

companies (the military programme permitting), but so far none seems to have taken advantage. Lorries for export to hot and humid regions might well benefit from a programme of tests in the hangar, and costs of the order of £30 per hour for heating and humidity are quoted.

Although the establishment comes under the direction of the Ministry of Technology, its function is still a military one. It is responsible for the trials of new aircraft and aircraft equipments before they go into squadron service. One of the station's facilities is, however, to be used for the Concorde programme. This is an old Canberra bomber, converted for use as a tanker. By spraying water from specially designed nozzles, it can simulate aircraft icing conditions. The Canberra can carry some 900 gallons of water, using tanks fitted on the bomb bay, and a converted fuel tank. When sprayed behind the aircraft, this produces a cloud into which the aircraft under test is flown. Again, this is a very much cheaper method of testing than waiting for the right conditions to occur naturally, which, as the staff at Boscombe point out, happens only when it is least wanted.

ROYAL SOCIETY

The Year of the Move

"THE most important event was an evening reception on November 21, 1967, when the society was honoured by the presence of its patron, Her Majesty the Queen, who formally declared open the society's new home at 6 Carlton House Terrace." So begins the Royal Society's report of council for the year ending September 30, 1968. But apart from removing to the heart of clubland the society has during the year increasingly involved itself in current problems of science education; the Dainton disease, the failure of industry and schools to attract scientists and technologists which was revealed in the Swann Report, and the problems of postgraduate education. The recent discussion meeting on "The Swing from Science in Schools" was a success, unlike the generally uninspired series of reports of sub-committees inquiring into postgraduate training. The last of these reports, on engineering and earth sciences, is promised this year.

During the year the society has initiated discussions on the introduction of metric units, given evidence to the Dainton Committee on a National Library, and agreed to increase the emphasis of its own library on the history of science, especially that in Britain. The society is, for example, investigating ways of preserving the papers of fellows.

In the expeditionary field the society is on the verge of achieving its aim of setting up a permanent research station on Aldabra island (see page 947) and it has contributed to the International Biological Programme through its expeditions in Uganda and New Guinea, as well as numerous projects in Britain. The society has also jointly sponsored, with the Royal Geographical Society, an expedition to the Mato Grosso, and with its counterpart in New Zealand has arranged an expedition in the New Zealand ship Endeavour to mark the bicentenary of Cook's first circumnavigation.

The European Exchange Scheme, in its second year, is flourishing. Eleven West European countries have now agreed to put up matching money totalling

£72,656 so the society can ask the British Government for that amount to finance overseas scientists in Britain. With this Government money and grants from the Ford and Wates Foundations and Pergamon Press, the society awarded 90 fellowships (53 from Britain to Western Europe and 37 from Western Europe to Britain) and 50 study visits. In addition the society made 37 exchanges with academies of science in Eastern Europe.

Parliamentary grants administered by the society in 1967-68 totalled £657,000, including £43,250 for rent and management of Carlton House Terrace. In the current year the society has a considerably larger budget, £802,000, most of the increase being for its International Fellowship Scheme and for furthering international relations.

CONSTRUCTION

Better Concrete

It is estimated that some £130 to £150 million is going to be spent on elevated roads in Britain in the 1970s. Structures such as the Hammersmith Flyover, the Mancunian Way and the Western Avenue Extension are therefore going to become increasingly common features of the urban environment. The design of elevated roads, however, poses several problems—they have, for example, to be supported on a very small ground area, and they must be capable of being constructed on a very restricted site. These and other problems associated with the design of elevated roads are being tackled by the Design Research Department



The addition of skid resistant texture to an existing concrete road.

of the Cement and Concrete Association's Research and Development Division at Wexham Springs near Slough. A comprehensive research programme lasting three years is now in progress at the laboratories with support from the Construction Industry Research and Information Association. Some of this work and other research on bridge design was demonstrated at an open day held last week at Wexham Springs. Work being done in two other divisions of the research station was also on display. The Construction Research Department deals with the construction process itself and its significance in relation to the properties of

concrete; with the aesthetic, functional and economic quality of the resulting products; and with the improvement of site procedures. Much time is spent in this department on problems associated with the construction of concrete roads. Results of tests of skidding resistance of this type of road have shown that the most effective and durable skid resistant surface for newly laid concrete on high speed roads is provided by closely spaced transverse grooving of the concrete surface. Work is also being done on ways of producing high skidding resistance on existing concrete roads which are smooth textured.

The Materials Research Department carries out research into the basic nature of concrete—the rheology, physics and chemistry of the bonding process that takes place during hydration of cement, the properties and influence of the various constituents of concrete and so on. Of potential importance are the very high strength materials being made in this department from hardened cement pastes containing no aggregates. All this research is backed up by a technical advisory and information service on the uses of cement and concrete, by publications and educational activities. Although the association works in collaboration with government laboratories like the Road Research Laboratory and the Building Research Station, and grant aided research associations, it receives no public funds. It is financed instead by voluntary levies paid by member cement companies on each ton of cement sold in the United Kingdom.

EDUCATION

Feeling the Squeeze

THE British Government's unilateral and hotly contested decision to raise the university fees charged to overseas students at British universities by a factor of more than three seems to be taking effect. There was a decrease of 4,000 in the number of foreign students at the universities during 1967–68. This is the estimate of the annual report of the British Council, which was published on November 28 (HMSO, 2s 6d). This was the first decline in the numbers of overseas students in Britain since the British Council began keeping records in 1957. The drop of 4,000 represents a decrease of 6 per cent in the total population of overseas students, but a decline of 13 per cent in the number engaged in full time education at the universities and technical colleges. In 1967–68 there were 69,000 overseas students in Britain of whom 30,500 were engaged in full time education. The equivalent figures for the previous year were 73,000 and 35,000 respectively. Another sign of the times is that in 1967–68, for the first time, the number of overseas postgraduate students exceeded the number of undergraduate students. This presumably reflects the world-wide increase in university education.

When the Government first announced its decision, the Committee of Vice-Chancellors and Principals conveyed to the Government the dismay and regret of the academic world. As the committee's recently published report says, "These reactions were represented forcibly to the minister by our committee", but the only response from the Government was an agreement to start discussions with the committee, the UGC and local authorities on the general levels of

university fees for both domestic and overseas students. This still seems to be the position, and the Vice-Chancellors have been obliged to recommend that the universities continue to charge the discriminatory fees as the negotiations drag on with no sign of a conclusion.

Keeping in touch with overseas students in Britain is, of course, only a small part of the British Council's work, the main purpose of which is to show the British cultural flag overseas. In common with the other overseas services, the council's budget was cut during 1967–68, and the Middle East war and the Nigerian civil war disrupted some of the council's activities, but most of its long-term projects have survived uncurtailed. The council is now represented in 75 countries, and during 1967–68 it mounted 122 exhibitions of books in 53 countries, had 42 officers serving in overseas schools and universities teaching English, and as usual promoted music and drama tours. This year, even after devaluation, the council has, with a budget of a little more than £13.2 million, £400,000 more spending power than in 1967–68.

LECTURES

Science for Christmas

CHRISTMAS lectures for schoolchildren were begun at the Royal Institution in 1826 by Michael Faraday, and have since become a permanent fixture. This year the lectures are to be given by a professor from the United States—Professor Philip Morrison from Massachusetts Institute of Technology, who will talk on "Gulliver's Laws, the Physics of Large and Small". Although not very many will be lucky enough to see the lectures live, they will be televised by the BBC—on December 28 and 31 and on January 2, 4, 7 and 9.

When the lectures started, little science was taught in schools and universities, and the lecturer faced a relatively uninformed "juvenile audity". Now things are different; all children learn some science at school, where teaching methods use visual aids to a much greater extent than hitherto. Television, too, might be expected to have taken the edge off the appeal of the Christmas Lectures. Happily this does not seem to be the case—the lectures at the Royal Institution seem to be as popular as ever. The task facing the lecturer is a difficult one, because his audience covers a wide range of ages—officially the children are between ten and eighteen. Professor King of the RI says that the aims of the lectures remain unchanged—to present scientific information in as interesting and amusing a way as possible and to capture the imagination and enthusiasm of the audience.

Other institutions and societies offer lectures too. Some of them, like those organized by the Zoological Society, are only for the children of members. Others, like those at the Natural History Museum and the Science Museum, are open to the public. The museums produce lectures, films and lessons for schools all the year round, but the emphasis in their Christmas lectures is on general themes and a popular appeal. This year, members of the staff of the Natural History Museum are lecturing on subjects ranging from dinosaurs to volcanoes to seashore animals, daily at 3 pm from December 27. The Science Museum is presenting lectures on the Quest for Speed, intended for 12 and 13 year olds.