Cold Fusion at Texas A&M: Problems, but No Fraud

A review has faulted the way research was conducted and reported but found no evidence to justify further investigation

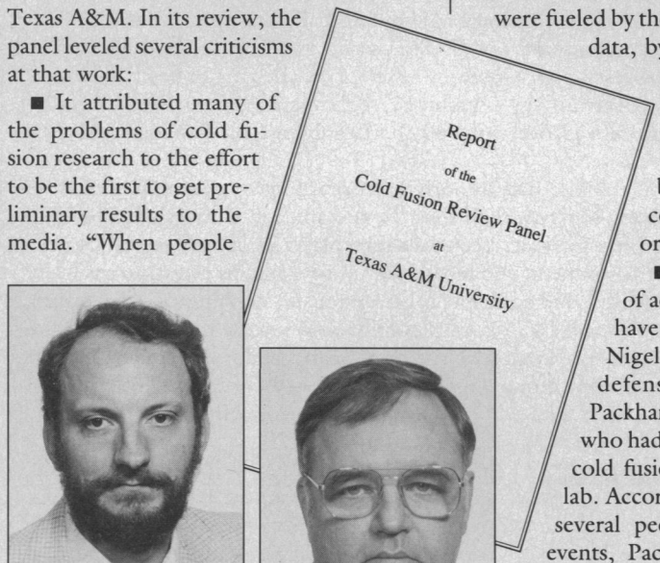
A 4-MONTH-LONG INTERNAL REVIEW OF cold fusion research at Texas A&M University has resulted in a report critical of the way many of the scientists involved in that research behaved, but it found no direct evidence of scientific fraud.

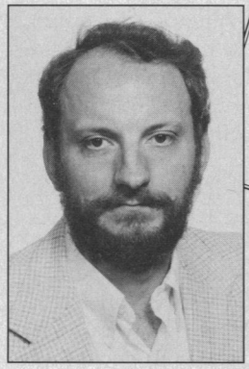
The university initiated the review after *Science* (15 June, p. 1299) reported concerns on the Texas A&M campus that some fusion cells might have been intentionally spiked with radioactive tritium to fabricate evidence for cold fusion. Those concerns centered on the lab of John Bockris, Distinguished Professor of Chemistry, who remains one of the most vocal proponents of the reality of cold fusion. Bockris' group had reported the highest levels of tritium in any cold fusion experiment in the United States—a finding other A&M cold fusion researchers were unable to duplicate. (Indeed, Bockris' team itself has seen no tritium from its fusion cells in nearly a year.) Although the evidence pointing toward possible fraud was circumstantial, knowledgeable researchers on and off the campus had expressed serious concerns in this regard, and *Science*'s article posed the question: Why hadn't the administration taken a hard look at the validity of those concerns, if only to protect the reputation of the university and its researchers?

The three-member review panel has now looked into the matter and concluded that, "While it is not possible for us to categorically exclude spiking as a possibility, it is our opinion that possibility is much less probable than that of inadvertent contamination or other unexplained factors in the measurements." "We didn't find anything that gave any credibility to those allegations [of fraud]," said Joseph Natowitz, a Texas A&M chemist who served on the review panel with physicist Edward Fry and nuclear engineer John Poston. Although the panel members did not perform an in-depth investigation of the spiking concerns, Natowitz noted, they probed enough to convince themselves that a full-blown investigation would be, in the words of the report, "a dubious use of University resources," and they recommended that the university pursue the matter no further.

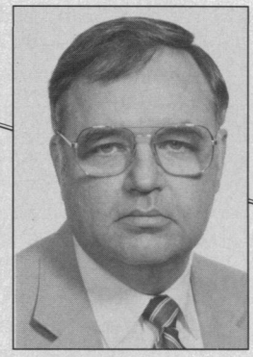
But the report was much more than a look into the allegations of fraud—it was designed to be a general assessment of the entire Texas A&M cold fusion program. As such, it provides a revealing analysis of how science can stumble when it comes across a controversial subject such as cold fusion, and it offers a provocative insight into the politically charged atmosphere that surrounded cold fusion research at Texas A&M. In its review, the panel leveled several criticisms at that work:

■ It attributed many of the problems of cold fusion research to the effort to be the first to get preliminary results to the media. "When people are in such a rush...they become careless," Fry said. In particular, the report faulted Texas A&M researchers Charles Martin, Kenneth Marsh, and Bruce Gammon for calling a press conference to announce evidence of excess heat from fusion cells and then remaining quiet when they discovered that their positive data arose from an experimental error. "If an announcement is made by press conference and a retraction is necessary, it should be by press conference," the report said.





The message is that eventually incorrect experiments fall flat on their faces: "Science takes care of itself."
—Edward Fry



"We didn't find anything that gave any credibility to allegations [of fraud]."
—Joseph Natowitz

■ A "breakdown in scientific objectivity" compromised much of the Texas A&M cold fusion work, the panel found. This was evidenced, the report said, "in language which refers to experiments which support a particular hypothesis as 'successes' and those which tend to refute it as 'failures.' " The report added that "rather tortuous arguments have been developed, in lieu of concrete scientific evidence or additional experiments, to support certain hypotheses, and the motives of scientists who have been critical of the research have sometimes been attributed to their supposed vested interest in the previously existing fusion program."

■ The controversy surrounding the cold fusion research ruined previously congenial working relationships. "I don't think anybody likes anybody else anymore," Fry said. According to the report, "The initial frictions occurred because of the headlong rush to be 'first' and the announcements of results via non-standard channels. Later, they were fueled by the non-reproducibility of data, by the failure to provide all participants with timely information, and by intemperate language used publicly by some to describe their colleagues' experiments or motives."

■ "A very serious breach of academic procedure may have been the handling of Nigel Packham's dissertation defense," the report said. Packham was a Bockris student who had performed much of the cold fusion research in Bockris' lab. According to the accounts of several people familiar with the events, Packham had done more than enough research outside the fusion work to deserve a Ph.D., but at Bockris' urging he included his cold fusion results in his dissertation. Manuel Soriaga, an untenured chemist on Packham's committee, was somewhat familiar with the cold fusion work and let Bockris know that he would have a series of questions for Packham during the defense. Soriaga seemed to have been the only committee member both familiar with cold fusion and likely to be hostile to it.

Bockris scheduled the defense for late in the afternoon, and a few minutes after Soriaga began to query Packham on the cold fusion results, Bockris cut off questions, saying that one of the committee members had another appointment. At that time, all the members of the committee, including Soriaga, okayed Packham's defense, but shortly afterwards Soriaga resigned from the committee—before it had given final approval to Packham's dissertation. (Packham

in the end removed the cold fusion results from the main body of the thesis and it was formally approved by the committee.)

Soriaga told the panel members that he had felt pressured to okay Packham's defense even though he had not been allowed to question him completely on its cold fusion component, which prompted the panel to write: "Tenured faculty should be particularly concerned to protect the prerogative of untenured faculty serving on the same committee....The administration needs to review its procedures regarding the proper conduct of such oral defenses."

Are there any further lessons to be learned from Texas A&M's cold fusion capers? Yes, Fry said, but not the type that can be embodied in a new set of university regulations. The message here is that eventually incorrect experiments and theories will fall flat on their faces, and the good stuff will prevail. "Science takes care of itself," he said.

Meanwhile, the Texas A&M administration hailed the panel's report. In a prepared statement, provost Dean Gage said that after "conducting exhaustive hours of inquiries and reviewing much documentation and research data," the panel "found no evidence of scientific fraud or any other improprieties."

■ ROBERT POOL

Brown Gets Science Committee Post

In the biennial shakeup of congressional committee chairmanships, one of the most popular legislators among science policy cognoscenti has risen to the top. House Democrats picked Representative George E. Brown, Jr. (D–CA) to be chairman of the Science, Space and Technology Committee, replacing Representative Robert A. Roe (D–NJ) who has moved over to chair the Committee on Public Works and Transportation.

The science committee has broad authority over nearly every government science and technology program, so its chairman has considerable influence in shaping U.S. science policy. Brown has for years been an active player in several science issues, including space, the environment, and technology policy, and his elevation has been greeted warmly by scientific and academic organizations in Washington. He "is one of the few people in Congress who is truly comfortable with science," says Gerald Roschwalb of the National Association of State Universities and Land Grant Colleges. Roschwalb says Brown brings a no-nonsense quality to his new post: "You don't get any romance from him about the beauty of science."

New directions. *Brown says a priority will be to get the space program on track.*

Brown has a degree in industrial physics from the University of California at Los Angeles. With a single, 2-year interruption he has been a member of the science committee since 1965. In an interview with *Science*, Brown said becoming chairman was one of his main professional goals. He says his priorities for the next Congress will be to help establish direction for the U.S. space program, to decide how to proceed with the Superconducting Super Collider, to develop alternatives to fossil fuel and nuclear power generation, and to find ways to improve U.S. science education. He also supports the Bush Administration's plans to double the National Science Foundation budget.

Brown was in line to become chairman of the space subcommittee before Roe's unexpected departure for the public works committee made the top spot available (*Science*, 30 November, p. 1202). He has not yet decided whether to take the space subcommittee chairmanship as well, or follow in Roe's footsteps by assuming the chair of the investigations and oversight subcommittee. None of the other subcommittee chair positions is likely to change.

■ JOSEPH PALCA

William Happer to Be DOE Research Chief?

Plagued first by controversy then by neglect as it went without a director for a year, the Department of Energy's Office of Energy Research may soon settle into a period of relative calm as it gets a new director. *Science* has learned that Energy Secretary James Watkins is likely to name as his new chief of research William Happer, Jr., a professor of physics at Princeton University.

Happer, 51, is an atomic physicist who has been advising the government on civilian and defense research programs for many years. He is already familiar with some of DOE's R&D programs, having served as chairman of the JASONS, a panel of academic scientists and engineers that advises the federal government on energy policy, defense matters, and other issues. He also chaired two National Research Council reviews of inertial confinement fusion.

DOE has not yet announced Happer's nomination, apparently because all the political reviews have not been completed. Happer, however, told *Science* he was looking forward to the job, despite the hard times that the Office of Energy Research is experiencing. One of Happer's first duties may be to bring a sense of stable leadership to basic energy research and the magnetic confinement fusion programs (see page 1501).

The last permanent director of the office, Robert O. Hunter, Jr., resigned in October 1989 after he had drawn fire for his attempts to overhaul the fusion program (*Science*, 20 October 1989, p. 319). Since then, deputy director James Decker has been standing in. Happer could start working at DOE as early as January, sources say, but officially he can't take control of the office until he is confirmed by the Senate. That's not likely to happen before February. ■ MARK CRAWFORD

Mark Crawford is a free-lance science writer.