

being negotiated with Britain, is probably of no significance, the fact of South Africa's growing isolation in the world seems certain to have been a factor in the calculations of Mr Vorster's government. Enriched uranium is an expensive commodity at the best of times, costing £50,000 a ton in the United States at present, and Mr Vorster must be reckoning that the manufacture of nuclear fuel within the republic would free his government from embarrassing pressures as the South African nuclear power programme unfolds.

The chief candidate for the "novel" process must be the centrifuge, on the lines being pioneered by Holland, West Germany and Britain. For one thing it is viable at a much smaller turnover than is the diffusion process, the smallest useful diffusion plant costing something over £250 million, and the output of a centrifuge can be increased easily according to demand. An alternative is the jet nozzle process, on which work has been done in West Germany, but this is thought less probable. In this method helium and uranium are forced through a nozzle and the uranium is removed by bending the beam into a curve, producing a centrifugal effect. So far the only announcement is that a pilot plant is under construction, and it is unlikely that appreciable amounts of uranium-235 will be available within the next five years.

The opportunity always exists, of course, for producing fuel for nuclear weapons by carrying out further enrichment, but the economic and political arguments alone for building an enrichment plant look convincing. Last year South Africa exported 3,965 tons of uranium concentrate, fetching about £7,000 per ton of uranium in the concentrate, which is still less than a seventh of the cost of uranium enriched to 2 per cent ²³⁵U from the United States—if available.

EUROPEAN SPACE

Britain upsets Timetable

It was not so much a reluctant as an unprepared British team led by the Minister of Technology, Mr G. Rippon, with Lord Bessborough in support, which met in Brussels on Wednesday of this week for the fourth European Space Conference. There were contrasts as well as parallels with the Common Market negotiations settling down in earnest there at the same time.

Britain last week failed to get a further postponement of the space conference—already postponed once on Britain's behalf because it clashed with the General Election. The move failed, partly because continental space ministers had already put off their summer holidays once. There was still a hope in London that the trickiest part of the conference, upon which the new government has yet to sort out its policy, could be held over until September or so. Two ministerial conferences in the year (for which there are precedents) would be better than breaking up indefinitely without any major decisions being taken.

The most critical issue facing the meeting was the extent of Europe's participation in the US post-Apollo programme of manned space stations supplied by re-usable shuttles. The concept makes nonsense of most of the forward planning for the European programme and especially the Europa launcher, which Britain no longer supports and which has recently suffered its fourth successive failure. The United

States cannot wait indefinitely for Europe to make up its mind and less than a 15 per cent share of the roughly \$1,000 million per year programme would not be worthwhile for either side, European space officials are saying. Europe needs to earmark one or more sectors of interest; the astronomy module and the space tug have been named. Options are closing fast, as the American space agency and its contractors were telling European industry a fortnight ago in Bonn. On the other hand, this is such a big and radical step that there is rightly hesitation at rushing wildly into it at the expense of scrapping the pattern of scientific and "useful" satellite projects that have been built up carefully over the past three years and are now ripe for further decision. At the least, a negotiating body to keep up the dialogue with the Americans should have emerged by this weekend. This spring saw a working party on the American offer set up within both of the main European space bodies, ELDO (under Mr J. Causse) and ESRO (under Mr J. A. Dinkespiler), and it would be obvious to draw on these.

Fundamentally the European space countries need to decide for at least the decade what value they put on space developments and how independent they can afford to be. This will take longer than this chopped and changed two and a half days in Brussels.

DATA TRANSMISSION

Netting the Data Traffic

A DATA transmission system that could become the prototype of a national data transmission network covering Britain was unveiled at the National Physical Laboratory this week. The system extends over the grounds of the laboratory at Teddington, and there is a link to the ship division five miles away at Feltham. According to Dr D. W. Davies, superintendent of the computer science division at NPL and moving spirit behind the new system, although the NPL net is small it is representative of the hardest part of a national system. A system which is in many ways complementary to that at NPL and deals with the long distance switching of data is being developed in the United States.

In the first instance the system being demonstrated this week provides a service for the staff of the laboratory. Basically it consists of a small computer (a Honeywell DDP 516) through which data can be switched from one part of the laboratory to another. Peripheral devices of all speeds such as teleprinters, graph plotters and visual display units can be connected through the computer to each other and to the laboratory's computing power. At present there are nine terminals scattered around the laboratory, and by the end of the year this is expected to have increased to forty covering the main buildings. There is no reason in principle why the network should not be extended to as many as 500 terminals, Dr Davies says, although this would far exceed the needs of the laboratory. But future developments might include the extension of the network to computing facilities which are available outside the laboratory, and there is a plan to include a large disk store in the system.

But the significance of the system being demonstrated this week to industry, universities, and government departments goes further than the service it