European Community research

Last goodbye to Super-Sara?

Brussels

ON the face of things, Britain could not have chosen a worse time to have led those urging the abandonment of the Super-Sara nuclear safety project at the research council held here last week. In the middle of the Sizewell inquiry and the debate on Britain's nuclear future, here was the United Kingdom anxious to cancel a major project conceived after the accident at Three Mile Island — an accident moreover which involved a pressurized water reactor (PWR) of the type which Britain plans to build at Sizewell.

On top of this, discussions on enhancing the importance of the Community's research activities are reaching a crucial stage and the United Kingdom is in general trying to dispel its partners' doubts as to whether the present government is positively interested in promoting a stronger Community.

Against all this, it must be said that Britain last week had the support of West Germany and the other member states except Greece and Italy in urging the project's abandonment, as well as an extremely negative experts' report. At the Research Council in December, Vicomte Etienne Davignon, the Commissioner for Industry, Energy and Research, had managed to postpone a final decision only by proposing that a trio of "wise men" should assess whether the project, given the escalation in costs, was still worth doing.

For Davignon, who nominated the experts himself, this seemingly adroit move proved, in the words of one British official, to be "an own goal". The report by Professors Birhofer, Holm and Teillac provided plenty of ammunition for the British and German delegations.

Although the report concedes that the project was originally a good idea, it concludes that because of the long delays, underestimates of budget and staff requirements and the possibility that the cost could continue to rise, the experiment was no longer cost-effective. Much the same results, it was felt, could be obtained from experiments being conducted elsewhere, and much sooner.

Despite the funeral atmosphere hanging over last week's council meeting, the last rites are still to be held over Super-Sara. The ministers will be meeting again on 10 March to consider what the alternatives are and the ministers took care to emphasize that neither Ispra nor the other three Joint Research Centres were at risk. The 293.9 million European Currency Units (ECU) (£161.7 million) set aside for the project would be spent instead on areas such as remote sensing, solar energy, fusion, the disposal of radioactive wastes or on the German suggestion of acid rain research. There was also some interest in turning the Joint Research Centres into

general European safety research centres.

Even so, much of the talk after the meeting was of apportioning the blame for a very expensive mess. So far, Super-Sara has cost more than 70 million ECU, and terminating the experiment, including the disposal of the Essor experimental reactor, will need up to a further 23 million ECU. And the United States will extract a substantial price for "European cooperation".

On Monday, the day before the Council meeting, Davignon had held a long press conference at which he roundly turned on the Council for procrastinating so long and causing the delays which had led to cost increases. The project was first approved in March 1980 but another year passed before the Council released a sum large enough (54 million ECU) to get going. Since then, doubts about the project have grown and led to postponement of other allocations.

The latest report points out that the conclusions of the "internal task force" released in April 1982 laid down a number of preconditions for success: that more money be immediately released, that the necessary personnel be assembled, that adequate management be appointed and that there should be no more delays. These conditions were never fulfilled.

This does not exonerate the Commission, however. The Commission gravely underestimated the cost of Super-Sara by a factor of 1.8. The management at Ispra has been extremely poor, while the Commission has failed to reform it in time or to present adequate alternatives.

The ten research ministers concluded from all this that "the decision-making processes for the preparation, adoption and implementation of the Joint Research Centres' programmes should be improved". But how? Davignon wants to have independent control of research programmes once they have been approved in principle and said that at the national level, ministers would not be found discussing research projects at in the detail customary in Brussels.

But the failure of Super-Sara reflects badly on nearly all concerned and must raise questions about the value of EEC research cooperation. Such misgivings were not, however, evident at this meeting. A favourable first reading was given to the three-year strategic framework programme which foresees raising research spending from 2.6 per cent of the EEC budget to 4 per cent. But there were few tangible suggestions as to how this might be done. "It was really a case of throwing out the one rotten tomato in a good bunch. Or, to mix metaphors, Super-Sara was the cuckoo in the nest that threatened the growth of other important research projects; it has to go", summarized one British official last week. **Jasper Becker**

US education

Money ahead

Washington

AMID new evidence of the worsening shortage of qualified mathematics and science teachers, the Reagan Administration last week presented to Congress the details of its plan for a crash programme to improve the teaching of mathematics and science in the nation's secondary schools.

The Administration's plan (filed in the House as HR 1324), which was first hinted at in the President's State of the Union address in January, calls for \$50 million to be spent each year on fellowships for up to 10,000 trainees. The money, which would be doled out through block grants to local school districts, would be aimed at teachers not currently in these subjects or would-be teachers who have science or mathematics backgrounds but not the necessary education courses. In either case, trainees would be chosen who would be ready to teach mathematics and science after just one year's training. The programme would continue for four years, training a total of 40,000 new teachers.

A \$20 million companion programme, administered by the National Science

Foundation (NSF), would seek to upgrade the training of an additional 10,000 teachers per year who are already teaching mathematics and science. This will probably be carried out through revitalizing the summer institutes that NSF has been running for teachers ever since the Sputnik launch set off the first wave of enthusiasm for science and mathematics improvement.

At a conference sponsored by the Department of Education last week, the proportions of the teacher shortage were outlined in vivid relief. According to data compiled by Betty Vetter, director of the non-governmental Scientific Manpower Commission, 22 per cent of high-school teaching posts in mathematics were vacant in 1982. In the Pacific coast states, where competition from the high-tech industries for technically-trained personnel is presumably especially high, 84 per cent of the

newly-employed science and mathematics teachers were not qualified to teach those subjects, she said.

"There is a growing body of evidence of diminishing quality as well", Vetter said. The average mathematics Scholastic Aptitude Test (SAT) score among all high school seniors last year was 467; among those seniors planning careers in education, it was 419. She added, "the number and academic standing of seniors planning to go into education were lower in 1980 than in 1972."

Paralleling this apparent decline in the competence of science and mathematics teachers is a continuing low level of performance in science and mathematics among students in general. Mathematics SAT scores have been declining for years, although they showed a slight upturn in 1982 (largely attributable to a dramatic rise in scores attained by minority students). Vetter noted that "half of all high school graduates take no math or science after the 10th grade". And the inevitable comparisons with other industrialized nations remain striking: in Japan, college-bound students take an average of three natural science courses and four mathematics courses in three years of high school. And, at college level, for every US engineering graduate, the United Kingdom turns out 1.1, West Germany 1.4 and Japan 2.6.

BAS's Falklands factor

THE British Antarctic Survey, conspicuous among British research organizations for having been offered more money to spend next year than it had hoped for, is planning that roughly £1 million of its extra £4 million should be spent in collaboration with universities. The survey's director, Dr R.M. Laws, says, however, that the recommendations of the survey's advisory committee have not yet been approved by the Natural Environment Research Council. One possibility is that there will be a seminar meeting with potential university collaborators in the early summer to decide which kinds of projects might be backed.

It is understood that the survey is also hoping with its own resources to embark on a marine geophysics programme, as well as to strengthen its work on marine living resources (based on South Georgia) and in particular its contributions to next year's international ice-age study and the coordinated study of marine resources planned for 1984-85.

Some of the windfall funds will be used to buy a trawler and aircraft, and to extend the airstrip at Rothera, on the west coast of the Antarctic Peninsula.

The extra £4 million available for 1983-84 is intended to increase to £5 million in succeeding years. In recent years, the survey's budget has not exceeded £6 million. Its unexpected good fortune seems to have been one of the uncovenanted benefits of the Falklands war. □

The difficulty of attracting trained scientists and mathematicians to teaching and keeping them there is exacerbated by a dismal salary picture. The average starting salary for 1982 graduates with bachelors' degrees taking jobs in industry or government was \$25,000 for engineers, \$21,000 for mathematicians, \$16,500 for biologists — and \$13,000 for teachers.

Some educators at last week's meeting doubted whether the Administration's proposal could do much given these structural problems. Others noted the absence of any funds for curriculum development, which had dried up since the days of the initial post-Sputnik wave of

enthusiasm. Dr George Keyworth, the President's science adviser, recently branded federal involvement in curriculum development as "social engineering".

A more ambitious proposal to revitalize science and mathematics teaching has already been approved by one House committee. This proposal, HR 1310, was introduced by Representative Carl Perkins (Democrat, Kentucky); it calls for the federal government to spend \$300 million in the first year. States could use these funds for teacher training, buying laboratory equipment, curriculum development or other programmes to improve science and mathematics teaching. **Stephen Budiansky**

Dead Sea project

Plan for filling sunken sea

ISRAEL'S long-discussed project to connect the Dead Sea with the Mediterranean has now reached the detailed planning stage and construction could be completed as early as 1990, according to the latest report from the Mediterranean Dead Sea Company. The main obstacle now is not so much the construction cost (estimated in January 1981 at US \$900 million) but opposition from the Hashemite Kingdom of Jordan, which regards the proposed construction as a breach of international law.

Politics apart, the case for the link-up is simple. Under natural conditions, the Dead Sea was a self-regulating hydrological system, with water-level maintained 393 m below sea level by an annual influx of some 1,600 million m³ of water from groundwater seasonal streams and, most importantly, the flow of the lower Jordan south from the Sea of Galilee. During the past two decades, however, the operation of the Israeli National Water Carrier, which draws its supply from the Sea of Galilee and the East Ghor Canal in Jordan, has reduced the inflow by 75 per cent. The result has been a 9 m drop in water level, the regression of the Dead Sea by up to several hundreds of metres and, following the 1979 drought, the actual splitting of the sea into two by a land-bridge formed at the Straits of Lisan.

Further hydroengineering works on the Jordanian side (including the damming of the Yarmuck and the extension of the East Ghor Canal) and increased demands for irrigation water on both sides of the border, are expected to increase the rate of shrinkage in the next decade. Without outside intervention the sea level is expected to fall to -408 m by 1990. The Mediterranean project aims to restore the water-level to the "historical" -393 m line, by bringing in water from the west. The cost of the project will be partly offset by generating hydroelectricity.

Since 1974, four possible routes for the Mediterranean link have been considered. That selected, on both economic and environmental grounds, is the most southerly, running from Qatif on the

Mediterranean, crossing the Negev south of Beer Sheva and entering the Dead Sea at Parsa, near the Straits of Lisan. The total route is some 110 km, of which 20 km will be an open canal following roughly the 100 m contour, with the crossing of the Judean mountains made by pressure tunnel. This system, it is planned, will carry 1,700 million m³ of water annually, until the Dead Sea is restored to the -393 m level, and thereafter 1,000 million m³ to maintain equilibrium. The generating capacity of the Parsa power station, at equilibrium, will be 1,080 million kwh per year.

The Jordanian objection to the plan is twofold. Firstly, Jordan claims that the proposed route is in breach of international law, since the intake installations are sited on "occupied Arab territory" — the Gaza Strip. Secondly, it says that the rise in sea level will result in the flooding of some of its best agricultural land, tourist hotels and roads, "antiquities" and the new Jordanian Potash Works, which started production last year and is expected to produce an annual income of \$200 million.

Part of the problem is that the Jordanians, as the water receded, built tourist facilities and the potash works right down to the water's edge whereas the Israelis, when the Dead Sea Works at S'dom became stranded inland, dug new channels to bring in brines to its evaporation beds.

Since the Israeli cost-effectiveness surveys include estimates for new construction at both the Dead Sea Works and the Jordanian Potash Works, it would appear that the Israelis might however meet reasonable compensation claims. The risk that total mixing of the Mediterranean and Dead Sea water would occur, making further extraction of potash impractical, would affect both plants equally, but is felt by the Israelis to be slight — an opinion not challenged by the Jordanians.

The Jordanian claim that good agricultural land and "antiquities" will be drowned seems less realistic, since the project is designed only to restore the water level to the pre-1960 mark. **Vera Rich**