

FUSIONfacts

A Monthly Newsletter Providing Factual Reports On Cold Fusion Developments

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Fusion Facts Now Reports on Both Cold Fusion and Other Enhanced Energy Devices.

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The ICCF5 PROCEEDINGS
is now at the printer for publication. They
will be sent before the end of December to all
ICCF5 participants. Extra copies can be
ordered for \$199 directly from the publisher
ICCF5 % IMRA Europe S.A., 220 rue
A. Caquot, 06560, Valbonne, France.

COMING IN FUTURE ISSUES!

1995 Scientist of the Year
Cold Fusion > 100 times input
Magnetic Motors > 200% Efficient
*Devices that Transform Ether
Power into Electrical Power*

A. THE BASIC FACTS OF OUR FIELD

By Peter Glück

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

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

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

- The McKubre cell, having a Pd rod as cathode, needs
weeks to trigger the reaction; typically 2 W excess heat are
obtained for a cathode of 2.5 grams;

- The Patterson Cell (displayed in October 1995) needs a few
hours to start and delivers 5 W excess for 40

milligrams of metal coated on the "metal plated microsphere catalyst." Productivity of the Pd rod is 5/2 compared to 2500/40 = 156 times greater for the catalytic cathode of plated beads.

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

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

The Arata Cell connects "wet" and "dry" systems. The proton conductors do the same in the realm of electro-chemistry.

Two strange related processes support this vision:

- The Reifenschweiler phenomenon a 'negative' nuclear process, decrease of radioactivity of tritium embedded in nanometric (i.e. catalytic!) titanium.
- Sonoluminescence -- light emission from cavitation bubbles -- is a phenomenon in great part unexplored and lacking a theory.

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

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

CLASSIFICATION OF EXCESS ENERGY SYSTEMS AND DEVICES

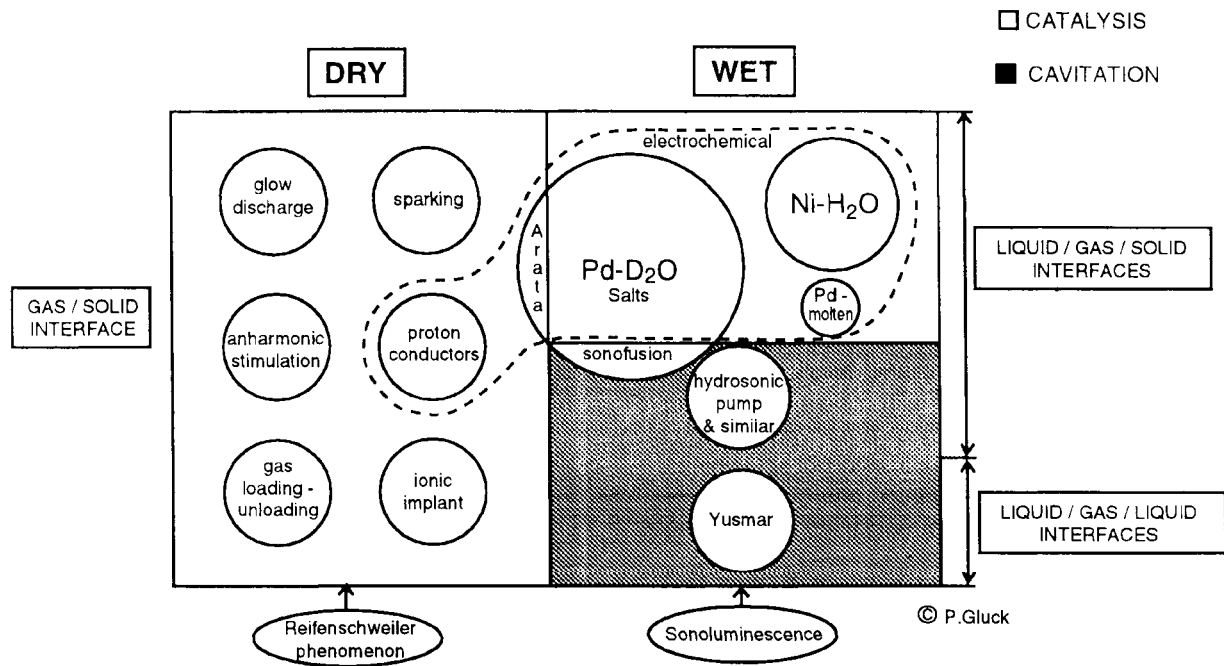


Fig. 1

cases and why. In the same time, for other systems the technological future is bright with a high degree of certainty.

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

Electrochemical systems.

1) There are troubles with the "classical" Pd/D₂O system -- the devices with compact cathodes are not good at generating catalytic centers and are not predictable or reliable. It's more an art than a science to work with them and, in my opinion, nothing can be changed. The systems are too sensitive and vulnerable to be used commercially as such. I think that it is a great loss that so much effort is focused on this subfield (e.g. the Japanese NHE program, at least the visible part of it). These devices have scientific potential but no technological perspective. It is now obvious that the very high value of the D/Pd ratio is not an asset *per se* but a requirement for the birth of active sites; the more engineered systems do not need it.

2) Improved Pd/D₂O systems -- the Arata Cell is a fine combination of a wet system with a complex double-cathode inside which deuterium is in contact with dry, hyperfine palladium. It is efficient and reliable. I dare to suggest that it would work even better with Pd-based catalysts protected by very thin Pd membranes. The Patterson Power Cell™ has a variant with Pd as active metal but it seems that the cheaper Ni/H₂O variant is preferred.

3) Ni/H₂O systems -- there is no new data regarding the Mills/Hydrocatalysis Power Corp. developments. It seems they have used cathodes made from extremely long Ni wires, obviously not the best choice when the number of catalytic centers is the critical factor. A more complex, extended, developed surface would be better. According to

this criterium, the Patterson Cell is "good." As seen from Hal Fox's analysis, published in *Fusion Facts*, Oct. 1995, if current density is increased above a limit, the performance is decreased -- that's because the number of energy generating points is constant and is the limiting factor. Increasing the temperature is beneficial for productivity -- the turnover of the catalytic centers is increased.

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

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

b) It was repeatedly suggested that lithium is a part of the fuel. If it is true, significant differences have to be shown when working with isotopically pure Li⁷ vs. Li⁶. The fundamental question: NUCLEAR or NOT NUCLEAR will get an answer and this may happen very soon!

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

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

Non-electrochemical systems.

6) The Stringham-George sonofusion system combines cavitation and catalysis -- the ultrasound activates the surface of the Pd target. Obviously, it is an interesting and apparently efficient system if the destructive side effects are under control. The information available about the functional parameters and performances is scarce.

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

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

-the ionic implant system of Kamada.

Both are "one-shot" systems characterized by ephemeral functionality due to a very limited reserve of gaseous fuel

which is suddenly discharged/used and after that the system is 'dead'. The scientific aspects are important, e.g. Kamada has demonstrated the very local character of these heat-generating processes.

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

11) The system of anharmonic stimulation of Piantelli et al. -- it appears to be a kind of technological optimum, based on the controlled generation of copious active sites. The mechanism described in their recent patent (see page 14) is in perfect accord with our surface dynamics.

Cavitation Systems

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

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

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

B. A VISIT WITH KENNETH SHOULDERS

By Hal Fox

What do most people talk about when they visit? Politics, People, Sports, and Sex, the last being perhaps the leading topic. Not so with Ken Shoulders. Here is the substance of our discussion. In review Ken stated, "There will be an elevation of the social system, elevation of man's social level by man's use of power. There will be an even distribution of power availability."

As we sat there at breakfast in the Residence Inn in Anaheim, California (a short walk to Disneyland or the Anaheim Convention Center) we were trying to come up with a simple phrase of the coming energy revolution. **Citizen Accessible** was the best I could do. The essence of our discussion is that technological developments and government actions are spreading power, communications, and government services to the people.

Those of us who have witnessed the short-term interference of DOE minions in trying to thwart the development of cold fusion, would not recognize that power is being spread to the people. Consider this: What is the power of your transportation compared to your parents or grandparents? What is your standard of energy living (power consumption) compared to those same forbearers? The government actions that have spurred energy development are numerous and range from the Army Engineers building dams to the Rural Electrification Administration ensuring that rural homes and farms are also served with power.

The same scenario is also seen in communications. The phone companies operate under some type of government supervision over public utilities. In most countries the government directly owns and operates the phone company (such as in England, France, and Germany). In America we have government regulation mixed with some degree of capitalistic freedom. The result is the best communications facilities in the world. These communications are rapidly improving with the laying of millions of miles of fiber optic cables.

The spread of government services to the people may not be so easy to defend. We didn't discuss that concept. However, consider that the government has made such things as poison control centers and heart-attack treatment centers available to more and more of the population. Here are some others (some more controversial than others) mental health, job service, aid to the handicapped, school lunch, aid to single-parent families, national parks, wild-life protection, etc. Add your own.

The most interesting concept that Ken declared is the following: The growing development of new energy systems will bring about a new method of taxation: taxing you for thermal pollution. **Ken suggested that our children or grandchildren will consume ten to twenty times as much energy as is consumed today by the average American.**

As we supplant the burning of fossil fuels with other forms of energy there will be less gasoline to tax, less fuel oil to

tax, and less natural gas to tax. How do you tax the use of space energy or tax the operation of a cold fusion furnace? Government will tax that one unavoidable byproduct of power - thermal pollution. Similar laws are already in place for other types of pollution. It won't take but a few legislative minutes to tax the thermal energy that you produce.

We discussed the magnitude of thermal pollution and what could be done. If you think that the CO₂ and global warming is a problem with the burning of fossil fuels, what will be the global warming problem when we begin to produce several new kinds of thermal-polluting devices? We have a choice. We melt the ice caps and bury Manhattan Island under a few feet of water **or we get rid of the thermal pollution.** And the nice part is that you will pay to do it.

If you have a good quality bowl built like a Thermos™ bottle, you can fill it with water, set it outside on a hot July night where the water surface can see the sky, and freeze water. For those of you who have solar collectors, plan on putting them on the north side of your house and pointing them at the sky where the sun is not shining. Then you get an idea of the type of technology that we will be seeing in the not-too-distant future.

"Reduce your tax burden with **Thermal-Emit!** Call or fax us now for a free estimate," is likely to be an ad on your children's or grandchildren's holographic television set and on the InterNet. Everyone will have to participate in the control of thermal pollution and, in addition, chip in enough to pay for all of those wonderful government services that lie at the heart of all government bureaucracies.

Well there you have an idea of what type of discussion one can have with Ken Shoulders. Oh yes, we talked about new energy developments, but that is another story. Sex, Sports, Politics, People? We just didn't get around to those subjects. Those topics seem to be well covered in the media. An afterthought: We don't seem to love the IRS. I wonder what our grandchildren will have to say about the ITPS (Internal Thermal Pollution Service).

A CHRISTMAS POEM

THIS YEAR WAS IT!

By Hal Fox

"Two years from now," I always say
When asked about Commercial Day. [1]
And then you'll hear a lot of hype
About the newest prototype.

"The first will come from Martin and Stan," [2]
Would have said any betting man.
Or others said, "Without a ban,
We'll be importing from Japan." [3]

Who would have thought they'd do so well
With a **Patterson Power Cell™?**
None of us, even a hexler,
Except just one: Jerry Drexler!

"I had the same observation
In my patent application.
If you want to learn some more
See my talk: ICCF-4." [4]

After all this energy dearth
You've been around to see **the birth.**
For six years you've read it here: [5]
CF applications are near!

We waited long, and we've been scoffed,
But always held our heads aloft.
We'll laugh, hearing that plaintive song:
"We knew it was true all along!"

Happy Holidays, faithful few; And have a Happy New Year too!

If God is willing, we'll be here
And read another poem next year. [6]

NOTES FOR NEW READERS:

[1] The day when cold fusion will be commercial.

[2] Martin Fleischmann and Stanley Pons.

[3] Japan was the first country to provide serious monetary support for "new hydrogen energy."

[4] Jerome Drexler, "Electrodeless, Multi-Megawatt Reactor for Room-Temperature Lithium-6/Deuterized Nuclear Reactions," Frontiers of Cold Fusion, ICCF-3 Proceedings, Nagoya, Japan, 1992, pp 663-666.

[5] *Fusion Facts* has been published monthly since July, 1989.

[6] The traditional holiday poem by our editor.

C. EDITORIAL

YEAR-END ROUNDUP

December, 1995, the end of the sixth full year after the announcement of the discovery of cold nuclear fusion (at least we think it is nuclear.) Denied, ridiculed, and buried by the most prestigious array of skeptics, "new hydrogen energy" has survived, developed, and achieved the status of a new potential industry as measured by willingness of a Fortune 500 company to buy a million dollar license.

New hydrogen energy is currently best typified by its most productive embodiment in the Patterson Power Cell™ (PPC). The latest PPC provided sixteen times as much thermal power output as input electrical power under the most conservative measurement conditions. Although there are some who are trying to make believe that in the time that it took to measure flow rates and temperatures between control and active PPC, there was dramatic changes in operating conditions. These suggestions were apparently made by latter-day members of the fusion equivalent of the flat-earth society.

So what else is new? **Space energy or an energetic aether** isn't new but it is newly recognized as the possible source of some enormously interesting and challenging new inventions: magnetic motors that are 200% to 400% efficient. Two patented motors, similar to the standard motors but dramatically different in efficiency have been patented and further developed by Yasunori Takahashi and Teruo Kawai of Japan.

Other developments include other means by which the energetic aether or space energy can be tapped. Experimental results are not as yet covered by patents so that public announcements are pending. In the same category is the further development of low-energy nuclear transformations (modern-day alchemy is an immediately understandable phrase but one that arouses immediate dismissal from much of the scientific community).

What is the commonality among these several discoveries? **Answer: They are all contrary to the current academic models of physical reality!** Strange it is that the ivy-covered bastions of science where professors praise their inventive predecessors for discovering and fighting for the acceptance of new scientific principles are also the centers of immediate condemnation for new discoveries. **A new discovery that forces model changes should be just as welcome as a new model of an automobile, not condemned.**

This technological review is being written on the 93rd anniversary of the first manned aircraft flight by Wilbur and Orville Wright at Kittyhawk. At first condemned as being of no consequence, this technology has grown such that today's passenger airplane has a wing span larger than the length of the first manned flight. Only the historians remember the names of those who scoffed at Wilbur and Orville Wright, but most high school students know who the "Wright Brothers" were. So will it be with the new discoveries of Pons, Fleischmann, Takahashi, Kawai, and others who are the discoverers of new energy devices.

Some new facts have emerged and or have been experimentally augmented during the past year:

1. Nuclear reactions are not limited to gas plasmas with sun-like temperatures.
2. The concept of an empty aether is replaced by an energetic aether after 80 years of being banished.
3. The Law of Conservation of Energy is still valid and devices that tap the energetic aether are Energy Transformers not perpetual motion machines.
4. There will be a resurgence of academic studies of magnetism as an interaction between ferromagnetic substances and an energetic aether.
5. Low-energy nuclear reactions and tapping the energetic aether are the power sources of the future.
6. The concept of an increasing demand for burning fossil fuels is outmoded and all current demand and supply prognostications for the energy future are outmoded and can be filed with studies on the supply and demand for whale oil.
7. Zero-emission vehicles will rapidly replace internal-combustion engines with or without Detroit's big-three support.
8. A forecast: Future taxes will be levied on thermal pollution.
9. Etc.

1995 has been the year in which new energy sources have been demonstrated to have commercial potential. The one-watt challenge has been met and greatly exceeded. However, 1995 is not the year in which these new discoveries will be acceptable to the academic community of scientists. That will come as corporations, involved in the production of new energy systems, encourage academic institutions to teach their employees (and potential employees) some of the concepts of enhanced energy systems.

D. NEWS FROM THE U.S.

CALIFORNIA - POWER-GEN '95 CONFERENCE

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

By Jed Rothwell

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

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

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

The flow calorimeter reservoir holds 2.5 liters and the flow rate is set between 1.0 and 1.5 liters per minute. A control cell is mounted parallel to the hot cell. The flow to both cells is regulated with precision valves. The reservoir and pump consist of a Magnum 220 aquarium pump with a micron filter attachment, with an additional Lucite cylinder built on top of the pump unit to hold a cooling coil, gas trap, and a 3.5 watt computer cooling fan. Water is circulated by a magnetic impeller pump, driven by a 50-

watt motor mounted underneath. Static in-line mixers ensure mixing. (These are plastic objects about an inch long with vanes to stir the flow.) A few weeks before the conference, Cravens decided to increase the flow rate in order to keep the temperature below 50 degrees C. The new flow rates exceeded the capacity of his flowmeters. He was not able to procure a bigger flowmeter in time for the conference, so no flowmeter was installed. Flow was measured by turning stopcocks to redirect fluid from the cell outlet tube into a graduated cylinder for 15 seconds. This test was performed many times, and the flow rate was not observed to change measurable, except when it was deliberately adjusted between runs. The water hose from the pump is coiled in an air cooled box on top of the reservoir. Air is drawn through the box by the cooling fan. The pump, cooling fan and DC power supplies electrolysis all have one common AC cord, which is monitored by a Radio Shack analog AC voltmeter and a multimeter. Total power consumption by all components is 85 watts.

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

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

Later on, in subsequent tests, I was able to observe the machine closely, and to make direct measurements of its performance with my own instruments. I tested the flow rate on the cold fusion cell side several times. As noted above, I did not see any measurable variation except when the flow was deliberately changed from 1,300 ml to 1,000

ml per minute by closing the valves. I checked the thermocouple readings in the reservoir, inlet and outlet with two thermistors and a thermometer. They agreed closely with the thermocouple readings. The reservoir temperature can be taken by removing the cooling loop section on top and inserting the thermistor probe directly into the water. Measuring inlet and outlet temperature required a little more ingenuity. I confirmed the outlet thermocouple reading by taking a 250 ml sample of water from the outlet pipe during a flow test and immediately measuring the temperature before the sample cooled significantly. I confirmed the cold fusion inlet temperature by turning off the control side joule heater and taking a 250 ml sample from the control outlet pipe.

Here is some sample data:

Test 1, December 4, two hours

INPUT POWER

Measured AC: $0.7 \text{ A} \times 120 \text{ V} = 84 \text{ W}$

Electrolysis: $0.18 \text{ A} \times 8 \text{ V} = 1.4 \text{ W}$

OUTPUT POWER

Flow rate 1200 ml/minute (300 ml/15 seconds)

Delta T Temperature 16 to 17 deg. C

$1200 \text{ ml} \times 16 \text{ deg. C} \times 4.2 = 80,640 \text{ j/min} = 1,344 \text{ W}$

Test 2, December 5, afternoon, 30 minutes

INPUT POWER

Measured AC: $0.7 \text{ A} \times 140 \text{ V} = 98 \text{ W}$

Electrolysis: $0.02 \text{ A} \times 3.0 \text{ V} = 0.1 \text{ W}$

OUTPUT POWER

Flow rate 1000 ml/min (250 ml/15 seconds)

Delta T Temperature 6.7 deg. C

$1000 \text{ ml} \times 6.7 \times 4.2 = 28,140 \text{ j/min} = 469 \text{ W}$

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

from their own beads as well as beads provided to them by CETI.

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

FLORIDA - MAGNETIC HEAT PUMP

Frank S. Howard (Kennedy Space Center), "Magnetic Heat Pump Containing Flow Diverters," *NASA Tech Briefs*, Nov 1995, Vol 19, No 11, pp 81-82, 1 fig.

EDITOR'S SUMMARY

"Flows that mix heated and cooled fluid would be suppressed," is the one-line abstract. The basic concept is that a magnetic field in a heat pump is designed so that internal flows that tend to mix hot and cold portions of the pumped liquid would be suppressed. The details of the proposed pump mechanism are clearly displayed in the figure accompanying the article. No details are provided on anticipated efficiency of such a heat pump.

INDIANA - LOW ENERGY REACTIONS

Courtesy of Drs. Kim and Zubarev

Yeong E. Kim and Alexander L. Zubarev (Dept. Phys., Purdue Univ., West Lafayette), "Optical Theorem Formulation of Nuclear Reactions at Low Energies," presented at Symposium on Nuclear and Cluster Collisions with Low-Energy Beams and Their Applications, Sendai, Japan, 27-28 July, 1995; to be published in *Genshikaku Kenkyu*.

AUTHORS' ABSTRACT

We describe a new optical theorem formulation of low-energy nuclear 2-body and 3-body reactions. We obtain analytical formulae for the cross-section $\sigma(E)$ which exhibit explicitly the energy and charge dependencies of $\sigma(E)$ and may provide a better physical understanding of anomalous low-energy enhancement of $\sigma(E)$ observed in deuterated and hydrated metals and also in nuclear fusion reactions relevant for the primordial nucleosynthesis and stellar evolution. Effects of halo nuclear states on the anomalous low-energy enhancement of $\sigma(E)$ are also discussed. Our formulation can also be applied to sub-barrier heavy-ion fusion reactions.

MASSACHUSETTS - DOWN WITH ELECTRIC CARS

Richard de Neufville (Chairs Technology & Policy Program), Stephen R. Connors (Energy Lab Electric Utility Program), Frank R. Field III (Materials Systems Lab), David Marks (Program in Environmental Engineering Educ. & Res.), Donald R. Sadoway (Dept. of Mat. Sci & Engr.), & Richard D. Tabors (Lab for Electr. & Electromagnetic Sys.) all at MIT, "The Electric Car Unplugged," *Technology Review*, Jan 1996, pp 30-36.

EDITOR'S SUMMARY

The following three statements are highlighted as insets to the article: 1) "Looking under the hood, a team of experts say the electric vehicles being developed today are inadequate and expensive and won't even notably improve air quality. So why are California and other states mandating that they be sold by 1998?" 2) "Generating the electricity needed to run electric vehicles will worsen air quality in regions downwind of fossil fuel-burning power plants." 3) "Cost-effective batteries that can provide the desired range for electric vehicles may simply not be available in our generation."

A famous person, whose name I've forgotten, said, "If an expert tells you that something can be done, you should probably believe him. If an expert tells you that something **cannot be done**, then he is probably wrong." This team of authors "...assessed the total environmental and economic effects of the manufacture and use of electric vehicles made with different materials and powered by many types of batteries." In their judgement, "...the electric vehicle policy defined by the California Air Resources Board is neither cost-effective nor practical. ... the technology of electric vehicles is still far from meeting the needs of a mass consumer market and it is unclear when, if ever, it will do so." **This article is a wonderful example of the whale oil syndrome.** ["The Whale Oil Syndrome," *FF*, vol 6, no 12, June 1995, p 13.] "What can we possibly find to replace the whale oil?" was the cry when whales began to become less plentiful.

These highly competent professors have some excellent points to make. Where they have demonstrated their shortcomings is in technological forecasting of current technology. Some examples follow:

Example 1. Problem: The article discusses the problem of heating the car in winter in Massachusetts and New York where it may require as much energy to heat the car as to propel it. Solution: The **Patterson Power Cell™** has

demonstrated the ability to provide 16 times as much thermal power as used as input electrical power. Of course, it will require development and testing. **But that technology is ready to be commercialized.** Therefore, do not drain the batteries for heat.

Example 2. Batteries have a problem: Experience (such as with laptops) show that claimed battery performance is about twice the actual performance. Lead-acid batteries have an energy density of about 35 watt-hours per kilogram while gasoline has about 12,000 watt-hours per kilogram. Solution: The recent development of super capacitors has led to the technological forecast of the development of improved capacitors of a similar type that will have an estimated ten times the energy storage of a lead-acid battery. **The business plan for this development estimates about \$2.5 million and 12 to 18 months to achieve moderate-scale production.**

Example 3. Problem: "...electric vehicles do not eliminate emissions--they simply move them elsewhere." "...The fuel [burned in a power plant] loses up to 65 percent of its energy when it is burned to produce electricity; 5 to 10 percent of what is left is lost in transmitting and distributing the electricity before it even gets to the electric car." The authors make no comparison with the degree of pollution control mandated for power plants as compared to the pollution allowed by the diesel-burning cars and trucks. Solution: No mention is made of the possible use of new energy systems to charge the batteries on-board. For example, this publication has many times advocated that the future development of new technology, such as high-density charge clusters (Kenneth Shoulders' U.S. Patent 5,018,180), will provide the technology for non-polluting on-board battery chargers.

One solution, which will be as acceptable to MIT as cold fusion, is the use of the new high-efficiency electric motors.

The authors do encourage the development of other technological solutions. One solution, which will be as acceptable to MIT as cold fusion, is the use of the new high-efficiency electric motors. We suggest that the authors follow the progress of the two Japanese inventors who are claiming the development of electro-magnetic motors that are 200 to 400 percent efficient. **If either the Teruo Kawai motor (patent EP 0 630 096 A1) or the Yasunori Takahashi motor (*The Sunday Times*, 10 Dec 1995) is as efficient as depicted, then the technological revolution to**

replace outmoded fossil-fuel vehicles has begun in earnest. [see pages 15-16.]

WASHINGTON D.C. - C.F. AT COSMOS CLUB

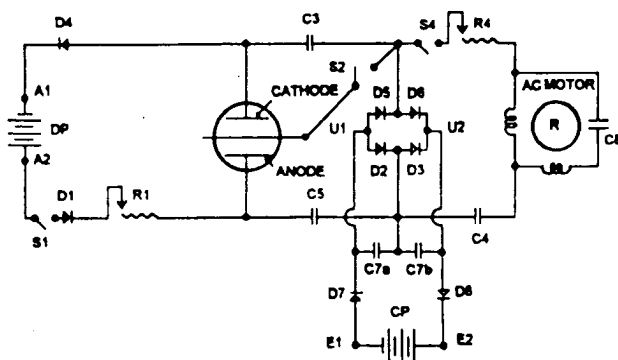
On Friday, 20 October 1995, Dr. David J. Nagel, of the U.S. Naval Research Lab, spoke at a meeting of the Philosophical Society of Washington. In the promo for the meeting, he said that the cause of cold fusion's poor public image is "a variety of mistakes by scientists and the government, and the unwillingness of journal, magazine and newspaper editors to pay attention to the topic." He mentioned the hundreds of people worldwide who are working on cold fusion research, the 200 attendees of the ICCF5 (half of whom had industrial connections), and the active experimental programs in Japan, Russia, India, and China.

Dr. Nagel presented some of the research data which, in his words, "cannot, in the opinion of the speaker, be attributed to fraud or error." The data indicate that nuclear reactions are behind some of the observations, and research needs to be funded, said Dr. Nagel.

E. NEWS FROM ABROAD

CANADA - IMPORTANT PATENT

US 5,449,989 "Energy conversion system;" Paulo N. Correa, Alexandra N. Correa; 12 Sep 1995; 15 Apr 1993. An energy conversion device includes a discharge tube which is operated in a pulsed abnormal glow discharge regime in a double ported circuit. A direct current source connected to an input port provides electrical energy to initiate emission pulses, and a current sink in the form of an electrical energy storage or utilization device connected to the output port captures a least a substantial proportion of energy released by collapse of the emission pulses. [See following article by Dr. Aspden]



ENERGY FROM A COLD-CATHODE DISCHARGE: A 30-YEAR SAGA

By Dr. Harold Aspden

The experimental discovery reported in U.S. Patent 5,449,989 (Inventors: Paul N. Correa and Alexandra N. Correa) affords me great personal satisfaction because it confirms my efforts on a related theme. *FF* readers may find the following reminiscences of interest.

Thirty and more years ago, I was researching the connection between the force of gravity and electrodynamics and in 1966 was ready to report a significant advance in that research. I published in that year the second edition of my book The Theory of Gravitation with a concluding chapter on the 'Electrodynamic Law of Force'. It discussed the anomalous forces discovered in the cold-cathode arc discharge and though saying that a full discussion was beyond the scope of that book it justified reference to the topic by explaining that this was "because the law of electrodynamics has the most immediate practical implications, and that these were as important to mankind as understanding gravitation."

I knew that the secret of linking gravity with magnetism was wrapped up with the anomalous energy activity that powered those very powerful anomalous forces. I also knew (as one can see by reading about mercury vapor lamps and discharge processes on pp. 6-59 to 6-61 of Condon and Odishaw's 1967 second edition of the Handbook of Physics) that such "discharge tubes have a negative current-voltage characteristic; hence the current will increase without limit for a constant applied voltage and the tube will be destroyed unless some means are taken to limit the current."

From my onward reading I found that physicists did not really understand the processes underlying these discharge phenomena and in 1977 I became bold enough to express my revolutionary opinions on the subject in a paper which, after close referee scrutiny and extension upon revision, was published in the *IEEE Transactions on Plasma Science* (p. 159, September 1977). To back up that publication and merely to assure independent publication of certain further practical implications I filed a U.K. patent application on August 18th 1977 which was later published as GB Patent Application No. 2,002,953.

It showed how the anomalous electrodynamic action could be harnessed to generate heat in an ion discharge chamber to yield power and how ions could be accelerated in a 'free energy' electrical charging process. I was then employed by

IBM and it was not appropriate for me to venture into such a controversial technological diversion, even in my private time and at my own expense, but my conviction took precedence on that occasion and I assured IBM that I was merely aiming at a publication in my own name for the public record.

I am glad I did this because later I heard of the experimental breakthrough by Geoffrey M. Spence (U.S. Patent No. 4,772,816, issue date September 20, 1988). He generated electric power on an 'over-unity' basis by using an ion accelerator that allowed an electrodynamic build-up of energy to grow as a space charge which was then tapped to draw electrical power output. The device in its broader sense accorded with one of the claims of my earlier 1977 patent application. Perhaps, Spence's research, though sponsored, may be in limbo owing to his problems of electrode burn-out after several hours operation of the devices he built.

Also, I was further encouraged when the Russian *Novosti Press Release* in 1989 (No. 03NTO-890717CM04) drew attention to Professor Chernetskii's discharge device which had been verified as generating 3 kilowatts of power with a 700 watt input. I have been awaiting further news on that Russian research, but that news release also stated that a one megawatt sub-station at the Moscow Aviation Institute was 'burned-out' when the discharge currents in a 'powerful plasma unit' reached criticality and set up a superstrong current that went back into the network. Maybe that has deterred onward research!

More probably, however, much of the difficulty with this subject vests in the question put in the summary of that news release: "Where does this mysterious energy come from?"

So now we are confronted with the Canadian breakthrough and I am mindful also of the recent reports on Dr. Win Lambertson's apparatus, which I see as quite closely related. Also I well recall the 1988 New Energy Technology symposium held by the Planetary Association for Clean Energy (Quebec, 1988), where I met Leon Dragone, now deceased, who I understood to be a college science teacher. He there described his experiments which demonstrated the energy anomalies of setting up an oscillatory discharge through an inductor connected to feed a load through an arc discharge, the anomaly being that of negative heating or cooling transferring energy into an enhanced current activity in the cool (white arc: anomalous oscillation) discharge but not in the blue (hot arc: no oscillation) discharge. Dragone, I know, did other research

on an over unity electric motor, which I believe warrants special scrutiny in our onward efforts.

Unquestionably, on the gas discharge theme, over-unity energy generation by a gain factor well exceeding 3:1 is in evidence from these various independent research pursuits. At last I can, from the data in U.S. Patent 5,449,989, begin to match experiment with the theory disclosed in my GB Patent Application No. 2,002,953.

The relevant formula on page 3 of that specification shows that ions tap 'free energy' to become accelerated 'anomalously' to speeds which increase with ion current i but are 10^7 cm/s when i is of the order of 5 or so amps. A discharge carried by ions (mass of the order of 10^{-23} gm) moving at such a speed and conveying the current i , would then represent power (as kinetic energy to be absorbed against a back EMF) increasing in proportion to i^3 , but of kilowatt order at 5 amps. The data in the Correa patent fit well with this interpretation and I am indeed gratified to see that my theoretical work is referenced in the patent specification as highly relevant background support.

I really believe that, after 30 years, the link between 'free energy' and gravitation is now emerging.

That Russian news release included the words "What if vacuum energy shows the road at last to the long-awaited Grand Unified theory?" I really believe that, after 30 years, the link between 'free energy' and gravitation is now emerging. Meanwhile, however, let us focus on the primary task of exploiting the new energy resource.

Harold Aspden
Sabberton Research
P.O. Box 35, Southampton S016 7RB, England.

HUNGARY - EINSTEIN'S SECOND POSTULATE
Courtesy of Dr. Gazdag

Lázló Gazdag (Janus Pannonius Univ., Pécs), "Einstein's Second Postulate," *Spec. in Sci. & Technl.*, vol 18, 1995, pp 150-152, 1 fig.

AUTHOR'S ABSTRACT

The Michelson-Morely experiment. In 1905, Einstein published in the *Annalen der Physics* his article entitled "The Electro-dynamics of Moving Objects," in which he

elaborated on the theory of special relativity. The theory is built on two postulates:

-- Postulate One: All motion is relative (this is easy to understand)

-- Postulate Two: The speed of light is constant in all inertial systems.

This second postulate causes the biggest headache, because 'it goes against all reason.'

Einstein started out from Michelson's experiment that had been carried out in 1883 and then repeated by Morely in 1887, which refuted the idea that there is an absolutely inert aether. It turned out that there is no such static medium which, in any case, would have to have unusual characteristics.

This inert aether would have to be super-fine, after all the planets move in it without any reactive force, and yet it would have to be super hard (solid), since light is a transverse wave and such waves only travel in solid objects.

...Flow, wave propagation. Flow characteristics of the super fluid medium have been revealed by Piotr Kapica using an ingenious experiment. He stated that physics has to progress in two directions, one is to the sources of energy, the other is to research into low-energy condensed mediums. History, the war and the cold war have interrupted progress, and research into atomic energy came to the fore, while the problem of low energy condensed mediums were forced into the background.

... Let us suppose that the aether does exist and has a quantum structure, in the form of a very dense but superfluid field. Let light cause its vibration. The source of light vibrates the components in various states of motion all at the same time, but those in a different state propagate with a different speed. We can also say that electromagnetic waves do not only have frequency spectra, but also have speed spectra.

... In the inertial system of the observer, there are always motionless aether components in relation to himself. In this inert segment, waves with c velocity exactly propagate towards the observer and he sees them. If the observer is in motion, then other segments will be inert in relation to him, and now he observes their vibration.

EDITOR'S COMMENTS

Gazdag has an interesting concept. We do know that in the late 1920's Michelson & Gale showed that the earlier Michelson-Morely experimental results were in error. That

the aether could have both a frequency and a velocity spectrum is an interesting concept. A challenge to our readers: How can we easily test this concept?

INDIA - THEORETICAL IMPLICATIONS

Courtesy of Dr. Afsar Abbas

Afsar Abbas (Inst. of Physics, Bhubaneswar, India),
"Implications of Theoretical Ideas Regarding Cold Fusion."

AUTHOR'S ABSTRACT

A lot of theoretical ideas have been floated to explain the so called cold fusion phenomenon. I look at a large subset of these and study further physical implications of the concepts involved. I suggest that these can be tested by other independent physical means. Because of the significance of these, the experimentalists are urged to look for these signatures. The results in turn will be important for a better understanding and hence control of the cold fusion phenomenon.

Since the initial claims, counterclaims and confusion of 1989, the field of "cold fusion" has settled down as a reasonably well pursued field all over the world as evidenced by several recent conferences and publications [1-7]. Perhaps not surprisingly, it has turned out to be a tough field experimentally as much as the results viewed globally are quite sporadic and the optimum conditions are still unknown. However, the bottom line is that whether conventional cold fusion or not, excess heat and/or neutron and/or He^4 etc., are being produced often in uncontrolled and unknown ways.

The theoretical situation regarding the cold fusion phenomenon is no better than the experimental situation described above. As many ideas as practically the number of people caring to work in this field have sprung up (see ref. 5, 8-10 for review of some of these). Several of these are in direct conflict with each other. One would like to bring some order in these to facilitate further understanding. A consistency study of a major subset of these theoretical ideas is the purpose of this paper.

The end result or a major input or requirement of a large number of theoretical papers to explain the cold fusion phenomenon (as a sample and review see 5, 8-10) is the following:

(a) The average separation of the deuterons in the D_2 molecule under the conditions prevalent in the cold fusion

experiments decreases (by say a factor of five) from the equilibrium distance of 0.74 Å.

(b) The average distance between the electron and the D nuclei decreases from the free space value of 0.5 Å under the cold fusion conditions.

(c) Both (a) and (b) are inseparably mixed up.

Given a model which falls in one of the above categories what more can one say about it? Certainly such interesting situations as stated in (a), (b) and (c) besides leading to an enhanced rate of fusion at low temperatures should have other physical implications. As we shall see it is indeed so. Below I shall suggest further experiments which should be able to say whether one of the above is taking place or not and hence should have implications for a better understanding and control of the cold fusion phenomenon.

Let us look at a linear molecule (with D_2 molecule as a prototype). Let the nuclear spin be I^- and the molecular rotational spin be J^- . With $F^- = I^- + J^-$ one finds that [11] the quadrupole interaction energy is given by

$$W_{Ez} = \frac{e^2 q_J Q}{2I(2I-1)(2J+3)(2J-1)} \left[C(C+1) \frac{3}{8} - \frac{I(I+1)J(J+1)}{2} \right]$$

where

$$C = F(F+1) - I(I+1) - J(J+1)$$

Here Q is the quadrupole moment of the nucleus and q_J is the molecular field gradient along the symmetry axis. In general, it is not easy to determine q_J for a molecule but it can be easily done for D_2 [12, 13]. For D_2 it is given as

$$q = \frac{-2Jq^1}{(2J+3)}$$

where

$$q^1 = \frac{1}{R^3} - \frac{1}{2} \int d^3r \rho(R, r, \theta) \frac{3\cos^2\theta - 1}{r^3}$$

Here R is the internuclear distance, ρ is the electron charge density, r the radius vector from a nucleus to the charge and θ is the angle that r makes with the internuclear line. The average has to be taken over the lowest molecular vibrational states. q_J can be obtained for D_2 in free space [12,13]. The quantity $e^2 q_J Q$ is called the quadrupole interaction constant and can be determined experimentally very precisely [11]. Historically by putting in the value of q_J the value of the quadrupole moment Q of deuteron was discovered the first time this way [14].

Now let us reverse the argument. Let the quadrupole interaction energy for D_2 molecule be determined experimentally under the conditions prevalent in the cold

fusion [1-7, 10]. As stated earlier we expect to detect major differences from the free D_2 value. Let us make a reasonable assumption that the value of Q is not affected. So any change in the quadrupole interaction constant will be attributed to change in q_J . One may then view this as a manifestation of categories (a), (b) and (c) as discussed earlier. After the experimental information is available, then it may turn out that it is reasonable and fruitful to view it as entirely due to only one of the categories of either (a) or (b). This will quite clearly make the analysis much easier. However, it is more likely that it is category (c) which has to be invoked to understand the data. This means that the aspects (a) and (b) may not be isolated by a study of the quadrupole interaction energy.

To isolate the effects given in (a) and (b) individually in addition to the determination of the quadrupole interaction energy, one has to suggest other experiments to do the job. In principle there may be several possibilities. The magnetic hyperfine interaction may be used to do this [11]. However, the effect visualized in (a) may be most easily isolated by studying the change in rotational spectra of D_2 under the cold fusion conditions [11].

In summary, above I have isolated interesting theoretical aspects of the cold fusion phenomenon. They are simple and have implications which can be experimentally tested through the study of hyperfine spectroscopy. Large effects are expected under the conditions prevalent during the cold fusion. I believe a proper experimental study as suggested here will help in clearing the cold fusion situation, both experimentally and theoretically.

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EDITOR'S COMMENT

What if the reactions are not d+d, but Li⁶+d, as suggested by Jerome Drexler?

INDIA - FREE POWER GENERATION

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

AUTHOR'S INTRODUCTION

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

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

EDITOR'S COMMENTS

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

ITALY - ANHARMONIC FUSION PATENT

WO 95 20816 "Energy generation and Generator by means of anharmonic stimulated fusion;" Francesco Piantelli; 3 Aug 1995, 27 Jan 1994.

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

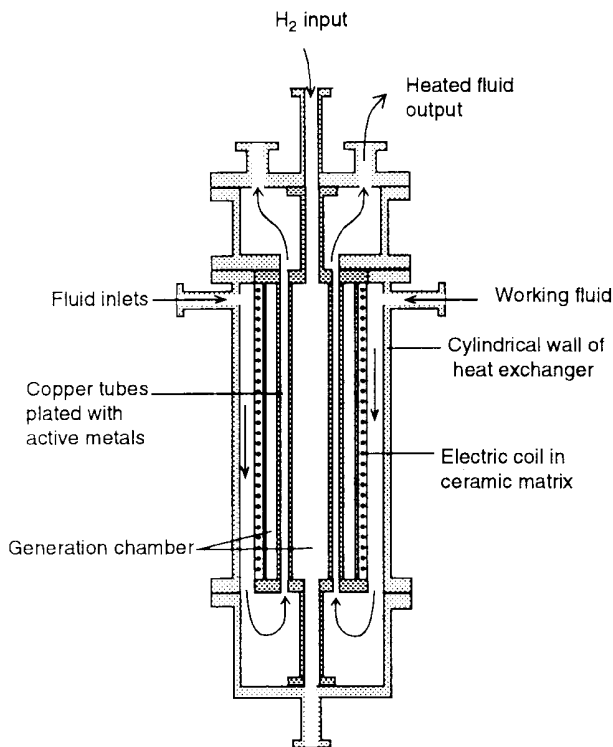
RE: THE PIANTELLI PATENT

A letter from Dr. Collis, Italy

12 November 1995

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

The energy generating process is based on 4 steps. The charging step loads the active core (for example pure nickel, nickel plated on copper, nickel alloy etc.) with natural hydrogen containing the usual 150 ppm deuterium. The heating step raises the temperature above the critical Debye temperature. The patent lists these Debye temperatures for a range of pure metals and alloys. The startup step induces vibrational stress and activates Cold Fusion of the hydrogen isotopes. Six startup methods are documented - thermal stress, mechanical impulse, electric striction, laser pulse, radio-frequency, ultrasonic-vibration. If the active core is ferromagnetic, for example nickel or



steel, a 100 millisecond pulse can be applied to the heating coil to initiate fusion. Once fusion is underway, the ultrasonic vibrations of the core sustain themselves without external stimulation forming stationary waves in the core. This forms the heat exchange step. The shutdown step can be brought about by either reducing the temperature to below the critical Debye value or by disorganizing the oscillations in some way. The reaction would also cease if the temperature were raised sufficiently to destroy the crystalline structure of the core. The patent vaguely notes that unspecified radio-active isotopes result from shutting down the reaction.

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

JAPAN - ELECTROMAGNETIC EUREKA

Courtesy of Mark Goldes

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

SUMMARY

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

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

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

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

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

Michael Laughton, a London University professor of electrical engineering is impressed, saying "It is an

incredible machine. Takahashi seems to have developed an extraordinarily efficient electric motor and control system which in principle, could be scaled up for an electric car."

JAPAN - TAKAHASHI MOTOR RELEASED

THE TAKAHASHI MAGNETS AND MOTOR

By Mark Goldes (CEO, Magnetic Power Inc.)

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

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

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

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

The BBC's magazine article describing the first scooter prototype stated: "The motor was retrofitted with the magnets and the original batteries were replaced with four small 12 volt batteries (a 48 volt starting system). The scooter arrived in London with its batteries almost discharged. It was driven on a freeway at an estimated 70 mph. It was also reported that acceleration from zero to 30 mph took about 4 seconds.

The earlier scooter was demonstrated to a Senior Engineer at Nissan's European Technical Center who said that this invention: "If it checks out in our own tests, has huge implications for everything which uses a motor - it could revolutionize the world." He was given to understand that the batteries were only used to spin the motor up to a speed where it would continue to run without input. A video was shown by the inventor during my London visit **which**

showed a prototype with a drive belt turning an alternator. The motor was connected to a battery for starting and the battery was then disconnected. Two headlights remained illuminated after the battery was disconnected.

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

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

JAPAN - PULSED DISCHARGES IN WATER

Courtesy of Dr. T. Matsumoto

Takaaki Matsumoto (Dept. Nucl. Engr., Hokkaido Univ., Sapporo), "Extraordinary Traces Produced during Pulsed Discharges in Water," bulletin of the Faculty of Engineering, Hokkaido Univ., No. 175 (1995).

AUTHOR'S ABSTRACT

This paper describes experiments of electrical discharges in water, in which AC shots of up to 100 V were applied to wire electrodes of palladium and platinum. Various kinds of anomalous traces were observed on the nuclear emulsions. Some of them were similar to that which were observed in previous experiments of electrolysis cold fusion. Extraordinary combined rings were newly observed, suggesting that tiny ball-lightning was hopping up and down between the nuclear emulsions. The mechanisms of forming the traces are also discussed by The Nattoh Model.

F. ARTICLES FROM OUR READERS

CANADIAN BREAKTHROUGH ON THE ONE (KILO) WATT CHALLENGE

By Dr. Harold Aspden

Research by Dr. Paulo N. Correa and Alexandra N. Correa of Concord, Ontario, Canada provides convincing evidence of over-unity electrical power regeneration. (See abstract of their US Patent 5,449,989, p. 10).

In granting this patent the Patent Office therefore knew precisely that this invention was claiming something revolutionary in energy conversion and generation!

Their experimental data of record in the patent specification show numerous tests involving the discharge of a source bank of 12-volt cells as the powered apparatus recharges an output bank of cells and/or runs an electric motor. Within 20 minutes of typical operation 0.988 kilowatt-hour of energy is generated for an input of 0.258 kilowatt-hours. This is the first of many tests described and listed in data tabled in the patent which includes copious experimental detail along with 21 figures.

The 'one-watt challenge' has become history! This latest breakthrough makes 1995, as was expected, a year that will be one for readers of *Fusion Facts* and *New Energy News* to remember. It should also be remembered as a year in which the U.S. Patent Office granted a patent that so clearly demonstrated what scientists believe to be 'impossible.' Performance efficiencies are clearly shown in the figures by data plots on a scale that runs to 1000%. In granting this patent the Patent Office therefore knew precisely that this invention was claiming something revolutionary in energy conversion and generation!

I feel that if I try here to summarize the Correa invention I cannot accord it the justice it deserves. Readers will wish to read the patent specification themselves. It is U.S. Patent Serial No. 5,449,989 granted on September 12, 1995. Suffice it to say that the apparatus uses the pulsed abnormal glow of a discharge tube, which, as physicists well know, has a negative resistance characteristic. What physicists have not appreciated, until this Correa disclosure, was the real possibility or the knowledge of precisely how to go about extracting 'free' energy by exciting self-sustaining oscillations in the plasma discharge. Undoubtedly, Dr. Correa's Labofex facility in Canada will have mustered a great deal of know how from research on this project and

we will hear more as that work comes to commercial fruition. For my part I am indebted to Dr. Correa for his kindness in drawing this recently issued patent to my special attention.

EDITOR'S COMMENTS

Whenever sparks, arcs, or plasmas are produced, there is a high probability that high-density charge clusters are produced. As detailed in Ken Shoulders' U.S. Patent 5,018,180, these high-density charge clusters can be used to produce more than 30 times as much electrical output as electrical input. We applaud Dr. Correa for adding yet another new enhanced energy product to the growing list of products that have the capability to alleviate the world's energy problems.

REPLACE THE POLLUTING AUTOMOBILE

By Hal Fox, Editor

Dr. Hans Nieper, Sekretariat, The German Association of Vacuum Field Energy, has sent us documentation on the medical problems associated with the use of catalytic converters. An article in the German publication *raum & zeit* (no 78, 1995, pp 84-86), titled "Kat-Autox Schädigen das Immunsystem" by Dr. Hans A. Nieper details the problem. In a personal letter from Dr. Nieper, he summarizes the problem as follows: After citing the problems of nerve gas production of phosphoric acid esters and phosgene from catalytic converters, Nieper adds, "but especially by the tremendous depositing of platinum in the dust along the roads [of the heavily-traveled autobahns]. This [pollution] must well lead to a high lung cancer risk. I rang the alarm bell because of the platinum risk 10 years ago, publishing a book..."

Nieper continues with reports from Germany and Switzerland showing the high concentration of platinum dust along highways, "...and this after less than 10 years of extensive catalyst use!" Nieper continues, "To my opinion the consequences shall be that all platinum and rhodium catalysts be unmounted immediately." Although there is present work on non-platinum and non-rhodium catalysts, it is not soon enough. Nieper has this important warning, "Considering the platinum catastrophe and the nerve gas emission, the entire situation is certainly heading to a potentially major law suit."

The problem is no longer the lack of engineering or science. The problem is one of unwillingness to change at all levels of government and industry. All of the standard learning of the automobile fabrication industry that deals

Zero-pollution vehicles are the only sensible answer to the problems of automobile pollution.

with the fabrication of the body, frame, and interior are valid. All of the technologies relating to steering, wheels, bearings, brakes, and drive train remain valid. All of the electrical and electronic systems (except for engine ignition system) are still needed. What we need to strip out and replace are fuel tanks, fuel distribution, internal combustion engine, engine coolant system, and all of the pollution control and engine exhaust systems. The replacement parts required are an electric motor, motor controller, batteries, and battery charger. Some modification of heating and cooling the interior of the automobiles will be required.

INTERNATIONAL CONCERN: Not only are there concerns in Germany but also the problems are expressed in a copy of letter from Marosli Ghazalli, CEO of Ventrigrates Sdn. Bhd. of Kuala Lumpur, Malaysia. Ghazalli writes, "The environmental issue is gaining momentum, and we ourselves are campaigning nationally for a clean-up of environmental pollution at all levels, in all industries. Working with the national party, particularly with the powerful Women's Movement, may give us an opportunity to apply pressure to the oil companies here and to the government in applying the same emission safety standards that is applied in Western Europe and the U.S."

NATIONAL CONCERN: The publication *MASSPIRG*, published in Boston by the Massachusetts Public Interest Research Group has the following two headlines in their Summer, 1995, and Fall, 1995, issues: "**Automakers Intensify Attack On Clean Air Law,**" and "**Detroit Fails to Gut Clean Air Standards.**" The battle on Beacon Hill, where the state officials meet, was begun after the legislature passed a Clean Air Law requiring that 2% of vehicles offered for sale in Massachusetts by 1998 be electric. The publication reports that in a June letter from the vice presidents of the three big automakers, they threatened to drop their voluntary clean car plan (an effort to reduce the pollution in automobiles that are not sent to California under California's even more severe clean-air requirements) unless Massachusetts and New York drop their requirements for the offering of electric cars for sale in these states. Apparently, the governors of these two states did not agree to reduce the requirements for zero-emission vehicles. And the health of the citizens of these states is thereby somewhat potentially improved.

In a public awareness flyer, MASSPIRG showed that the Clean Car Plan will mean 36% less smog in the Northeast over the next 25 years than with the automaker's plan. **We have news for the automakers. The rapidly-changing technology will not take 25 years to be implemented.** This author predicts that in 15 years the use of internal combustion engines in a family car in the U.S. will not be socially acceptable. This same flyer reports that a recent poll by the American Lung Association determined that 75% of all people in the Northeast favor cleaner cars, including zero-emission electric cars.

The American Lung Association in Washington, D.C. has published a booklet, "Why We Need Cleaner Cars For Public Health and Economic Development." This booklet makes the following pointed statement:

"...scientists with the Harvard University School of Public Health have reported that air pollution may kill an estimated 60,000 people per year." The figures for deaths in traffic accidents is about 40,000 per year.

We need zero-emission vehicles. Zero-emission vehicles means electric-powered vehicles until someone invents another type of zero-emission engine. The automotive industry should be directing more of its efforts toward the production and sales of electric vehicles.

WHAT ARE THE PROBLEMS? Current electric motors are heavy. Current lead-acid batteries are heavy and a pound of battery does not store near as much energy as a pound of gasoline. Current electric motor controllers are expensive. Battery-chargers are designed for plugging into the electrical grid. Opponents state that the pollution is just being moved from the automobile to the local power plant. To get suitable mileage from a charge, the automobile must be light weight and therefore, less safe.

Here are the answers:

HEAVY MOTORS: New developments in super high strength magnets allow for the design and manufacture of lighter, more powerful, and more efficient motors. A new Japanese patent includes test data showing that the motor being patented is 317% efficient. [See *NEN*, Nov. 1995, p 1] The combination of these technologies means smaller batteries and less weight.

BATTERIES: The new nickel-hydrate battery (so-called Green Battery™) is about twice as good as the lead-acid

battery. The new lanthanum-nickel battery from Belarus is equally as good. Planned new battery technologies will provide further improvements. Better batteries mean less weight.

MOTOR CONTROLLERS: Motor controllers, and other parts for electric cars are expensive mainly because they are being bench-produced and not assembly-line produced. Some new developments in special integrated circuit technology will greatly reduce the cost of these electronic motor controllers.

Space-age structural materials and design techniques can provide as much or more safety than we have when driving along with a tank full of flammable gasoline.

BATTERY CHARGERS: There are some new developments that will increase the effectiveness of battery charging, including the use of on-board battery chargers. One of the candidate systems for on-board battery charging is the use of the Patterson Power Cell™ technology coupled with high-efficiency closed-loop turbine generators. Of course, immediately available are off-the-shelf battery chargers that plug into the standard electric grid. On-board battery chargers reduce the amount of batteries required and therefore reduce the overall weight.

POWER PRODUCTION: The current type of electric vehicles get their charge from the standard electric power grid. It is not a completely true statement that the use of electric cars merely transfers pollution from the highway to the power plant. The rest of the story is that there are stringent EPA requirements for the power plants to reduce pollution and they do so much more effectively than we do with highway vehicles using internal combustion engines. The latest developments of **new hydrogen energy** devices produce over fifty times as much thermal power as consumed electrical power. Therefore, this new technology can greatly reduce pollution while providing the thermal power for the generation of required power for electric vehicles.

SAFETY CONSIDERATIONS: It is well known that Cadillac passengers have less serious injuries than the passengers of light-weight compact vehicles when the cars are involved in similar accidents. **With improved electric motors, improved batteries, and the use of on-board battery chargers, the electric vehicle does not have to sacrifice safety by using light-weight construction.** In addition, the effective use of modern space-age structural materials and design techniques can provide as much or

more safety than we have when driving along with a tank full of flammable gasoline.

SUMMARY: It is not the need for scientific breakthroughs that is holding up the development of zero-emission vehicles. The holdup is the lack of commitment to design engineering, to gearing up for high-volume production, and funding the marketing of the electric vehicles.

Those of you, who are old enough, will remember that all electric and all gas stoves came with legs and stood on the kitchen floor. **Not one major manufacturer initially adopted the revolutionary concept of built-in (slide-in) kitchen stoves.** Several small companies began manufacturing "built-ins." Most of them experienced rapid growth. All of them were then bought out and all major manufacturers of kitchen ranges became builders of "built-in" ranges. **The electric automobile industry is now being developed by many small companies who, it is predicted, will later sell out to major automobile manufacturers or disappear because of inability to compete.**

The technology is here. The time has come. We highly recommend that all of our readers, support the zero-pollution vehicle market. In my garage, I have an electric-red (the name of the color) Ford Ranger pickup truck with the engine removed and replaced with batteries (lots of batteries) and a 30 horsepower electric motor. We plan to use this electric pickup as our testbed for newer types of motors, controllers, batteries, and battery chargers. Currently, this pickup gets 40 miles to a charge. Our design goal is to have an on-board battery charger that will provide the freedom to go anywhere, anytime (with reasonable stops for the batteries to become recharged).

[We wish to express our thanks to Dr. Hans Nieper for the latest information from Germany and also to Dana Rotegard for sending us copies of the MASSPIRG and American Lung Association publications. We also urge our readers to support the American Lung Association in their annual drives for funds. Editor.]

G. LETTERS FROM READERS

LETTER FROM DR. HAROLD ASPDEN

11 December 1995

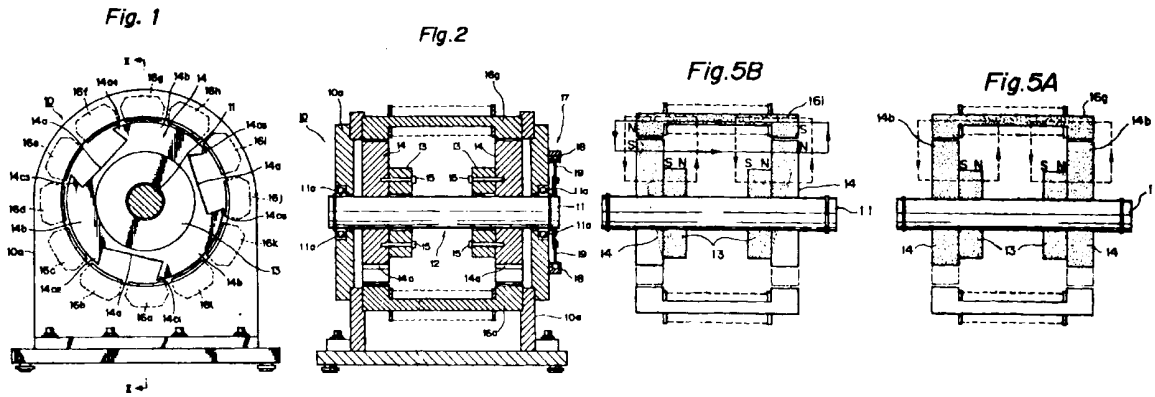
Subject: The Japanese Motor

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

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

This is very similar to the machines I am testing but there are interesting differences. The essential feature common to both, the one needed for the over-unity operation, is the provision of magnetizing sources (the magnets and the coils) in the machine core structure with their axis of magnetization at right angles (i.e. not in line with) the air gaps between and stator poles. This ensures that the magnetomotive force across the gap is augmented by that generated by the forced alignment of the domain flux within the ferromagnetic core adjacent the pole faces. Conventional motors usually put the magnetizing coils on the poles directly, which is good design practice to avoid leakage effects, but no good for over-unity operation because it provides close inductive coupling so that the back EMF absorbs all its input power from the windings and takes none from the free source provided by the electron activity in the iron.

Best regards, /s/ Harold Aspden



Figures from the Kawai patent.
Figures from the Kawai patent.

LETTER FROM ZVI SHKEDI, Ph.D.

14 December 1995

We were somewhat surprised to read your introduction and comments in the November 1995 issue of *Fusion Facts*, regarding the two cold fusion articles published in the November 1995 issue of *Fusion Technology*.

It appears that the Shkedi et al. paper was completely misunderstood and misrepresented in the "Editor's Introduction." The conclusion of the work was **NOT** that excess heat has not been found in the light-water cells. On the contrary, excess heat WAS FOUND AND MEASURED in all the light-water cells.

The difference between this work and all other published research in the field is that once excess heat was found, the researchers did not pause to celebrate but continued the research to identify the source of the excess heat. To everybody's surprise, including the authors', the source of the "excess heat" was identified as unaccounted internal recombination of hydrogen and oxygen. In other words, the common assumption that underlies almost even "successful" light water experiment, i.e. that the Faraday efficiency is unity, was proven to be wrong.

When the "excess heat" data were analyzed, taking into account the actual Faraday efficiency, measured in real time, all "excess heat" disappeared and the energy balance

turned out to be exactly zero. The data, the methodology, and the analysis, are all presented in the Shkedi et al. paper.

By contrast, it is interesting to note that in the Mills and Good paper published in the same issue of *Fusion Technology*, the excess heat claimed to be found by Mills and Good is predicated on the assumption stated following equation (7): "The net Faraday efficiency of gas evolution is **ASSUMED** to be unity."

In response to the *Fusion Facts* "Editors Comments" on the Shkedi et al. paper, the following information may be of interest:

Famous cold fusion scientists have served as consultants to Bose Corp. throughout the research. Many more, from around the globe, have either visited the Bose cold fusion laboratory or were visited by one of the Bose team members. The authors have included in the list of experiments every advice given them by the most famous and successful cold fusion researchers. In addition, manuscripts of the publication were sent out for comments and suggestions to many researchers with whom the authors kept close contacts. All the recommendations have been implemented, yet, the end result was no real excess heat.

For the heavy-water experiments the authors have tried all known sources of "hot" palladium; spent unlimited resources to have custom lots of palladium and palladium/silver manufactured for them according to successful researchers specifications; had single-crystal palladium cathodes custom grown; palladium grain size ranged from a few microns to single crystal; D/Pd loading ratios were consistently in the range of 0.85 - 0.95; yet, again, no excess heat.

The authors have offered to some of the most famous scientists in the field to try their cathodes, cells, and loading protocols in the Bose calorimeters, at Bose expense. All offers have been declined despite the fact that the Bose calorimeters were the most accurate and most stable calorimeters reported in the field. Since the Bose cold fusion laboratory has been disassembled this opportunely is no longer available.

With all due respect, the conclusion is unavoidable. So, let's stop classifying scientists as believers or non-believers. Instead, let's remove from the experiments all assumptions and possible sources of error. The challenge presented at the conclusion of the Shkedi et al. paper is still open - "...all reports claiming the observation of excess heat should

be accompanied by simultaneous measurements of the actual Faraday efficiency." Will anyone pick up the glove?

Very Truly yours,
/s/ Zvi Shkedi
Bose Corporation
The Mountain
Framingham, MA 01701-9168

LETTER FROM INDIA

21 November 1995

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

Yours Sincerely, /s/ P. Tewari

[Article cited on page 14]

LETTER FROM DR. FILIMONOV, RUSSIA

14 November 1995

I want to pass some information about 3rd Russian Conference on Cold Fusion and Nuclear Transmutation held in Dagomys near Sochi at October 2-5, 1995. It was organized by SRC "Erzion" (Dr. Yuri Bazhutov) under scientific sponsorship of Russian Acad. Sci., Russian Physical Society, Int. Nuclear Society (Moscow), Russ. State Committee on Higher Education and Moscow State University. This time it was carried out in good living conditions due to sufficient support of sponsors.

There were 40 participants from Russia and also the NIS: Belarus (Dr. A. Bulyga), Ukraine (Drs. V. Zelenskii and P. Golubnichyi); U.S.A. (Drs. M. McKubre, T. Chubb and Mr. R. Smith); Japan (Drs. H. Kozima, K. Fukushima, T. Itoh and R. Kubota); France (Dr. J. P. Millot). I wasn't in attendance, but Dr. Alexey Bulyga shared information with me. 32 reports were presented (9 - theory, 19 - experiment, 4 - reviews and applied aspects) about an hour in duration. Translation from Russian to English (and vice versa) was

provided. Foreign guests commented on the high level of presented reports. It was decided to carry out the next conference in May 1996.

Not being a participant, I don't want to discuss presented the contributions, though there were many new and interesting results. I thank Dr. A. Bulyga and H. Kozima, who shared their impressions with me. I only want to mention a talk by Dr. Yu. Bazhutov "Registration of neutrons, tritium and radiocarbon production under operation of hydroaggregate YUSMAR [Potapov's engine]," that linked once more Cold Fusion and (presumably) Zero Point Energy, exhibiting that your intention to consider these topics together was wise one.

Recently one more note about this topic appeared in the Belarussian press. It was an article by Dr. Vladimir Bocharov about James Griggs's engine, "It is warm from water, as it is from fire." (*Vecherniy Minsk* newspaper of 23 Oct. 1995; earlier, 25 Apr. 1995, the same author [Bocharov] published similar article about YUSMAR).

Author uses information from "*Cold Fusion*," vol 1, no 2, June 1994, but erroneously calls it "The Magazine of Water-Fuel Age" considering a header as magazine's title. He gives a brief description of Hydrosonic Pump and supplies his own version of its principle of operation. According to V. Bocharov (Cand. Sci. in Chemistry), "excess heat generated is chemical and originates under recombination of some parts of broken water molecules with composition of new substances. Part of water somehow 'burns' and hydrosonic pump becomes a sort of furnace that produces heat without air, fire and smoke." He writes that "J. Griggs has his followers [evidently Dr. Yuri Potapov] who have created their heat generators absolutely dissimilar to the American version but also reproducing this phenomenon reliably. The common point of all these furnaces is the following: they are related to hydrodynamical devices which provide tremendous quantity of 'hammers' for water disintegration. V. Bocharov speculates that this type of generators use input energy extremely inefficiently: energy "is spent mainly to friction of water (sic!) that yields physical heat but just quite a little [of energy] is spent to breaking molecules yielding additional (chemical) heat under recombination of some fragments." He gives an example of a newly invented method of water 'splitting' in supercritical state by strong magnetic field (inventor A.G. Bakayev, Perm, Russia) as a basis for prospective excess heat devices of the next generation. Below, the author speculates about using 'additives' to water: "some of them may provide breaking molecules executing a role of knives, others being not combustible in

usual sense of this word may 'burn' altogether with water and so on."

My comment: author's hypothesis is entirely incorrect. No combination of water molecules' parts can yield more energy that is needed for H₂O destruction, and chemist Bocharov surely knows it. Such irresponsible speculations have a goal either to exhibit author's erudition or to make a fool of public statements when and where correct scientific explanation is absent or suppressed. So true information about New Energy is urgently needed everywhere in the world in spite of the obstruction of conservative scientific community and officials.

I wish you every success in your noble task of delivering this information from "the cutting edge" of modern science and technology through your *Fusion Facts* and *New Energy News*.

Very truly yours, /s/ Ben Filimonov

H. MEETINGS

ICCF6
Sixth International Conference on Cold Fusion
 will be held 13-18 October 1996
 Hotel Apex Toya, Hokkaido, Japan
 sponsored by
 Japanese National Institute for Fusion Science
 Tel 052-789-4253 /or 4260
 Fax 052-789-1037

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

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

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

attend the conference to present it and pay the registration fee of \$400 by 1 April 1996. Notification of acceptance will be mailed by March 1, 1996.

Topics to be covered include, but are not limited to:

- Power quality
- Transmission system analysis
- System operating topics
- Applications of artificial intelligence and control techniques to power systems
- Energy storage and renewable techniques
- Analysis of electromagnetic transients in power systems
- System economics
- Artificial neural networks and applications to power systems
- Power converters/Power electronics
- Automatic control applications
- Reluctance machines
- Induction motors design and control
- Permanent magnetic motor drives
- Power system relaying
- Self-excited state estimation
- Harmonic active and passive filters
- System dynamic performance
- Frequency dependent system models
- Electronic and high frequency converters
- and others.

RUSSIAN CONFERENCE

We have just received information about a conference that will take place in St. Petersburg in May of 1996. Our correspondent did not give the name of the conference, but the speakers are to be researchers in free energy, gravity, and time experiments. The goal of the conference is demonstration and description of new experiments to find investors, customers and answers for questions in joint discussions.

Official organizers are Pulkovo Observatory, Russian Academy of Science, Physical Society of St. Petersburg and the International Academy for MegaScience. The committee is chaired by Dr. Anatoly P. Smirnov.

For information contact: Fax 7-812-2741210, 7-502-2013516 Phone (Russian & English) 7-812-2747877 from 1900 to 2300 Moscow time.

Commercial Column

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

COMPANY: PRODUCT

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

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

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

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

Holotec AG. Clean Energy Technology, contact André Waser, Gen. Mgr., Bireggstrasse 14, CH-6003, Luzern, Switzerland. Phone 011 41-41 7360 4485, or Fax 011 41-41 7360 4486.

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

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

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

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

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

INFORMATION SOURCES

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

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

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

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

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

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

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

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

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

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

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

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

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