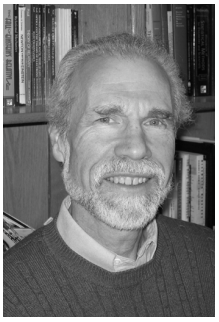
BREAKING THROUGH EDITORIAL



A Celebration of Effort

Bill Zebuhr

Infinite Energy began as a magazine focused on cold fusion, but since the early days has also reported on and promoted a broad range of new science and technology. One of the reasons for the broader outlook—aside from exploring the idea of "infinite energy" in as many ways as possible—is that progress was slow (understandably) in taking cold fusion from a controversial theory to a useful technology.

When I became a technical editor for *IE*, I took the position that the magazine should focus more on basic science than a particular technology because the "new energy" technologies had such a repeating history of always being "about to happen" but never actually happening. This was true of magnetic motors, zero point proposals and other new energy technologies, as well as cold fusion. I have doubts about magnetic motors and most of the zero point energy plans, but have never doubted since 1989 that cold fusion was a real science. I have often doubted, however, that cold fusion would produce useful energy pursuing the science as it has been understood.

Photo by Duy Tran

ICCF14 Keynote Speaker Llewellyn King and Chairman David Nagel

Our technical editor Scott Chubb is one of the world's experts on cold fusion, but I am a relative newcomer to the field and attending part of the 14th International Conference on Condensed Matter Nuclear Science (ICCF14) was a very good experience for me. Starting at the opening of the reception the atmosphere was upbeat and exciting. There was an abundance of good spirit, good intellect and good humor in the room. Even the food was good. This struck me as remarkable given the very long, tough road to get to the current state of development—which still seems a long way from producing a commercial product. The world should be very thankful that such dedicated scientists and visionaries exist.

Keynote speaker Llewellyn King spoke sensibly and passionately about the need for alternatives to oil and coal, setting the proper stage for the discussions to follow. David Nagel spoke of the problems, progress and prospects of the Fleischmann-Pons Effect. He acknowledged that it has been a long and frustrating path and that the science is not yet understood fully but that great progress is being made. He also noted that even if cold fusion is not successful as a major energy source, it will lead to a better understanding of the universe and may be valuable as a way to transmute elements. That would be a major success and could be very valuable in cleaning up nuclear waste and maybe certain kinds of other waste. The tailoring of materials for specific purposes will become more and more valuable in the future as special needs are revealed and conventional sources diminish. David left me with the impression that the hard work was paying off and that even as limitations were discovered, new opportunities opened, and even though the light could still not be seen at the end of the tunnel, at least there was evidence and belief that the light was there. It was great to see his enthusiasm after such a marathon of effort. Progress was being made, the effort is worth it, and it is still fun. Of course, a lot of it is not fun but the fact that a lot of it is can get people through the hard times.

Fun may not be the right way to look at it. There is great satisfaction when success is achieved, but sometimes there is a long time between successes. Dennis Letts, a long time, mostly self-funded researcher, had dozens of successful experiments in a row and then went four years without a success when one of the variables changed. That was not fun, but he persevered and again achieved success. The long term vision and conviction that the rewards will be huge drives people onward. I believe the rewards will be huge and that many researchers also believe that, but I do not think that they necessarily think of the reward in financial terms. It is almost self-evident that if someone makes a useful device that the financial rewards could be great, but that vision is far in the future for most so the rewards must be the satisfaction of having a significant impact on science and the joy of the journey.

Some researchers are at least partially financed by foundation grants, including some from the New Energy Foundation. These grants are possible because of individual donors who have the vision to see the benefits from this research even during the long stretches of frustratingly slow progress and no useful product in sight. These donors are extremely important to the field and can be the difference between ultimate success and failure. The amount of money is so small from most other sources that sometimes even small amounts make a big difference. It is not just the money itself but the idea that there are people out there that believe in the work being done. Donors also support conferences, including ICCF14, and "scholarships" for students to attend these events. This helps spread ideas and promote progress and good will. They deserve special thanks for their contribution, which is often behind the scenes or even anonymous.

Very encouraging technical progress is being made on a number of fronts. Keys to repeatability are being found, some high over-unity values are being recorded, the quantities of heat being produced are increasing, and theories are being refined. Some realistic evaluations of how a useful device might be produced are being discussed and some higher temperature processes that can help facilitate the design of such a device are being successfully tested. There is a healthy collaboration between researchers and the effort is truly international, so knowledge comes from a diverse base and the eventual results will be more easily utilized around the world.

The whole field is still greatly under-funded. The investment climate has changed greatly in the last few years. In the late 1990s if you were not a dot-com with the promise of quick money and no annoying real hardware to produce, it was very hard to raise capital for a new venture. Now a new wave of interest has begun and that is the environmental/sustainable technology field. Venture capitalists are now aware that when one is dealing with atoms instead of bits, the required capital can be much greater and the time to market much longer. On the plus side, some of the opportunities are huge and the world benefit great. Instead of thinking in terms of two years and very high margins with an investment that might total $20 million or so, the realization now is that it could take five to ten years and require an investment of $100 to $200 million to develop some of the new technologies dealing with energy and water. True venture capital is needed, but there is still no viable plan to create a return on investment even with a ten year view.

Some of the technologies may be ready for investment soon. If high over-unity devices showed promise of reliability and reasonable cost if made in volume, a plan that could attract investment could be presented. The ability to transmute elements could be a very attractive investment if reasonably reliable results were focused on a specific appropriate market. This could enable other technologies, such as nuclear power or toxic waste remediation. In view of the improving investment climate, there may be a benefit in some cases to shift the thinking from how to keep doing experiments on a low budget to thinking about what could be done if money was not the limiting factor. Combining resources, doing many experiments in parallel, and the benefits of mass production could be considered.

The science is improving, experimental techniques are improving and the field is gaining acceptance. I am encouraged that the time for some practical application is approaching. The spirit of the conference was uplifting. It was an example of human intellect and spirit at its best.