

OLD WORLD

Fusion Research at Culham Expands

OUTLINE design studies on a fusion reactor are under way at the Culham laboratory of the United Kingdom Atomic Energy Authority. Work in the past five years has led to a much more optimistic assessment of the chances of fusion being used to provide electrical power, and support for the AEA's fusion work is to be increased from £3.9 million this year to £5 million a year by 1975-76. This reverses the decision taken in 1968 by the Labour Government and Mr Anthony Wedgwood Benn to halve the support for fusion research.

The decision to increase support follows the report by Sir Harrie Massey to Mr Tom Boardman, Minister for Industry, in which the AEA's fusion work was examined.

Dr R. S. Pease, Director of Culham, said last week that developments in high temperature plasma physics, in the understanding of toroidal magnetic field systems, particularly toroidal pinches, and in methods of suppressing the rapid diffusion (Bohm diffusion) that leads to poor thermal insulation, have all made the practical development of a fusion reactor a distinct possibility.

The enlarged programme has also been made possible by cooperation with Euratom. The—at any rate partial—solution to Euratom's future that was agreed on February 5 included an increased fusion research programme. Although this decision has still to be ratified, the Culham fusion programme will be jointly managed by the UKAEA and Euratom as part of a Euratom programme that will be carried out chiefly in national laboratories and which will be running at between £20 million and £25 million a year. Research at Culham will constitute about a quarter of the total, Dr Pease said, and about £1.25 million of the money spent at Culham will come from Euratom. The remainder will be provided by the UKAEA.

Dr Pease was also at pains to stress the importance of cooperation with the United States and the Soviet Union, and he cited the studies carried out in 1969 with the Soviet Union on Tokamak T-3 which has provided some of the best results yet with these experimental fusion assemblies.

The eventual aim of the enlarged programme at Culham will be to produce a plasma with a temperature of 100 million K and a density of 10^{14} cm⁻³ with a confinement time of over a second. Culham will try and reach this goal with continued effort on confining magnetic

fields within toroidal magnets. At present Culham has three new experimental assemblies in operation in order to achieve this goal. First, there is a superconducting levitron; second, a high beta toroidal experiment (HBTX); and third, a CLEO Tokamak/stellarator experiment. The laboratory also plans to build further stellarator and Tokamak apparatus in the near future.

Each one of these pieces of equipment enables different facets of fusion to be examined. In the Levitron, for example, long confinement times can be studied—times of up to 1/10 sec have been obtained with this apparatus but the density of the plasma has been low. In the HBTX there is a dense plasma but unfortunately a lower containment time, while in the CLEO Tokamak apparatus discharges lasting 1/10 sec have been obtained with poorly conducting walls (such as would be obtained in a reactor) but when a combination of optimum density and good temperatures is obtained the confinement time drops to 1/100 sec.



Dr R. S. Pease

The next step according to Dr Pease is the construction of a large apparatus in which a high density, high temperatures and a long containment time can be simultaneously maintained. The apparatus will be toroidal and probably a tokamak. Culham is at present actively discussing with Euratom where this apparatus should be constructed. But wherever that might be it is planned to have it in operation by 1978.

If the problems of maintaining a plasma at high temperatures and high

density for long times can be beaten then the next step is to develop a fusion reactor that can produce electricity commercially. This is a long way ahead although Dr Pease feels that when the large apparatus is built there will be a chance, however slight, that fusion power will be a reality before the end of the century. It remains to be seen whether this is more of a hope than an expectation.

EMBO

New Secretary

DR JOHN TOOZE is to be the Executive Secretary of the European Molecular Biology Organization. The decision, taken by the EMBO council last week, will mean that Dr Tooze will relinquish his position as research administrator at the Imperial Cancer Research Fund in London. Dr Tooze has been a regular contributor to *Nature* for the past seven years, and was deputy editor in 1968 and 1969.

Dr Tooze takes over the job from Dr Raymond Appleyard who is himself taking up another job with the European Commission in Brussels. Dr Appleyard, who was director and head of the biology programme in the Industrial, Technological and Scientific Affairs division, is now the Director General in the Dissemination of Information division.

The agreement among ten of the fourteen EMBO countries to build a European Molecular Biology laboratory in Heidelberg is to be signed later this week in Geneva. Before building can start the agreement will have to be ratified by the respective governments, a process which could take as long as a year. Although EMBO and the proposed laboratory are not directly linked, the new Executive Secretary will set up office in Heidelberg, but this will not happen for about 18 months. In the meantime EMBO will continue to be managed from Brussels.

CRIMOND TERMINAL

Loch Rerieved

TOTAL Oil Marine and the British Gas Corporation have put their plans to build a gas processing plant above the Loch of Strathbeg near Aberdeen into abeyance. The purchase of an alternative site at St Fergus, three and a half miles south of the loch, is being arranged