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THE MAGNETIC ROTATING APPARATUS

– Press Release –

[If the following Press Release is reporting factual information that can be verified, then this may be the first commercial over-unity rotating, magnetic new-energy device. The first western hemisphere demonstration will be given in Mexico City in early July, 1998. *NEN* plans to attend. We will post our report on the INE Webpage <www.padrak.com/ine/>.]

Inventor Kohei Minato, the Thomas Edison of the new millennium, has acquired more than 50 patents and intellectual property rights from all over the world for the energy creating "Magnetic Rotating Apparatus." Mr. Minato's generating device utilizes the magnetic force of repulsion to create and emerge clean safe energy.

The "Magnetic Rotating Apparatus" employs a number of stationary neodymium magnets arranged at regular intervals on the peripheral portion of a rotor. The polarity of each magnet, which is located radially outward from the rotor, is identical. The machine is started with an electromagnetic stator. When activated, the magnetic fields repel creating rotation of the rotor. As the rotations per minute (rpm's) increase, the electrical consumption to the electromagnetic stator decreases. This phenomenon is in direct conflict with accepted laws of physics and is achieved through the repelling magnetic fields. It operates without heat, noise or pollution of any kind. It can be produced in size from ultra small to very large.

One of the prototypes available for viewing operates with an input of 34 watts of electricity and outputs a maximum of 500 watts. "Magnetic Rotating Apparatus" applications currently under development include usage from cell phones and laptop computers to automobiles and giant power stations.

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OHMORI-MIZUNO EXPERIMENT REPLICATED

In a letter from Dr. Eugene Mallove, the Ohmori-Mizuno experiment is reported along with aids for the experimenter to replicate it. Mallove cites the experiment as being both visually and audibly spectacular: brilliant glowing pink, purple and lavender with white flashes on an underwater tungsten electrode. The plasma-like underwater discharge on the electrode often manages to disintegrate or melt tungsten underwater with only about 50 to 80 watts of power. Tungsten's melting point is around 3680°K. There is also evidence for transmutation of elements.

Dr. Mallove reports the process as being totally reproducible with no "loading time." Three groups researching this technique have all gotten excess heat results. A comprehensive article about the experimental results will be published in Infinite Energy #20, due out on July 22.

In calorimetric assessment: Heating credit should be taken for the full mass of water in the cell from the initial temperature of say 80°C to the boiling point. However, you may find it difficult to push the average solution temperature up to 100°C, because the steam ejected cools the solution so rapidly. Also, the boiling point is lowered because of the electrolyte. This is wonderful, because we can use steam. The main source of the excess appears in the amount of steam produced: water vaporized requires 2268 J/gm.

WARNING: Ohmori and Mizuno experienced significant apparent electromagnetic effects on their instruments during these experiments.

Note from the Editor:
In our laboratory, we have been working with and writing papers about similar experiments using aluminum and zirconium. The Ohmori-Mizuno experiment is a welcomed addition to the high-density charge cluster technology. Professor Ohmori was a participant at the Second International Low Energy Nuclear Reactions conference held at College Station Texas, in September 1996. It was a that conference that Shoulders presented his paper on high-density charge clusters and Fox presented a paper on "Electro-Nuclear Transmutation: Low-Energy Nuclear Reactions in an Electrolytic Cell." In the proceedings of that conference (*Journal of New Energy*, vol 1, no 3, 1996) a paper on "Plasma Injected Transmutation" by Fox, Bass, and Jin was also published (after important patent applications were filed). See also "Electron Charge Cluster Sparking in Aqueous Solutions." by Bhadkamkar and Fox in *JNE*, vol 1, no 4, Winter 1996.

Fusion Briefings

ANS AND THE CF SESSIONS
A Report on "Cold Fusion" Theories and RESULTS at the Most Recent American Nuclear Society Annual Meeting
By Patrick Bailey (Pres. INE)

American Nuclear Society: Transactions of the 1998 Annual Meeting, Nashville, TN, June 7-11, 1998

ISOTOPES AND RADIATION SESSION
Session Organizer: George H. Miley (Univ. of Illinois)

Michael C. H. McKubre, Steven Crouch-Baker, Francis L. Tanzella (SRI Int), **"Materials and Electrochemical Conditions Affecting Hydrogen Absorption in Metal Cathodes."**
George H. Miley (Univ of Illinois), **"Characteristics of Potential Low-Energy Nuclear Reactions in Solids."**
Maria A. Okuniewski, James A. Patterson, Gabriel B. Collins (CETI, Sarasota), George H. Miley (Univ of Illinois), **"Amelioration of U-235, Pa-234m, Pb-121, and Ac-228 Within an Electrolytic System."**
Mitchell R. Swartz (JET ETI), **"Improved Reactor Performance Using "Pi"-Notch Operation and Gold Electrodes."**
James Patterson, Martin Gruber (CETI, Sarasota), **"Separation of H_2O, D_2O, and T_2O Using a Novel Membrane Separation Technique."**
Hal Fox, Shang Xian Jin (Trenergy), **"Low-Energy Nuclear Reactions from Charge Clusters."**
Yeong E. Kim, Alexander L. Zubarev (Purdue Univ), **"Open Problems and Uncertainties in the Conventional Nuclear Fusion Theory at Low Energies."**

TRANSMUTATION AND ISOTOPE PRODUCTION BY LOW-ENERGY NUCLEAR REACTION IN SOLIDS - II
Session Organizer: George H. Miley (Univ. of Illinois)
All Papers Invited (Transactions: pp 87-93)

John C. Fisher (Fisher Consult), **"Cold Fusion Phenomena Understood as Polyneutron Chain Reactions."**
R. A. Oriani (Univ of Minnesota), **"Testing the Polyneutron Theory of Low-Energy Nuclear Reactions.'**
Talbot A. Chubb, Scott R. Chubb (Oakton Int) **"Argument for Pressure-Controlled Nuclear Fusion Tests."**
Yan Kucherov (ENECO), **"Nuclear Excitation by Acoustic Resonance."**
Scott R. Chubb, Talbot A. Chubb (Oakton Int), **"Aneutronic, Radiationless Nuclear Fusion in Metal Deuterides at Absolute Zero."**
Heinrich Hora, Jak C. Kelly (Univ of New South Wales - Australia), George H. Miley (Univ. of Illinois), **"Nuclear Shell Magic Numbers Fitting Low-Energy Nuclear Reaction Experiments."**
Lali Chatterjee (Cumberland Univ), **"Nucleo-Weak Model for Isotope Production in Low-Energy Nuclear Reactions."**

THORIUM TRANSMUTATION

F. Celani (INFN-LNF, Frascati, Roma, Italy), M. Achilli, A. Battaglia, C. Cattaneo, G. Buzzanca, P.G. Sona (CISE spa, Italy), A. Mancini (ORIM srl Italy), "Preliminary Results with "Cincinnati Group Cell" of Thorium "Transmutation" Under 50 Hz AC Excitation."

We performed, at the CISE Nuclear Laboratory from February '98, four experiments with the so called "Cincinnati Group Cell", which consisted of a Zr-Zr cell using a 50 Hz AC line current found in Italy.

The first two experiments where "blank" control runs that were mainly aimed to understand the intrinsic peculiarity of this kind of AC electrolysis.

In experiment #1, we added 80 mM of NaNO3 and one drop (ie- 20 mM) of 37% HCl to 25 ml of de-ionized water electrolyte. The experiment was performed following, as close as possible, the I-V-T protocol developed by the Cincinnati Group (CG). We experienced a very large and abrupt temperature and pressure increase which broke the safety valve. We then analyzed the material inside the cell and found nothing strange: only Zr, Hf, and Na. The cell was then

mechanically cleaned by removing approximately 0.1 mm of the surface.

Experiment #2 was similar to #1 except that no NaNO3 was added and we modified the I-V-T protocol to avoid a large pressure buildup. Subsequent SEM analysis of the particulate from this run showed only Zr, O, and C1. ICP-MS showed: Zr and Hf.

Experiment #3 was made using 25 ml of electrolyte from a solution composed of 100 ml of de-ionized water plus one gram of Th $(NO_3)_4$*XH_2O plus 20 mM (one drop) of 37% HCl. Radiometric intensities of Th in the initial solution were 1.0 of ^{232}Th and 12.6 of ^{230}Th indicating that it was not only "natural" ^{232}Th. The experiment was run for 55 minutes with Imax = 2.6A; Vmax = 22OV, Pmax = 30psi. Subsequent qualitative ICP-MS revealed B, Cs, Hg, Cu, Na, A1, V, Cr, Ni, Zn, Pb, and Mn. A chemical balance indicated 18% of the original Th was missing, and a radiometric balance (alpha + Beta) showed a 12% Th deficit.

Experiment #4 was made following, as close as possible, the CG protocol (except that we started at 10 V to avoid a repetition of the large pressure increase). The experiment ran for 55 min with Imax = 4.8 A; Vmax = l8OV; Pmax = l90 psi. Subsequent ICP-MS and ICP-optical analyses strongly suggests, based on our experience, that the results were very similar to experiment #3. Chemical balance showed 78 mg of Th remaining from the 102 mg initial quantity. Other elements detected were ^{10}B and ^{11}B (3.2 mg), Cu (l.0 -1.5 mg) but not in normal isotopic ratio, ^{133}Cs (0.2 mg), and Hg (0.16 mg). The following elements were qualitatively detected: Na, A1, V, Cr; Ni, Zn, Pb, and Mn. **When we used only ICP-MS, several other masses appeared compared to when we used combined ICP-MS and ICP-optical analysis.** A post-run radiometric balance (alpha + beta) showed a 14% Th deficit, but it did not have unusual unbalanced isotopic ratio.

Further studies are underway to more fully understand our preliminary results.

COLD FUSION CONFUSION REIGNS IN WASHINGTON

By Stephen Kaplan (kap808@europa.com)

[Published in: *The Oregonian*, June 10, 1998]

President Clinton has expressed great concern about global warming and the long-term impact of the burning of fossil fuels on the environment. He claims that new energy technologies will help us move beyond our dependence on highly polluting ways of producing energy.

However, President Clinton is not receiving accurate advice from the Department of Energy (DOE) about one possible new source of clean energy: low-temperature nuclear reaction proceses (popularly known as "cold fusion").

In a recent letter to Congresswoman Elizabeth Furse, the Department claims that the reports of "anomalous excess energy and "anomalous nuclear effects" in cold fusion experiments have not been verified and that there is "no scientific evidence... that would suggest transmutation of radioactive materials can be achieved through low-temperature nuclear processes."....

There is a growing body of experimental evidence that indicates anomalous excess heat and transformation of elements are regular occurrences in cold fusion experiments. In thousands of experiments, credible researchers have immersed rods of palladium, nickel, and titanium in water, charged them with electricity and observed not only the byproducts of nuclear reactions, but also have seen more energy coming out of the reactions than it takes to create them..

This was confirmed by scientists gathered at the Seventh International Conference on Cold Fusion (ICCF-7) that was held in Vancouver, BC April 19-24, 1998. At that conference, Dr. Les Case, a New Hampshire engineer, shared his path-breaking research on a cold fusion cell that appears to dependably produce excess energy. Subsequent tests of that process by scientists at Cold Fusion Technology, Inc. verify his claims.

.... Moreover, there is also evidence that indicates that low-energy nuclear processes can transmute radioactive elements into non-radioactive substances. Two companies - CETI and the Cincinnati Group - have sold demonstration transmutation devices to other scientists. ... Moreover, the transmutation of radioactive elements by both of these devices has been independently confirmed by other laboratories.

Although the evidence for the reality of low-energy nuclear processes is being denied by the DOE, it has not escaped the attention of scientists advising foreign governments. Prominent scientists from Japan, China, Russia, Italy, France, Germany and other countries are involved in cold fusion research. ....

Unless President Clinton reaches out to get scientific counsel from a wide variety of advisors, he will not be able to develop a rational energy policy for the future. If the DOE has failed to provide balanced judgement regarding cold fusion research, in what other ways vital to national security and well-being might it [DOE] be misleading the President?

> Science is the belief in the ignorance of experts.
> -- Richard Feynman [or the ego-norance]

ABSTRACTS FROM ICCF-7

April 1998 – Vancouver, BC, Canada

Program Manual and Abstracts

Part Three (cont'd from May 1998 *NEN*)

Proceedings will be available in July from:
ENECO, 391-B, Chipeta Way,
Salt Lake City, UT 84108.

K. Ochiai, K. Maruta, H. Miyamaru, T. Iida, A. Takahashi (Dept. Nucl. Engr., Osaka Univ., Japan), "**Measurement of High-Energetic Particles from Titanium Sheet Implanted with Deuteron Beam**," p 108, 2 refs.

Deuteron beam implantation experiments with metal sheet have been performed to find out energetic charged particles which mean the evidence of new fusion reactions with large Q-value for the explanation of the Fleischmann-Pons effect or the large excess heat production in the D_2O electrolysis experiments. Especially, we have tried to measure the signals in high energy region which KASAGI et al. have reported.

Titanium thin foil (50 μm) and sheet (1 mm) were used as samples. Deuteron beam intensity was about 150 keV, 5-50 μA. Also, a Peltier-effect device was set on the backside of the sample in order to lower its temperature and to suppress the diffusion of deuterium implanted in the sample. The energetic charged particles emitted from the sample were measured by a Si-SSD with the depletion layer of 2 mm thickness. The types of the particles were successfully identified from the measurement of the energy loss in a screen foil set in front of the detector. We checked the signal wave forms for high energy events.

In the experiments with the thick sample, unusual counts were measured in the energy region higher than the nominal 3 MeV proton peak due to the well-known D-D reaction. They seemed to be the same data as those of the KASAGI's experiments. Moreover, the unusual Count rate increased with increment of D-D protons. More detailed and long term measurements with some modified samples are now under way to identify the original reaction for the explanation of the high energy counts.

T. Ohmori (Catalysis Res. Cntr., Hokkaido Univ.), T. Mizuno (Fac. Engr., Hokkaido Univ.), "**Observation of the Product Elements of Nuclear Transmutation Reaction on/in Several Metal Electrodes by the Cathodic Electrolysis in Light Water Solutions**," p 109.

We have confirmed using several analytical methods that many kinds of new elements are produced on/in Pd, Pt, Au and W electrodes after the electrolysis in light water solutions. For example, for Au cathode, the products were Fe, Zn, Cr, Cu, Ca, Ti and Si and Mg as the products were detected only by the electrolysis at an extremely high current density. The mass spectrometry analysis was carried out for many kinds of elements over mass numbers of 1 to 208. The isotopic compositions of above elements were significantly different from these natural isotopic distributions. For example, the isotopic composition of natural iron is 5.8% Fe54, 91.72% Fe56, 2.2% Fe57 and 0.28% Fe58. On the other hand, in the case of iron produced on/in an Au electrode content was 5% Fe54, 62% Fe56 and 33% Fe57. It is known that the natural isotopic distribution varies only by less than 0.003% for iron. Essentially the same phenomenon was confirmed more than ten times under the. ... We concluded from above results that some transmutation reactions take place during the electrolysis and above elements with anomalous isotopic distribution is the products of the nuclear transmutation reaction. This suggests that some new interaction works among protons, electrons and electrode material atoms, which becomes the origin of the new phenomenologies observed in this study.

M. Okamoto, Y. Oya (Dept. Quantum Sci. & Energy Engr., Graduate School of Engr., Tohoku Univ., Japan), H. Ogawa, M. Aida (Res. Lab. Nucl. Reactors, Tokyo Inst. Technol.., Tokyo, Japan), "**Material Conditions to Replicate the Generation of Excess Energy and the Emission of Excess Neutrons**," p 110.

The reproducibility of the anomalous phenomena occurred in Pd-LiOD electrolysis has been very poor, resulting many severe criticisms. The key parameters for occurrence of the anomalous phenomena, especially the excess heat generation and the emission of the excess neutrons have been investigated thorough a series of electrolysis in Pd-LiOD(H) systems. The key parameters have been selected as follows.

1. Purity of Pd cathode
2. Shape and size of Pd cathode
3. Processes of pretreatment of Pd cathode
4. Electrolysis mode
5. Electrolyte
6. Purity of the medium
7. Initial Open-Circuit-Voltage

... The light water and the heavy water were purified by distillation with potassium per manganese as a strong oxidation reagent. The initial open-circuit-voltage was examined in the course of experiments and was found to be low for the replication of the anomalous phenomena. The lower and constant initial open-circuit-voltage can be realized by the present pretreatment of Pd electrode and the purification of the medium. Under these experimental conditions, the anomalous phenomena with appreciable correlation between the excess heat generation and the excess neutron emission could be replicated successfully. The details will be presented and discussed in the presentation.

R.A. Oriani (Dept. Chem. Engr. & Matls. Sci., Univ. Minnesota, Minneapolis), "**Anomalous Heavy Atomic Masses Produced by Electrolysis**," p 111.

A recent theory by J.C. Fisher of low-energy nuclear reactions proposes that neutrons bound into clusters (polyneutrons) are the causative agent in the generation of excess thermal power and in the appearance of nuclides that were not present initially in the specimen. A prediction

of this theory is that stable neutron-rich atoms should be generated. The present work seeks to test this prediction specifically for neutron-rich carbon and nitrogen. The technique applied limits the detection by high-resolution mass spectrometry of oxides, formed from species on an electrolysis cathode, which are stable at 1020-1050° C and which are volatile at room temperature. Very heavy masses were found from four used cathodes which were not seen from the corresponding blanks. ... Fisher's theory predicts carbon atomic weights between 187 and 208 AMU. We conclude that the polyneutron theory must be taken seriously and that experimental techniques must be devised to provide positive evidence for the generation of neutron-rich nuclides.

Ken-ichiro Ota, Taichi Kobayashi, Naobumi Motohira, Nobuyuki Kamiya (Chem. Energy Lab., Fac. Engr., Yokohama Natl. Univ.), "**Heat Measurement During the Heavy Water Electrolysis Using Pd Cathode**," p 112, 1 ref.

... The material characteristics of Pd cathode might be a key factor to get the excess heat. In our group the heat balance during the heavy electrolysis using different types of Pd cathodes. First we developed two types of the flow calorimeter system combined with the thermochemically closed cell and the constant power electrolysis. One is the high heat recovery system using ceramic insulator where the heat recovery is up to 99%. ...

Using these systems the heat balances during the electrolysis have been measured in 1 M LiOD heavy water solution for mechanically treated Pd, impurity(Ag and B) controlled Pd and surface modified Pd. Although we observed the excess heat several times, most of the excess is so small and at the boarder of the error limit of the system (1 - 6% of input power). The large excess heat production that is more than 50 % of. input power like the result of Fleischmann and Pons has not been obtained either in steady state nor in burst form.

Y. Oya, M. Okamoto (Dept. Quantum Sci. & Energy Engr., Graduate School of Engr., Tohoku Univ., Japan), H. Ogawa, T. Saburi, M. Aida (Res. Lab. for Nucl. Reactors, Tokyo Inst. Technol., Tokyo, Japan), O. Odawara (Interdisciplinary Graduate School of Sci. & Engr., Tokyo Institute of Technol., Yokohama, Japan), "**A Role of Alkaline Ions for Dynamic Movement of Hydrogen Isotopes in PD**," p 113.

The existence of the lithium is one of the important key factor to initiate the deuterium based nuclear reactions in solid states, especially in palladium metal. The role of lithium has to be elucidated to reproduce and to intensify the anomalous phenomena. To reveal the necessity of lithium in the electrolysis with Pd cathode, the electrolysis using LiOD(H), NaOD(H) and KOD(H) has been performed with the pulse mode electrolysis technique. The pulse mode electrolysis technique has been used to initiate the dynamic movement of the hydrogen isotopes as reported in the last conference. ...

Clear differences in desorption rates and depth profiles between LiOD(H) electrolysis and NaOD(H) or KOD(H) electrolysis have been identified. In the presentation, the details of the experiments will be presented and the role of the lithium ion will be discussed.

Thomas O. Passell (Electric Power Res. Inst., Palo Alto, CA), "**Search for Nuclear Reaction Products in Heat Producing Palladium**," p 114.

EPRI has sponsored several research projects to check the claims of cold fusion made in the 1989 announcement of Pons and Fleischmann. The evidence obtained indicates that the claimed amounts of excess heat in highly deuterated palladium are indeed present under conditions difficult to achieve but successful in some 30 to 50% of the serious attempts. **While the excess heat appears confirmed, the source of the heat is unclear.** By inference it must be from some reaction with at least ten times chemical reaction heat outputs per atom present, well above 200 electron volts per atom. The only known reactions in this category are ones involving the nucleus. ...

G.S. Qiao, X.L. Han, L.C. Kong, S.X. Zheng, H.F. Huang Y.J. Yan, Q.L. Wu, S.L. Lei, X.Z. Li (Dept. Phys., Tsinghua Univ., Beijing, China), "**Nuclear Products in a Gas-Loading D/PD and H/PD System**," p 115.

Helium-4 was observed in a gas-loading D/Pd system using high resolution mass spectroscopy, and nuclear transmutation evidence was found in a gas-loading H/Pd system using electron probe microanalysis after the excess heat measurement.

High resolution mass spectroscopy is able to reach the resolution of $(M / \Delta M) \approx 770$, which is high enough to distinguish the Helium-4 peak from the D_2 peak in the mass spectrum ($(M / \Delta M) \approx 156$ is necessary to distinguish He-4 from D_2). The ratio of He-4 to Ne-20 is measured to avoid any contamination from the air. The ratio of He/Ne in the D/Pd gas-loading system is 0.55 ± 0.02 after one year gas-loading process. The ratio of He/Ne in the air is 0.32 ±

0.02. The ratio of He/Ne in the original deuterium gas is 0.32 ± 0.02 also although the helium-4 components there is very low in the absolute value. This is an evidence showing that there is a helium-4 source inside the deuterium gas-loading D/Pd system after one year loading and de-loading processes. ...

In order to avoid the possible contamination from the environment, a careful search along the total length of palladium wire (250 cm) was conducted to identify any new elements which do not exist in the environment. A lot of elements were identified such as Cu, Ni, Fe, Ca, Sn, K, CI, Pb, S, P, Si, A1, and Tb etc. The most interesting element is the rare-earth element Tb (Terbium), which does not exist in the environment at all. Tb was found by EDX spectrum first; then, searched along the Pd wire surface by WDX image method.

As a conclusion, we might have reproduced the nuclear transmutation experiment in our gas loading system. This provides a better technique to identify any possible nuclear products in addition to Helium-4.

Zhang Qingfu, Chen Licai, Sun Yue, Liu Fusheng (Inst. Atomic & Molecular Sci. High Temperature & High Pressure, Sichuan Union Univ. P.R. China), "**The Crystal Structure Transition of Ti-cathode Owing to the Electrolysis in Water**," p 116.

Prof. Gou Qingquan has shown that the cold fusion may occur easily when the crystal of Ti-cathode absorbs sufficient amount of D atoms and then changes its structure from hexagonal to face-centered cube of TiD_2 owing to the electrolysis in D_2O.

... This means that in order to get the ionic crystal TiD_2 from Ti-cathode in D_2O, the electrolysis experiment must also endure long time at about 20 days. According to this rule, we use Ti-cathode and Pt-anode to electrolyze D_2O. After 20 days, the ionic crystal of TiD_z in Ti-cathode and "excess heat" are measured. The prediction of prof. Gou is verified.

Gou Qingquan (Inst. Atomic & Molecular Sci. at High Temperature & High Pressure, Sichuan Union Univ., P.R. China), "**Cold Fusion Mechanism and Cold Fusion Materials**," p 117.

A theory based on crystal physics has been developed to explain the cold fusion phenomena. It is proposed that when deuterium are absorbed into the lattice of palladium metal, attractive action of the six surrounding palladium atoms upon the absorbed deuterium causes its electron cloud to be expanded into a huge sphere, giving rise to a weaker interaction between the deuterium nucleus and its electrons and consequently a higher degree of freedom for its motion inside the lattice. Screening of the deuterium nuclei by the "huge" electron sphere reduces the Coulomb repulsion between two neighboring deuterium nuclei dramatically and causes them to approach each other, collide and fuse. The same theory is also shown to be applicable to titanium cathode.

V.A. Romodanov, V.I. Savin, Ya.B. Skuratnik, V.S. Barashenkov, B.F. Kostenko, M.Z. Yuriev (State SRI SPA "LUTCH", Moscow Reg.), "**High-Temperature Nuclear Reactions in Condensed Media**," p 118, 3 refs.

Early by us is shown, that one of the most significant, on quantity, products of nuclear reactions in condensed media (NRCM), arising at low energy interaction of charge particles for hydrogen isotopes in irradiation conditions by accelerated ions at high temperatures target, is tritium. Tritium plays the role of indicator, describing availability of NRCM. ...

The present work is devoted to discussion of theoretical models, enabling to explain above the mentioned features, give the direction of further researches and to predict the probable results of perspective searches.

We have developed the projects of power-generating devices, productions of new materials, salvaging of radioactive wastes.

V.A. Romodanov, V.I. Savin,.Ya.B. Skuratnik, V.N. Majorov (State SRI SPA "LUTCH", Podolsk, Moscow Reg.), "**Tritium Generation in Metal by Thermal Activation**," p 119, 3 refs.

We have shown, that at high temperatures of target, in bombardment conditions by accelerated ions of hydrogen isotopes from plasma of powerful glow discharge, the nuclear reactions in condensed media (NRCM) with tritium generation can arise. ...

The present work is devoted to study of influence for experimental method on ratio of the tritium generation rate stipulated by nuclear reactions and unnuclear reasons at thermal activation. ...

V.A. Romodanov, V.I. Savin,,Ya.B. Skuratnik, M.Z. Yuriev, (State SRI SPA "LUTCH", Moscow Reg. Russia), "**Nuclear Reactions in Condensed Media and X-Ray**,' p 120, 3 refs.

By us is shown, that at excitation of nuclear reactions in condensed media low energy of interaction for charge particles (NRCM), one of main products is tritium. The measured ratio of various products for reactions of excitation by ions bombardment from plasma of powerful glow discharge has made for neutrons/tritium, about 10^{-9} -10^{-7}; for charge particles/tritium, about 10^{-7}-10^{-6}; for gamma ray/tritium, about 10^{-6} -10^{-4}. ....

The present work is devoted to study of generation x-ray at occurrence of NRCM. The first results on darkening of x-ray films are received and it is current the preparation to registration of the radiation by various gauges. The results on conformity for generation of electromagnetic radiation and tritium are discussed.

Dana Rotegard (Advanced Energy Technology Corp., St. Paul, MN), "**The Case for "New Energy" Technology: Low Energy Nuclear and Over Unity Devices Compared to Conventional Energy Technology**," p 121.

"New energy" science has advanced and diversified since 3/23/89. Large constituencies exist for rival alternate energy technologies including "hot" fusion, wind, photovoltaic, biomass, geothermal, ethanol and others. Conventional energy technologies such as coal, petroleum, natural gas, and conventional fission dominate the current market. These technologies are compared in a variety of parameters including their (present and potential) external costs: risks: scalability; passive/active nature; entrepreneurial appeal; constituencies; time line evaluation of these rival technological visions demonstrate the economic and environmental importance of the new energy technologies and provide some insight as to why constituencies with rival visions have attacked cold fusion and over-unity devices as a political threat.

A.S. Roussetski (P.N. Lebedev Physical Inst., Russian Acad. Sci., Moscow, Russia), "**Observation of (DD)-Fusion Reaction Products in Electrolytically Deuterized PDO/PD-Structures**," p 122.

Emission of protons and neutrons was observed in PdO/Pd deuterized structures. The samples was prepared by vacuum annealing of Pd foils with thickness of 30 and 40 microns. Then the samples were annealed in oxygen. The thickness of the PdO layer was 200 Å.

The samples were used as cathodes in electrolysis of 1M NaOD solution in DO. Then, they were placed near the detectors to observe nuclear emissions (neutrons and charged particles), as a result of fusion reactions: $d + d \rightarrow n + He^3$ (1) or $d + d \rightarrow p + T$ (2). ...

It was observed that the neutron and the proton emissions may be uniform during the long time with an intensity 1 1/s into 4 Pi Sr. "The burst" regime was also possible with emission of 10^3 particles during the time less than 100 s. The ratio of proton and neutron fluxes was estimated as $Np / Nn \cong 1$. ...

The results of experiments with various detectors are in good agreement with each other. This allows us to make a conclusion that (dd)-fusion reactions are really take place in deuterized PdO/Pd structures.

S.V. Vakarin, A.L. Samgin (Inst. High-Temp. Electrochemistry., Acad. Sci., Ekaterinburg, Russia), "**An Explanation for Positive and Negative Results Concerning Anomalous Effects in Superionic Crystals**," p 123.

Considerable recent attention has been focussed on the experiments with oxide bronzes and other superionic materials. We elaborated a criterion which permits us to predict neutron generation from oxide bronzes. At first it was associated with the existence of the perfect structure channels, in which a fast ionic transport occurs. ...

Then a necessary condition for a positive result is in sufficient number of perfect channels. ... We emphasize that the channel structure of bronzes acts as "working" deuteron accumulator. Man-made capillary systems may play a similar role. Our model is adaptable also to anomalous effects in ceramics.... Deuterium may also interact with other metals positioned in the neighborhood of breaking of bonds inside the channel.

A. Samgin (Inst. High-Temp. Electrochemistry, Ural Branch of Russian Acad. Sci., Ekaterinburg, Russia), "**Quantum-Biological Approach to the Study of Anomalous Effects in Deuterium-Solid System**," p 124, 3 refs.

As has already been noted by Fleischmann in the context of the cold fusion problem, a progress in the ideas of condensed matter physics may lead us to a totally different understanding of biological processes, and that's going to be more significant than cold fusion. ...

In the present paper some puzzling parallels between anomalous phenomena in the solid-hydrogen isotopes systems and quantum biological processes associated with the energy transfer are considered. ... The availability of nonequilibrium conditions is of fundamental importance in cold fusion. However, the requirement on nonequilibrium conditions also is an common feature of biology, and only given the processes of feedback, a number of important physicochemical processes in the cell can be realized , that must be crucial in cold fusion.

C. Sanchez, F. Cuevas and J.F. Fernandez (Dpto. Fisica de Materiales, Univ. Autonoma de Madrid, Spain.), "**On Neutron Emissions from the Titanium-Deuterium System**," p 125, 2 refs.

The possible occurrence of nuclear reactions in solids (NRS) has been tested in two well-characterized experimental conditions by using the Titanium-Deuterium system. In one of them, samples of titanium deuteride (TiDx $x \approx 2.0$) have been thermally cycled, paying special attention to this process as a possible triggering mechanism of NRS. Thermal cycles have been run from -60° C to 60° C in order to force the sample to suffer the $\delta - \epsilon$ phase transition. In a second set of experiments a well-characterized iodide-titanium film has been used after being highly loaded with deuterium. This film proves to have a higher purity than common samples used in NRS experiments. ....

Neutrons are monitored while doing all these experiments and no clear evidence of the nuclear fusion. reaction $D + D \rightarrow {}^3He + n$ is detected. It is confirmed that NRS, whatever they are, are producing a very low level of neutron emissions.

Lev Sapogin (Dept. Phys.,Technical Univ. (MADI), Moscow, Russia), "**The Theory of Excess Energy in Abnormal Glow Discharges (Correa's Reactor)**," p 126, 3 refs.

Before in investigations Paulo and Alexandra Correa had obtained generated electrical current which did not connect with nuclear reactions. Maybe these processes can explain with help of energy generation in Unitary Quantum Theory. In report is offered theory of processes taking place in Correa's reactor. These processes confirm Unitary Quantum Theory. In future solve all power problem must be tied with these processes.

I.B. Savvatimova, V.Ul. Korolev (SIA LUTCH, Podolsk, Moscow region, Russia), "**The Heat Effect Comparative Analysis in Ion Irradiated Various Cathode Materials Glow Discharge**," p 127.

The heat effect comparative analysis of low energy deuterium and protium ion irradiated various cathodic materials by glow discharge is offered. The installation allows to conduct the heat measurements under the next conditions from 10 to 800 degrees cathode temperature, from 50 to 1100 voltages, from 5 to 400 mA current.

The distributions of thermal flows and heat balance in four kinds of the cathode units, methodical errors of measurements and ways of positive effect accuracy registration increase are analyzed.

Results of comparison of heat efficiency for Pd and its alloys (PdPtW, PdRu, PdNi), as well as for a number of pure metals (V, Nb, *Zr,* Ag) are given [Figs. 1, 2].

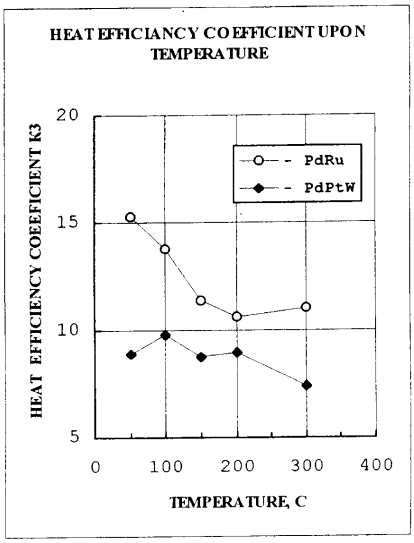

Fig 1.

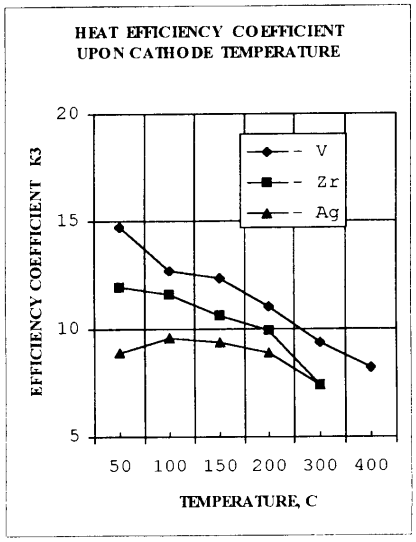

Fig 2

Materials arranged on registered heat efficiency according to experimental data. The summed up heat efficiency measurements in Pd alloys may be represented in the following way: PdPtW, PdRu; PdNi; PdCu.

I.B. Savatimova (SIA LUTCH, Podolsk, Moscow region, Russia), "**Transmutation Effects on Glow Discharge Cathode. Nuclear Phenomena or Ion Irradiation Results?**" p 128, 1 ref.

Cathode materials elemental and isotopic structure before and after experiments in low energy ions Glow Discharge were compared. The cathode materials were analyzed after experiment and after post-experimental annealing.

The isotope shift tendency of the Pd, Pd alloys (PdPtW, PdRu; PdNi; PdCu) and in other cathode materials (V, Ag) was observed for matrix and impurity elements.

It was shown that the change of impurity elemental and isotopic composition after irradiation of the cathode by glow discharge plasma ions depends up on the structure of the cathode material and the working environment, ion flux density and the location of the analyzed layer relative to the surface. SNMS, EDS and SMS were used.

The dependence of the isotope ratio of impurity and matrix elements and its concentration upon the type of irradiating ions (protium and deuterium) has been noted But the groups of a certain impurities were repeatedly observed after irradiation under similar conditions: light -masses 6, 7, 10, 11, 19, 20, 22; middle masses 0, 5 matrix; near matrix (Ag, Yn, Cd, and others) and heavy masses 120-140 (Sn, Te, Ba) by SNMS method. ...

Such elements increasing as Cd, Sn was observed for any Pd based materials usually after Glow Discharge experiments with their different concentration. We found 138, 132 and 167-175 isotope series (Er, Tm, Yb...). These masses with equal amplitude peaks were noticed in two analyzing layers - the. first layer near the surface and the second layer, that was got after 1 micron sputtering. It means that it is not ion bombardment or diffusion process consequence.

We discovered only Cd isotopes group formed (a few backgrounds) in Ag cathode. These masses were repeated in the second scanning layer too.

The quantity of additional impurity elements after ion irradiation decreased in the following order: Pd, alloys PdPTW, PdNi. Additional impurity elements minimum quantity in pure metals was observed for Ag cathode.

The maximum increase of impurities correlated with the maximum excess heat during ion irradiation of palladium cathodes in the glow discharge.

D.S. Silver, J. Dash (Phys. Dept., Portland State Univ., OR), 129. "**Surface Studies of Palladium After Interaction with Hydrogen Isotopes**," p 129.

Several pairs of cold rolled palladium cathodes (40 pm thick) were electrolyzed in series for various times up to six minutes. One of each pair was in light water electrolyte and the other in heavy water electrolyte. After electrolysis these cathode-, were characterized by atomic force microscopy (AFM) and secondary ion mass spectrometry (SIMS).

The AFM studies of the heavy water electrolyzed cathodes revealed asperities, craters, and nodules, suggesting that

localized melting and recrystallization had occurred, as we reported previously on specimens electrolyzed for longer times. AFM studies 1.5 years later revealed loose, nanometer-sized particles, indicating that these cathodes continued to change during storage, long after electrolysis was performed, which we also reported previously on other cathodes. The morphology of palladium cathodes electrolyzed in light water electrolyte remained nearly identical to that of the unelectrolyzed control, even after 1.5 years.

SIMS profiles of six palladium isotopes for a cathode electrolyzed for six minutes in heavy water showed inversions of isotopic abundance compared with the control. These results are similar to those which we reported previously on another palladium cathode electrolyzed for a longer time.

Roman E. Sioda (Inst. Industrial Organic Chem., Warszawa-Zeran, Poland), "**Hot-Spot Mechanism of Hypothetic "Cold Fusion" Phenomena**," p 130, 5 refs.

After intensive research work for several years and on several Continents, the reality of "cold fusion" is still questioned. One of the possible explanations, if the phenomenon is real, is a hot-spot hypothesis. It follows from a letter to *Nature* in London by R. Seitz in '89, where the author suggested that palladium may contain very hot spots (centers) of active fusion reaction.

This hypothesis has been further developed by the present author, in cooperation with R. Kuehne. It follows that hot spots in metals may be physically possible, as can be shown by heat-transfer arguments.

G. Stoppini (Phys. Dept., Univ. Pisa, Italy), "**Nuclear Processes In Hydrogen Loaded Metals**," p 131.

G.H. Miley and G. A, Patterson and independently T. Mizuno, T. Ohmori and M. Enyo claim to observe nuclides produced in Ni (z -- 28) when used in electrolytic light water cell. They used thin layers of Ni (5 10-6 cm) and claim to observe the effect in a reproducible way.

The secondary nuclides are distributed in a wide range of Z and A and show nuclides with Z < 28 and accumulations at Z = 48 and 78 that recall Ni-Ni fusion.

If the nuclides at Z = 48 and 78 are Ni-Ni fusion they can be produced only when the original Ni nuclei gain enough kinetic energy to overcome the repulsive Coulomb barrier. We discuss this data in terms of current physics. In particular we assume that the gain of kinetic energy derives from an impulsive increase of absolute nuclear binding energies (b.e.) due to high rate orbital capture of electrons, from Ni nuclei. ...

The model discussed implies emission of secondaries like neutrons, gamma rays, X rays etc.

E.K. Storms (Santa Fe, NM), "**Use of Loading Efficiency, D/PD Limit, Deloading Rate and Excess Volume to Judge the Value of Palladium for use in Cold Fusion Studies**," p 132.

The challenge is to find a simple method to identify palladium which will eventually make excess energy without need for the time consuming process of calorimetric examination. Past methods have relied solely on achieving a critical average composition. A large number of palladium samples treated in a variety of ways and containing physical properties can be used in conjunction with the average composition for this purpose.

Loading efficiency is combined with the open-circuit-voltage to give an indication of whether barriers are present to deuterium uptake. The deloading rate and excess volume are used to indicate the presence of paths for deuterium loss. Achievement of the highest D/Pd limit occurs when a barrier is absent and when the number of exit paths is small. These quantities are highly variable even within a batch of palladium having the same treatment.

E.K. Storms (Santa Fe, NM), "**Relationship Between Open-Circuit-Voltage and Heat Production in a Pons-Fleischmann Cell**," p 133.

A concentration gradient forms within palladium when it has fully loaded with hydrogen using the electrolytic method. Because the largest concentration is formed on the surface, the necessary critical concentration of deuterium for "cold fusion" is expected to first occur within this region. Because the surface composition depends on many factors, its value is not consistently related to the average, bulk concentration of deuterium. Therefor, the average composition is no the best predictor for excess energy production. A better indicator is the open-circuit-voltage (OCV).

The OCV is proportional to the deuterium activity in the surface region. This value must be above 1.06 V (referenced to clean Pt) before excess energy will be seen regardless of the average composition. The behavior of the OCV indicates that deposition of elements other than deuterium is necessary for the energy-active-state to be produced.

R. Stringham (E-Quest Sciences, Mountain View CA), "**Cavitation in D_2O with Metal Targets Produces Predictable Excess Heat**," p 134.

Acoustically generated transient cavitation bubbles, TCBs, are created in D_2O and characteristically collapse violently on surfaces of target metal lattices in the M3C device. During the one micro second collapse process of a pseudo-adiabatic nature, the bubble contents are dissociated and ionized with a portion of the contents accelerated via the formation of a bubble jet which is directed through the target surface into a lattice. The bubble jet produces local super loading of deuterons within

the metal lattice a few micro seconds in duration before diffusion quickly dissipates these deuterons throughout the lattice. These TCBs are natural dense plasma micro accelerators in the range of 100 ev. ... Both the calibration and cavitation experiments are run at steady state temperatures for about 24 hours as the Q(x) cannot be determined until steady state conditions are reached (about 2 hours).

The experimental objective was to gather the results of 150 runs and deduce relationships that are not obvious with just a few experimental results. Parameters such as pressure, temperature and metal targets can. be changed for each run. ... The metal foil targets were titanium, silver, copper, nickel titanium alloy, stainless steel or empty reactor. ... The excess heat, Q(x), was often greater than 3 times the heating from the piezo input. ...

The target metal Cu is of special note as it produces the highest ratio of Q(x) to (A+B) of 6 to 1.

Hiroshi Sugiura (IMRA Europe, France), Eiichi Yamaguchi (on leave from NTT Basic Res. Lab.), **Calorimetric Analyses of the Excess Heat generated from Pd:D and Pd:H by the *'In-vacuo* Method**," p 135.

More than 100% of excess heat was observed with 100% reproducibility from Pd:D set in a vacuum system.

All the operations to the Pd sample (30 x 30 x 1 mm^3) were performed in *vacuo* throughout the experiment. First, we cleared gases out from the sample by heating up to 600° C for 2 hours in the vacuum chamber. Second, we introduced D_2 (or H_2) gas into the same chamber at room temperature. The loading ratio was found to be typically 70%. Third, we transferred the sample to the second vacuum chamber through a vacuum tube connection, and deposited Au (1500 A) on a surface of the Pd:D (Pd:H) plate. The sample was again transferred to the third vacuum chamber through another vacuum tube and was heated up to 70 - 80° C by applying the constant electric power through W needle. Several hours after keeping to apply the power, we observed the anomalous increase of the sample temperature. ... We will discuss the detailed method for estimating the excess heat in this 'in-vacuo' technique.

Mitchell R. Swartz (JET Energy Technol., Inc., Massachusetts), "**Comparative π-Notch [0ptimal Operating Point] Characteristics of Solid State Nuclear Systems**," p 136, 1 ref.

Several years of investigations of nickel light water systems using noise-analyzing thermal power spectroscopy has revealed a reproducible excess enthalpy achievable through driving these systems only at their optimal operating point or region [π-notch]. These optimal operating points (relative peak output along the input power drive axis) appear to be characteristic behavior of each active nickel electrode.

This analysis is now extended with data from others' reports of excess heat and nuclear ash production in palladium-heavy water systems. There appear to be similar optimal operating points for palladium-heavy water production rates of excess heat. tritium and helium-4.

It is important that attention of investigators in this field consider the fact that isotopic fuel loaded systems may exhibit such an optimal input power drive for maximal product production at intermediate input power levels. The impact of the existence of such optimal operating points is important because, in addition to the problems of achieving adequate loading of active electrode materials, off-peak system operation may contribute to the difficulty in observing the phenomena via failure to achieve significant reaction rates.

Mitchell Swartz (JET Energy Tech., Inc., Wellesley Hills, MA, & MA Inst. Tech., Cambridge, MA), Peter L.

Hagelstein (MA Inst. Techn., Cambridge, MA), Gayle Verner (JET Energy Tech. Inc., Wellesley Hills, MA), Kenneth Wright (MA Inst. Tech., Cambridge, MA), "**Vacancy-Phase Nickel Cathodes**," p 137, 2 refs.

Vacancies are present in metals at very low concentration unless some procedure has specifically been used to generate vacancies and means are made to halt thermally-driven recombination of such vacancies. ...

The generation of high levels of metal atom vacancies is reasonably theoretically well understood, but there are reasons to consider the impact between such vacancies and the desired highly loaded hydrided states. Essentially, hydrogen atoms in the vicinity stabilize the vacancy by a few tenths of an eV per neighboring hydrogen in NiH and PdH, versus the roughly 1.5 eV formation energy associated with vacancy creation in the pure metal. Consequently. thermodynamics predicts that host metal lattice vacancies should form spontaneously in highly loaded NiH and PdH, limited only by the vacancy diffusion rate from the surface or from internal sources of vacancies. The high temperature high pressure synthesis reported previously was observed to occur at a rate limited by this vacancy diffusion process.

Metals that have been irradiated with supervoltage (>1.5 MeV) electrons at high doses, and high dose rates, achieve a saturation density of defects that can be on the order of a few tenths of a percent. Therefore, investigations have continued regarding the impact of expected electron-irradiation induced metal lattice dislocations and vacancies. These are termed irradiation-synthesized cathodes. ... The impact of high voltage electron irradiation given metachronously prior to nickel light-water electrolysis experiments, four terminal conductivity, performance, and other preliminary measurements have been undertaken to begin to distinguish the impact of such irradiation.

Mitchell Swartz (JET Energy Tech., MA), Hal Fox (Fusion Information Center, Salt Lake City, UT), "**Metanalysis of the Cold Fusion Literature**," p 138.

Since the announcement of the discovery of cold fusion (CF) in March 1989, we have reported on *CF* as it has been replicated and demonstrated in laboratories in over thirty countries. This considerable effort by the scientific community has resulted in a massive and developing volume of cold fusion papers; many published in peer-reviewed journals, and others presented at technical conferences or published in technical publications. ...

The annual rate of published articles in CF continues unabated in this field (mean 227 papers/year; range 100-400). We have examined this steady increase in scientific papers output in this field, and have analyzed the efforts on a country, and state, basis. The main countries contributing to cold fusion scientific effort are Japan (110,343), United States (86,930), Russia (52,198), India (28,71), Italy (13,108), France (11,41) and China (10,81), where the numbers indicate the *CF* experimental paper output in 1995-1996 and the cumulative scientific CF paper output from 1989 through 1996 including theoretical and peripheral papers. Although the United States leads with more than 900 articles published, Japan with a third of this amount has a greater number of experimental articles published (110 vs. 86 in the 1995-1996 time period). .... Despite an unprecedented reluctance on the part of many peer-reviewed [journals to publish] publications in the field continues, although it is down from the 1989-1990 peak.

Akito Takahashi (Dept. Nucl. Engr., Osaka Univ., Japan), "**Results of Experimental Studies on Excess Heat vs. Nuclear Products Correlation and Conceivable Reaction Model**," p 139, 3 refs.

To study possible correlation of excess heat phenomenon and nuclear products in "cold fusion" experiments, we have done three kinds of experiments, i.e., open and closed electrolysis of D_2O/Pd cells and D-ion implantation into Ti and Pd metals. This paper summarizes results of 5 yrs (1993-1997) studies at our laboratory under the NHE Basic Research Project, and proposes a conceivable reaction model of three body deuteron fusion.

Results of open and closed cell electrolyzes experiments have concluded that, in relation to excess heat phenomenon, there are no neutrons, no characteristic X-rays (no major high energy charged particles) and, however, marginal level of possible He-4 generation. ...

Ryoji Takahashi (Univ. Tokyo, Japan), "**Excess Heat Caused by Electrolysis for Drilled Charcoal Cathode and Heat Without Power Input by Immersion of Charcoal in Heavy or Light Water at Elevated Temperatures**," p 140.

The anomalous increase in the excess heat by the electrolysis for the drilled charcoal cathode was reported in the last conference. This paper shows an extended work on the drilled charcoal and a newly derived excess heat, heat without power input,occurring above 90° C, where the vaporization is high.

In this one year the excess heat was measured for about 300 points drilled in various charcoal cathodes, different in the size the orientation and the location. The data distributed from -10% to +240%,but there found a rule that the data is decided by the heat generation in the first one minute. To say accurately, the rate of the heat generation takes a peak at the ten seconds after the start. So it was considered that the excess heat in the charcoal by the electrolysis is due to the same mechanism. Another important factor necessary to produce the high excess heat is the fluctuation of the current. The electrolysis current is supplied by dc source, so the fluctuation does not occur usually. However, if the current is concentrated to a point in the cathode and is high enough, it is interrupted by the bubble and the fluctuation takes place. ...

Ryoji Takahashi (Univ. Tokyo, Japan), "**Proposal of Microdrop-In-Bubble Model for Cold Fusion and Related Phenomena**," p 141, 1 table.

In a previous paper it was reported that the microdrop is responsible for the cold fusion (Proc. of ICCF-4, 4, 91). For the explanation of the two kinds of excess heat obtained for charcoal (ICCF-7), an improved model is proposed i.e. microdrop-in-bubble model is described in the paper.

The picture of the microdrop engine is shown in comparison with the heat engine in Table 1.

	Microdrop Engine	Heat Engine
Phase Transformation	to super water	to vapor
Entropy	negative	positive
Actuation of Engine	by negative pressure (electrical, mechanical, ionization)	by heat
Life and death	life	death

The excess heat caused by electrolysis is due to the electric actuation of the microdrop, and the heat without power input is due to the mechanical actuation.

F. Tanzella, M. McKubre, S. Crouch-Baker (SRI Intl., Menlo Park, CA), P. Hagelstein (MA Inst. Tech., Cambridge, MA), "**Methods for Observing Anomalous Energy Transfer in Solids**," p 142.

Several researchers have reported evidence of anomalous energy transfer in solids. Credible reports have been made of ambient temperature charge ejection, atomic hydrogen emission, tritium production, induced radioactivity, fast ion emission, ^{4}He production, and excess heat associated with ^{3}He production. We have assembled the instrumentation required to conduct experiments similar to some of these reported and to observe the effects of the associated anomalous energy transfer. Candidate mechanisms for the associated reactions will be discussed in association with the theory presented by Hagelstein. ...

Experiments also have been performed to study the effects of interstitial diffusion barriers, hydrogen isotope loading of vacancy-laden Pd, and on-line gamma spectroscopy of PdH_xD_y. We have produced and measured hydrogen isotope loading of Pd cathodes with interstitial diffusion barriers in an attempt to measure lattice-induced alpha or beta emission. Alpha, beta, and/or gamma spectroscopy may be performed on electrochemically loaded Pd cathodes which have electron irradiation induced vacancies to test the hypothesis that vacancies are central to anomalous energy production. We have also performed gamma-ray spectroscopy on PdH_xD_y cathodes during *in-situ* electrolysis experiments and on the post-experiment cathodes. The results of these experiments will be reported as well as descriptions of the emission apparatus and spectrometers used in these studies.

S. Tsvetkov, E. Filatov, V. Khokhlov, "**Thermal Effects at the Titanium Anode in Molten (LiCl-KCl) + LiD Mixtures During Electrolysis**, " p 143.

The electrolysis of lithium deuteride dissolved in molten alkali halide mixtures under both inert and deuterium atmospheres has been carried out. The obtained results show the heat release at the titanium anode during the run. The thermal effects observed were found to be greater than those calculated for supposed electrochemical reactions with the known thermodynamic data.

S.A. Tsvetkov (Sverdlovsk Branch Res. & Dev. Inst. Engr., Russia), "**Experimental Data for Initiation of Cold Fusion by Oxygen**," p 144.

An other approach to the cold fusion phenomenon based on deuterium interaction with oxygen in solid is considered. Experiments carried out by other authors are analyzed from the indicated point of view. Results of evaluational experiments on enhanced frequency and magnitude of defected neutron pulses via deuterium interaction with oxygen in titanium are presented.

S.A. Tsvetkov (Sverdklovsk Branch Res. & Dev. Inst. Power Engr., Russia), A.G. Lipson (Inst. Physical Chem. RAS, Moscow, Russia), "**Necessary Conditions of Cold Fusion**," p 145.

On the basis of nine-year experience of work attempt to formulate conditions is made, which need to be observed for realization of experiments on cold fusion for reception of positive results.

As positive results registration redundant are considered is excess power, neutrons, gamma-radiation, operating time tritium, helium and other elements during experiments.

Experiments carried out by authors and other scientists are analyzed. On the basis of this analysis necessary conditions of cold fusion are formulated. They are
1. Phase transition solid by deuterium interaction and very more area solid are needed,
2. Optimum phase transition. time in deuterium-solid system is needed,
3. Background neutrons in solid is needed,
4. Oxygen in deuterium-solid systems is needed,

S. Ueda, K. Yasuda, A. Takahashi (Dept. Nucl. Engr., Osaka Univ., Japan), "**Study of Excess Heat and**

Nuclear Products with Closed Electrolysis System and Quadrupole Mass Spectrometer," p 146.

... In this work, the mechanisms of cold fusion are investigated by using a closed D_2O electrolysis system. This electrolysis cell used LiOD as electrolyte, Pt anode and Pd cathode. This system can measure generation of excess heat, loading ratios (D/Pd), neutron and ^{4}He. ...

In this present work, excess heat over 3 σ level was regarded as real excess heat considering statistical and systematic errors of the system. Excess heat was observed for some of materials and correspondingly ^{4}He was detected. Any meaningful increases of neutron and tritium were not observed. ...

B. Dragć, Z. Marić, J.P. Vigier (Univ. Pari VI, France), "**Interpretation of "Cold Fusion" in Terms of New Bohr Orbits Resulting from Spin-Spin and Spin-Orbit Couplings in External Magnetic Fields. Theoretical and Experimental Evidence**,' p 147.

The excess energy, soft X-rays and new nuclear ashes observed in H_2^+ and D_2^+ electrolytic and plasma discharge experiments can be analyzed and explained in terms of new "tight" Bohr levels resulting from spin-spin and spin-orbit couplings connection protons, electrons and neutrons in the presence of external magnetic-fields (when they enter certain metals Pd, Ti, Ni, etc.) In the so called "Cold Fusion" experiments, with the related "Quantum jumps," for example, in the proton-electron-proton alignment, one sees that within an external magnetic field, the Bohr-Sommerfeld quantization yields ~40 kev transitions which explain the excess energies observed so far. With D_2^+, one also obtains tunneling between deuterium nuclei, which explain observed "nuclear ashes." This model thus implies new "chemical and nuclear effects within the frame of the usual Quantum Mechanical Formalism.

Recent experiments supporting this model and a theoretical model of H_2^+ and D_2^+ will be presented and possible extensions briefly discussed.

V. Violante (Erg/Fus CRE ENEA Fraseati, Italy), "**Extended Analysis of the Lattice Ion Trap as Possible Collision Mechanism Between Nucleus in Condensed Matter**," p 148.

In a previous work the authors proposed a possible mechanism to explain a strong reduction of the mean distance between deuterons in the palladium lattice. It has been shown that positive ions (i.e. deuterons) confined by means of a quadrupolar electrodynamic containment around palladium lattice tetrahedral sites (lattice ion trap) can dramatically decrease their mean distance. In the proposed picture the coherent oscillations of the Fermi level electrons of the palladium atoms seem to have a dominant role in the deuterons dynamics.

In the previous work the analysis has been carried out in the particles relative coordinate system. In this work the dynamics of the particles is studied in the trap coordinate system, rather than in the particles relative ones, since in this way it is possible to follow the position of a moving particle (deuteron or proton) inside the metal lattice cell. ...

The calculations confirm the collision mechanism and show the interaction effect between the moving particles and the metal lattice atoms.

James T. Waber (Res. Prof. Phys. (Retired), Michigan Technological Univ., Emeritus Professor of Matl. Sci., Northwestern Univ.), "**The Synthesis of Nuclear Theory of dd Fusion with Solid State Theory of Bipolarons**," p 149.

The study of the R-Matrix method of treating fusion cross sections as studied by Hale et. al. revealed that low energy d-d fusion could lead to the formation of an excited state of the alpha particle, namely the O^+ state. The shadow poles indicate the significance of the body potential in the extranuclear region. The transition to the ground state would not occur by photon emission since the state involved an EO monopole nor by the emission of various fermions, but by excitation of energetic phonons. That is the nuclear energy, as suggested by Schwinger. would be dissipated throughout the lattice as in the Mossbauer effect.

The quantum mechanical requirement for the fusion involves the body potential in which the repulsive d-d potential is neutralized by the surrounding electrons. The solid state model involves the occupation of a single lattice site by two spin-paired deuterons as envisioned in the current bipolaron theory of superconductivity. This is not forbidden by the exclusion principle but is energetically favored as Ranninger has shown. He and Robin have developed a self consistent theory of quasi-free fermions and boson occupation. ...

J.L. Waisman, R.H. Summerl (Irvine, CA), "**Practical Application of X-Heat**," p 150.

Since its discovery in 1989, Pd/D X-Heat has been shown to be "real" by dozens of Lab's worldwide. Heating events produce much more heat than any previously known reactions, with negligible side reactions. Most of the experiments have used electrolysis at ambient pressure and temperature, to "load"a palladium cathode with deuterium. Generally, several watts / cm.^{3} of cathode have been produced. ...

However, the authors believe (also with good reason) that electrolytic loading at ambient conditions is limited in power-density and reproducibility, and will not lead to applications cost-competitive with fossil fuels. But the same pattern of thinking, the same technologies, and the same experimental data, point

to a path which will generate reproducible high power-densities, in a range of temperatures and pressures which will lead to practical applications. X-Heat will replace fossil fuel at the same use temperatures, without significant pollution and at competitive costs. ...
This presentation includes an overview of:
- The new pattern of thinking.
- The useful known technologies.
- The experimental evidence.
- The design method and examples.
- Proposed confirming experiments.

Tieshan Wang (Inst. Modem Phys., Chinese Acad. Sci., Lanzhou, China), Kentaro Ochiai, Toshiyuki lida, Akito Takahashi (Dept. Nucl. Engr., Osaka Univ., Japan), "**Nuclear and Atomic Cluster Effect of Deuterium Molecular Ions (D^3) Implanted into Palladium**," p 151, 6 figs, 5 refs.

The deuterium molecular ion, which is consisted of three deuterons and forms a small cluster, was used with relatively large beam current (up to 500 micro amp) to bombard a palladium metal target, in order to study the cluster effect in the atomic and nuclear interaction in solid.

The molecular ion beam (cluster deuterons) and mono-atomic ion (single deuteron), whose energies were adjusted as from 10 keV to 100 keV per deuteron. were alternately implanted into palladium target. The differences between the application of two kinds of beam were obtained by comparing the radiation yields of X-rays, gamma-rays, charged-particles and neutrons which were induced by two kinds of beam with the same adjusted energy per deuteron. Experimental results are [presented]. ...

Tieshan Wang (Inst. Modem Phys., Chinese Acad. Sci., Lanzhou, China), Kentaro Ochiai, Toshiyuki Iida, Akito Takahashi (Dept. Nucl. Engr., Osaka Univ., Japan), "**Study of Possible Indirect Fusion Reaction in Solids**,' p 152, 6 refs, 8 figs.

A very broad unknown peak, which appeared between triton peak (1 MeV) and proton peak (3 MeV) of D-D reactions, was frequently observed in our deuteron beam implantation experiments with large current into palladium. The peak could be seen in almost every run of experiment. Because the counts in this peak kept almost constant ratio (about 0.15), compared with those of normal proton peak of D-D fusions which took place within the implanted deuteron range near the surface 'of palladium target, the peak was considered as proton peak of the D-D fusion occurred deeply (beyond the deuteron range) inside the palladium target plate. Compared with the direct D-D fusion of well known beam-target reaction, the fusion deeply inside the target was named as the indirect fusion reaction in solid which should be induced by some other trigger conditions than the direct beam-target effect of deuteron implantation.

... Both of molecular ion (D3+) beam and mono-atomic ion (D+) were applied to the experiments. The results have shown that the deuteron atomic ion beam could induce higher rates of the indirect fusion reaction, compared with the deuteron of molecular ion beam.

By analyzing above experimental results, it was found that the indirect fusion had some kind of dependence on target material type, temperature, deuterium loading ratio, etc....

Tieshan Wang, Zhiguo Wang (Inst. Modem Phys., Chinese Acad. Sci., Lanzhou, China), Kentaro Ochiai, Toshiyuki Iida, Akito Takahashi (Dept. Modem Phys., Osaka Univ., Japan), Yubo Piao (Inst. Nucl. Phys., Lanzhou Univ., China), "**Anomalous Radiation Induced by 1-100 KeV Deuteron Ion Beam Implantation on Palladium**," p 153, 6 refs, 8 figs.

1-100 keV deuteron beam was implanted into palladium target, in order to study the interaction of deuteron ion beam and solid. X-ray, γ-ray, charged particle and neutron was measured. A series of anomalous experimental phenomena was observed.

The experimental phenomena are so mysterious and can not be interpreted by any existing physics theory. The further investigation is needed and ongoing.

Norio Yabuuchi (High Scientific Res. Lab., Japan), "**Low-Temperature Nuclear Fusion Outside of Solids**," p 154.

The author has considered the possibility of low-temperature nuclear fusion outside of solids, and has developed the following theories.

The first is a theory regarding the occurrence of fusion and fission in unstable nuclei.

The second is a theory for elucidating the structure of the nucleus.

The third is a theory of the similarity of the bonding of nuclear fusion and atomic bonding.

The fourth is a theory of bonding due to the energy levels and orbits of nucleons.

Eiichi Yamaguchi (on leave from NTT Basic Res. Labs., Japan), Hiroshi Sugiura (IMRA Europe, France), "**Progress Report on the Study of Excess Heat and Nuclear Products by the 'In-vacuo' Method Run at IMRA Europe**," pp 155, 2 refs.

A pre-annealed Pd plate (1000° C, 24 hours) was immersed in D_2 (H_2) gas at room temperature. A thin Au film was deposited on one side of the Pd:D (Pd:H), and the sample was transferred to the analysis chamber without braking the vacuum. A constant electric power was then applied through a W needle to the sample. After applying the electric power, temperatures at various points were measured in order to evaluate the excess heat generation from the samples. ... During this measurement, the observation for the generation of He-4, charged particles, neutron-γ spectra, neutron counts and X-ray spectrum were continuously performed by the mass-spectrometer, Si SSD's, BC-501A liquid scintillator, He-3 neutron counters and CdZnTe SSD, respectively.

We have observed the excess heat generation with 100% reproducibility not only from Pd:D but from Pd:H. ... The total amount of excess heat was approximately 2.5 kJ for any case, indicating that the energy generated was approximately 1 eV.per D (H) atom. The excess heat generation has also been found to be strongly correlated to the sample distortion. Nevertheless, none of the nuclear products seemed to be detected clearly. This result suggests that the highly reproducible excess heat observed in the present experiment is related to the lattice distortion. We will discuss this origin under the condensed matter physics.

Zhongliang Zhang, Minghong Zhong, Fuming Liu, Jun Liu (Inst. Chem., Academia Sinica, Beijing, China), Xingzhong Li (Dept. Phys., Tsinghua Univ., Beijing, China), "**A Right Calorimetric System Needed in the Studying Electrolysis System in the "Cold Fusion" Field**," p 156, 5 refs.

As the title of this work said: a right calorimetric system needed in the studying electrolysis of "cold fusion". At first, it should notice how much heat will be generated during an

electrolysis process. Then according to the heat a right calorimetric system can be selected. A type calorimetric system for measuring heat flow in power, such as the mass flow calorimeter or thermal conduct calorimeter, must be suitable to determine heat generated during a electrochemical process, such as electrolysis of water in studying "cold fusion" and, further, the good precision of the apparatus used in one's work must be provided.

Zhongliang Zhang, Minghong Zheng, Yuming Liu,Jun Liu (Inst. Chem., Acad. Sinica, Beijing, China),

"**Examination of the "Excess Heat" Generated**

During Electrolysis of D_2O and H_2O on a New Type Calorimetric System," p 157, 4 refs.

After the results of "excess heat" generated during electrolysis of D_2O had been obtained by us, it seemed to be worthwhile for us to make another such investigation on a new type calorimetric system, which is a microcalorimetry system 2107, LKB-producer in Sweden. It should be necessary to know the change of elements of the cathode used before and after electrolysis. A microcomputer was used to acquire and digitize the calorimetric and electrolytic signals.

Details are presented.

COLD FUSION TIMES
Contents vol 6, no 2, Spring 1998.

K. Kuroiwa, Y. Ohtsu, G. Tochitani, H. Fujita, "Experimental Investigation on Loading Ratio D/Pd Using High Pressure and Deuterium Glow Discharge Methods," *Rept. Fac. Sci. Eng., Saga Univ.*, vol 26, 1997, pp 33 (Japanese, Engl. abstract), *CFT*, pp 8, abstract.

A 12.5*12.5*0.2 mm plate of 99.9% pure Pd was mounted in a chamber and deuterated with D_2 gas at up to 6 atm pressure. This achieved D/Pd ratios of about 0.75 after 50 hours or so. The Pd sample was then weighed at intervals while being kept in air, and did not lose much deuterium. For the glow discharge, it seems to have been done at 20 Torr and 10 mA through a 50 kohm resistor, i.e. about 500 V total applied. The results of this are not clear to this abstracter, who has to find stuff in between the Japanese text and in figures. The abstract says that after glow discharge charging, the ratio was kept at 0.70 by cooling the Pd sample.

R. Lu, "The (d,d) Fusion in Solar Flares," *J. Qingdao Univ*. (1997), vol 6, pp 70 (Chinese, Enlg. abstr); *CFT*, pp 8, abstract.

The author refers to F&P-89 and this paper is meant to relate to cold fusion: temperatures in solar flares are essentially "cold" compared to those assumed to be required for plasma dd fusion, so if it took place there, fusion would be cold. Lu believes that there is evidence for dd fusion by (it seems) ^{3}He detected in some flares.

D.S Shelton, L.D. Hansen, J.M. Thorne, S.E. Jones, "An Assessment of 'Excess Heat' in 'Cold Fusion' Calorimetry," *Thermochim. Acta* 297 (1997)7; *CFT*, pp 8, abstract.

The Jones and coworkers team takes a close look at how cnf calorimetry has been done. They point out several weaknesses in prior designs, and design a calorimeter of their own. Theory is outlined. It turns out that stability and repeatability of a given design are no guarantee of good performance. Every calorimeter should be checked using a chemical reaction of known enthalpy, yet this has not been done previously. Simple calibration using electrical heating is not sufficient. Inadequate mixing might occur and thus temperature gradients in the commonly used cells, making any results quite unreliable. Another defect has been unstable heat paths. The authors suggest that purported excess heat would not be observed if calorimeter design were improved along the lines described in the paper.

Z. Zhang, F. Liu, M. Liu, Z. Wang, F. Zhong, F. Wu, "Calorimetric Studies on the Electrorefining Process of Copper," *J. thermal Anal.*, vol 50 (1997), 138. *CFT*, pp 8, abstract.

In this work, the Chinese team use a cell and calorimeter rather like that of F&P, and the work is motivated by F&P CNF results. Instead of calorimetry in Pd / D_2O, they applied it to copper deposition. They find that there is excess heat, roughly linear with current density, and conclude that something anomalous is going on, some unknown process; and that thermodynamics might be wrong.

T.V. Prevenslik, "Sonoluminescence: Microwaves and Cold Fusion," *Nucl. Sci. Tech.* 8 (1997) 94; *CFT*, pp 8, abstract.

The author continues his theoretical work on sonoluminescence, which he believed may be accompanied by cold fusion. He states that microwaves may be generated and cause some cold fusion, though no much. However, high power pulsed microwaves aimed at the bubbles might increase the cold fusion rate. He suggests research using MW sources at 1/35 Ghz pulse width of 1 ns and a rep rate of 10^4 Hz.

Noboru Oyama, Osamu Hatozaki, "Nuclear Fusion Induced by Electrochemical Reaction," *Oyo Buturi*, vol 60, no 3, pp 220-226 (1991); *CFT*, pp 10, abstract.

Attempts have been made by large number of research groups throughout the world to duplicate the electrochemically induced nuclear fusion proposed by F&P, Jones et al. However, there have been both positive and negative results during the past two years. Such a situation seems to originate from the lack of reproducibility of the results, and, therefore, many factors such as electrode materials, electrolysis conditions and detection methods should be clarified to realize cold nuclear fusion. A brief history of the development of this research subject is described and the basic information regarding the electrode reaction of the D_2O electrolysis using a Pd cathode is presented for further clarification of this phenomena.

Akito Takahashi, "Production of Neutron, Tritium, and Excess Heat," *Oyo Buturi*, vol 62, no 7, pp 707-109 (1993); *CFT*, pp 10, abstract.

Major results obtained up to now in cold fusion experiments are introduced for neutron, tritium and excess heat generation. Neutron spectra show a 2.5 MeV peak and a 3-10 MeV continuous component. An anomaly is also shown in the n/T ratio of 10-4 to 10-9. The production of excess heat has been confirmed in many laboratories.

INFINITE ENERGY
Papers from past issues not published in either *NEN* or *Fusion Facts*.

T. Benson, "A 'Micro-Fusion' Reactor: Nuclear Reactions in 'The Cold' by Ultrasonic Cavitation," *Infinite Energy*, vol 1, no 1, March/April 1996, pp 33-37, 11 refs, figs.

T. Mizuno, K. Inoda, T. Akimoto, K. Azumi, M. Kitaichi, K. Kurokawa, T. Ohmori (Hokkaido Univ., Sapporo, Japan), M. Enyo (Hokodata National College of Technology, Japan), "Formation of ^{197}Pt Radioisotopes in Solid State Electrolyte Treated by High Temperature Electrolysis in D_2 Gas," *Infinite Energy*, vol 1, no 4, Sept/Oct. 1995, pp 9-12, 3 refs, 3 figs.

J. Rothwell, "Very Hot Cold Fusion: Dr. Mizuno's Ceramic Proton Conductors," *Infinite Energy*, vol 1, no 1, March/April 1996, pp 14-17, 3 figs.

E. Storms, "The Nature of the Energy-Active State in Pd-D," *Infinite Energy*, vol 1, nos 5-6, Nov 1995-Feb 1996, pp 77-81, 8 refs, 13 figs.

E.F. Mallove, "Alchemy Nightmare: Skeptic (Dr. Kevin Wolf of Texas A&M Univ.) Finds Heavy Element Transmutation in Experiment," *Infinite Energy*, vol 1, no 2, pp 30-32, 1 fig.

Julian Schwinger (Nobel Laureate), "Cold Fusion: A Brief History of Mine," *Infinite Energy*, vol 1, no 1, pp 10-13. (published posthumously)

"American Nuclear Society Meeting Features Low-Energy Transmutation Session," (results from Patterson Power Cell Radioactivity Remediation) June 5, 1997, Orlando, FL, *Infinite Energy*, vol 3, nos 13-14, March/June 1997, pp 14-15, 3 tables.

Eugene Mallove, "Thorium Activity Remediation," The Cincinnati Group, Robert Bass, Robert T. Bush, Robert Liversage, er al., *Infinite Energy*, vol 3, nos 13-14, March/June 1997, pp 16-32 many figs.

Nuclear Waste

LAWSUIT OVER HANFORD SITE
Courtesy G. Vesperman

Associated Press, "Lawsuit Threatened over Waste," *Las Vegas Review-Journal*, 9 June 1998, p 5B.

SUMMARY

The state of Washington is tired of waiting. They are going to go to court to force the DOE to honor its commitment to timely cleanup of the Hanford site. They have estimated that 70 out of 177 buried tanks have already leaked, spilling about a million gallons of radioactive waste into the soil and aquifer under the 560 sq. mile site. More leaks are feared. According to a 1989 pact with Washington state, the DOE and the EPA agreed to pump liquid waste from single shelled tanks into double shell tanks. Only 119 our of 149 tanks have been emptied, leaving 5 to 6 million gallons in jeopardy. By the Tri-Party Agreement, the job was to have been completed by 1995.

MICROBIAL CORROSION
Courtesy Richard Shamp

"Discoveries: Nuclear Problem," *The Washington Times*, 31 May 1998, p D8.

SUMMARY

In the Savannah River Site in South Carolina, the underwater aluminum-based tanks containing spent nuclear fuels had developed microscopic cracks only a year after their filling. Acid-producing bacteria are blamed for this dangerous corrosion. Local water samples contained relatively high microbial densities. [Surprise: Some life forms can exist in high-level radiation environments! – Ed.]

MIXED WASTE AT CARLSBAD
Courtesy of Richard Shamp

Joby Warrick (staff writer), "EPS Approves Opening of N.M. Nuclear Waste Dump," *The Washington Post*, 14 May 1998, p A6.

Scott Baldauf (staff writer), "New Mexico Nuke Dump Fine With Most Neighbors," *Christian Science Monitor*, 21 May 1998, pp 3-4.

SUMMARY

Vast underground tunnels in a complex mile-square maze near Carlsbad, N.M. are the new home for Cold War radioactive wastes in an EPA okayed, DOE backed repository called the Waste Isolation Pilot Project (WIPP). It is capable of storing up to 850,000 barrels of contaminated materials, from 10 nuclear weapons facilities across the country.

WIPP was built in 1986, but 12 years of court challenges prevented its use until the EPA finally approved it last month. The controversy centered around the question of whether the ancient salt formation in which is it built will keep the nuclear waste from leaching into the groundwater. Although WIPP is half a mile deep, the area is one of the most active oil and gas fields in the state, and therefore full of drill holes. This causes the critics to question its long range safety. The first shipment of nuclear wastes could begin as early as June 19th.

WHISTLE BLOWERS AND THE DOE

John Stang (staff writer), "O'Leary Tells Court of DOE Reprisals," *Tri-City Herald*, 5/27/98, p A1.

SUMMARY

An agency wide pattern of reprisals against whistle blowers at several DOE sites in the early to mid-1990's was spoken of in a deposition by former Energy Secretary Hazel O'Leary recently, during a Oak Ridge whistle blower's lawsuit against the DOE.

According to a recent USA Today article, Joe Carson, a DOE safety inspector, is alleging DOE cut some of his duties and is transferring him out of Oak Ridge for raising safety concerns. DOE says it is for a reporting violation and harassing other workers.

O'Leary said she was impressed with the credentials and intelligence of the whistle blowers. "It was to me extraordinary that these people had been interpreted to me (by DOE employees) as crazies." She soon installed a "zero tolerance" policy on reprisals against whistle blowers.

O'Leary said she met with groups of whistle blowers at most DOE sites she visited during her first 3 years. Many had cited the lifting of whistle blowers' security clearances was a typical reprisal. She gave an example of one of Hanford site's first whistle blowers, Casey Rudd, who raised safety concerns in the late 1980's. Rudd now works for the Washington Department of Ecology. O'LEARY testified Rudd's role was a model she hoped DOE would copy.

A Government Accountability Project site at <www.gao.gov> has available a transcript of O'Leary's testimony. GAP is a whistle blower advocacy organization.

Miscellaneous

SCALAR WAVES
by Tom Bearden

What I called "scalar waves" are pure longitudinal EM waves (LW). Per a nice paper by R. Ziolkowski, whenever an EM wave starts to form, both the transverse and longitudinal waves start to form. However, the transverse wave has a function which cancels the longitudinal wave. So if that function persists, we get the familiar EM wave. Now when we cancel the normal wave, we cancel the component that had cancelled the LW. So we get out a LW.

A normal old EM wave is comprised of photons (or so we can consider it, if we wish). Now a photon is a piece of angular momentum. So it's a piece of energy welded to a piece of time, with no seam in the middle, so to speak.

What the "pieces of energy" represents, in the dynamic oscillating wave, is a dynamic oscillation of the energy density of 3-space. Now here physics does an odd thing. It just ignores the dynamics of all those "time pieces." In other words, not only is the spatial energy structured and dynamic, but so is the flow of time (I discovered the mechanism that generates the flow of time when I was at

grad school at Georgia Tech). Physicists just visualize the "observer time" flowing smoothly, and ignore the fact that the EM wave carries time dynamics as well as energy dynamics.

When you make what is CALLED a transverse wave, you ignore (or have a component that cancels) that time-density variation. That is a normal transverse wave; considered as an oscillation of the energy density of three dimensional space, with a structureless, free-flowing time stream.

When you make a longitudinal wave, by definition it cannot vary the energy density in 3-space. That is fixed. So it can only vary the time-density dynamics. In other words, a longitudinal EM wave is a time-density oscillation. That is, it oscillates the rate of flow of time itself, about some steady median value.

We cannot measure time; we see that as a spatial change. So we observe it as a velocity-modulated wave. It seems to be increasing and decreasing its speed about some median speed. That's what I have been calling a scalar EM wave. It is now recognized in the literature.

A pure longitudinal EM wave has infinite energy and infinite velocity. We don't make those. Instead, we make a pseudo-longitudinal wave; i.e., a "pretty good" longitudinal wave that still has some low-level transverse component.

A pseudo-longitudinal EM wave has finite energy and finite velocity, but its velocity may be less than or greater than the velocity of light in free space. When it's subluminal, it's called an "EM particle."

Nimtz and his colleagues have also transmitted Mozart's 40th symphony down a waveguide at speed 4.7 c, and clearly listened to it on the other end. This blows the tar out of the old saw that "information cannot be transmitted superluminally." In fact, quantum tunneling has been known to permit superluminal communication, for some decades.

When Maxwell wrote his theory, everyone (all 35 or so of the good electrodynamics; that's all there were!) assumed the material aether (a material fluid filling all space). In other words, they thought that there was no place in all the universe that was devoid of mass. Period. So all the EM entities are DEFINED as mass entities: Electrodynamics today does not actually have anything to say -- anything at all! -- about the form of EM entities in mass-free space. Even the scalar potential's magnitude at a point is defined as the energy in joules collected upon an intercepting point Coulomb at that point. In other words, they have confused the magnitude of the water collected in/on a standard bucket from a raging river, as the magnitude of the water in the river at the dipping point! The scalar potential itself isn't even a scalar entity! It's a multiwave, multivector entity. It's a bunch of bidirectional rivers of EM energy, flowing in both directions at once. Of course, how much of that flow is diverged by (collected upon) an intercepting Coulomb, is a scalar value! But that has nothing to do with the magnitude of the potential itself, just the magnitude of how much is dipped from it by a standard bucket.

So EM theory is thoroughly and seriously flawed, from the ground up.

Now let's see what happens when you transmit and receive a signal (simplest case).

First, in the transmitter you perturb the Drude electron gas, which being embedded in a violent interaction with the active vacuum, perturbs the active vacuum. In other words, the mass perturbations in turn perturb the spacetime. Then that SPACETIME perturbation propagates to the receiver, where it interacts with the waiting Drude electrons, perturbing the Drude gas (the mass).

Rigorously, we have a MASS-TO-SPACETIME TRANSFORM, followed by a SPACETIME-TO- MASS TRANSFORM. Neither of those appears in electrodynamics.

Instead, by assuming the material there in the space, Maxwell and the others assumed a MASS-TO-MASS TRANSFORM (INTERACTION). As we saw, what he wrote actually consists of two hidden transforms, the mass-to-ST transform and the ST-to-mass transform, in serial order.

The vacuum/spacetime is just a big old scalar potential (an active virtual particle flux, and a very intense one). It is comprised of longitudinal EM wave pairs, by Whittaker 1903. By Whittaker 1904, those vacuum perturbations (spacetime perturbations) are just two potential functions -- each of which is just LW functions. So the entire thing in the vacuum is just a bundle of LW functions.

Now here's the giant leap in physics, a real revolution! We always told you that scalar waves were electrogravitational. And so they are.

Look at the two "hidden transforms" that are really involved. Well, they are nothing but just Wheeler's general relativity principle! In short, "mass interacts upon spacetime to curve it, and curved spacetime interacts back upon mass to move it or form forces."

So INFOLDED INSIDE MAXWELLIAN ELECTRODYNAMICS HAS ALWAYS BEEN FULL GENERAL RELATIVITY! But a really marvelous GR.

Between two electrons, the E-force is on the order of 10^{42} times as strong as the weak G-force. So since the EM force is used in this case as the agent of ST curvature, this is a far, far more powerful GR force and ST curvature than is made by the weak little G-force that the astrophysicists mostly track, and have to go to the stars, lots of cumulated mass, etc. in order to get enough ST curvature to measure. For that reason, gravitation has remained a non-laboratory science.

By making the proper assembly of LWs, we can alter spacetime directly, and powerfully, because we are using a far, far larger ST curvature force than the physicists now ordinarily use. And we can engineer it on the bench, or in devices.

Think of any effect on matter that you desire Anything at all. In GR terms, that effect requires the formation of "vacuum engines" or "spacetime engines," -- i.e., inter-nested clusters of ST curvatures. Those vacuum engines/spacetime engines are precisely what can be built by assembling and using longitudinal EM waves.

I'm in process of filing a long tech paper to the U.S. patent office, followed by several patent applications. Want to transmute elements? Just flip one quark in one nucleon, and bingo! You have an isomer (either one element up the chain, or one down it). You can make multiple jumps, etc.

In cold fusion, e.g., what is REALLY going on is the inadvertent formation of such ST engines. Now time waves are not shieldable by Faraday cages. So they go right through the electron shells, into the atomic nuclei. Get the picture? Now you can put specialized EM-GR fingers right down into the nucleons, in fact into the quarks comprising those nucleons, etc. Since there are lots of H ions, H_3O ions, etc. in a liquid, the possibilties for "nuclear engineering" with determinism rather than staid old random statistics, is breathtaking. Those fellows are getting lots of new nuclides, without yet controlling the basic action which is electro-nuclear, but in the new sense I just described.

So if you'll just substitute the more modern term "longitudinal EM wave" for the term "scalar wave," and realize that you are in an engineerable electro-gravitational theory, you will have it in a nutshell.

A-55 FUEL
By Sam Faile

Gunnerman reportedly sold limited A-55 fuel rights to Caterpillar for their use only, for $millions. Thus, Caterpillar does not have all the rights but only a right to use for their own equipment. Caterpillar had formed another company with A-55, Advanced Fuels, that lasted two years before it was bought out by A-55.

Mr. Gunnerman has spent millions on tests, getting good environmental results at the EPA-funded Southwest Institute, with new engines under laboratory conditions getting 10% more mpg based on a unit of fossil fuel. For the real world involving older engines, the improvement in mpg was as much as 29%. A diesel powered bus got 3 mpg but with the A-55, obtained 2.1 mpg which is an improvement on a per-unit fossil fuel basis. Another advantage for diesel engines is that A-55 can be composed of the cheaper Naptha/H_2O fuel. In Nevada, some buses are now running on A-55 and there is a dedicated truck route for A-55 fueled trucks between California and Nevada.

In regard to Ed Henderson's offer of running a Porshe, Mr. Polak said, "Mr. Gunnerman would not be interested. People respond best to what the EPA says and Mr. Gunnerman has decided to have the tests done at an EPA facility, another official facility and in house. His money would not be as wisely spent to have private tests."

The main emphasis is on cleaning up the environment where there is a lot of room for progress involving diesel vehicles and power generators. Even when coal is burned they have a re-burn process that reduces pollution. A-55 Corp. is working with a few Ohio utilities on reducing emissions. Even though gasoline powered cars are a market target, it is down the list of priorities because a lot of the pollution due to gasoline engines has already been removed.

The A-55 group have found a way to eliminate the previous need for nickel pieces added to the combustion chambers

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COSMOLOGY NOTE
Greg Hodowanec 4-16-98

I. **Some Remarks on the Relation $C = (\epsilon^\circ \mu^\circ)^{-1/2}$**

A. Introduction

While the relation $C = (\epsilon^\circ \mu^\circ)^{-1/2}$ was known (and confirmed) for well over one hundred years, it was largely held with some doubt, primarily due to debates over the nature of ϵ° and μ°. Its proponents followed the reasoning as summarized in an article by Kulba [1], while the antagonists generally followed the arguments as expressed by Milnes [2]. Here, I will present an outlook based upon my Rhysmonic Cosmology [3] and postulate that ϵ° and μ° actually describe **real physical effects** and are not just constants of proportionality needed to balance out equations!

B. Rhysmonic Cosmology

I have been developing this Cosmology since about 1959 and it is based upon Planck's Natural Units and their many derivatives. To refresh your memory on the Planck Natural Units, refer to my brief paper on the velocity of light [4]. In essence, rhysmonic cosmology constructs a **finite** spherical universe which consists of **only** an extremely small 'particle' which I have termed a **rhysmon** (Greek for ever-moving) and the **void** (which could be considered as the **empty** space in some present theories). **All** else is but modifications to theis basic structure! This structure (the aether if you wish) is essentially 'locally' **bound** as a basic cell unit and thus could be considered as a 'stationary' aether. However, it is extremely dynamic and energetic and thus provides the **sole** intrinsic source of energy in this universe. For further refreshment I recommend a review of reference [3].

The dynamic nature of this structure will be further considered in a proposed Cosmology Note: "Extraction of Energy Directly from the Aether." Here, I will consider only two properties of the pure 'undisturbed' rhysmonic 'aether.' These will refer to the 'elasticity' of such a structure: [1] $\epsilon°$, which in essence describes **linear** effects (i.e., E-fields and [2], $\mu°$, which describes **rotational** effects (i.e., H-fields) in the bound structures and thus the electromagnetic (EM) fields.

C. The Nature of $\epsilon°$ and $\mu°$

Conventional theory considers $\epsilon°$ and $\mu°$ as fundamental to the electromagnetic field. For example, the permittivity of a medium, ϵ, is a measure of the degree to which the medium can resist the 'flow of charge' and thus is defined [5] as the ratio (at the same point) of the electric displacement (D) to the intensity of the electric field (ϵ) that products it, i.e.,

$$\epsilon = \frac{D}{H}$$

The permittivity of free space is termed the **electric constant**, $\epsilon°$, and it may be determined directly from its **dimensional formula** (6), i.e.,

$$\epsilon^o = \frac{T^2 Q^2}{ML^3},$$

The permeability of a medium, μ, is defined [5] as the ratio (at the same point) of the magnetic flux density (B) to the strength of the magnetic field (H) that produces it, i.e.,

$$\mu = \frac{B}{H}$$

The permeability of free space is termed the **magnetic constant**, μ^o, and it may be determined directly from its **dimensional formula** [6], i.e.,

$$\mu^o = \frac{ML}{Q^2}.$$

The relations really describe 'elastic stresses' in the aether (or rhysmoid) due to linear and rotational forces impressed on this aether. Implied is an exchange of energy between the two 'stresses' in the propagation process.

D. Determination of the Rhysmonic $\epsilon°$ and $\mu°$.

Planck's Natural Units (also rhysmonic units) are used in these determinations (as Ref. [4] for their values in CGS units).

Here, $\epsilon^o = \frac{T^{*2} e^{*2}}{M^* L^{*3}}$ = 1.0 statfarad / cm.

This can be converted to:

8.854×10^{-12} farad / meter, in S.I. units.

Also, $\mu^o = \frac{M^* L^*}{e^{*2}}$ = 1.113×10^{-21} stathenry / cm.

this can be converted to:

1.256×10^{-6} henry / meter,

in S.E. units.

These results indicate that the **rhysmonic** determined values of $\epsilon°$ and $\mu°$ also agree with the presently accepted $\epsilon°$ and $\mu°$ values.

E. The relation $C = (\epsilon° \mu°)^{-1/2}$ in terms of rhysmonics

Using Planck's Natural Units in the dimensional analysis we have:

$$\epsilon^o \nu^o = \frac{T^{*2} e^{*2}}{M^* L^{*3}} \times \frac{M^* L^*}{e^{*2}} = \frac{T^{*2}}{L^{*2}},$$ where in this

product all cancels out except a $\frac{1}{V^2}$ term!
[where V = velocity]

Therefore, C, Now reduces to:

$$C = \frac{1}{\sqrt{\frac{T^{*2}}{L^{*2}}}} = \sqrt{\frac{L^{*2}}{T^{*2}}} = \frac{L^*}{T^*},$$

a velocity term. Substituting in Planck's Natural Units for L* and T*, we have:

$$C = \frac{L^*}{T^*} = \frac{1.6161 \times 10^{33}\ cm.}{5.3906 \times 10^{-44}\ \text{sec.}} = 2.99794 \times 10^{10}\ cm/\text{sec}$$

which is also the experimental value for the velocity of light in free space, i.e., in the aether! The reason for this is that L* and T* (which are fundamental to the construction of the aether) are explicitly contained in the relation ($\epsilon° \mu°$) and thus they are fundamental units also. The relation $C = (\epsilon° \mu°)^{-1/2}$ was originally determined empirically, but it should now be seen as another relation which can define the speed of light in **free space**, independent of its direction.

CONCLUSIONS

1. Rhysmonic Cosmology has postulated a finite aether construction which can be described in terms of Planck's Natural Units (PNU) and its many derivatives.
2. The 'undisturbed' aether has mechanical and electrical characteristics which reflect the **elastic** nature of this medium. These are expressed in $\epsilon°$ and $\mu°$.
3. An electromagnetic (EM) disturbance in this medium will propagate at a velocity, C, largely due to the nature of $\epsilon°$ and $\mu°$. I also suspect an interaction with the universal G-Field is also involved.
4. It is therefore concluded that $\epsilon°$ and $\mu°$ are **real** and **valid** concepts, not only for EM fields, but also for many other manifestations in this universe.
5. It is my hope that **more** of you will become involved in the further development of this Cosmology. I am indebted to Bill Ramsay for his useful contributions to the theory and especially his practical experimental works.

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3. G. Hodowanec, Rhysmonic Cosmology, self published, 1985. (Now out of print, copies of original pages are available from: Rex Research Archives, P.O. Box 19250, Jean, NV, 89019)
4. G. Hodowanec, "An Alternate Determination for the Velocity of Light," Untapped Technology in Review, Summer 1995. Also in, *New Energy News*, vol 4, no 5, Sept. 1996.
5. Dictionary of Physics, Penguin Books, 1997.
6. B.S. Massy, Units, Dimensional Analysis and Physical Similarity, Van Nostrand Reinhold, 1971.

A two-volume set (670 pages) of the life's works of Greg Hodowanec is available from New Energy News for $60.

LIGHT MATTERS..... REALLY!

K.G. Tatterson, "Boom! From Light Comes Matter," *Photronics Spectra*, Nov. 1997, p 31.

SUMMARY

By bumping a 46.6 BeV electron beam from the two mile long Stanford Linear Accelerator into a photon beam at 527 nm from a 'tabletop terawatt' Nd-glass laser, a team of scientist have apparently "created" the first electron-positron pairs produced via a light-by-light process. In the two-step process, a high-energy electron travels through laser-focusing optics, then "kicks" one of the photons at nearly 30 GeV of energy. **That proton reacts with the other photons to create particles of matter.** The significance of the experiment was the production of matter using real photons, as opposed to "virtual photons." The team of physicists is comprised of scientists from Stanford University, University of Rochester (N.Y.), Princeton University, and University of Tennessee. They acknowledge that practical applications are very limited, but just knowing that they have severely bent or broken a fundamental law of physics is enough.

WASTE IN COMMERCE AND ENERGY
Wingate A. Lambertson, Ph.D.

Recently, the *Wall Street Journal* has carried two stories on U.S. support for the development of a Baku-Ceyhan pipeline in the Caspian Sea region. The first story on May 28th, told how U.S. Energy Secretary Federico Pena renewed a U.S. commitment to the construction of a pipeline from Azerbaijan through Georgia to Turkey. This support was worth $20 billion for 65 projects. His presentation was given to a conference organized by the U.S. Trade and Development Agency in Istanbul. Mr. Pena is leaving his job in Commerce in five weeks.

The second story on June 1 in the same paper was of a pledge by James Harmon, President of the U.S. Export-Import Bank, saying that "There is no limit" to the funds available. He expects it to equal the level of lending to China or about $6 billion.

Here we have a situation where the U.S. government will lend between six and $20 billion to the Azerbaijan International Operating Co. to build a pipeline where it suits the U.S. government rather than by using the most economical route. This U.S. generosity should concern all taxpayers as it is probable that soon after the pipeline is completed it will be obsolete.

This could be good news for those of us who are searching for ways to have our energy collection methods funded. My most recent inquiry about ZPE collection was from India. I shall suggest to this company that they contact the U.S. Trade and Development Agency in India and have them arrange a regional conference on ZPE. We will point out to the Trade and Development Agency that more ZPE is available in India than all of the oil in and around the Caspian Sea. We will have them select the six most promising ZPE collection methods from the regional conference and request loans from the U.S. Export-Import Bank of $1 billion for each method.

A possible reason that Secretary Pena has been unable to accept cold fusion and ZPE is that the programs suggested have been too small.

CASPIAN SEA OIL PROJECTS
Courtesy of Win Lambertson

Hugh Pope (*WSJ* staff reporter), "U.S. Shows Support for Caspian Sea Oil Projects," *Wall Street Journal*, 5/28/98.

SUMMARY

U.S. commitment was renewed last month for the construction of a major oil-export pipeline from Azerbaijan through Georgia and on to Turkey. The U.S. reportedly has committed the U.S. Export-Import Bank, the Overseas Private Investment Corp., and the U.S. Trade and Development Agency to assist the development of the associated 65 projects, which are worth $20 billion.

Why? Energy driven motives are related to energy development, power production and pipelines that would exploit the 100 to 200 million barrels of possible oil reserves around the little exploited Caspian Sea.

Geo-political motives are behind the U.S. attempts to freeze Iran out of the Caspian oil picture. The U.S. has also been promoting the various regional states' independence from the old Moscow ties, as well as supporting democratic and market reforms.

International finance driven interests may resist new spending at this time of low oil prices. There is not now enough Caspian production to warrant it, they maintain. Moscow also opposes a proposed pipeline to Baku which would skirt Russia and go under the Caspian Sea from Kazakhstan and Turkmenistan.

BINDING FORCES

Toby Grotz, Robert Q. Achzehner, Don Rapp, "The Origin and History of the Smith Coil, "*Electric Spacecraft Journal*, Jan/Feb/Mar, Issue 21, June 9, 1997, pp 24.

Because the binding force meter is virtually unknown in new energy research, we would like to present the following description, written by Wilbert Smith and published in *Topside*, #12, Winter and Spring, 1963. This instrument may prove useful in investigating the effects of stress on the fabric of space due to the generation of unconventional fields and forces.

Matter, as we know it, is held together by "forces" the nature of which we do not clearly understand. We have developed some very elegant theories to explain most of the observed phenomena, and we add sufficient "correction factors" to make the theory fit the rest. But every now and then we come face to face with something which our theory just will not explain, and rather than admit that our theory is inadequate, discard it and start over again. This is well demonstrated in the matter of binding forces.

Some years ago, following some rather bad airplane crashes for which there was no satisfactory explanation, the people from "elsewhere" were asked through "contact" if these crashes were possibly due to our craft flying too close to their craft. We were informed, however, that our pilots flew around in complete disregard of the regions of **reduced binding** with which this planet is afflicted, and very often such craft were not designed with a sufficient factor of safety and came apart.

When we countered by saying that we knew nothing of such regions, we were informed that means for detecting them were easily within our technology and that we should build suitable instruments and then pay attention to what they registered.

The principle of the "binding meter" was then explained to us. The principle is quite simple: all matter is held together by the relative configurations of the three basic fields of nature, tempic, electric and magnetic. These configurations are characteristic of what we call the molecular structure, and the interactions of these fields is **not** linear.

Structurally the binding meter consists of a nylon fiber which is stressed close to its elastic limit (after having been over stressed to establish stability) pulling against a steel spring which is stressed well below the elastic limit. The nylon fiber is wound around a spindle which carries a pointer so that any longitudinal movement of the fiber will cause the spindle to turn and the pointer to move across an arbitrary scale. In setting up the instrument nylon fishing leader was used and pre-stressed to the breaking point and this point noted. The instrument was then threaded and one end fastened to the spring and the other placed under tension to 75 percent of the previously noted breaking stress, and the end clamped under a washer which was somewhat softer than the nylon (to grip it solidly without deforming the nylon). [See Fig. 8] The whole instrument was then set aside for a few days to make sure that it was stable, after which the pointer was slipped to mid scale and the instrument was considered ready for service.

Many Successful Instruments

By making the body of the instrument of aluminum tubing about ½ inch diameter and 10 inches long, the combination gives very good temperature compensation, and a range of temperature of 100°F makes less than ½ division on an arbitrary scale of 12. There is no perceptible change over the complete range of humidity and no barometric sensitivity was observed. Dimensions apparently are not critical parameters.

My colleagues and I have investigated the general areas through which aircraft have flown just prior to unexplained crashes showing several scale divisions change. These regions seem to be roughly circular and about 1,000 feet in diameter, and probably extend upward quite a distance. A few have been detected by air when planes

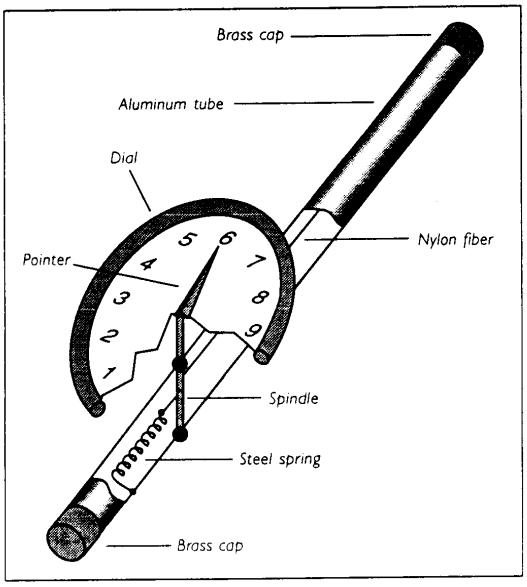

Fig. 8 Diagram of Smith's binding meter

have flown through them, but fortunately in these cases the craft were strong enough to remain intact.

Whether this is generally true or not we cannot say, but it does appear that things are somewhat stronger in the northern latitudes than they are farther south, and certain areas seem to be permanently afflicted with reduced binding. We do not know if the regions of reduced binding move about or just fade away, but we do know that when we looked for several such regions after three or four months we could find no trace of them.

It would therefore appear that this business of reduced binding would stand quite a bit of further serious investigation.

LETTERS

LETTER FROM JAMES B. WRIGHT

Re: Nelson Fink's comments on space-energy equivalence, *NEN*, vol 6, no 2, June 1998, pp 23.

In a paper on the Cosmological Redshift (soon to be submitted to the *JNE*) I identify the aether as an all-pervasive energy, having mass as one of it's characteristics. In that I also calculate its total mass (and that energy is the holy grail of *NEN*) I feel that a brief note on my reasoning may be of interest to the readers of *NEN*, and possibly spur some new ideas.

First, we take the radius of the observable universe (about 6 trillion miles), calculate its volume, and then divide this by the number of galaxies in that universe (200 billion). This gives average galactic volumes, which are then converted into spheres to surround each galaxy, such as the Milky Way. It appears that the radius of the space around the average galaxy is at least twenty times greater than the radius of the visible portion of the galaxy.

Next, using Rubin's calculations that the unseen mass that surrounds a galaxy (and affects its rotational speed) is about five times the visible mass within the galactic radius, ten times that mass at 2R, fifteen times that mass at 3R, etc., we calculate that an average galaxy has an associated unseen mass (or "dark mass") which is more than 100 times greater than its visible mass. We equate this dark mass to the aether, i.e., to energy, and discover that we are living in an ocean of energy, which occupies the inter-galactic, inter-stellar, and intra-atomic regions.

The acceptance of space as energy provides a sink for the mass that disappears in the $E = mc^2$ equation, rather than have it become some incomprehensible "field". It also provides a tangible medium which apparently is the determining factor for the permeability and permittivity of "space", which, in turn, determine the speed-of-light (C).

Note, especially, that in the $E = mc^2$ formula, $C = 1/(\mu\epsilon)^{0.5}$, and that this allows the formula to be re-stated as $E = m/(\mu\epsilon)$, a formulation that uses the fundamentals that determine the speed-of-light rather than the derivative itself. This further suggests that the medium that determines the values of μ and ϵ has a some role to play in the amount of energy that is realized from the annihilation of a given quantity of mass.

Going back to the Rubin paragraph, study of the dark mass distribution indicates a density gradient which is a function of $1/R^2$, suggesting that a given atomic reaction near the galactic core will release less energy than one in its outer regions.

This also suggests that atomic activity at the sun's surface that produces some characteristic spectral display will produce that display at a lower frequency than (say) on earth where the energy is less dense.

Comment are solicited.
Jim Wright
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Yreka, CA 96097
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Email: jimdon@thegrid.net

FREE-ENERGY COMING SOON ?
By Jason Dunlap

Claims of free-energy machines, cold-fusion, and other fantastic technologies have been around for decades. We have heard stories of how government agencies and industry giants have conspired to keep such technology out of the mainstream. Inventors who succeeded at proving such technology were intimidated and threatened

if they tried to create a product or have their inventions patented. Some were even killed. The scientific community always consider such stories as nonsense and insisted that such technology was impossible. Well things have changed.

Many of you can remember that, last year, Center of Attention [a newsgroup located in San Jose, CA] financed and sponsored a mission to uncover and report about the reality of free-energy. It was hoped that we could make connections with those inventors that had actual working models, reveal the technology to the world and have an impact on making free-energy machines a part of our daily lives. Frankly, at the time, I felt we had failed to have much of an impact but Drunvalo says otherwise [1].

He claims that efforts made by a small group of people in California to uncover and video working free-energy devices has paid off. He said that the video and all the information was put on the Internet. The information was shared world-wide. Inventors, who were too intimidated in the past, began to try again to have their inventions patented. Drunvalo said that in just the last 3 or 4 months, governments around the world seem to be willing to allow this new technology to come to the surface. Astounding as it may seem, the motivation of the government is that the information should be released for the good of humanity! Apparently, attitudes are, indeed, changing.

In February of this year, Germany allowed a patent on a free energy device based on the relationship of certain carbon atoms. It is a small, thin film that outputs about 400 watts and will run all of our appliances indefinitely. The device is being presented to the world by a Prof. Deiter of Germany. Drunvalo went on to say that there were several other free-energy inventions that will soon be revealed and it will definitely change everything. Whether the transition will be smooth or rocky is a mystery, for now. Drunvalo made it clear that there was much he couldn't tell us at this time, but said he would give more information at the workshop in Oakland.

I would like to point out, that I doubt Drunvalo was referring to Center of Attention's efforts when he said a video about free-energy is what made the difference. I rather think he meant some other group, that did a better job than we did. I find it interesting that even though it probably was not our efforts that made the difference, we nevertheless were following an identical plan. It was as if, in some cosmic way, we were one among others that answered a "call" without even knowing it. It comforts me to know that whatever we try, in regard to working for the good of humanity, is worthwhile and if everything doesn't work out just the way you expect, you can be sure there are others, following through. I will be trying to find out exactly which video he was referring to and let you know how to obtain a copy.

Robert Perala and Tony Stubbs asked pointed questions and got Drunvalo to elaborate, in great detail about these things. This show revealed a lot of detailed and important information, most of which I have told you about. The show was taped, and if you want to purchase the entire tape, it is available for $12.00 plus shipping. There were many details and discussions not mentioned in this report. Call, email or write Barbara, and she will get a copy of the full report sent to you.

The Philosopher's Stone
http://earth.vol.com/~voltron//
http://www.spiritualjourneys.com

[1] Dunvaleo Melchizedek is a speaker and lecturer at several conferences, who is interested primarily in the application of the old religion of Egypt, and in the use of Orgone energy.

RESPONSE:
from Patrick Bailey, President of the INE

The group that you are referring to that has made a big major difference in the "free-energy" field is the Institute for New Energy, established in 1993 to build the bridge between "unorthodox science" and the "scientific establishment". The INE also publishes a large newsletter each month, the *New Energy News*, with past issues available. The INE has a large website at: http://www.padrak.com/ine/ with several supportive files, such a Table of Contents for all *NEN* issues, and including a subject index at:

http://www.padrak.com/ine/SUBJECTS.html

I have also been personally responsible for bringing the reports and data on these new devices into the mainstream scientific community since 1990, through both the International Association for New Science (the IANS) and the yearly international conference on energy conversion technology, the Intersociety Energy Conversion Engineering Conference (the IECEC) which is supported by all of the major US technical societies, including the AIAA, AIChE, ANS, ASME, IEEE, and the SAE. Papers that have been presented in these many conferences are summarized and linked in the INE website.

We have now created a condition where inventors and researchers are no longer afraid or intimidated to share the results of their work, and many are now cooperating on an international basis. While overt suppression may seem to still exist to this day, these cooperative efforts are making it virtually impossible to hide and suppress the technical advances that are being made and reported around the globe.

As a friend of Drunvaleo, I personally invite him, through you, to cooperate with us in contacting the researchers that he is referring to, and to allow the INE to support and report on the findings that are being uncovered today. I do not believe that Drunvaleo has all of the answers, and neither does any one particular organization. However, by sharing and supporting each other, we can overcome any obstacles that would, and have in the past

traditionally, stood in the way of our own scientific progress.

We offer support and cooperation to Drunvaleo and any others that would assist us in this quest. I am easily reachable.

Patrick Bailey
President, Institute for New Energy
ine@padrak.com
http://www.padrak.com/ine/

Meetings

INE NEW-ENERGY SYMPOSIUM
August 14-15, 1998

Deadline for papers July 15, 1998.

Meeting will be held at the University of Utah Union Building on Friday and Saturday, August 14-15, 1998. Cost, if paid by 1 August 1998, is $100 for members and $125 for non-members ($150 at the door). Special prices for students.

All papers accepted for presentation will be published in the *Journal of New Energy*. The journal will be available shortly after the conference.

Author's are encouraged to send their abstracts immediately. The editorial staff of the *Journal of New Energy* will select the papers to be presented. Author's will have from 30 minutes to one hour for their presentation depending on the number of papers that qualify for presentation. If excess papers are offered, new-energy experimental papers will be given preference.

18th International
Symposium on Discharges & Electrical Insulation in Vacuum
August 17-21, 1998
Eindhoven, The Netherlands
Hosted by the Eindhoven University of Technology

Scientific Program, Papers will be presented on all aspects of: Fundamentals of Discharges and Breakdown in Vacuum; Vacuum Discharge Devices and Applications; and Vacuum Insulation Technology and Applications.

Mini-Courses held parallel with conference: Diagnostics for Vacuum Devices, and Production Technology for Vacuum Insulated Devices

A **technical exhibition** will be held featuring components and systems in the area of vacuum discharge devices and vacuum insulated devices (e.g. vacuum switchgear, vacuum deposition and coating, X-ray and microwave tubes and other beam-devices, high-power devices, and equipment for analysis, monitoring and test purposes).

Hotel accommodation in downtown Eindhoven, a short distance from the University Conference Centre, is available through the EUT Conference office at reduced rates.

Information for Authors
Accepted papers will be published in conference proceedings, available at the registration. A limited number of accepted papers will be selected for publication, in a modified and extended version, in Special Issues of *IEEE Transactions on Plasma Science* and *IEEE Transactions on Dielectrics and Electrical Insulation.* The working language of the symposium is English. All printed matter will appear in English.

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E-mail: C.L.A.Schreurs@ieb.tun.nl
Website: http://www.ele.tue.nl/evt/isdeiv/

"Environmental Needs"
33rd Intersociety Energy Conversion Engineering Conference (IECEC)
August 2-6, 1998 Colorado Springs, CO

Sponsored by the American Nuclear Society, American Inst. of Chemical Engineers, Society of Automotive Engineers, American Inst. of Aeronautics and Astronautics, American Society of Mechanical Engineers, and Inst. of Electrical and Electronics Engineers.

For further infromation:
ANS Proceedings Office, IECEC '98
555 North Kensington Ave.
La Grange Park, IL 60526
Phone: 708/579-8253; fax 708/352-6464
Web page: www.inspi.ufl.edu/IECEC98

MARCH FOR PEACEFUL ENERGY
October 24, 1998
WASHINGTON, D.C.

Organized in support of the "Million Solar Rooftop" promise President Clinton made at the last Earth Summit, the March for Peaceful Energy has been embraced by a wide range of solar, new energy and anti-nuclear coalitions.

The March for Peaceful Energy aims to hold President Clinton to his promise and pressure Congress in creating a similar program to the one which gave birth to the microchip in the 50's, massively reducing cost of production.

The March is being organized by students at the University of Maryland College Park. They have taken full advantage of the Internet by designing a terrific website. The word has quickly gotten around, building strong grassroots support. Already an impressive list of speakers and performers have lent their names to the rally. A dozen other alternatives energy events are being planned for October 24th around the world. The DC March organizers plan to bring focus to all of them via comlinks and teleconferencing.

America has become complacent about energy issues. We have been lulled into a false security by low oil prices and a moratorium on nuclear plant construction. But the urgent need to retrofit the existing energy infrastructure still lies ahead. A recent air quality crisis in Europe and India's nuclear tests have rekindled a spirit of activism. Taking it to the streets has always proven effective when all else fails.

Energy is at the root of increased standards of living for all. The development of safe and clean power providing electricity to suburban homes and remote locations alike should be priority in Washington.

Contributions to the march should be made out to SC Solar. We are still looking for additional sources of sponsorship. Currently we are in need of organizations or individuals to help the cause by mobilizing people in their specific areas.

CONTACT:
Richard Lasken, President of DC Solar
c/o University of Maryland College Park
Box 73
College Park, MD 20742
(301) 345-3454
E-mail: PlantSeedK@aol.com
http://www.index.com/peace

Second International Symposium on Consciousness, New Medicine and New Energy
November 26-27, 1998
Ibuka Hall, Waseda University
Tokyo, Japan

Symposium slogan: Toward New Human Civilization

The Second International Symposium on Consciousness, New Medicine, and New Eneryg will bring together scientists and scholars from Japan and elsewhere to discuss their pioneering work and raise new questions for further research on the inter-relationship of consciousness, matter and energy, complimentary and intergrative medicine, and new energy technologies.

Research in these frontier areas challenges the dominant scientific paradigm, but new scientific world-view and paradigm had appeared at the first symposium. This second symposium will help facilitate this new paradigm, based on wholeness which is important for the future of humanity and the whole earth.

Contact: Mr. Hideo Hirano, symposium secretary at:
Tel/Fax: 0426-65-9371

STAIF BREAKTHROUGH PROPULSION PHYSICS SESSIONS

CALL FOR PAPERS:

The Breakthrough Propulsion Physics sessions in the **Conference on Applications of Thermophysics in Microgravity and Breakthrough Propulsion Physics**, will be held as part of the Space Technology & Applications International Forum (STAIF-99), January 31 - February 4, 1999, in Albuquerque, NM. The website for more information is http://www-chne.unm.edu/isnps/isnps.htm. The abstract contributors should E-Mail or call the author when an abstract is sent so we can be looking for it.
Thanks.

Sessions:
EMERGING PHYSICS TOWARD
PROPELLANTLESS PROPULSION

Alan Holt,
Chair, NASA Johnson Space Center,
DanieL C. Cole,
Co-Chair, IBM Microelectronics

Papers are invited that present theories, experiments, or empirical evidence that describe research directions or specific approaches for the development of a capability to propel a vehicle in transatmospheric, near-earth space and deep space regions, without the use of rockets or beamed power. These capabilities include applications of: (1) fundamental physics of forces and acceleration, addressing enhanced coupling between inertia, gravity, electromagnetism, inertial frames and/or space-time; (2) fundamental physics of motion through space time or the

motion of perturbations of space time; and (3) fundamental physics of energy exchange mechanisms. Papers are also invited which (4) describe and compare competing theories or empirical evidence, with special emphasis to their potential for achieving a propulsion breakthrough, and which (5) address the use of microgravity research and technology testbeds associated with the International Space Station, Station-based and other free-flyers and earth-to-orbit vehicles.

EMERGING PHYSICS TOWARD HYPER-FAST SPACE TRAVEL

Catherine Asaro,
Chair, Molecudyne Research
Claudio Maccone,
Co-Chair, Alenia Spazio

Papers are invited that present theories, proposed experiments, or empirical evidence that are aimed at addressing how to attain the maximum transit speeds physically achievable. This includes: (1) fundamental physics of forces and acceleration; (2) fundamental physics of motion through spacetime or the motion of perturbations of spacetime; and (3) fundamental physics of energy exchange mechanisms. Papers are also invited which (4) describe and compare competing theories or empirical evidence with special emphasis to their potential for achieving such a propulsion breakthrough.

EMERGING PHYSICS TOWARD BREAKTHROUGH SPACECRAFT POWER

Dave Goodwin,
Chair, U. S. Department of Energy, Office of High Energy & Nuclear Physics F.
Michael Serry,
Co-Chair, Digital Instruments Inc.

Papers are invited that present theories, proposed experiments, or empirical evidence that are aimed at addressing breakthrough energy production methods to power spacecraft propulsion. This includes fundamental physics of energy exchange mechanisms, and how energy exchange mechanisms might relate to kinetic energy of motion. Papers are also invited which describe and compare competing theories or empirical evidence.

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

Clustron Sciences Corp.: Contact: Ron Brightsen, 703-845-8531.

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.

German Association for Vacuum Field Energy: DVS-Secretariat, Feyermuehler Str. 12, D-53894 Merchernich, Germany. Tel: 011-49/(0)2443-8246 Fax: 011-49/(0) 2443-901880 E-mail: dvs@gptec.com Internet: www.gptec.com/dvs.

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.

Trenergy, Inc., has acquired rights to develop and produce a new-type of thermal power based on the controlled production of clean nuclear reactions from plasma injected transmutation. Contact through P.O. Box 58639, Salt Lake City, UT 84158-0639, Voice 801-583-6232, Fax 801-583-2963.

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 Corp.: Founded in 1996 to facilitate the introduction of commercially viable energy alternatives. 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

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

Antigravity News and Space Drive Technology, bimonthly newsletter, pub. J.E.Cox Enterprise, P.O. Box 655, Marietta, GA 30061-655 (Phone 770-218-9693). Per year $36. U.S., $48 foreign.

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/

Elemental Energy, monthly newsletter, edited by Wayne Green, 70 Route 202N, Petersborough, NH 03458. Email: <design37@aol.com>

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.

Future Technology Intelligence Report, monthly newsletter, making available technological information now omitted from establishment media. Back issues available at substantially lower cost on the InterNet at <www.tarapublishing.com> FTIR, P.O. Box 423652, San Francisco, CA 94142-3652.

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: halfox@slkc.uswest.net
or 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. Address & phone above.

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

Positive News and *Living Lightly*, quarterly, edited by S. Crockett-Burrows. The Six Bells, Bishops Castle, Shropshire SY9 5AA UK. Tel: (01588) 630-121 / 122

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.

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