

and on such a schedule their array would be in operation by 1984–85. If the 25-metre dish is approved for funding next year, as hoped, there will be no conflict. However, if it is postponed again, then relations between what could become rival projects would be more delicate.

Experience has taught supporters of the ground-based array that any debate over who should run the facility ought to be resolved before the funding battle begins. Many feel that proposals for a mid-west telescope floundered because of inter-university rivalry for control. "We are determined not to make the same mistake again", says one radioastronomer.

David Dickson

Nuclear protests

Were Croats first?

With the Madrid Conference about to commence its review of the Helsinki Accords on Security and Cooperation in Europe and the Campaign for Nuclear Disarmament recently revitalized in the United Kingdom it is interesting to look back at what was almost certainly the first ever anti-nuclear protest — that of Dr Ivan Supek, a Yugoslav physicist, in 1944, more than a year before nuclear bombs were dropped on Hiroshima and Nagasaki.

Before the war, Supek had been a pupil of Heisenberg. In 1941, after a visit to

impossible the final victory of progressive forces — a victory which Marxist theory stated was inevitable. Therefore such weapons could not exist.

Supek, however, remained unconvinced, and a few months later published his papers from the congress in the Croatian popular science journal *Priroda* under the titles "Developments in Modern Physics" and "Science and Society".

Although at that time his main fear was of the perverted use that the Nazi regime could make of science (biology as well as physics), his stand against nuclear weapons has never wavered. He has from the beginning been an active participant in the Pugwash movement, and is extremely wary of proposals for peaceful uses of nuclear energy (including research), lest they be perverted to military ends.

Vera Rich

Research councils

Geological setback

The Department of the Environment will slash a third from its spending on geological science over the next three years, raising a question mark over the future of the Geological Survey of Great Britain, officials of the UK Natural Environment Research Council (NERC) said last week.

NERC was launching its first annual report since Sir Hermann Bondi took over a month ago as the new chairman of NERC (see *Nature* 5 June, p. 349). Bondi had no influence over the report and was much less concerned than his colleagues: "This report is not in my style", he said. "As you know, I'm an eternal optimist."

Bondi favours the Rothschild "customer-contractor" principle, which the report described as a threat. In 1973 NERC lost control of a third of its budget to government departments, following Lord Rothschild's recommendations for a shake-up in government science spending. At the time, the council warned that many of its projects — such as the Geological Survey — which were dependent on a group of customer departments would be vulnerable to the whim of any one of its customers. "It is of little comfort that this forecast is proving correct" says the report.

A quarter of NERC's £20 million contract research income depends on multi-customer contracts. The Geological Survey itself costs about £4.5 million a year, of which the Department of the Environment currently contributes £1.5 million. The survey was established in 1835, and produces near-surface and deep geological maps of Britain, improving them area by area as techniques develop. Some 180 scientist-years are spent each year on the survey, which involves 10 field units and a number of palaeontologists and chemists, mostly at the Institute of Geological Sciences (IGS).

The survey, UK geologists argue, is a national resource, drawn on regularly in

major civil engineering works, for example. But if the Department of the Environment takes too short a view, the value of the survey will be diluted and ultimately lost. A thorough survey for a "sheet" covering an area of 12 miles by 18 miles takes around 25 scientist-years and 5 to 7 years. "So you can't turn on a tap when you need a survey" said Dr Brian Kelk, who heads NERC's geosciences division. The survey is not purely an academic exercise. Dr Kelk argues that the survey must be developed on a continuous basis. It is not possible to predict exactly which areas are likely to prove important; for instance, the massive construction work carried out for North Sea oil terminals on the west coast of Scotland and the Shetlands would probably have been slowed without the geological maps which may have seemed of only academic interest when they were made in the 1920s.

Other bodies in the "consortium" which has managed the survey since Rothchild are the Department of Energy (contributing 5 per cent), the Department of Industry (also 5 per cent) and NERC (60 per cent, through the science vote of the Department of Education and Science). But the consortium will now collapse, with the Department of the Environment cutting its share to 20 per cent and offering its money piecemeal for particular areas and purposes. A new management structure must thus be found for the survey — and one is being sought actively by the director of the IGS, Dr G. M. Brown, who will present his proposals to NERC in two weeks' time. Dr Brown will also have to cope with other Department of the Environment cuts at IGS, where the department is reducing its spending from £3 million (at 1979 prices) this year to £2 million in 1982–83, out of a total IGS budget of £16 million. Staff recruitment, for one thing, will be reduced to a trickle.

Nevertheless, NERC's total income of £56.6 million in 1979–80 will hold roughly constant in real terms in 1980–81, largely through a slight increase in funds from the Department of Education and Science; but there is another problem over the replacement of the council's two research ships, RRS *Shackleton* and RRS *Discovery*. The *Shackleton* is older, and will probably be retired around 1983. The *Discovery* should remain effective until about 1987, but a new ship must be found to replace her if Britain is to maintain her place in oceanographic research, says NERC. This would cost £18–20 million at present prices, plus equipment: and to have her ready for the 1988 season, the order must be placed in 1984 at the latest. But there is no sign of the necessary money being made available — except perhaps if the ship were used jointly by the Science Research Council's Marine Technology Directorate and NERC.

It is here, perhaps, that Bondi's contacts and experience in the Advisory Board for the Research Councils — which advises on



Supek (left) and comrade, 1944

Heisenberg in Leipzig, he said that, although his main interest at the time was solid-state physics, he was able to make an "informed guess" that the Germans were working on both fission and fusion bombs.

Supek made his fears known in June 1944, at a congress of Croatian "cultural workers" (a term which included scientists) held in the newly liberated town of Topusko. His views did not go unchallenged. Several Marxist participants were doubtful that such weapons could exist at all. Nuclear weapons in Nazi hands, they argued, would render utterly