Cold Fusion Still in State of Confusion

A government report recommends against setting up any special programs; meanwhile, cold fusion is still hot in a few labs

THERE WERE NO SURPRISES in the report issued last week by the federal government's Cold Fusion Panel. The committee found no convincing evidence for the controversial claims of room-temperature fusion and advised against setting up programs to pursue them further. What is surprising, however, is that after most labs have dropped their investigations, a few persistent ones continue to study the phenomena and they seem more convinced than ever that something important is going on.

The panel's report formalized a growing conviction in the scientific community: The cold fusion effect, whatever it is, is not going to generate commercially useful power. In the words of the panel, "The experiments reported to date do not present convincing evidence that useful sources of energy will result from the phenomena attributed to cold fusion." Moreover, the panel doubted whether these phenomena actually are signs of "the discovery of a new nuclear process," as originally claimed. For these reasons, the panel said, the federal government should not spend the money to establish any cold fusion research programs. However, the panel agreed that enough questions about cold fusion remain unanswered to justify the Department of Energy's continued funding of a modest number of individual cold fusion experiments.

In the face of mounting skepticism about the cold fusion claims, however, a few scientists are still swimming against the tide.

At Texas A&M University, three independent teams say they are amassing more and more support for the claims made in March by electrochemists Stanley Pons and Martin Fleischmann. John Appleby, who heads a group doing calorimetry experiments on the so-called fusion cells, said he continues to measure excess heat coming from the cells. It comes in two forms—a steady, low-level heat production plus bursts of much higher levels. "We are now very confident about this," he said.

A second group directed by John Bockris has detected large amounts of tritium in cells similar to those of the Appleby group. Team member Ramesh Kainthla said the group has found tritium in both the electrolytic solution and the gas produced in the electrolysis, and the amounts are several orders of magnitude higher than in control cells.

A third group led by Kevin Wolf has seen both tritium and neutrons in the cells.

Unfortunately, the various hints of fusion never seem to show up together. The cells that produce heat are not the ones in which tritium is found, which are not the ones that give off neutrons. And, as in every other laboratory that reports seeing the fusion phenomena, the effects are erratic—they appear in some cells and not in others, and they appear and disappear in the same cell, without apparent rhyme or reason. Indeed, the Cold Fusion Panel noted that none of its members was ever lucky enough to visit a laboratory at a time when an operating cell was actually producing excess heat.

At the University of Utah, Pons says he is even more convinced of the original claims, and a second group has also measured excess heat. The metallurgy lab of Milton Wadsworth tested six cells with electrodes of varying sizes and four of those have shown bursts of energy. In one 90-minute burst, a cell put out 42 watts of energy with an input of only 9 watts, said Hugo Rossi, interim director of the university's fusion program.

At Stanford University, Robert Huggins is standing adamantly by his claim of seeing measurably more heat coming from cells with heavy water than from cells with normal water, a difference that seemingly can be explained only by some kind of nuclear process.

And researchers at Los Alamos National Laboratory continue to see neutrons coming from canisters of pressurized deuterium containing palladium and titanium.

Do these few positive results justify spending much more money on cold fusion research? The Cold Fusion Panel concluded that, when balanced against the large body of negative evidence and the lack of any feasible theoretical explanation for cold fusion, they do not. The state of Utah, however, is marching to a different drummer. The state legislature has authorized $5 million for cold fusion research, subject to the approval of a nine-member advisory panel. The panel met on 11 July, and James Brophy, vice president for research at the University of Utah, said the members seemed to be favorably impressed with the experimental evidence. The university has proposed a comprehensive research program to be funded partially by the state of Utah, and Brophy said he is "optimistic" the committee will soon release a portion of the $5 million to get it started.

■ ROBERT POOL

Some Companies Keep a Foot in the Door

Despite a widespread conviction among scientists that cold fusion will never be used to generate power, some businesses are keeping their options open just in case.

General Electric, for example, has signed an agreement with the University of Utah to cooperate on cold fusion research. One GE scientist is now working in the lab of Pons and Fleischmann at Utah, and the company has committed itself to keeping at least three other scientists working on cold fusion experiments at its research and development center in Schenectady, New York. GE cautioned that it has not confirmed the Pons/Fleischmann result, nor even necessarily believes it, but said the potential of cold fusion is too great to ignore. GE says it will keep its scientists working on cold fusion "only as long as reasonable progress is being made toward answering the question as to what is happening in the electrochemical cells."

Meanwhile, Johnson Matthey, the British metallurgical company that supplied the palladium rods Pons and Fleischmann use in their experiments, said it will sign a collaboration agreement with the University of Utah. The company, which employs some of the world's best metallurgists, will cooperate with the university on research into the processing of the metal electrodes used in the fusion cells.

James Brophy, vice president for research at the University of Utah, said more than 60 companies have signed confidential disclosure agreements with the university. By promising not to reveal what they learn, the companies get to examine the technical details of the nine patent applications the university has filed so far on the cold fusion process. If cold fusion turns out to be a valuable discovery, these companies will already know what the university has to sell. ■ R.P.