Double blow for cold nuclear fusion

- Harwell investigation stopped
- Los Alamos collaboration fails

Washington

Two negative announcements about cold fusion last week may prove particularly troublesome to Stanley Pons and Martin Fleischman, the researchers who set off the controversial debate with their claim on 23 February that a palladium electrode immersed in heavy water will produce large quantities of excess heat.

Dr David Williams, leader of a large team at the UK Atomic Energy Authority's Harwell laboratory in Britain which has been examining cold fusion since mid-February, and which had received help from Fleischmann in setting up its electrolytic cells, announced that the team had finally abandoned its experiments, having found no signs at all of anything unusual.

In the United States, officials at Los Alamos National Laboratory (LANL) let it be known that efforts to collaborate with Pons and the University of Utah had, after much negotiation, come to nothing The idea that LANL scientists should examine working cold fusion cells at the University of Utah was brought up by Pons at last month's congressional hearing on cold fusion in response to questions about the difficulty of reproducing the claimed results and the importance of verifying them.

But at a press conference following the special cold fusion session at the Los Angeles meeting of the Electrochemical Society (*Nature* **339**, 84; 1989), Pons said that the collaboration was "subject to the signing of agreements", and a spokesman for LANL said that lawyers from the University of Utah were being very careful not to lose their grip on patent and intellectual property rights.

By the time of the Santa Fe cold fusion meeting (*Nature* **339**, 325; 1989), James Brophy, vice-president for research at the University of Utah, said that legal problems had been overcome and that the collaboration could proceed once a timetable had been arranged with Pons. But then, according to Howard Menlove of LANL, the laboratory had indicated to Pons its readiness to proceed, but received no indication of when work might begin.

After some weeks, an official annoucement was made last week by LANL because it was felt that constant talk of a collaboration without there being scientific activity behind it could be misleading to observers of the cold fusion scene. Menlove says that LANL is still ready to participate if Pons wishes it.

The decision by scientists at Harwell to end their investigation of cold fusion was eventually made, after almost three months, because the laboratory could not continue to devote man-hours, money and material to the project. Ten scientists, led by Williams, had spent three months and £320,000 on the studies, which began in the middle of February, even before the now famous 23 March press conference at the University of Utah, when the cold fusion claim was made public.

Fleischmann, of the University of Southampton, is also a consultant to Harwell, and had consulted his colleagues there originally to ask for their assistance in looking for a flux of neutrons from an electrolytic cell. An experiment was set up with Fleischmann's help.

After 23 March, the Harwell effort grew, and Williams and his colleagues obtained from Johnson Matthey, suppliers of palladium to Pons and Fleischmann, samples of every kind of palladium the company could provide, as well as some items made to order.

Williams therefore feels that the Harwell experiments have covered every conceivable aspect of palladium metallurgy, a murky subject which has frequently been invoked as an explanation for the purported success of a few experiments amidst the failure of most. But the Harwell team has not been allowed access to any of the electrodes from Pons and Fleischmann's working cells, which are now apparently back with Johnson Matthey.

Fleischmann last visited Harwell shortly after Easter, but since then had stayed away in order that the experiments should be seen as entirely independent of the original cold fusion claims.

The Harwell group also tried titanium electrodes, as well as some heavy-electron alloys and a number of well studied hydrogen-storage compounds, all with negative results. The sensitivity of their neutron detectors was even enough to contradict the claims of low-level neutron emission which have been made by Steven Jones and his colleagues at Brigham Young University.

Although no new science has come out of the Harwell investigation, Williams says that the interdisciplinary collaboration was nevertheless rewarding. But he has formed "trenchant opinions" about the dampening effects of lawyers on scientific investigations, and worries also that this public failure of a "crazy idea" may make scientists generally more reluctant to discuss the crazy ideas which are an essential part of progress. **David Lindley**

US LAUNCH VEHICLES

Titan boosts space plan

Washington

THE successful launch of a Titan IV rocket by the US Air Force on 13 June, coinciding with the release by the National Aeronautics and Space Administration (NASA) of a new timetable for shuttle and other launches, marks the end of the period in which the US space programme has been rethought and reorganized in the aftermath of the Challenger accident. The availability to NASA and the Department of Defense of a range of unmanned rockets as well as the shuttle restores much of the flexibility lost when the shuttle was fixed on as the sole US launch vehicle.

The Titan IV, a 'stretched' version of earlier rockets in the series, is seen by the US military community, which had always been critical of dependence on the shuttle, as the workhorse of its launch fleet. The identity of the payload launched last week is classified, but has been widely reported to be an early-warning satellite, destined for geostationary orbit and capable of detecting the plumes of enemy missiles.

Also last week, NASA issued a revised manifest for shuttle and expendable launch-vehicle flights, and the Titan IV is included for the first time. It will be used to send off the comet rendezvous asteroid flyby mission (CRAF), which had not previously been allocated a firm launch slot. Although NASA made the decision to put CRAF on a Titan IV instead of the shuttle because it was confident of the new rocket's imminent availability, the issuing of the manifest at the same time as the Titan's maiden flight was coincidental; the US Air Force had made no prior announcement of the launch.

The Hubble Space Telescope (HST) loses a few months, and is now scheduled for launch in March 1990 instead of December this year. The earlier shuttle flight has been given over to a mission to recover the long duration exposure facility (LDEF), a satellite carrying 57 experiments which was put into orbit by the shuttle in 1984. If not recovered soon, LDEF will re-enter the atmosphere and burn up.

The HST has suffered incessant and frustrating rescheduling because, unlike planetary missions such as Magellan (successfully sent off to Venus last month) or CRAF, it does not need to be put into orbit at any special time. A novel feature of NASA's latest manifest, intended to ameliorate this problem, is the designation of six shuttle flight opportunities, starting in 1992, with no reserved payloads. This extra flexibility in planning should mean that isolated launch difficulties should not require wholesale revision of the manifest. **David Lindley**