Cold fusion gathering is incentive to collaboration

- Some evidence for neutron production
- Claims of energy generation mostly ignored

Washington

THE latest conference on cold fusion, a three-day meeting organized by Los Alamos National Laboratory in Santa Fe, New Mexico, last week, lacked the drama and intensity of other meetings around the United States earlier in the month. "Relaxed and civilized" was how one participant described it.

Debate centred on the reality and origin of the low level of neutron emission from an electrode of palladium in heavy water reported by Steven Jones and his colleagues from Brigham Young University. Not only were Stanley Pons and Martin Fleischmann absent from the meeting, but their claims of extraordinary heat output from cold fusion received little attention.

John Appleby, of Texas A&M University, repeated his group's assertion that they have measured excess heat in a number of electrochemical cells. Although the magnitude of heat output is comparable to that claimed by Pons and Fleischmann, it remains unclear whether this has anything to do with fusion.

Another Texas A&M group, led by Kevin Wolf, said they had found substantial amounts of tritium in some cells. But although the amounts they reported were 100 to 10,000 times above background, the accumulations were still considerably less than expected if the excess heat were due to deuterium fusions which generated tritium. Moreover, an analysis of a heat-producing palladium electrode by a research division of Rockwell International showed no accumulation of helium.

Because the measurements have been done by different groups, no single cell has been assessed for heat, tritium and helium, but the small quantities of fusion products suggests that at best only some fraction of the excess heat can be of nuclear origin.

Apart from the Texas A&M results, most of the discussion in Santa Fe concerned neutrons. The most intriguing new results were from Los Alamos National Laboratory itself. Howard Menlove announced that his group had detected low neutron fluxes, in bursts and spikes rather than the continuous output claimed by Jones, from a variety of experiments. In some cases, they had simply placed palladium and titanium, in the form of powder, sponge or metal shards, in high-pressure deuterium gas; in about 30 per cent of their experiments, sporadic neutron emission was observed.

Because they have used three neutron detectors simultaneously, swapped dummies for real test samples and made background measurements, Menlove says his group's experiments convince him that under some conditions neutrons are indeed created by the interaction of certain metals with deuterium. But their success is only occasional, and they are now trying to understand how the form and preparation of their metal samples determines the outcome of the tests.

Menlove's results are broadly consistent with those from the Brigham Young group, but direct comparisons are hard to make. The Los Alamos neutron detectors are about 100 times more efficient than those used by Jones, so that the bursts that Menlove sees, which typically contain 100 or 200 neutrons, would have been registered by Jones as a single particle. Nevertheless, the average neutron production in the two experiments is similar.

Set against these positive signs were results from a comparable series of experiments carried out by a group from Yale University and Brookhaven National Laboratory. Announcing their findings, Moshe Gai of Yale had no neutrons at all to present, at a level of detection sensitivity considerably better than Jones's experiments. To resolve this contradictory state of affairs, Gai invited Jones to bring one of his neutron-generating cells to Yale. Jones accepted the offer.

The cooperative spirit evident at the meeting was counterpointed by the absence of Pons and Fleischmann, who said at a congressional hearing on cold fusion (*Nature* **339**, 4; 1989), and have since repeated, that they were planning to work with scientists from Los Alamos in a critical assessment of their experiments. But a spokesman for Los Alamos made it plain that no such collaboration has occurred, because the University of Utah had not wished to enter into any agreement that it perceived would jeopardize its patenting and priority rights.

The lack of progress in substantiating the claims of Pons and Fleischmann has stalled any action in Congress. Staffers on the subcommittee on energy, research and development have been talking to several of the protagonists, including critics of cold fusion such as Nathan Lewis of the California Institute of Technology, and until a scientific consensus is reached, Congress, despite its enthusiasm of two weeks ago, will not be financing any large development projects.

David Lindley

SCIENCE EDUCATION

Hughes dollars draw students

Washington

THE Howard Hughes Medical Institute (HHMI) moved into the second phase of its programme of support for undergraduate science education last week with the award of $61 million to 51 universities. The money will be used to support programmes designed to recruit and retain good science students.

HHMI is now by far the most biggest player in the field of US undergraduate science education, well ahead of the National Science Foundation, which has suffered a shortage of funds for its own initiatives. Legal constraints limit HHMI's role as a grant-giver: most of the income from its $5,000 million is spent employing fully qualified researchers.

Two years ago, the institute awarded $30.4 million to 34 liberal arts colleges and 10 historically black colleges (see *Nature* 329, 574; 1987). This year, the recipients are the best universities but the emphasis on encouraging women and minorities to study science remains. A total of $22 million will be spent on intensive introductory and laboratory courses aimed at attracting students from these under-represented groups. The rest of the money is to be used for curriculum restructuring and new laboratory equipment ($20 million), initiatives to involve more faculty scientists in undergraduate teaching and research projects ($8 million) and outreach programmes aimed at students in local schools and colleges ($11 million).

Penelope Austin

GENETIC ENGINEERING

The flowers that bloom next spring

Bonn

FORTY thousand genetically-engineered pink petunias are to bloom in West Germany despite the continuing controversy over new legislation to control such experiments (page 327). Last week, the Federal Health Office experiment approved an experiment by Heinz Saedler of the Max Planck Institute (MPI) for Breeding Research in Cologne (*Nature* 338, 194; 1989). But the MPI group will not plant the petunias until 1990; approval came too late for the 1989 season. Environmentalists have opposed the petunia planting, not because they thought the flowers harmful but because they thought it would set a precedent for releases of other genetically-engineered organisms.

Steven Dickman

Correction

IN A News article entitled "Fire strikes Jackson Laboratory" (*Nature* 339, 169; 18 May 1989), Gerald Callahan was incorrectly identified as being at the University of Colorado. He is at Colorado State University in Fort Collins. □

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