UK research

Neutron source inaugurated

WITH much fanfare, and in the presence of the prime minister Margaret Thatcher the Spallation Neutron Source (SNS) at the Rutherford Appleton Laboratory in Oxford was officially inaugurated this week. It is expected to be the last major facility constructed by Britain's Science and Engineering Research Council (SERC) for the foreseeable future.

Despite the delays and doubts that have afflicted its seven-year construction period, SNS is now acknowledged to be potentially the most powerful machine of its type in the world. Ebulliently, SERC's press office makes much of a quote that reportedly originated from the Argonne Laboratory, where there is a similar facility: "My God, they're going to blow us out of the water!"

Hitherto, British scientists wishing to make use of a neutron beam have depended heavily on the nuclear reactors of the Institut Laue-Langevin, Grenoble, a facility that is much oversubscribed. With a potential influx at the SNS of 4×10^{16} neutrons per second and an associated proton beam current twenty times greater than that available at the Argonne Laboratory, Britons would now seem to be well catered for. However, financial shortages have led SERC to negotiate with other countries, exchanging beam time with the provision of capital investment in the form of detectors, for example.

Another trade-off currently being investigated involves potential British use of the projected European Synchrotron Radiation Facility. Without such arrangements, SERC could only operate the SNS for about one third of the financial year 1986-87. As it is, the facility will close down — as far as users are concerned, at least — from Christmas until early April 1986, the start of the next financial year.

The principal users of SNS will be those wishing to use elastic and inelastic neutron scattering to probe solids and liquids. The neutrons are generated by the impact of a beam of protons on a uranium target. The protons arrive in two 100 ns bunches, 300 ns apart and repeated at 20 ms intervals, each pulse containing about 10^{13} protons. Having started off as negative hydrogen ions boosted to 70 MeV in a linear accelerator, the protons enter a synchrotron from which they impinge on the target with energies of 800 MeV or so. As the term "Spallation" indicates, the protons cause a greater number of neutrons to be ejected from the uranium, dissipating a quarter of a megawatt of heat in the process and leaving a highly radioactive target. Thus water cooling and remote handling techniques are essential.

Philip Campbell

UK environment

Labour's green charter

JOBS are a common political lure; less common is the claim that hundreds of thousands of them will result from proper environmental planning and research, as the UK Labour Party's Jobs and Industry Campaign promised last week at the launch of its environmental charter.

With proper planning, says Labour, economic growth and full employment can follow from such policies as product recycling, nuclear waste controls, reduction in pesticides, and protection of the countryside environment. Environmental research, says Dr David Clark, Labour environmental spokesman, is one source of new jobs as well as of the necessary data for planning. He criticized the recent slashing of the budget of the Natural Environment Research Council and of the Soil Survey, which faces a halving of its budget in April. Instead, he said, Britain should follow the example of West Germany, where 300,000 environmentally related jobs have been created.

Health problems around such plants as British Nuclear Fuel's Sellafield should be "relentlessly investigated" and the current moratorium on the dumping of radioactive wastes at sea should be continued. (The London Dumping Convention voted to suspend this method of disposal indefinitely last week but Britain voted against the resolution, which is not legally binding.) Such policies need a Department of the Environment with backbone says Labour, which wants the ministry to be a Department of Environmental Protection and Development. The new name is intended to signify a change in emphasis and inter-departmental clout.

Labour sees Britain's refusal to join the "30% Club" for acid emission reductions as "the most glaring example" of unmet international obligations concerning the environment. Britain is the largest producer of sulphur dioxide in Western Europe and yet no effort is being taken to retrofit power stations. "Not only is it morally wrong to pollute our neighbours' lakes and forests but it is economically stupid", according to Dr Clark.

In the countryside, "erosion of planning control" is manifested in the Forestry Commission, whose afforestation policies are "beyond control". Another offender, according to the Labour charter, is agriculture, "the largest subsidized industry in the country". Spurred by these subsidies, the industry produces "unsaleable surpluses of grain, butter and beef", while farmers are discouraged from conservation efforts and wildlife lose habitat.

Mrs Angela Rumbold, new Conservative Environment Minister, defended the government's policies by claiming that "management of the environment must be by the best practicable means . . . and clear both about the costs and benefits of taking action and about the risks of leaving things as they are".

She echoed the Labour charter by calling for more public disclosure of pollution data, particularly from nuclear facilities. She also pointed out the dangers Britain faces: "A 'cheap and dirty' image will be of no benefit to our industry at home or abroad." She did not, however, mention jobs as an ingredient of the government's "practical green policies".

Elizabeth Collins

IMAGE
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REASONS

Père David's deer which is to be re-introduced into China next spring. In 1900, most of the population was wiped out when they escaped from the Imperial Hunting Park near Beijing after its walls were damaged by a flood. The last wild specimen was shot in 1939 in the marshlands of the Yangtze delta where 30 deer from zoo populations will be placed in a new wildlife reserve. (Photograph courtesy of Zoological Society of London).