opened in the past few weeks, as it has become clear that the decision not to participate in the building of the 300 GeV machine may have been a serious error of judgment.

The truth is, of course, that the issue of British membership in the consortium which will build the new accelerator was at once extremely carefully studied in advance and yet almost casually decided. The Council for Scientific Policy appointed a committee under Professor Michael Swann to make a thorough investigation of the matter and the Government was shamed into publishing this document in good time for plenty of discussion among the interested parties—high energy physicists on the one hand and a variety of sceptics such as chemists on the other. Briefly, the Swann committee argued that the building of the new machine would be tolerable within a balanced programme for the development of science as a whole only if the total expenditure on academic research in Britain were to increase by at least nine per cent a year. This conclusion sprang from the assumption that existing British facilities for research in high energy physics, especially the laboratories at Harwell and Daresbury, would continue to function at much their present scale. It is not surprising that the response of the Department of Education and Science to this opinion was a somewhat startled unwillingness to make such a generous forward commitment to academic research in British universities. To begin with, the department was fortified by the divisions there seemed to be among academic scientists about the virtues of the proposed machine. At no time does the department itself seem to have taken seriously or even to have suggested the possibility that other procedures might be used for financing British participation. In the end, and too late, it was left to the Science Research Council to enquire whether a proposal to participate which was coupled with the planned shutdown of facilities in Britain would be acceptable to the Government. (The suggestion that a British site would be more acceptable seems to stem from that same abortive enquiry.) But in practice it seems that the meticulousness with which the Department of Education and Science regarded the process of decision making within its own establishment was translated into an appearance of half-heartedness when it came to present its case to other ministries and to the Cabinet. That, at least, is a generous description of what seems to have taken place. The result is that a great many politicians have been taken by surprise to see how deeply felt among the professional community is the decision not to participate in the building of the 300 GeV machine. The politicians have also been taken aback because events have not borne out the predictions of the Foreign Office that a British decision not to participate would quickly be followed by similar decisions elsewhere, particularly in Western Germany. At some point it will obviously be important to know just how such a carefully discussed policy can have been so ineptly decided.

Two matters call for more immediate attention. First, there is the question of what will happen now at CERN. With the accession of Switzerland to the proposed treaty on the 300 GeV machine, there is now no reason why construction should not be pushed energetically ahead. The next step will be the start of planning work. A site should be chosen by the early summer and, with luck, construction work may start a year or so from now. One way and another, it looks as if the European machine will be roughly a year behind the American machine on which construction started a few weeks ago at Weston, Illinois. Given the higher initial energy, this is an entirely respectable interval of time. In other words, it seems entirely possible that European governments will be well placed to keep high energy physics going in Europe until the late eighties at least. That is something to their credit.

There remains the question of when, if ever, the British Government will find itself signing the agreement which it refused some months ago. Much obviously will depend on the way in which the British economy develops, and it would be wrong to underestimate the importance of sheer financial stringency as well as lack of imagination in the calamitous decision not to play a part. But the appointment of Dr Adams as director of the new project is in a curious way a proof that it is almost inevitable that the British Government must play a part. The question is not so much whether as when. At this stage, it would be at once politically impracticable and perhaps undesirable to ask that the Government should turn its previous decision upside down. But a year from now, circumstances could well be very different. The principal need is that British participation should be guaranteed no later than the point at which important decisions on construction have to be implemented in terms of concrete and steel. It would in particular be unfortunate if the new machine were built without facilities which would later have to be added at considerable expense. This is why the inevitable interval of non-participation that there will now be should not be allowed to last too long. The best course for those concerned to see a truly European machine at 300 GeV would be to make a detailed examination of the ways in which the British Government could afford to participate within a comparatively slowly rising science budget. This is a task which only the Nuclear Science Board of the Science Research Council can accurately undertake. Dr Adams, no doubt, will be glad to help.

CERN

Adams, CERN and 300 GeV

As *Nature* went to press, the Council of CERN, the European Organization for Nuclear Research, was gathering in Geneva for the purpose of electing a director for the 300 GeV accelerator project. There was little doubt that the man appointed to the job would be Dr J. B. Adams, Member for Research of the UKAEA, and a former Director-General of CERN. Barring a last minute change of mind by the Council, Dr Adams seemed certain to get the job he has been coveting for some time, and, as befits candidates for offices like these, he had no comment at all to make this week.

There is no doubt that Dr Adams is a good choice, not least because the job will call for all his formidable energies. Dr Adams' career is extraordinary. In 1940, without formal qualifications, he joined the Telecommunications Research Establishment, perhaps the most fruitful and successful government laboratory which has ever been set up in Britain. After the war, he joined the Harwell laboratory of the AEA, where he stayed for eight years. In 1953 he joined CERN, and became Director of the Proton Synchrotron Division in 1954, and Director-General of CERN in 1960. Then he moved on to become Director of the Culham Laboratory of the AEA and, briefly, Controller at the Ministry of Technology. Since 1966 he has been Member of Research for the AEA, and has been instrumental in setting up the Programmes Analysis Unit at Harwell. He has honorary doctorates from the University of Geneva and the University of Birmingham.

When the 300 GeV project is formally under way, Dr Adams' title will be Director-General, but until then it seems likely that he will be appointed a director at CERN. Despite the British refusal to join the project, there now seems very little doubt that it

Dr J. B. Adams

will go ahead—the latest country to agree is Switzerland. But the formal decision is not likely to be taken for another year or so. The decision about where the accelerator is to be should be taken in the summer of next year, probably in June. There is still some hope that by the time the formal decision is taken, the British Government will have come round and will agree to support the project, although this must depend on Britain's economic position at the time. It is known that the Treasury is not best pleased by the advice it was provided with in the period before the decision was made—the Foreign Office, for instance, is said to have told the Treasury that if Britain withdrew from the 300 GeV project, other countries would do the same. As is now known, this advice turned out to be distinctly unreliable.

Meanwhile, some British MPs are keeping up the pressure. One of them, Mr Tim Fortescue, has written to Mrs Shirley Williams, Minister of State at the Department of Education and Science, about a parliamentary answer she gave him on December 5. On that occasion, she declared that the Nuclear Physics Board of the SRC had made its recommendation (to support the 300 GeV machine) "on the assumption that the site would be in Britain". Mr Fortescue says that as far as he is aware, the Nuclear Physics Board made no such assumption, and asks Mrs Williams either to let him know on what authority she made her statement, or to take an early opportunity of putting the record straight. The department confirms that the letter has been received, but no reply has yet been sent.

ASTRONOMY

Observing the Stars from Space

THE first of three planned Orbiting Astronomical Observatories (known as OAOs) was successfully launched from Cape Kennedy last week. This is more than two years after the fiasco of the first attempt at launching an OAO, when electric arcing short-circuited the spacecraft's power system. Several improvements have been made to the design and operation of the spacecraft since then.

The principal benefit of having an observatory outside the Earth's atmosphere is that observations can be made in the ultraviolet region of the spectrum, at wavelengths that are almost totally absorbed at the Earth's surface. This first observatory, labelled OAO-2 in recognition of the earlier failure, has an elaborate programme of stellar charting ahead of it; there are two separate observational systems on board, one built by the Smithsonian Astrophysical Observatory at Cambridge, Massachusetts, and designed to study up to 700 stars each day, and the other built by the University of Wisconsin to give detailed information on a few select stars each day. Both sets of equipment operate at ultraviolet wavelengths.

The 4,400 pound observatory has been sent into a circular orbit 474 miles above the Earth's surface in a plane at about 30 degrees to the equatorial plane. It orbits in about 90 minutes. Energy for the batteries is obtained from a set of solar paddles, and the orientation of the spacecraft is measured by light-sensitive trackers which are locked on to specific reference stars. There are six such trackers, which move round as the craft follows its orbit, and NASA has announced that three of the trackers have locked onto reference stars as planned, the other three merely being engaged in tests.

As rays from the Sun cause serious interference with measurements from the stars, the telescopes in both sets of equipment only operate during the part of the orbit—about a third—when the craft is in darkness. The Smithsonian and Wisconsin packages are situated at opposite ends of the vehicle, and view at 180 degrees to each other. Intricate planning and programming have been necessary to ensure that both sets of equipment are making observations at fruitful orientations, as the satellite can only receive information from the ground (and relay it back) for about 10 per cent of the orbit.

The Smithsonian equipment consists of four tele-