likely stabilized by finite ion orbit effects, which is not accounted for in ideal MHD theory. Importantly, it appears that some kind of internal relaxation mechanism maintains the FRC equilibrium in a state that is tilt stable. Steinhauer presented preliminary work on the ideal stability of local modes (e.g., interchange or ballooning) that may be responsible for the observed relaxation.

SESSION VII: Y. TOMITA

Proton-Driven Two-Energy Stream Cyclotron Instabilities and Associated Anomalous Processes in Magnetized Plasmas

K. Chen analyzed weak relativistic effects on the cyclotron frequencies of fusion-produced protons and ions that revealed a novel two-stream gyrospace even without beams in real space. This leads to a two-energy stream cyclotron instability for protons to drive waves and to slow down anomalously. The instability comes from the coupling of the proton and slow-ion Bernstein branches. The growth rate of the cubic instability is proportional to $(n_p/n_s)^{1/3}(\gamma_p - 1)^{1/3}$, while the efficiency is proportional to $(n_p/n_s)^{1/3}(\gamma_p - 1)^{2/3}$, where n = density and γ = Lorenz factor. Low proton harmonics in a deuterium plasma belong to the cubic instability, while a quadratic instability with a growth rate proportional to $(n_p/n_s)^{1/3}$ dominates at the high harmonics on a low hybrid band. Both linear and nonlinear scaling laws have been verified by their full kinetic particle-in-cell simulation with quiet start. The theoretical and simulation studies achieved good agreement with measurements of ion cyclotron emission in D-D experiments on the Joint European Torus (JET). The simulation results show that protons are anomalously slowed down, while some are accelerated to twice their birth energy; the fast ion density fluctuation and the phase bunching are large; and the background ions are heated up and become non-Maxwellian. The result is the same for protons in a D-^{3}He plasma.

p-^{11}B and D-^{3}He Fusion via IEC

T. Rider examined confinement of p-^{11}B and D-^{3}He in IEC. Issues included electron and ion losses, bremsstrahlung emission, and undesired side reaction rates [$^{11}B(p,\gamma)^{12}C$ and $d(d,n)^3$He]. He concluded that IEC appears to offer higher power densities, lower bremsstrahlung losses, and reduced side reactions in comparison with other confinement schemes using these fuels. The charged particles from the reactions offer the direct conversion of fusion products for highly efficient power systems. Additional work is still needed to evaluate IEC, but it appears possible to construct D-^{3}He reactors. It does not appear possible at this time to use p-^{11}B. Ion thermalization and upscattering losses are the greatest problems for either reaction. Bremsstrahlung is also a problem for p-^{11}B.

PANEL

A general discussion was held following the presentation of the papers. Session chairs presented a summary of each of the main topics and the key points raised. Many of the points presented are included in this summary. The next meeting will be held in Japan. Copies of the slides collected at this workshop are available from G. Miley, University of Illinois, Fusion Studies Laboratory, 103 S. Goodwin Avenue, Urbana, Illinois 61801.

G. Miley gave a tour of the University of Illinois Fusion Studies Laboratory during the afternoon of March 17, 1993. The participants were able to witness the plasma contained within the grids of the IEC, including the jet and star modes reported during the IEC discussions. The demonstrations were led by J. Javedani, A. Satsangi, and Y. Yamamoto.

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April 16, 1993

SUMMARY OF INTERNATIONAL SYMPOSIUM OF NEW ENERGY, DENVER, COLORADO, APRIL 17–18, 1993

INTRODUCTION

Some 20 scientists, inventors, and writers from various countries gathered for a 2-day retreat and symposium on new energy on April 14–16, 1993, at Estes Park, Colorado, sponsored by the International Association for New Science (IANS). Subsequently, members of this group were the keynote speakers at a 2-day symposium on new energy held April 17–19, 1993, in Denver, Colorado.

Cold fusion, over-unity energy machines, solid-state excess energy devices, and zero-point energy (ZPE) devices were some of the subjects discussed. This gathering of the world's leaders in new energy devices was an historic first. The end results are expected to accelerate the development and commercialization of some of the new energy systems now being developed.

An example of one of the leading new energy devices is the Tewari motor-driven generator, which produced high-amperage, low-voltage power equal to about three times the power used to run the electrical motor. P. Tewari is the chief project engineer of the Kaiga project in India, where this device has been under development for more than 10 years.

HIGHLIGHTS OF THE RETREAT

The objective of the retreat was to get the world's top scientists, inventors, and writers in the field of new energy together. There were beneficial results from the face-to-face meeting, the sharing of information, and the informal arrangements for cooperation in practice and theory. The outcome of the meeting was the decision to form the Institute for New Energy, to publish the *New Energy News* newsletter, and to hold future retreats, workshops, and conferences; in other words, to facilitate communication.

Those invited to the retreat were associated with new, nonstandard, or unusual methods of producing energy. Some were theoreticians with splendid credits for technical publications, such as Harold Aspden, Peter Graneau, and Stefan Marinov. Others could be counted as determined experimentalists who are finding methods to provide new, nonpolluting sources of energy, such as Don Kelly, Troy Reed, and Tewari. Others could be classified as reporters or writers, such as Hal Fox and Moray King.

The consensus of the group is summarized as follows:

1. This meeting was an historic first and should become a periodic event.

2. The most important activities were the meeting of others working in new energy, the exchange of information, and the group acceptance of the importance of continuing development work.

3. It was recognized that most projects are based on real science (but in many cases, not readily accepted science).

4. It is important to improve modes of communication among workers in new energy. Therefore, it was unanimously agreed that the IANS establish the Institute for New Energy and publish a newsletter, *New Energy News*, with Hal Fox as editor.

5. It was agreed that one prominent, tested, and working over-unity device should be built, verified, and properly reported to the media.

HIGHLIGHTS OF THE SYMPOSIUM

The symposium was attended by about 300 persons. In general, three simultaneous papers were presented per hour. The following is a list of the speakers and their topics:

Harold Aspden, The World's Energy Future
Patrick G. Bailey, A Unique Class of Alternative Catalysts for Fuel Cell Applications that Replace the Need for Precious Metals
Frano Barbir, Hydrogen Energy Technologies: Pathway to Commercialization
William Baumgartner, Energy Extraction from the Vortex
Bob Beutlich, From Metaphysics for "Physics 2001"
Tim Binder, Transmutation of the Elements, a Modern Alchemical Team's Experiment with the Concepts of Walter Russell
John O'M. Bockris, Cold Fusion
Gene Fisher, Review of Viable Over-Unity System
Hal Fox, Impact of Cold fusion and Other Enhanced Energy Systems
Peter Graneau, Concept of a Capillary Fusion Reactor
Toby Grotz, Working Models of Free Energy and Transmutation Systems
George D. Hathaway, Experiments with a Unipolar Dynamo of Novel Construction
Jeffrey A. Hayes, Tesla Plan, A Comprehensive Solution
James J. Hurtak, Hydrogen: The Fuel for Future Transportation
Don Kelly, The Status of Free Energy
Moray B. King, Fundamentals of a Zero-Point Energy Technology
Ron Kovac, A New Portable Powerpack Used to Test New Energy Ideas and Sources
Ken MacNeil, The World Control Factor—Energy
Stefan Marinov, The Generator "Venetin Coliu" Produces Free Energy
Roy McAllister, Improved Energy Conversion Efficiency Will Spark Transition to Hydrogen in Commercial Applications
Stan Meyer, Atomic Energy Balance of Water
Andrew Michrowski, Vacuum Energy Developments
Henry C. Montieth, Light Action and the Litraonics Microscope
Panos Pappas, The Three Conservation Laws of Nature: Energy, Momentum, and Angular Momentum
Hans J. Petermann, The New Science Including Hydrogen Fusion
Dale Pond, Substantiation and Standardization of the New Paradigm
Harold Puthoff, Quantum Zero-Point Energy, Condensed-Charge Technology, and Engineering Applications
Troy Reed, The Reed Magnetic Motor
Marcos Rodine, The Dandelion Puff Principle Based upon Point Energy Creation Physics
John Stover, Motional Fields and the Edwards Effect
Paramahamsa Tewari, Generation of Cosmic Energy and Matter from Absolute Space (Vacuum)
Charles Wallach and Panos T. Pappas, Effects of Pulsed Magnetic Field Oscillations in Cancer Therapy
Charles A. Yost, Electrical Propulsion for Spacecraft.

Some poster sessions were also presented:

Roy E. Graham, Jr., New Energy—It's Really Very Old
Gerald A. Kollsch, Toward a Real Theory of Reality
Paul A. LaViolette, The U.S. Antigravity Squadron
Donald Reed, Evidence for the Screw Electromagnetic Field in Macro- and Microscopic Reality
Thomas F. Valone, Armature Reaction in the Homopolar Generator.

In addition, a representative from the Planetary Association for Clean Energy, Inc., of Ottawa, Canada, demonstrated an extensive bibliography with comments on new energy. This work was supported by the Canadian government with the objective of reviewing past literature and creating a data base of new energy effects. The rationale for this program was that some scientific findings may have been published that have not become a part of science and engineering applications. The latest entry in the data base was made in 1989; therefore, this data base is an excellent companion to the cold fusion data base developed by the Fusion Information Center (at least to the extent of reporting on cold fusion and other enhanced energy devices). There should be an excellent opportunity for melding these two data bases into one larger data base.

HIGHLIGHTS OF THE PAPERS

Some of the papers presented at the symposium were speculative and may be important contributions to new ways of thinking about new science (for example, Pond's paper discusses a new paradigm). Some papers were clearly presentations of projects for which funding is being sought (for example, Aspden's presentation, which covered three U.S. patents for which he is seeking a buyer). Some papers were reports on the state of the art in various new energy projects or technologies (for example, Tewari's paper on the Kaiga project in India and papers by Bockris, Graneau, and Fox on cold fusion). Other papers discussed past work that deserves to be reviewed for present applications (for example, Binder's paper on Russell's work, Montieth's paper about the Litraonics microscope, and Hayes' paper about the Tesla turbine).

Following are brief summaries of some of the presentations:

H. Aspden: The Physics of the Magnetic Energy Source

If current is run through a coil as a part of a transformer having an air gap, energy is stored in the air gap. Aspden's

point is that energy is stored in the air gap, and under proper conditions, the energy could be tapped and used before it is returned to the environment. Aspden claims that the Adams and Tewari over-unity energy machines use this energy. Another anomaly is that if a magnetizing force H is applied to a magnetically permeable material, a small amount of H provides a large increase in B-H, up to a certain level. Above this level, an increase in B-H is achieved only with a considerable increase in H. Aspden suggests that this region of higher magnetization is seldom used by the engineering profession and that this is the region that is available for tapping vacuum field energy.

R. McAllister: Precision Spark Injection Business Opportunity

McAllister gave an excellent presentation showing how arrays of solar collectors (patterned after a design by McDonnell Douglas) could be used to produce hydrogen gas by the disassociation of water. The hydrogen gas could then be used to power homes, automobiles, and industry. McAllister ended his presentation by showing a new type of spark plug or injector that could be used to power engines that could then use a variety of fuels from gasoline to propane to natural gas to hydrogen.

H. Fox: Impact of Cold Fusion and Other Enhanced Energy Systems

Each attendee was provided with a copy of this paper; therefore, the lecture covered some of the various ways in which cold fusion has been developed and is developing. Several types of devices were shown on an overhead projector, and a brief explanation was given on the development of each device.

H. Puthoff: Quantum Zero-Point Energy, Condensed-Charge Technology, and Engineering Applications

Puthoff presented an excellent review of quantum energy, ZPE, and the many scientific discoveries that have led to a more general acceptance of ZPE. Puthoff cited Lamb shift (quantum fluctuations), changes in rates of spontaneous emission, atomic ground-state stability, and the Casmir forces as substantiating the concept of space energy. Puthoff covered some of the means by which excess energy has been found that were related to ZPE, especially the work of Ken Shoulders and his own work.

M. King: Principles of Cohering the Zero-Point Energy

King is the author of *Tapping the Zero-Point Energy*, which is available from the author. This book contains about 200 references to peer-reviewed scientific literature. With such references, one is able to guide a discussion on ZPE with any scientist and remain within the field of acceptability. King's collection of slides covers both theory and application of ZPE.

J. O'M. Bockris: Cold Fusion

Bockris presented an excellent talk on the state of the art of cold fusion. He cites work at Texas A&M University, where a large quantity of tritium has been created by a Pons-Fleischmann-type cell. He also gave some interesting historical background on Pons and Fleischmann. Bockris cited R. Mills as reporting tritium production as a function of the time of electrolysis. Bockris emphasized the value of pulsing the electrical current and also of making increasing corrective changes to the input electrical current level on a daily basis. Bockris states that the theory is difficult. Many scientists have taken the attitude that the Coulomb barrier cannot be penetrated, and therefore, cold fusion must be wrong. However, that approach is based on experiments with plasma. In a metal lattice, the situation is very different. The theory must involve metal lattices, screening by the large flow of electrons, and even the presence of various electrostatic or electromagnetic fields.

G. A. Fisher: Review of Viable Over-Unity Systems

Fisher is the vice president of Fisher Electric Motor Technology in St. Petersburg, Florida. His presentation was mainly about a version of the Papp noble gas engine. The principle of the noble gas engine is the use of a combination of helium, neon, argon, krypton, xenon, and possibly radon. These gases are normally considered not to undergo chemical combinations. Therefore, under the conditions of use in the engine, the noble gases do not combine and become lost in the system. Usually, an existing engine is modified so that the gases that are put into the engine are protected from being exhausted; in other words, the entire piston, cylinder piston rod, and probably the crankshaft compartment are sealed. The engine is operated by some combination of a low voltage followed by a high voltage fed to a special sparking device. When the spark or gas plasma discharge interacts with the noble gases, the gases expand rapidly and force the piston down the cylinder.

The proceedings of this symposium are available from the International Association for New Science, 1304 South College Avenue, Fort Collins, Colorado 80542.

Hal Fox

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May 20, 1993