Ron Kovac et al., on plasma physics, Harold Aspden's work on high-efficiency motors; the Finsrud motor; the proven Davis tidal turbine; further investigation of the Rowe Effect; the Neal-Gleeson Process; Kenneth Shoulders' work with high-density charge clusters; plasma-injected transmutation effects; and low-energy transmutation of radioactive wastes. Some of these scientists and inventors are today's geniuses. Others may not be classified as geniuses but their work is ingenious and

deserves active support. Also, the independent testers and organizations that are available to provide independent and accurate verification of the operation of a device also deserve active support (e.g. Emmerich, Grotz, Hathaway, Puthoff, Rosenthal, etc.).

There are several resources supporting new-energy research and today's geniuses. The INE, KeelyNet and other organizations have large and growing websites. Internationally, PACE offers a huge energy device database on CD. Other groups are also offering supportive services. USE THEM! Support each other! If you have any good information and you want to get it out to those who care about what you are doing, use these resources and ask for help! ASK! Some researchers will want to remain very secretive, that is their right - Great! - As long as the devices get developed and commercialized. Here is what all of us can do: **For Researchers:** Make your research known, make your needs know, and ask for support. **For Funders**: Make your interests known, ask about worthy inventors whom you can contact. **For Incentives**: Zenergy is offering $100,000.00 for the demonstration of a new "free energy" machine. **For Supporters**: Write articles and papers on what you think inventors and researchers need to do to get their ideas developed and commercialized. Tell them how to make their invention commercial. Use the websites and the publications! Greed is obviously not working. Cooperation, stock positions, and teamwork can work! Do it together!

F. THE CHALLENGE

Consider the number of people who subscribe to the following U.S. publications (listed alphabetically): *ANE Newsletter, Cold Fusion, Cold Fusion Times, Electric Spacecraft Journal, Electrifying Times, Fusion Technology, Infinite Energy, New Energy News, Journal of New Energy, KeelyNet BBS, PACE's Clean Energy Review, and Space Energy Journal.* **To a large extent, these subscribers represent those who are the most informed and the most interested in resolving the world's energy problems.**

Here is the challenge:

Each editor, each publication, and each subscriber is challenged to do the following:

1. Encourage the funding of new-energy technology by both government and private (such as rich individuals, organizations, educational or movie groups, non-profit donations from major companies and corporations, or even from venture capitalists).

2. Do something to expand the number of subscribers for each of these publications.

3. Form mutual fund groups dedicated to the funding of new-energy development.

4. Promote the allocation of grants by private charitable associations to support new-energy development. Write letters to government leaders urging them to support new energy development. Write letters to editors of publications that continue to treat new-energy devices as impossible.

5. Be pro-active (not reactive) and be accurate!

Join together to make things actually happen! NOW!

No one individual or organization can do everything. Everyone can do something! **Together, we can do anything!** Group actions are the most effective means to promote change. We should be aggressive, verbal warriors in support of worthy new technology and better life styles. The world is worth saving from further fossil-fuel pollution. We owe it to our children and our grandchildren to leave this world a better place for our having been here. If we don't make the change, who will? The forefathers of this country pledged their lives, their fortunes, and their sacred honor to make this a better country. What will you pledge to make this a better world?

G. SOME NEW-ENERGY WEBSITES

ANE - www.acad4newenergy.com
INE - www.padrak.com/ine/
KeelyNet - zeta.cs.adfa.oz.au/KeelyNet/
PACE - www.padrak.com/ine/INE3.html
Others - www.padrak.com/ine/WEBSITES.html

Note: The above websites are case sensitive. Use exactly as printed.

THE NEED FOR AN ENERGY POLICY
Courtesy of Gordon Moody

Gordon B. Moody (editor, *Global Energy Outlook*), Editorial, April 1997, vol 2, no 4, pg 1. Reprinted by permission.

Hydrocarbons lubricate and fuel the world's economies. U.S. political strategies successfully contributed to the collapse of the former Soviet Unions' economy through an agreement with Saudi

Arabia to dump millions of barrels of excess oil supplies on world markets to destroy the Soviet export oil economy which fueled its military machine and state industries. **The Russians learned the lesson well.** We either do not understand the energy security issues or simply ignore them. The Russians have maneuvered the U.S. into giving Russia exclusive control of all Central Asia's oil. While the U.S. places unilateral sanctions against many of the key producers in the Middle East, Russia and China are making multi-billion dollar joint-production agreements with Iraq and Iran and are likely to gain both political and military advantage over the West. Saudi Arabia is a time bomb which could self-destruct and the U.S. could see Russia playing the oil card on the U.S. economy in reverse. **Who says we don't need an energy policy?** [Bold is *NEN's* editor's choice.]

Editor's note: As we have mentioned before in this publication, the timely arrival of new energy sources **may be the technology that keeps oil-poor nations from starting a war to gain oil sources.**

Fusion Briefings

A NEW COLD FUSION EXPERIMENTAL DEVICE

David Moon, Chuck Bennett

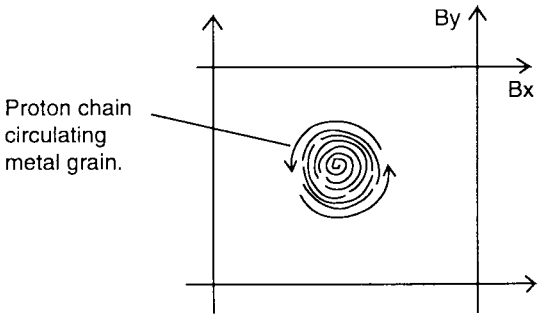
Theoretical models that have been developed to explain the new phenomena of cold fusion and sonoluminescence are generally more immediately useful if they lend themselves to experimental testing in the laboratory. Successful tests then would have a much better chance of leading directly to a marketable invention in the commercial areas of energy production or element transmutation.

Two such models by the authors [1,2] are merging into a picture of the active site (in some cold fusion experiments and in sonoluminescence) in which "strings or chains of protons" form inside energized bubbles as a swirling plasma vortex. The nuclear fusions and transmutations releasing both thermal energy into the lattice and electromagnetic radiations (some of which are reabsorbed by the lattice and surrounding water) can occur.

One of us (Bennett) has proposed that a dynamic swirling plasma vortex tends to contract in on itself as light is emitted outward [3]. Thus, it is implied that a vorticular string of protons, which happens to wrap around a tiny spherical metal grain, might hug the sphere even tighter as the mass-energy is released. It is noted that the strings of plasma protons were estimated to oscillate at a microwave frequency [2].

A conceptual design for a hydrogen gas-phase cold fusion device follows from the authors' combined theoretical model. The device would employ powdered or fine granular metal (Ni, Fe, Pd, Ti, W) inside a metal cylinder or chamber which is fitted at either end with electrodes connected to a voltage oscillator adjusted to a microwave frequency. The cylinder is wrapped in perpendicular solenoid coils (generating magnetic fields Bx and By) to create a "magnetic cage" effect. Delivery tubes for the H_2 gas are attached to the cylinder containing the powdered metal.

In principle, the magnetic cage will trap the proton chains on each tiny piece of metal, motivating an oscillating circular vortex motion at a to-be-determined resonant microwave frequency, thus generating an evolution of mass-energy conversion (see figure).



The entire apparatus will be surrounded by a chamber filled with a heat-conducting fluid to carry away the excess heat. Ideally, reactions will cease upon termination of the magnetic fields or oscillating microwave voltage.

In testing this device, we urge that safety precautions be taken (e.g. small scale) until cell response can be determined.

References

1. C. Bennett, "Tiny Bubbles," *Infinite Energy*, vol 2, no 7, March-April 1996, p 7.
2. D. Moon, "Gentlemen, Start Your Bubbles," *Infinite Energy*, vol 2, no 11, Nov.-Dec. 1996, pp 76-78.
3. C. Bennett, "Gravity as Piezo-Electromagnetism," preprint, May 1997, to be published.

DOE CUTS FUNDS ON PRINCETON TOKAMAK

Staff of AP, "Federal budget cuts pull the plug on N.J. fusion reactor," *Deseret News*, 5 April 1997, page A2.

"Hot Fusion will be the energy source in twenty years, **just as they have been saying for the past forty years**," is the way Tokamak Fusion Reactor work has been described in the past. This article reports on the shutdown of the Princeton's Tokamak Fusion Test Reactor which set the world record in 1994 for fusion power by generating 10.7 million watts for about one second – less than 50 cents worth of power.

"But after nearly half a century and $8.2 billion worth of U.S. research, scientist are thought to be decades away from that goal," states the article. The Princeton budget has been cut from $111 million in 1992 to about $52 million for 1998. The number of employees which had been as high as 1,100 will be reduced to about 300 in June 1997.

However, we predict that **Nature's micro-mini Tokamak**, the high-density toroidal charge cluster, discovered by Kenneth Shoulders and, independently by Rod Neal and Stan Gleeson, will be one of the major energy-producing devices of the future.

ENERGY MEASUREMENT POSITIVE

J. Dufour, J. Foos, J.P. Millot, X. Dufour (Shell Research/CNAM Lab. des Sci. Nucl., Paris), "Interaction of Palladium/Hydrogen and Palladium/Deuterium to Measure the Excess Energy per Atom for each Isotope," *Fusion Tech*., vol 31, no 2, Mar 1997, pp 198-209, 7 refs, 9 figs, 2 tables.

AUTHORS' ABSTRACT

A search for the products of fusion reactions that could be triggered by sparking in hydrogen isotopes produced a negative result with no signatures above background being found. Very significant excess energy production in both hydrogen/palladium and deuterium/palladium systems is reported. The conditions of occurrence for this excess energy production are discussed, and the formation of a tightly bound state of the hydrogen (deuterium) atom is put forward to explain the results.

AUTHORS' CONCLUSION

From these results, we conclude that a very promising reaction occurs in metallic-hydride-forming metals when loaded with hydrogen isotopes and submitted to high transient electric currents. We think that explaining the phenomenon by a rearrangement of the

bounding between the proton and the electron, due to the confinement of the metal lattice, is more plausible (although not known) than invoking highly improbable fusion reactions. We intend to put more effort into understanding this reaction.

ENERGY & Fe IN GOLD ELECTRODES

Tadayoshi Ohmori, Tadahiko Mizuno, Yoshinobu Nodasaka (Hokkaido Univ., Japan), Michio Enyo (Hakodate Nat. Col. of Technol., Japan), Hideki Minagawa (Hokkaido Nat. Indust. Res. Inst., Japan), "Transmutation in the Electrolysis of Light Water – Excess Energy and Iron Production in a Gold Electrode," *Fusion Tech*., vol 31, no 2, Mar. 1997, pp 210-218, 8 refs, 11 figs, 3 tables.

AUTHORS' ABSTRACT

The identification of some reaction products possibly produced during the generation of excess energy is attempted. Electrolysis is performed for 7 days with a constant current intensity of 1A. The electrolytes used are Na_2SO_4, K_2SO_4, K_2CO_4, and KOH. After the electrolysis, the elements in the electrode near the surface are analyzed by Auger electron spectroscopy and electron probe microanalysis. In every case, a notable amount of iron atoms in the range of 1.0×10^{16} to 1.8×10^{17} atom/cm^2 (true area) are detected together with the generation of a certain amount of excess energy evolution. The isotopic abundance of iron atoms, which are 6.5, 77.5, and 14.5% for ^{54}Fe, ^{56}Fe, and ^{57}Fe, respectively, and are obviously different from the natural isotopic abundance, are measured at the top surface of a gold electrode by secondary ion mass spectrometry. The content of ^{57}Fe tends to increase up to 25% in the more inner layers of the electrode.

LATTICE ION TRAP

Vittorio Violante, Antonella De Ninno (ENEA, Settore Fusione Centro Ricerche Frascati, Rome), "Lattice Ion Trap: A Possible Mechanism Inducing a Strong Approach Between Two Deuterons in Condensed Matter," *Fusion Tech*., vol 31, no 2, Mar. 1997, pp 219-227, 21 refs, 9 figs.

AUTHORS' ABSTRACT

The behavior of ions confined by means of quadrupolar electrodynamic containment around palladium lattice tetrahedral sites is discussed. Ion confinement in an quadrupolar trap is known to be strongly influenced by initial conditions and trap parameters. The system studied is a lattice ion trap for deuterons, supposing they occupy the tetrahedral sites over a certain concentration. The electron

motions seem to have a dominant role in the dynamics of two deuterons moving around such lattice sites. A computer simulation describes the deuteron dynamics and reveals an approach mechanism that could dramatically decrease the mean distance between two positive charges embedded in a lattice.

PHUSONS IN NUCLEAR REACTIONS

Mitchell R. Swartz (JET Energy Technol., Massachusetts), "Phusons in Nuclear Reactions in Solids," *Fusion Tech.*, vol 31, no 2, Mar. 1997, pp 228-236, 56 ref, 2 figs, 3 tables.

AUTHOR'S ABSTRACT

An explanation is given for the anomalous branching ratio in solids based on Boson-cooperative removal of the ^{4}He* energy prior to decay by two-body fission. Facilitated by isospin restrictions that limit conventional pathways, the excess heat is driven by the reconfiguration to the more tightly bound ^{4}He ground state. A temperature rise occurs as well-mixed acoustical and optical phonons are unable to carry off all the local momentum and excess energy of the reactions. Four-vector analysis indicates conservation of energy, which suggests the use of a fusion quantum of energy delivered to the lattice's phonon cloud: a phuson. Special relativistic considerations indicate that the phonon cloud subtends ~450 to 800 unit cells and can couple with de-excitation times >0.1 *fs*. Thus, commensurate levels of neutrons and gammas are not required because of unique isospin and energy restrictions that facilitate the alternate Bose-cooperative pathway leading from the excited state.

ENERGY NOT CORRELATED TO NEUTRON EMISSION

José F. Fernandez, Fermin Cuevas, Miguel Algueró, Carlos Sánchez (Dip. Fisica Mats. C-IV, Univ. Autonoma de Madrid), "Experimental Investigation of Neutron Emissions During Thermal Cycling of TiD_x ($x \approx 2.00$)," *Fusion Tech.*, vol 31, no 2, Mar. 1997, pp 237-247, 32 refs, 8 figs, 4 tables.

AUTHORS' ABSTRACT

The production of neutrons from D + D reactions in thermally cycled titanium deuteride (TiD_x) ($x \approx 2.00$) is investigated in depth. Special attention is given to cubic-tetragonal (δ-ϵ) phase transition that TiD_x experiences near room temperature as a possible triggering mechanism of "cold fusion nuclear reactions." The (TiD_x) ($x \approx 2.00$) samples, possessing

well-known properties about the δ-ϵ transition, are cycled at temperatures (from –60 to 60°C) where the phase transition takes place. The cold fusion signature is investigated by measuring the neutron flux of the sample during the experiments. No significant neutron signal above the background level is found during thermal cycling of the TiD_x samples. It is concluded that in the samples investigated, no correlation exists between the δ-ϵ transition and the trigger of the D + D reactions. Background deviations give an upper limit of the rate of the D + D → ^{3}He + n reaction of $\lambda < 10^{-23}$ fusion/p-d·s.

CATHODE SURFACE MODIFICATIONS

Keiji Kunimatsu (Imura Japan Co., Ltd., Sapporo), "Surface Modification of the Cathode in the Study of Cold Fusion," *Hyomen Gijutsu*, vol 41, no 3 (1996), pp 218-222, in Japanese.

AUTHOR'S ABSTRACT

A review, with 12 refs., on relations between D absorption on Pd cathode and excess heat, measurement of the absorption, and surface modification of Pd cathodes with thiourea for increase of the absorption.

DEUTERON HOPPING

Fu-Sui Liu, (Physics Dep., Beijing Univ., Beijing, China), "The Phonon Mechanism of the Cold Fusion," *Mod. Phys. Lett. B*, vol 10, no 23 (1996), pp 1129-1132.

AUTHOR'S ABSTRACT

The longitudinal acoustic phonon can induce a time-dependent hopping rate of deuteron in PdD, and leads to the cold fusion.

TRANSMUTATION IN SEMICONDUCTORS

I. Shlimak, A. N. Ionov, R. Rentzsch, J. M. Lazebnik (Jack Pearl Resnick Inst. Adv. Technol., Bar-Ilan University), "On the Doping of Isotopically Controlled Germanium by Nuclear Transmutation with a High Concentration of Shallow Donor Impurities," *Semicond. Sci. Technol.*, vol 11, no 12 (1996), pp 1826-1829.

AUTHORS' ABSTRACT

Experimental results are presented of the neutron transmutation doping (NTD) of isotopically controlled ^{74}Ge crystals, irradiated with a high dose of neutron flux F (up to 4 x 10^{19} cm^{-2}). A series of heavily doped samples of *n*-Ge:As with small compensation ratio K = NA/ND was obtained. Two novel effects connected with high neutron dose *F* have been observed: (i) the dependence of the free electron concentration *n* = ND - NA on *F*, linear at small *n*, sats. at *n* > 3 x 10^{17} cm^{-3}; (ii) if the NTD procedure is applied to samples previously highly doped by As, the final value of *n* even decreases (a 'negative doping'). These effects are explained by the enhancement of the formation of complexes of an As impurity with radiation damage at high *F*, which leads to a decrease of *n*.

BIOLOGICAL TRANSMUTATION

Patent RU 2052223 C1; Method for producing stable isotopes due to nuclear transmutation, such as low-temperature nuclear fusion of elements in microbiological cultures; Vladimir I. Vysotskij, Alla A. Kornilova, Igor I. Samojlenko (Tovarishchestvo S Ogranichennoj Otvetstvennostyu Nauchno-Proizvodstvennoe Ob'edinenie "inter-Nart"); issued 10 Jan 1996, appl. 18 Jan 1995 (in Russian) . Title only translated.

RADIOACTIVE WASTE AMELIORATION

Patent JP 07239397 A2; Transmutation of radioactive waste by muon-catalyzed fusion reaction; Hideo Harada, Hiroshi Takahashi (Doryokuro Kakunenryo, Japan); issued 12 Sep 1995; appl. 28 Feb 1994; 7 pp. Abstract: In the method using 14 MeV-neutron generated from muon-catalyzed fusion, a target cell consists of a D-T high pressure gas cylinder target successively surrounded by (1) a first FP cell containing ^{90}Sr or ^{137}Cs, (2) a transuranium element cell, (3) a ^{6}Li cell containing ^{6}Li-Al alloy, (4) a second FP cell contg. ^{93}Zr, ^{99}Tc, ^{129}I, or ^{135}Cs, and (5) a thermalizer part containing D_2O, and (6) a ^{6}Li outer cell. T may be supplied from ^{6}Li(n,a)T using neutron thermalized by D_2O.

OLD & NEW TRANSMUTATION

Ole Bostrup (Espergaerde Gymnasium, Den.), "The Traveling Chemist in Darmstadt, Germany – Modern and Antique Alchemy," *Dan. Kemi*, vol 75, nos 6/7 (1994), pp 10-11 (in Danish).

AUTHOR'S ABSTRACT

A very brief history is presented on early alchemy and modern transmutation of elements at Darmstadt and Giessen in Germany. Beginning with the alchemist Andreas Libavius (1540-1616), the history culminates with the Society for Heavy-Ion Rearch, and the experiments done with the universal linear accelerator and the heavy-ion synchrotron.

Space Energy

DEMONSTRATION OF CASIMIR FORCE

S.K. Lamoreaux, "Demonstration of the Casimir Force in the 0.6 to 6 μm Range", *Phys. Rev. Let.*, vol 78, no 1, 6 Jan 1997, pp 5-8, 15 refs, 4 figs.

AUTHOR'S ABSTRACT

The vacuum stress between closely spaced conducting surfaces, due to the modification of the zero-point fluctuations (ZPF) of the electromagnetic field, has been conclusively demonstrated. The measurement employed an electro-mechanical system based on a torsion pendulum. Agreement with theory at the level of 5% is obtained.

EDITOR'S COMMENTS

Call it ZPE, ZPF, or aether, we welcome any experimental evidence that provides a better understanding of the nature of space and, even more welcome, experiments or ideas of how to tap the infinite energy of space. The measurement of the Casimir force, as done in this experiment, between a metal plate and a metal sphere, is quite dramatic as the spacing is smaller than 1 micrometer. However, it has taken very sensitive measuring equipment to produce the results. The magnitude of the force is of the order of 100 microdynes. The plate was an optical flat and the sphere was a spherical lens both of which were coated with a thin layer of copper. The size of the plate used was 2.54 cm. (one inch) in diameter and the spherical lens was 4 cm in diameter. The closest spacing achieved was about 0.6 micrometers.

Miscellaneous

GRAVITATION SHIELDING POSSIBLE

E.E. Podkletnov (Moscow Chem. Scientific. Ctr.), "Weak Gravitation Shielding Properties of Composite Bulk $YBa_2Cu_3O_{7-x}$ Superconductor Below 70 K under E.M. Field," Univ. Cincinnati Engineering, report # MSU-chem 95, abstract cond-mat/9701074.

AUTHOR'S ABSTRACT

A high-temperature $YBa_2Cu_3O_{7-x}$ bulk ceramic superconductor with composite structure has revealed weak shielding properties against gravitational force in the state of levitation at temperature below 70 K. A toroidal disk was prepared using conventional ceramic technology in combination with melt-texture growth. Two solenoids were placed around the disk in order to initiate the current inside it and also to provide rotation about its central axis. Samples placed over the rotating disk demonstrated a weight loss of 0.3 to 0.5%. When the rotation speed was slowly reduced by changing the current in the solenoids, the shielding effect became considerably higher and reached 1.9 to 2.1 % at maximum.

TORSIONAL SPECTROSCOPY

Hector E. Avram, Robin L. Armstrong, (Dept. Phys., Univ. Toronto, Canada), "Spin-Polarization Torsional* Spectroscopy in β-Phase Palladium Hydride," *Phys. Rev. B*, vol 34, no 9, Nov. 1986.

AUTHORS' ABSTRACT

A spin-polarization torsional spectroscopy experiment is reported for three samples of β-phase palladium hydride (PdH_x) with hydrogen concentrations x = 0.80, 0.75, and 0.71. The measurements were carried out at a proton magnetic-resonance frequency of 30 MHZ and a temperature of 40 ± 0.5 K. Frequency spectra were obtained by Fourier transformation of the transient signals detected in the time domain as a function of the duration of the locking pulse after the spin-locking sequence. These spectra provide numerical values of the two lowest tunneling splittings. Both tunneling frequencies decrease in an approximately linear fashion with increasing hydrogen concentration as expected if the changes are related to the reduction in the number of vacancies to which a proton can tunnel. These data should provide a useful test for future theoretical models proposed to describe phonon-assisted tunneling of hydrogen in metals at low temperatures.

* [Not Torsion Fields in the Russian sense. Ed]

LIGHT IS THE GHOST OF MASS

Chuck Bennett

This decade has seen an upsurge in the interest to resurrect a workable æther in order to provide a practical medium for the analysis of newly discovered phenomena such as over-unity hydrogen energy production, the manipulation of gravitation and over-unity electric motors [1-5]. An æther concept based on a permeable medium whereby matter and light waves were separate from each other was squashed as "superfluous" at the turn of the century [6]. Therefore, the new æther must provide an answer to the obstacles encountered, such as manifested by water filled telescopes, stellar aberration and the Michelson and Morley null result.

One approach to this overall goal is to invoke the property of quantization (or discrete particles) to the fundamental structure of the æther [7]. In a recent interview with Arthur C. Clarke, the power available from empty space in terms of "zero-point energy" is described by the late Nobel laureate, Julian Schwinger, as the tapping of "quantum fluctuations" [8]. The quantization of the æther can be explained by the view that the æther consists of a sea of particles that are on the order of a million times lighter than the electron. The mass range of the particles is in the range for the spectrum of all light photons. Therefore, the æther simply consists of a medium of "condensed photons." Then light can be viewed as evaporated mass and mass as condensed light. Steven Rado has characterized this approach in terms of an ideal gas [9]. As far as knowing what's in-between the particles: it doesn't matter. And that is to be taken literally because there isn't any definable matter between the particles, just uncondensed primordial gradient fields or vacuum.

A theory for gravitation has been presented based on the approach that gravity is the "æther wind" [10]. Gravity is related to mass and mass is related to light energy via the equation, $E = mc^2$ [11-12]. Gravity can be modeled as a mass gradient and is shown to be inversely proportional to the emanation of light energy as a light gradient by the proportionality constant, $-c^2$. In other words, light is basically a "hole" in the quantized æther that travels as a perturbation opposite the knocking action of the particles that

comprise the medium. This is why light can be thought of as "the ghost of mass."

This phenomenon is emphasized in two well known actions. When a positron and electron meet, the mass does not necessarily get "annihilated," it simply turns to as equivalent amount of light energy in the form of two powerful γ photons traveling in opposite directions with opposite spins. In another example, when an electron hops from a higher orbit to a lower orbit, a quantum of light energy as a photon is released as exemplified by the Bohr hydrogen atom in a spectrum of discrete quantum energies. The mass loss of the electron is negligible, but the mass and energy of the photon is described by the relations, $E = m_p c^2 = hf$, and $m_p c\lambda = h$, where m_p is the equivalent mass of the photon, h is Planck's constant, f is the frequency, λ is the wavelength, and λ is related to f by $c = \lambda f$. Photon emission is a good example of where mass (the electron) goes in and light (the photon) goes out.

A quantized æther allows general relativity to be reduced to the mechanics of a real and workable medium rather than an abstract notion that space is curved described by a stream of ambiguous mathematics. Real models of physics have enabled the engineering of flight and hopefully can be extended to the speed-of-light realm to enable luminal or super-luminal space flight.

The three so-called proofs of general relativity may be explained by a quantized æther. Gravitation is the process where the particles that comprise the particle sea are accelerated inward to the center of a mass. Therefore, light would be slowed going against gravity and accelerated towards gravity. This has been shown to be true in experiments where the frequency of photons is shifted to red or blue depending on the direction in the earth's gravitational field. Light from distant stars gets bent towards the sun as viewed from the earth by a very subtle amount. Gravity as the æther wind explains this phenomena. And finally, if gravitation is limited by the tangential speed of the underlying particle of the æther, analogous to sound in gas molecules, then very subtle effects would be observed in rare occasions such as the delay [precession] in the orbit of the perihelion of the planet Mercury as a deviation from calculations based on Newtonian gravitation.

References:

1. H. Fox, "The Nature of the Æther," *New Energy News*, vol 4, no 12, April 1997, p 9.
2. M. Twain, "Æther Workshop," preparation for Workshop (to be held at Stanford Univ. July 18-20, 1997). Plasmatronix, Intl., P.O. Box E, Menlo Park, CA 94026, Phone 415-569-3299.
3. H. Fox, "So You Want to Be Involved in New Energy?" *New Energy News*, vol 4, no 12, April 1997, pp 2-3.
4. M.G. Millis, "NASA Preparing for the Future," *New Energy News*, vol 4, no 12, April 1997, pp 6-7.
5. H. Aspden, "The Motors that Keep Us Alive," *New Energy News*, vol 4, no 12, April 1997, pp 1-2.
6. A. Einstein, "On the Electrodynamics of Moving Bodies," *Annalen Derphysic*, vol 17, no 5, September 26, 1905, pp 891-921.
7. C. Bennett, "A Quantized Æther," *New Energy News*, vol 4, no 7, November 1996, p 7.
8. F. Guteri, "An Odyssey of Sorts," *Discover*, May 1997, pp 68-69.
9. S. Rado, Aethro-Kinematics, Aethron Publishing Co., Los Angeles, 1994.
10. C. Bennett, "Gravity as the Æther Wind," April 1997.
11. C. Bennett, "Einstein's Mass Dilation as Æther Drag," *New Energy News*, vol 4, no 12, April 1997, p 7.
12. A. Einstein, "Does the Inertia of a Body Depend Upon its Energy?" *Annalen Derphysic*, vol 18, no 3, November 21, 1905, pp 639-641.

TEXAS A&M REFUSES SEMINAR

John Kirsch (staff writer), "Panel Speakers Draw Criticism from Some A&M Faculty Members," *Bryan-College Station Eagle*, 15 April 1997, pp A2, A7.

SUMMARY

An alternative energy seminar featuring Dr. John O'M. Bockris, Distinguished Professor of Chemistry, was denied the use of the Engineering/Physics Building on the night of Friday, April 18, on the grounds that the credentials of its four speakers were questionable. The listed participants were Drs. Bockris (Texas A&M) and Pat Bailey (of the Inst. for New Energy), J.J. Hurtak of the Academy for Future Science, and graduate student Todd Hathaway, who was also an organizer of the seminar. No University funds were being used for the event.

The faculty spokesperson quoted by the newspaper was Frank Cotton, also a Distinguished Professor of Chemistry at Texas A&M, who told the reporter that faculty members and administrators had forced the cancellation of seminar plans after learning who the speakers were. "They're all kooks and charlatans," Mr. Cotton was quoted as saying.

Bockris' research in such controversial areas as cold fusion and low-energy nuclear reactions has drawn criticism from his fellow faculty members for several years. The newspaper mentioned that the Web site for participant J.J. Hurtak provided information on ordering a UFO video [which possibly the University faculty thought was condemning evidence against him].

The seminar, Alternative Energy Resources & Technology, was held instead at St. Mary's Catholic Student Center, which had no problem with the controversial nature of the information. The following are two letters which directly resulted from the Texas A&M faculty decision.

To: Editor, Bryan-College Station Eagle
For: Letters to the Editor

I read with sad depression a recent article written yesterday, April 15, by John Kirsch, Eagle staff writer, about the Friday evening lecture at Texas A&M University, in which I am a scheduled speaker. **Unfortunately, his article is mostly trash and misleading** – as he has published his own version of illusions and negative thoughts about this seminar – without ever bothering to check out any of the facts, issues or intentions of the speakers. An e-mail with a summary of his article that was sent to me is attached.

As a newspaper editor, you may want to publish the truth about what is happening in the world. This includes presenting **both sides** of any issue, whether it be what is happening in the areas of advanced energy conversion research, or (dare I say) what really happened in Waco.

If you want to see what is happening in the area of "cold-fusion," where Japan has over 200 active patents and is doing repeatable over-unity (new potential energy) research, you can access that information at the Institute for New Energy Web site: www.padrak.com/ine/.

I include for you to review in your office a copy of a 1994 paper (6 pages) presented by SRI International under EPRI (Electric Power Research Inst.) funding, where they stated that they had also achieved a major "cold fusion" reaction in one of the three experiments that they performed. This is one new area of advanced energy research where things are indeed happening. There are also other areas where other exciting things are happening – that anyone is able to see – if they take the time to pull their heads out of the sand!

If you wish to continue to publish slanted and misleading stories for sales-appeal without including the facts on both sides – stay out of my way!

I will be there Friday evening. You should formally send John Kirsch to write and publish exactly what is said and exactly what happens – and not what he thinks others should hear, especially to slander others or mislead your readers. I would think that your readers would like to know what is actually happening and not someone's morbid thoughts about it.

I have personally seen several times how the press is able and has slanted and tainted the truth to serve its own egotistical or financial purposes. I do not allow that behavior in my life. I am sure that you would also not want that type of behavior in yours. I will look forward to Friday evening.

Sincerely, /s/ Dr. Patrick G. Bailey, President, Institute for New Energy

Ph.D., Nuclear Engineering, MIT, 1972
Past Technical Program Chairman for the IECEC (1984, 1991)
Past Steering Committee Member, IECEC (12 years)
Past Project Manager, EPRI, Nuclear Power Division, Nuclear Safety and Analysis Dept.
Active researcher

♢ ♢ ♢

APOLOGIES TO DR. BOCKRIS

The attached letter was received by Dr. John O'M. Bockris on Monday, April 21, 1997; therefore, the matter regarding the seminar's change of venue has been resolved. Out of respect for the individual that submitted the letter, the person's identity will be protected. The following information was forwarded to 1500 faculty, staff, and students on campus and the Board of Regents of Texas A&M.

Dr. John Bockris
Distinguished Professor
Chemistry Department, Texas A&M University

On behalf of faculty, staff and students that were involved with the decision to cancel the "Alternative Energy Resources & Technology" seminar, please accept this humble apology for the poor judgement that resulted in reversing the decision to not hold the seminar on campus. Based upon the material presented at the seminar at St. Mary's Catholic Student Center, you have proven that your work in cold fusion is legitimate and should be taken

seriously. 173 patents in the cold fusion field is convincing evidence in and of itself.

It is truly unfortunate that you have unnecessarily [experienced] so much resistance in sharing your ground breaking research with the University community. I sincerely hope that the other people involved with making the mistake of forcing your seminar off campus will be open-minded enough to allow the Fall 1997 Alternative Energy Conference to be held on campus.

Sincerely, /s/ (name deleted)
Mechanical Engineering Dept.
Texas A&M University

News Release
FOR IMMEDIATE RELEASE

Mike Fisher
ZENERGY CORPORATION

$100,000 FOR DEMONSTRATION OF A FREE ENERGY MACHINE

Chandler, Arizona, April 15, 1997 - To further the quest towards a fuel-less and pollution-free power source, Zenergy Corporation announces a challenge to all scientists and inventors developing advanced energy machines. Zenergy offers to pay US$100,000 to any individual or corporation who can demonstrate a working "free energy" machine.

Zenergy believes the momentum in this field is increasing and several breakthroughs are imminent. Zenergy was founded with the vision to help facilitate these breakthroughs, thereby providing mankind with clean, inexpensive, and abundant energy sources. Now is the time for a fuel-less energy machine to power our homes, cars, and portable computers. The founders of Zenergy are willing to risk their money in order to find a machine which can then become the power source of a new generation.

To qualify for the Challenge, the machine must produce a minimum of 100 watts of net power output, and the output power must exceed the input power by 150% or operate in a self-running condition. The machine may draw energy from an external power source, but may not draw power from heat, radiation, induction, a transducer or any other traditional storage device within or external to the device unless agreed to before the Challenge. Conventional technology such as the following will not be considered: internal combustion engines, fuel cells, solar cells, nuclear fission, wind generators and hydroelectric sources.

Certain types of batteries which exhibit extraordinary characteristics may be considered.

Further details and conditions of the Challenge can be obtained at the Zenergy Internet Site located at http://zenergy.com, or by contacting Zenergy Corporation at 602-814-7865.

COSMOLOGY NOTES
Greg Hodowanec

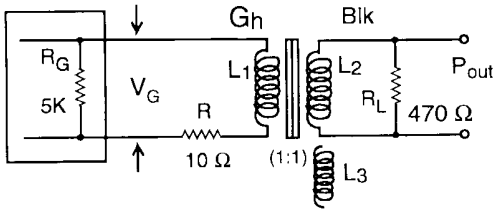
FYI: Brief simple tests continue to show a relation between reactive components and the fundamental Rhysmonic Frequency! A low level (sinusoidal) excitation of the coils here results in a 'parametric' type of interaction with the aether itself and builds up to useful levels which then can be used as real power in resistive loads. I have a strong suspicion that **all** free energy devices will be shown to involve this type of process.

/s/ Greg

I. Test of Special 3-coil Transformer

This coil was fabricated by Bill Ramesy, a knowledgeable researcher and a highly adept experimenter. The three coils were wound on top of each other of #30 AWG enamel wire. The coils had an inductance of about 3 mH (1Kc) and a resistance of 5.5 ohms (the ferrite core was approx. 5/16" diam., 1-3/4" length). The coils were roughly evaluated in the reactive mode as given below:

A. Test #1 $f_0 \cong 53.8$ KHz



25 MHz Scope used (good sinusoidals)

$V_G \cong 5$ V (pk-pk) $\cong 3.53$ V (RMS)

$$i_G \cong \frac{3.53}{5 \times 10^3} \cong .71 \text{ mA (RMS) (I line)}$$

Both } $P_{in} \cong 2.5$ mW (RMS)

$V_{out} \cong 5$ V (pk-pk) $\cong 3.53$ V (RMS)

$$i_{out} \cong \frac{3.53}{0.47 \times 10^3} \cong 7.51 \text{ mA (RMS)}$$

Both } $P_{out} \cong$ **26.5 mW** (RMS)

R = 10 Ω: $V_R \cong 105$ mV $\cong 74.2$ mV (RMS)

$$i_R \cong i_{circ.} \cong \frac{74.2}{10} \cong 7.42 \text{ mA (Rms)}$$

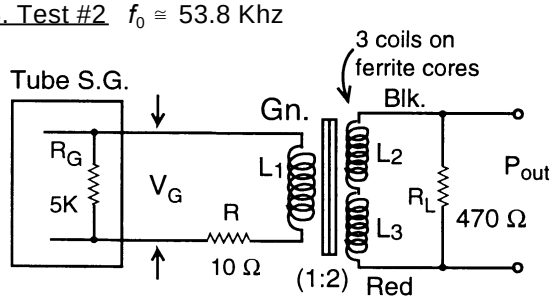
$$\text{P.G.} = \frac{P_{out}}{P_{in}} \cong \frac{26.5}{2.5} \cong 10.6 \text{ times}$$

$$\text{also P.G.} = \frac{i_{circ.}}{i_{line}} \cong \frac{7.42}{.71} \cong 10.5 \text{ times}$$

Reactive Power

$L_1 \cong V_G \times i_{circ.} \cong 3.53 \times 7.42 \cong$ **26.2 mW**
(**almost same as P_{out}**)

B. Test #2 $f_0 \cong 53.8$ Khz



$V_G \cong 1.6$ V (pk-pk) $\cong 1.13$ V (RMS)

$$i_G \cong \frac{1.13}{5 \times 10^3} \cong .23 \text{ mA (RMS) (I line)}$$

Both } $P_{in} \cong 0.26$ mW (RMS)

$V_{out} \cong 3$ V (pk-pk) $\cong 2.12$ V (RMS)

$$i_{out} \cong \frac{2.12}{0.47 \times 10^3} \cong 4.5 \text{ mA (RMS)}$$

Both } $P_{out} \cong$ **9.54 mW** (RMS)

R = 10 Ω: $V_R \cong 125$ mV $\cong 88.4$ mV (RMS)

$$i_R \cong i_{circ.} \cong \frac{88.4}{10} \cong 8.84 \text{ mA (Rms)}$$

$$\text{P.G.} = \frac{P_{out}}{P_{in}} \cong \frac{9.54}{.26} \cong 36.7 \text{ times}$$

$$\text{also P.G.} = \frac{i_{circ.}}{i_{line}} \cong \frac{8.84}{.23} \cong 38.4 \text{ times}$$

Reactive Power

$L_1 \cong V_G \times i_{circ.} \cong 1.13 \times 8.84 \cong$ **10 mW**
(**almost same as P_{out}**)

II. Conclusions:

These results appear to be quite similar to Sweet's early VTA tests?

LETTERS

Re: *NEN*, April 1997, page 8
"Magnetic Gravity Field Monitoring"

Dear Sir,

I note your invitation to offer comments on the experiment described in this article. Regrettably, I am unable to offer a scientific and mathematical appraisal of the effects as observed but feel that perhaps another British academic, Dr. Harold Aspden, (knowledgeable on most things magnetic) may be in a better position than myself to enlighten your readers.

On reading the article, it became apparent that the author was perhaps placing a wrong interpretation on his observations and I would suggest that what he attempted could be related to other phenomena which has been reported elsewhere and also appeared on the Internet.

The following [projects] I feel are relevant and worthy of further investigations:

1. The Hammel and Sinclair levitating craft.

2. The Bedini experiment using the principles of Hammel and Sinclair.

3. The GRASSHOPPER PROJECT..... Whilst in America, this was at one time secret, it is important to realize that this originated from East Germany in the 1960's and came to prominence some eight years ago, therefore, I am assuming it is in the public domain by now. I recall the late Rolf Schaffranke's comments on learning of this... "He thought that teleportation had been achieved."

For the uninformed, this experiments comprised two quartz toroids as the core material with a capacitor on both major faces and each core including a toroidal winding.

Both toroids were mutually at 90° to each other and energized with an unknown A.C. signal. A brilliant white light was observed and when the two coils were

brought together (as you would close an open book) the whole assembly vanished. Normally this unit would have re-appeared at another location, hence the title Grasshopper. Fortunately in the last experiment the unit could not be found but because telemetry control was used it was subsequently located past Pluto's orbit traveling at a velocity of 0.9 x C. Thus it will be seen that the work of Bill Ramsay appears to be linked to previous experiments.

This factor has prompted me to ask, why Pluto's orbit for the direction of travel? It also prompts the questions:

a. Will two objects in free space having identical frequencies experience a force of attraction or repulsion? No one has been able to answer this question.

b. Since the earth has its Schuman frequency = 7.8Hz., do other planets, etc., have their own frequencies and what are they?

c. Does this [planetary frequency] have any significance in the way the orbits of celestial bodies are maintained?

Finally, we could refer to Principle of Ultra-relativity in which one of Sieki's co-workers not only produced a Tachyon flare but apparently weight loss was also observed, if I understand it correctly. One may also refer to Revolution in Science, Technology, and Medicine by Hans Nieper, which I believe also covers this topic.

I hope these few observations and comments may inspire an extension to the work of Bill Ramsay and lead to a better understanding of Mssrs Hammel's and Sinclair's efforts.

Sincerely, /s/ Donald P. Walton

Lighter notes

CONFIDENCE

At a recent computer software engineering course in the U.S., the participants were given an awkward question to answer:

"If you had just boarded an airliner and discovered that your team of programmers had been responsible for the flight control software, how many of you would disembark immediately?"

Among the ensuing forest of raised hands only one man sat motionless. When asked what he would do, he replied that he would be quite content to stay on board. With his team's software, he reasoned, the plane was unlikely to even taxi as far as the runway, let alone take off.

(borrowed from *The Electrostatics Newsletter*, who found it somewhere on the Internet)

Meetings

Intersociety Energy Conversion Engineering Conference

IECEC - 1997

July 27 to August 1, 1997
Hilton Hawaiian Village, Honolulu, HI

Abstracts in the area of "Innovative Concepts – Cold Fusion" and other Advanced Energy Conversion Technology areas were accepted until January 17, 1997. Draft papers due March 1997, and Final papers are due in May 1997.

More info. available at: <busassist@aol.com>

ICCF-7

International Cold Fusion Forum
Vancouver, B.C., Canada
April 19-24, 1998

With the maturation of the field, ICCF-7 seeks to attract a more diverse audience including additional scientists, research institutes, students, national funding agencies, commercial interests, journalists, and spouses. It is the objective of ICCF-7 to provide a productive international forum for communication and education.

Calendar:
June 1997: Local Organizing Committee call for 1-2 paragraph abstracts for sampling of potential presentations. Selection rules and evaluation criteria will be provided at this time.
September 1997: Official call for full, one-page abstracts. Final peer review process begins.
December 1997: Final notification to all presenters regarding the format of their presentation.

January 1998: Deadline for final abstracts to be published in ICCF-7 Program Manual and Website.
April 1998: Conference. All presenters must hand in their final papers during the conference for timely inclusion in the publication ICCF-7 Proceedings.

A different topic is planned for each day at ICCF-7. An invited presentation with summary review or global implications for the entire field will begin each day's topic, followed by five oral presentations on the topic. Afternoons will be entirely devoted to enhanced poster sessions, which include a 3-5 minute oral preview and summary. A "Top Ten" poster presenters will be selected by the attendees, and each will conduct an expanded 15 minute presentation to the full audience on Thursday afternoon. Three evening workshops will also be held.

Topics include: Heat & Related Products, Nuclear Processes & Products, Materials & Innovative Approaches, and Theory & Nuclear Physics.

For more information or to get on mailing list, contact:
ICCF-7 c/o ENECO
391-B Chipeta Way, Salt Lake City, UT 84108 USA
Phone (801) 583-2000 Fax (801) 583-6245
jaeger@ENECO-USA.com

Conference on the Fundamental Structure and Mechanisms of the Universe
May 30 - June 1, 1997
at the Gold Rush Country, about 2 hrs. from San Francisco in the foothills of the Sierras.

"The conference will be a search for a common structure that will clearly explain the behavior of electromagnetism and matter, forces, space, time, entropy, at a fundamental level, and remove the wave particle duality, and should allow physics to move forward again." Organized by the Alexandria Foundation.

For further details, refer to web site:
www.kcbbs.gen.nz/users/rtomes/conf-l.htm

An **AETHER Conference** is being planned for July or August 1997 at Stanford, CA. Its purpose is to bring together contacts, researchers and theorists on the subject of the Aether. For further info contact: Plasmatronics, Int., P.O. Box E, Menlo Park, CA 94026, Tel. 415-569-3299.

Commercial Column

The following companies (listed alphabetically) are commercializing cold fusion or other enhanced energy devices: [Listings with your additional copy, or boxed, for small annual service fee.]

COMPANY: PRODUCT

American Pure Fusion Engineering and Supply: Warren Cooley, 1-800-789-7109 or 503-585-6746. Email to: Coolwar@aol.com

CAI, Inc., CAI has acquired rights to develop and produce a new-type of thermal power based on the controlled production of clean nuclear reactions from micro-miniature tokamaks (provided by nature). Contact through FIC, Voice 801-583-6232, Fax 801-583-2963.

Clustron Sciences Corp.: Contact: Ron Brightsen, 703-476-8731.

ENECO: is in the business of commercializing the exciting new field of low energy induced nuclear reactions in solids via patent licensing, joint-ventures, and co-operative research. ENECO, University of Utah Research Park, 391-B Chipeta Way, Salt Lake City, Utah 84108 USA. Contact Fred Jaeger, Voice 801-583-2000, Fax 801-583-6245. Email: jaeger@ENECO-USA.com

E-Quest Sciences: Contact Russ George, FAX 415-851-8489.

Fusion Information Center (FIC): Research and development of new energy systems. The world's most complete resource depository for cold fusion research information, as well as other new energy research including zero-point energy; space energy research; electronic, electromagnetic, and mechanical over unity devices and transmutation. We are the publishers for ***New Energy News***, and *the* ***Journal of New Energy***. Voice 801-583-6232, Fax 801-583-2963. Contact Hal Fox.

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.: Rome, Georgia. Contact James Griggs, Voice 706-234-4111 Fax 706-234-0702.

JET Energy Technology, Inc.: Weston, MA. Contact Dr. Mitchell Swartz, Voice 617-237-3625. Fax 617-237-3625.

Labofex, Experimental and Applied Plasma Physics: Ontario, Canada. Contact Dr. Paulo N. Correa. Tel 905-660-1040
Fax 905-738-8427

Magnetic Power Inc.: Sebastopol, CA. Contact Mark Goldes, voice 707-829-9391, Fax 707-829-1002.

Nova Resources Group, Inc.: Denver, CO. Call Chip Ransford, Phone 303-433-5582.

UV Enhanced Ultrasound: Hong Kong. FAX 852-2338-3057.

"YUSMAR"- Scientific-Commercial Company: President: Dr. Yuri S. Potapov, 277012 Kishinev, Moldova. Phone and Fax 011-3732-233318.

Zenergy Corporation: 390 South Robins Way, Chandler, AZ 85225. Contact Reed Huish: 602-814-7865, Fax 602-821-0967, e-mail: info@zenergy.com

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

Academy for New Energy (ANE) 216 Commerce Drive, Ste. 4, Fort Collins, CO 80524. Tel. 970-482-3731
ANE Newsletter, quarterly publication of ANE, edited by Robert Emmerich.

Advanced Energy Network Newsletter, quarterly. Advanced Energy Network, P.O. Box 691, Rondebosch 7700 Capetown, Rep. South Africa.

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

Cold Fusion Times, quarterly newsletter published by Dr. Mitchell Swartz, P.O. Box 81135, Wellesley Hills MA 02181. Home Page: http://world.std.com/~mica/cft.html

Cycles, a R&D newsletter, published by Dieter Soegemeier, Editor, GPO Box 269, Brisbane, QLD.4001, Australia. Phone/Fax: +61 (0)7 3809 3257.

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

Electrifying Times, 3/year magazine. 63600 Deschutes Market Rd, Bend, OR 97701
541-388-1908, Fax 541-388-2750, E-mail <etimes@teleport.com>
www.teleport.com/~etimes/

Fusion Facts has become a section in the *Journal of New Energy*.

Fusion Technology, Journal of the American Nuclear Society, edited by Dr. George Miley, 555 N. Kensington Ave., La Grange Park, IL 60525.

Infinite Energy, bi-monthly magazine. P.O. Box 2816, Concord, NH 03302-2816. Voice: 603-228-4516. Fax: 603-224-5975 E-mail 76570.2270@compuserve.com

Institute for New Energy (INE), organization to promote and help find funding for new energy research.
Visit our **Home Page**: www.padrak.com/ine/ which contains many important scientific papers and current reports on all areas of research. E-mail: ine@padrak.com
Salt Lake City, Utah. Voice 801-583-6232, Fax 801-583-2963.

New Energy News monthly newsletter for INE, highlighting the research and development in the worldwide new energy arena. Edited by Hal Fox.

Journal of New Energy**,** quarterly, presenting papers representing the new areas of energy research, leading-edge ideas in the development of new energy technology, and the theories behind them. Published by the Fusion Information Center, Inc. Editor: Hal Fox.

KeelyNet BBS - Jerry Decker, 214-324-3501
Internet: www.keelynet.com
E-mail: jdecker@keelynet.com

Planetary Association for Clean Energy Newsletter, quarterly, edited by Dr. Andrew Michrowski. 100 Bronson Ave, # 1001, Ottawa, Ontario K1R 6G8, Canada. Web page: http://energie.keng.de/~pace

Space Energy Journal, quarterly, edited by Jim Kettner & Don Kelly, P.O. Box 1136, Clearwater, FL 34617-1136.

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

CHARGE CLUSTER TRANSMUTATION

By Hal Fox
Editor, *Journal of New Energy*

ABSTRACT

Kenneth Shoulders has presented a paper showing that much of the excess energy produced by cold fusion is due to fracto-emission of high-density charge clusters which cause nuclear reactions. Neal and Gleeson have discovered how energetic charge clusters in water solutions can reduce radioactivity. Jin et al., have produced a mathematical model of high-density charge clusters together with associated transport of positive ions and has shown that this energetic toroid can induce nuclear reactions by plasma injection into target nuclei. High-density charge cluster patents are now pending on inventions that will reduce radioactivity, produce thermal energy without neutrons, create scarce elements from plentiful elements, and make table-top particle accelerators practical. Data from independent replication of nuclear reactions produced by charge clusters will be presented together with professional reports detailing the mechanisms involved in plasma-injected transmutation. The latest developments in the new technology of plasma-injected transmutation will be summarized and the expected environmental impact will be outlined.

A. INTRODUCTION

The discovery by Rod Neal and Stan Gleeson has shown that excess thermal energy or reduction of radioactivity can be produced by the use of high-density charge clusters in an electrochemical reactor [1]. Kenneth Shoulders has shown that high-density charge clusters, under appropriate conditions, can cause nuclear reactions [2]. Sam Faile and Nicholas Reiter have shown that exploding bridge wires under atmospheric pressure using short, high-potential electric discharges appear to produce some nuclear reactions [3]. Shoulders has further shown that the fracto-emission of charge clusters is a probable cause of the nuclear events and excess heat in at least some cold fusion experiments [2]. These discoveries of the

production and control of high-density charge clusters provide scientists with a new tool by which the physics of matter is being explored.

B. HISTORICAL REVIEW

A search of the literature for some experimental and/or theoretical evidence of charge clusters has provided some historic insights. A recent paper by Bhadkamkar, et al., [7] provides an exemplary but not exhaustive review of the literature dating from 1957 (which cites a reference as early as 1906) to 1995. Many of the writers of the papers reviewed were exploring the onset and control of electrode luminescence. Had they found that nuclear reactions would occur under some conditions, they would have decided that such evidence was the result of contamination. The understanding of the nature of nuclear reactions during most of this century precluded the concept of nuclear reactions being produced by the low energy (low electric potential) used in the experiments being reported in this paper.

C. LOW-ENERGY NUCLEAR REACTIONS

Because of the continued reluctance of many scientists to accept the experimental fact that nuclear reactions could be produced with low-energy and because few scientific journals would publish articles on low-energy nuclear reactions, Professor John O'M. Bockris hosted a low-energy nuclear reaction conference in June 1995 at Texas A&M University. Dr. Bockris is one of the world's recognized specialists in electrochemistry and was one of the first to replicate the cold fusion experiments announced in March 1989 by Professors Pons and Fleischmann. Bockris and associates were the first to demonstrate that tritium (a sure sign of nuclear reactions) could be produced in a cold fusion reactor. The proceedings of this conference were published as volume 1, number 1 of the *Journal of New Energy*.

A second conference on low-energy nuclear reactions was hosted by Professors John Bockris and George Miley (editor of *Fusion Technology*, an international journal of the American Nuclear Society) in September 1996 and the proceedings were printed as volume 1, number 3 of the *Journal of New Energy*. Papers reporting conclusive evidence of low-energy nuclear reactions in cold fusion cells were presented at this conference. In addition, a paper by Kenneth Shoulders [2] showed how high-density charge clusters could be responsible for at least some of the excess heat found in many cold fusion experiments. Another paper by Bass, et al.,[1] was the first paper reporting on the experimental evidences of nuclear reactions in the Neal-Gleeson Process.

D. THE VALVE METALS

In the early days of the growing electron-tube industry, the first electronic tubes (used as diodes) were named **Fleming Valves**. The term **valve** for an electron tube was more prevalent in England than in the United States. The early electron emitters were the hot filaments. Later, the cathode was added. To make an effective cathode a combination of a conducting metal and a substance that was a good electron emitter (thermionic emission) was required. It was found that certain metal and metal oxides were suitable. Thus the term **valve metals.**

As the solid-state devices (diodes and transistors) became popular there was also a studied search for material that would provide the basis for controllable displays. Therefore, there was considerable experimental work examining the luminescence of certain metal oxides. To quote van Geel, et al. [5] in their introductory remarks: "It has been known for a long time (cites A. Günthershulze, *Ann. Phys.* **21**, 929-954, 1906) that during the anodic oxidation of several metals, such as Al, Mg, Ta, W, Zn, and Zr, a light-effect occurs. In this process the metal is placed as the anode in a suitable electrolyte; during the passage of current oxygen is developed at the anode, an oxide film is formed, whilst at the same time luminescence can be observed."

E. BEYOND LUMINESCENCE

Some of the earliest papers reviewed [5] reported experiments with oxide layers on aluminum. Later papers, such as Waring and Benjamini [6], Alwitt and Vijh [7], and Wood and Pearson [8] reported more generally on the development of luminescence and with the magnitude of the breakdown voltage using silicon, in particular, and using valve metals in general.

Some of the interesting observations include the following: van Geel et al., [5] reports on the anode and cathode flashes when the aluminum oxide electrodes are powered with 200 cps alternating current at 25 volts. Waring and Benjamini [6] report on the phenomena of **breakdown** with the following comments: "Since the thickness of the oxide is proportional to the voltage ... there seems to be no reason to anticipate a limiting voltage or breakdown. We have, however, noted the increase in bubbling just before breakdown." Further, these authors note that: "Since the field during growth is about 1.6×10^7 v/cm and therefore near the breakdown limit anyway, this increase is enough to cause the weaker spots in the oxide to give way, thus **showing the sparks**." In their conclusions, the authors state, "**Spark** discharges penetrate into the solution," and "When **sparking** begins, the general glow decreases; the current and luminescence are concentrated in these limited, intense, breakdown locations." A further exploration of a variety of papers relating to cathode luminescence can be found in the paper by Bhadkamkar and Fox [7].

F. FIELD EFFECT EMISSION

When a valve metal is used as an anode in an electrolyte (usually of a metal salt), an oxide layer is rapidly developed on the anode. When a sufficient oxide layer is produced (by slowly increasing the voltage applied to the anode up to a few hundred volts) the resistance of the electrode has been greatly increased. When this electrode is used as the cathode (or used with a.c.) the electrode oxide layer may be seen to glow, then to produce small sparks, and with higher voltages produce vigorous sparks.

Our working hypothesis is that sparks are caused by the high voltage drop across the combination of the oxide layer and the double layer surrounding an electrode. The Al anode produces a charge cluster by field emission, probably at the surface of the oxide layer. The charge cluster is then accelerated (through the oxide) toward the surface of the aluminum anode where it drills small micrometer holes into the aluminum.

In the case of other valve metals used as cathodes, the charge cluster appears to be emitted from the metal/metal oxide boundary; bores through the oxide layer; and erupts into the electrolyte solution. Occasionally, a spark appears to maintain its ability to exist in the electrolyte as noted by this author and by Matsumoto [8]. The use of a.c. may be beneficial because the fracture through the oxide layer can be **healed** or **restored** during the **anodic** portion of the a.c. cycle and the charge clusters can be emitted during the **cathodic** portion of the a.c. cycle.

In the experiments conducted at the author's laboratory, working voltages (both a.c. and d.c.) currently range up to about 550 volts. The amperage ranges from tenths of amperes to about 5 amperes (about the limit of the power supply) **and, of course,** is a strong function of the surface area of the electrodes being used. Another strong parameter for the voltage and current used is the molarity of the electrolytic solution. The lower the resistance of the electrolyte, the higher the current for a given voltage. Also, the larger the electrode surface, the higher the current.

To create sparking from the electrodes it is necessary to have a sufficient resistance of the metal oxide layer so that the electric potential gradient will produce field emission of the charge cluster. The charge cluster is usually quickly quenched by the low resistance of the electrolyte. In a low-pressure gas, and especially on the surface of a dielectric, a charge cluster can remain as a stable entity until the charge cluster impacts a low-resistance or conducting surface. For more details of charge clusters in gases see references by Shoulders [2, 9, & 10].

G. THE PHYSICS OF CHARGE CLUSTER NUCLEAR REACTIONS

A typical charge cluster consists of miniature toroids of highly-dynamic electrons ranging from 10^8 to 10^{13} electrons per cluster. As first shown mathematically by Jin [11] the highly dynamic nature of the charge cluster provides the electromagnetic forces that create the stable toroid. Larger charge clusters may consist of many smaller charge clusters that tend to form a ring-shaped (somewhat like a smoke ring) necklace. See Fig. 1 for a depiction of a charge cluster in an accelerating electric potential field.

The charge cluster has the capability of attracting from its environment a number of positive ions ranging from one to ten positive ions for each million electrons [2]. The type of positive ions carried depends on the environment in which the charge cluster is produced. With or without the piggy-back positive ions, the charge cluster can be accelerated by an electric gradient to about the same degree as a single electron. Therefore, a 5,000 volt potential can accelerate the charge cluster (especially in a near vacuum) to about one-tenth the speed of light. **This is important: a particle accelerator for protons would need to use about nine million volts potential to provide the protons with the same velocity provided to the charge cluster and its attached load of protons.** This is the phenomena that allows us to create nuclear reactions with a relatively low-energy input! This phenomena, first elaborated by Shoulders [2] provides, by standard classical principles, a new window on physics.

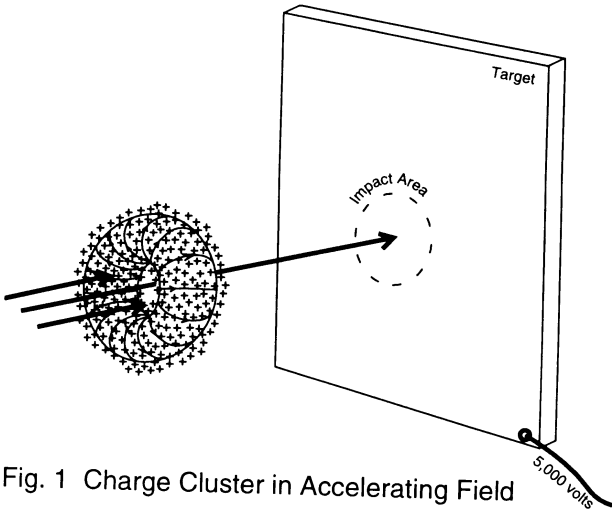


Fig. 1 Charge Cluster in Accelerating Field

According to Jin [11], both the electric and the magnetic potentials of this small charge cluster can have extremely large local values. As shown in Fig. 2 when the charge cluster approaches a target anode, the electrostatic field is high enough to repel all electrons away from the nuclei of the target anode metal lattice leaving a plasma of fully-ionized metal nuclei that have not had time to avoid the approaching charge cluster.

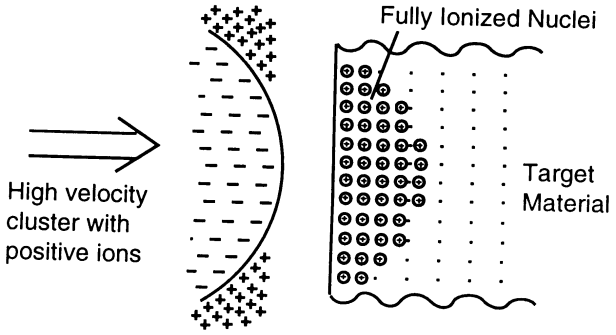


Fig. 2 Charge Cluster Impacting Target

The high-velocity positive ions apparently bypass the Coulomb barrier of the target nuclei and penetrate many of the target nuclei in their fully-ionized plasma state. If the positive ions are protons, the results are nuclear reactions allowed by conservation rules. If the target nuclei are heavy metal elements (such as thorium or uranium) the impact of one or more protons into a target nuclei may result in spontaneous fission. **Under these extreme high-field local conditions, the normal plasma physics of nuclear reactions (the probability of particle collision/fusion) is no longer valid.** We are now working in a physical regime that has yet to be fully studied.

H. SOME EXPERIMENTAL FINDINGS AND SUGGESTIONS

Those who experiment with the creation of electron charge clusters in an electro-nuclear cell (reactor) will, hopefully, be guided by reading some of the extensive literature, especially papers listed in the references to this article. When creating charge clusters to be used for the promotion of nuclear events in an electrolyte, the following protocols should be considered:

1. Sparking at the electrode is necessary but not sufficient for the production of nuclear events. A charge cluster can produce an observed spark but fails to have sufficient energy to promote a nuclear reaction.
2. It appears necessary to maintain (or periodically renew) the oxide layer on a valve metal to produce nuclear-active charge clusters. It is, of course, the concept that the charge clusters must carry (piggy-back fashion) positive charges and the cluster must achieve a critical energy level to promote nuclear reactions.
3. The molarity (and the resulting conductivity of the electrolyte) may be an important operational parameter. The concept is that the charge cluster must be able to persist for some short time period and energetically impact a nucleus in the electrolyte to produce a nuclear reaction. It is believed that the potential gradient between electrodes and/or at the metal/metal-oxide layer must be maintained above some critical value for nuclear reactions to be possible. A lower field gradient (higher conductivity) in the metal/metal-oxide layer or in the electrolyte may only produce Joule heating and not produce the desired level of nuclear reactions.
4. Experimental evidence suggests that in an aqueous environment the hydrogen and oxygen nuclei are involved in multiple or sequential nuclear impacts that cause some of the nuclear reactions. It is hypothesized that one nuclear reaction surrounded by many hydrogen, oxygen, and electrolyte ions can produce other local nuclear reactions. Some of the observed nuclear byproducts are best explained by appealing to the concept of multiple-body reactions. No evidence of chain reactions have been found nor predicted. Local chain reactions are deemed to be highly unlikely in such low temperature environments.
5. The Coulomb barrier may be much less than the field strength of a charge cluster. The charge cluster must have sufficient electrons so that this negative electric field strength can aid in overcoming the Coulomb barrier before nuclear reactions can be expected.
6. A variety of nuclear reactions can be expected by control of the energy of the charge cluster; the selection of the environment that provides the positive ions (protons, deuterons, tritons, alpha particles, etc.); the acceleration of the charge cluster; and the target material. Many Ph.D. dissertations are expected to explore experimental results from varying these parameters within the next few years.
7. A charge cluster is best produced by the use of short, negative pulses provided to a proper cathode material. Sub-nanosecond pulses are deemed to be best. However, the technology for producing high voltage nanosecond pulses is in its infancy.

The author and associates found that producing vigorous sparking at the electrodes in an aqueous solution of thorium chloride did not appear to reduce the level of radioactivity by a significant amount. Further study and experiments led to a method by which higher energy could be added to these charge clusters produced on the surface of selected valve metals. Independent measurements of **before** and **after processing** samples of the thorium electrolytes **for the first successful experiment** resulted in the reduction of radioactivity by at least 11% as measured by the gamma-ray count emitted from samples of the same size. As soon as the new patent application has been filed and further experimental evidence is obtained, further details and results of these experiments will be provided.

I. SUMMARY AND CONCLUSIONS

The new technology for the production, control, and application of high-density charge clusters has been shown to be consistent with standard physical principles. The production of low-energy charge clusters has been shown to result in nuclear reactions. The current and planned work has special application to the reduction of radioactivity of high-level radioactive wastes. New and exciting applications for this new technology are expected to be rapidly discovered, invented, patented, engineered, and commercialized for the benefit of all humanity.

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