Beyond LENR (aka 'Cold Fusion') to Useful Energy

BY JEANE MANNING

We're in a time of big changes. The CEO of a new energy company developing a revolutionary product says, "If we had started this ten years ago, we'd be dead by now."

Even a change for the better is not always easy. We resist letting go of an outmoded belief or worldview despite the fact that it's not solving our problems. It's all the more difficult to ditch a worldview if you've defended it for many years and expect reward for your elite knowledge.

Are respected elders of the "cold fusion" field stuck in such an unproductive position?

One knowledgeable observer who says they are is a scientist from Romania, Dr. Peter Gluck. Even before retiring from the chemical industry, he actively researched the cold fusion/LENR field. (LENR stands for Low Energy Nuclear Reactions, a description arising from the dominant worldview in that field of research.)

Tired of hearing about feeble results from experiments, or higher levels of excess heat that can't be reproduced on demand, Dr. Gluck urges scientists influential in the LENR field to move on. A number of scientists have fixated on the belief that the anomalous heat from their experiments comes from nuclear reactions, and their focus was stuck for too long on the particular experiment announced by Martin Fleischmann and Stanley Pons in 1989.

Before the end of 1989, critics had shouted down those two electrochemists. Prestigious universities reported that their results couldn't be reproduced. A hastily-convened government panel, mainly experts in hot fusion, rushed to a judgment against cold fusion. Academics and science publications slammed doors against such research. The media reported the name-calling but later didn't mention others' experiments that proved Fleischmann and Pons' tabletop experiment did put out anomalous excess heat.

"Cold fusion came before its time, Dr. Gluck writes on his blog (egooutpeters.blogpost.ro.) "It is too complex, too new, too unexpected, too messy, too multifaceted, too dynamic, too non-linear and too weird to be really understood and controlled at the time of its discovery."

In the 1990s and onward, beleagured scientists who stayed with the research spent time and energy defending Fleischmann and Pons' deuterium-and-palladium process. They wanted to convince critics from the nuclear physics establishment that cold fusion does create a nuclear fusion reaction without emitting dangerous radiation. Discoveries of transmutation—elements strangely changed into other elements—further confused the picture. As the years passed, dissident researchers concluded that what happens in the experiments isn't even a fusion reaction.

John Hadjichristos shows experimental Hyperion

Some LENR scientists retreated into the safer position of "we're making discoveries in basic science," instead of resolving to make practical heating devices that ordinary people could use soon. Fleischmann and Pons' original vision lost its momentum. The two had wanted to bring a new source of clean energy to the world and develop useful products.

LENR hasn't solved the world's energy problems, so in Dr. Gluck's view it makes sense to move on to a new category of research and development—"LENR+." The difference is that LENR+ aims more directly at making commercial products. For example he looks to a relatively new company which has that focus—Defkalion Green Technologies—and sees cause for optimism.

Defkalion Green Technologies' Success

Thanks to Dr. Gluck's long-distance friendship network, a few days ago my engineer friend Vlad and two of his colleagues and I had the privilege of visiting the Defkalion Green Technologies (DGT) laboratory in Vancouver—meeting the officers of the company, watching a demonstration of their new energy technology called Hyperion, and learning about it from their Chief Technical Officer.

The good-news claim is that DGT can control their multi-stage dynamic process. We observed their fifth-generation apparatus being ramped up in minutes instead of taking hours or days to reach levels of heat output several times higher than equivalent energy input of electricity. If we had watched it longer, we may have seen even higher levels of more output than input.

Afterwards it was explained to me that the tested apparatus so far produces five kilowatts. The next prototype is expected to able to operate nine reactors working in parallel, creating a multireactor producing up to 45 kilowatts. The power of each reactor can be modulated to put out between one and five kilowatts by use of the control mechanism—electrical currents creating plasma.

All that's needed to stop the reactor from producing excess heat energy is to switch off those currents that create plasma.

The Hyperion doesn't burn fuel; it creates a reaction involving atoms' nuclei but not any nuclear reaction known by nuclear physicists. Instead it's said to be somewhere between nuclear and chemical energy. Bottom line: a 45-watt Hyperion unit tested in Greece ran continuously for six months on less than three grams of powdered nickel and two liters of hydrogen.

Standing in the laboratory that DGT rents at the University of British Columbia and observing their core technology working smoothly on a nearby table, it felt like I was observing the bare beginnings of a new era. Defkalion's sixth-generation apparatus, which we didn't see, is a pre-industrial version designed for household use—analogous to the little personal computer which skipped past the huge expensive mainframe computers and reached the public.

We were extra lucky to be there, because the Defkalion laboratory was soon to be put into lock-up mode in order to meet development deadlines. They will present a paper at the July 21-27 International Conference on Condensed Matter Nuclear Science at the University of Missouri and are strongly considering presenting audiovisual material during the August 5-8 National Instruments conference in Austin, Texas.

Continued on Page 58

Continued from Page 16

Defkalion relocated their head office and basic research-and-development laboratory from Greece in late 2012, after their government failed to help the start-up company. After the financial crisis, their government's officials had other matters on their minds, so Defkalion shareholders continued to carry the burden of providing funds for the work. It was also difficult for the company to get reliable cooperation from other institutions.

Canadian national and provincial governments, in contrast, offered a stable environment for research-and-development companies, with a support network and fiscal incentives.

Their new location offers advantages such as the ability to rent advanced measuring equipment at UBC's chemical engineering department next door. Possible future cooperation could result in new ceramics to support structures inside Defkalion's device, or the university's theoretical experts might further explain the working process.

The company's Chief Technical Officer, John Hadjichristos, says their core technology is also operating elsewhere. Defkalion has set regional laboratories in Milan, Italy and in Athens; the newest Defkalion location will soon be announced in Brazil. These regional laboratories will develop various industrial applications in direct partnership with companies whose expertise lies in each application, such as connecting Defkalion's core technology to Sterling heat engines, marine propulsion and space propulsion—to name a few.

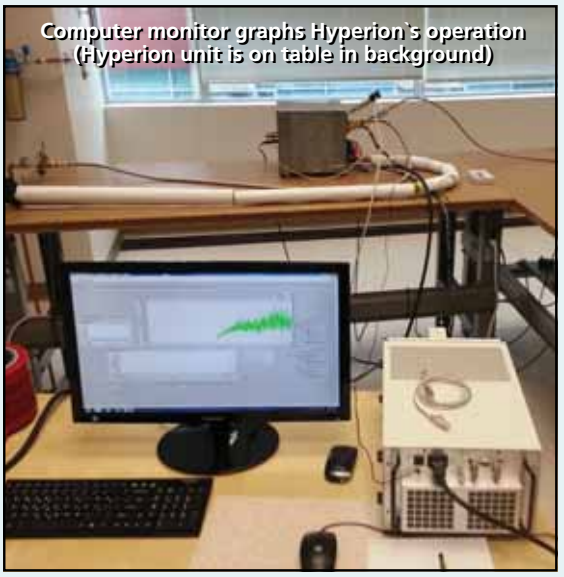
In Vancouver, he and his lab assistants won't try to specifically engineer Hyperion products for aircraft, steel factories or other industries. "We're not specialists at everything. Our job is to produce safe, green and low cost energy."

Defkalion's business development officer, Symeon Tsalikoglou, explained further, "The responsibility to develop specialized usage of Defkalion's technology will be on those companies that are partnering with Defkalion for common R&D projects."

When they first came together, the Defkalion team didn't plan to develop an energy source technology of their own. Hadjichristos explained that five years ago they began to investigate developing certain industrial products. That effort came about because Andrea Rossi of Italy—of whom I wrote in this column last year—claimed he had a game-changing nickel and hydrogen energy technology that could be turned into industrial products..

Alex Xanthoulis, now CEO of Defkalion, built a team to investigate and see if Rossi's energy catalyzer, E-Cat, claims made sense or not. Xanthoulis and his new team then formed a company. They found out that Rossi was indeed onto something.

"But unfortunately for him, it is not well designed to be controllable," Hadjichristos told us, "so it was impossible to develop a technology around something that cannot be controlled."



Computer monitor graphs Hyperion's operation (Hyperion unit is on table in background)

While Defkalion was in a business relationship with Rossi's company, the Greek company invested much money on designing around what is called a black box—a technology whose inner secrets are not revealed.

Rossi said as much in his August 4, 2011, press release announcing the end of his agreement with Defkalion Green Technologies for the production of E-Cats. "...no information, nor industrial secret nor any technology whatsoever has been...disclosed...to Defkalion nor to any Greek company....it still remains a well-preserved industrial secret."

In addition to Rossi's secrecy about the technology, there were complications in business dealings, such as how Rossi dealt with a contract that his company had with Defkalion.

Last week Hadjichristos didn't want to get into a discussion of the two companies' divorce and just said to us, "we hope that he will be successful also." He recalled that Defkalion's problem at the time was that they had invested their shareholders' private money into product-design projects and faced a decision—to stop and give up on that area of research or try to conquer its challenges by themselves.

When Defkalion faced that decision, Hadjichristos had studied almost all of the scientific papers available in the LENR online library at that time. He had some ideas and proposed, "give me six months and a small team of scientists and I might have a chance to make it happen."

Hadjichristos decided not to take direction from other scientists' previous LENR attempts, except for minor areas of research, such as how to handle materials. The team did look for common features of what they called the Nuclei Active Environment found in successful LENR methods. "Already we understood that the process could not be controlled in the environments used in all the experiments since Fleischmann and Pons..."

Unlike LENR researchers whose initial goal is getting the highest level of heat output from their prototypes, Defkalion first designed their apparatus for its ability to control the phenomenon. The goal of achieving the best ratio of output to input came afterward.

The Greek team began with small ideas and played with them and checked out suggestions from even very young scientists on their team instead of rejecting unusual original ideas. Nature's clues were also recognized; LENR-type events happen in the sun's corona and possibly in Earth's crust and in volcanic explosions.

Early in their experimentation, in one incident, they suddenly saw unexpected levels of heat energies. Eventually they were confident that they understood the reaction.

Defkalion's terminology makes sense; instead of Low Energy Nuclear Reactions (LENR), the company would prefer to say Heat Energy from Nuclei Interactions (HENI). The words "nuclear reaction" in LENR could raise red flags in many countries' nuclear regulatory agencies. Representatives of industries in 70 countries have contacted Defkalion about potential licenses to manufacture Hyperion products in their home country.

There's much more to tell about Defkalion Green Technologies, such as their "Mrs. Maria" motto—a reminder that they intend to bring affordable power to all the vulnerable low-income people for purposes such as home heating—and how they solved a technical problem by thinking like the strategists in an ancient Greek legend about the War of Troy. I'd also like to write about their company's team-building and the vision of a new energy era where people could share an energy abundance with neighbors. It's in line with an ancient Greek tradition; a philosophy is important.

John Hadjichristos told Peter Gluck—regarding the need to keep academic dogma and egos out of a definition of the new phenomena—that more open-minded attitudes and unity among specialists are required. "Science is one, and we have to keep it that way if we want to keep on talking with Mother Nature ...We cannot see or listen and understand her stories if we stop talking to and hearing each other." ■

Jeane Manning's blog can be found at http://ChangingPower.net.