

which is a paltry £8,000 a year. "That," says Miss Weston, "will have to go up." But not yet. The museum's budget is run on a quinquennial basis and there are still eighteen months to go before the new settlement is due.

UNIVERSITY RESEARCH

Physical Sciences Cut

THE growth of postgraduate numbers in the physical sciences is to be heavily restricted following the government's white paper on education published last November.

Now that the University Grants Committee has apportioned the £1,392 million (1972 prices) of recurrent grant that makes up the 1972-77 quinquennial settlement, certain of the white paper's provisions have become clearer, in particular the stipulation that the numbers of postgraduate students are to be cut from the current 19 per cent of full-time students to 17 per cent. This amounts to a 60 per cent reduction on the extra numbers of postgraduates requested by the vice-chancellors in their submissions to government.

Vice-chancellors are seriously concerned at this cut in the growth rate which will increase Britain's postgraduate numbers by only 7,000 to 52,000 by 1976-77, and they are also critical of the way post-experience courses, taught postgraduate courses and research degrees have all been lumped together in the calculations.

Guidance as to the numbers of postgraduates in each subject area that individual universities should aim at has been given to the universities by the UGC, and from these figures it is apparent that science and technology have suffered badly from the reduction in growth, physics and chemistry taking the largest cuts, with medicine, social sciences and business studies receiving the largest increases in postgraduate numbers.

A number of vice-chancellors are also seriously worried by government advice, issued through the UGC, that growth in the numbers of overseas postgraduate students taken by British universities should also be cut. Many of these come from the third world and it is felt that training overseas postgraduates in skills that can be used in their own countries is one of Britain's most helpful contributions to the developing nations.

The vice-chancellors also maintain that the universities must be given full compensation against inflation during the quinquennium. The settlement is a particularly tight one with the universities being asked to take more students at lower unit costs, and the vice-chancellors feel that this can only be done if inflation is not allowed to further cut the actual monies available.

SPACE

ELDO Lingers On

THE European Launcher Development Organization won a two-month reprieve at a council meeting in Paris last week. The council decided to keep the Europa II programme running until April 1 after France and Germany had again failed to agree over the long-term continuation of the programme.

Europa II is all that is left of the ELDO programme after the decision of the European Space Conference in December last year (see *Nature*, 240, 516; 1972) to scrap Europa III in favour of a new French launcher proposal, L3S, which the French claim will be considerably cheaper than Europa III would have been.

The Europa II programme consists of two test firings during this summer and autumn, the second of which will carry a dummy load to represent the communications satellite Symphonie I.

Two firings of Symphonie are then planned, followed by a launch of an ESRO satellite to complete the Europa II programme. The French are eager to see the programme through, but the Germans are believed to favour scrap-

ping the launcher, which has proved a costly failure so far, preferring instead to send Symphonie up on an American Thor Delta launcher.

Last Friday's meeting did little to produce any solution to the disagreement, but the council did agree that the Europa II programme is to continue as planned until April 1. A final decision on the future of the programme, and therefore of ELDO, will be reached "in good time" before then.

ELDO's future as a separate organization is in any case limited. The European Space Conference held last December agreed to a British proposal that a European Space Agency be formed by 1974. Under this proposal ELDO is to be merged with ESRO under the control of the agency which will also oversee individual space programmes of the member countries. It is expected that this new agency will also be responsible for developing the L3S, a three-stage launcher which the French claim will have the same performance as Europa III but at a cost of Fr 2,200 million (about £180 million) compared with the estimated Fr 3,000 million that Europa III would have cost (see *Nature*, 240, 434; 1972).

HOVERTRAINS

New Linear Motor

IT is now feasible both to levitate and to propel a hovertrain using only a linear induction motor. This was the crux of the Friday evening discourse delivered last week at the Royal Institution by Professor Eric Laithwaite, of Imperial College, London, one of the founding fathers of the linear motor.

Professor Laithwaite backed up his assertion by demonstrating the latest version of the transverse flux motor. This kind of motor, in which the flux is perpendicular to the direction of motion rather than along it, was evolved by Professor Laithwaite, Dr J. F. Eastham and the Imperial College group in 1968 and developed since then.

Although the new motor was first exhibited at a high speed transportation exhibition in the United States last year, the details were revealed for the first time last Friday. The unveiling is particularly timely because of the extreme uncertainty at present about the future of Tracked Hovercraft Limited, the wholly owned subsidiary of the National Research Development Corporation, which has now developed a hovertrain weighing ten tons, supported on an air cushion and propelled by a linear motor. This vehicle recently achieved a speed of 107 miles an hour on the company's 1-mile test track in Cambridgeshire; the average acceleration on this occasion was $\frac{1}{3}$ g.

The government has not yet decided whether or not to inject another £4 million into the hovertrain project, but Professor Laithwaite said this week that for this amount of money it would be quite possible, using the new motor, to build a 30-ton vehicle capable of carrying passengers and travelling at 250 miles an hour within three years. This would involve lengthening the test track to 3 miles. Professor Laithwaite also says that such a vehicle could hover at a height of 6 inches above its track. The present British hovertrain, the RTV 31, travels along with a clearance of only an inch or two.

Research on high speed transport of this kind is being actively pursued in several other countries, the United States, France, Germany and Japan for example. But whereas most people seem to be agreed that the linear motor, in some form, is an essential ingredient of any arrangement, there are differences of opinion about how vehicles should be made to hover. Germany favours a suspension system involving a feedback loop to maintain stability, whereas the United States, France and Japan are putting their money behind levitation based on superconducting magnets. Both these systems suffer from the disadvantage that they will probably prove much more expensive (in liquid helium for example) than a system that makes use of a transverse flux linear motor and thus requires no separate means of levitation or suspension.