Zealand. Norway clearly has the most efficient system —the proportion of unsatisfactory calls for which the system could be blamed was only 3 per cent, against 9 per cent in the UK and 11 per cent in New Zealand. In Britain, trunk calls were twice as likely to go astray as local calls—nearly 20 per cent were unsatisfactory because of the failure of the system. This, the report points out, is not because the equipment is old and out of date—the failure rate on modern exchanges is much the same as that on pre-war exchanges. The fact is that too little equipment has been provided, so that exchanges are often swamped with calls. When this happens, callers get the engaged signal; it seems that about one-third of the engaged signals are caused in this way, the other two-thirds representing genuinely engaged lines.

The only way to get around this difficulty is to supply more new equipment which, the GPO says, means higher telephone charges. The Prices and Incomes Board found that productivity in the telecommunications side of the GPO had been increasing at a rate of more than 8 per cent per year, and was satisfied that no important improvement could be made in time to avoid a price increase. In the next three years, the GPO is intending to spend £1,100 million on investment in telecommunications; in order to do this, and to make the target return of 8·5 per cent on net assets, increases in prices were inevitable. Subscribers will have to suffer now if they are to get a better system later. In the longer term, the GPO should be wondering how to increase the number of subscribers—compared with other developed countries, Britain still has very few telephones—183 telephones per 1,000 of population in Britain, against 459 in the USA and 440 in Sweden.

Measuring Aptitude

INVESTIGATION into supplementary predictive information for university admission is the carefully worded title of the project set up in 1966 by the committee of vice-chancellors to examine academic aptitude tests for university entrants. While various working parties and councils discuss the entire structure of the sixth form curriculum, the vice-chancellors' investigation is an attempt to provide for more education and less cramming under the existing A-level examination system. Academic aptitude tests would provide information for university selectors on candidates' general ability to think effectively and would supplement the assessment of knowledge provided by A-level examinations. In this way the aptitude tests should remove some of the pressure to cram from the A-level courses.

Recommendations for tests of this kind were made in the Robbins report in 1963 and, although the vice-chancellors took three years to set up the investigation, in such matters it is a question of better late than never. The project is being financed by grants from the Department of Education and Science and the Schools Council for an initial four year period, and the first tests were made in 1967. The experimental aptitude test being used in the project is based on a multiple-choice, objective type of test developed by Professor R. A. C. Oliver of the University of Manchester. This in turn evolved from tests of this kind which have been used successfully in the United States for 40 years. Numeracy and verbal ability are the two main factors which are assessed. It is hoped that the tests will measure general ability, not facility in particular subjects, and will therefore be useful in assessment of candidates who want to read a subject at university which they have not studied at school. Aptitude for arts or science should also be indicated. Sixth formers who are not very clever but who have had good teaching, and those who are very bright but have not been well taught, are likely to be misjudged if assessed by A-levels alone, so it is hoped that aptitude tests will show them in their true light.

Experiments with tests of this kind are inevitably slow, because the results cannot be judged until the first sixth formers who are tested have finished their university courses. To save on time on the first series, a number of first year undergraduates were tested last October. In all, 37,000 tests were given, although not all the sixth formers are likely to go to university. This year, 20,000 sixth formers who are intending to apply to university will be tested. As a guard against prejudice or contamination of the sample, the results of the tests are being kept entirely confidential. If useful tests can be developed from this project, and the system becomes operational for the whole of Britain, the results will probably be made available to schools as well as to the university selectors. Because the tests do not depend on a syllabus, they could be given at the beginning of the fourth term in the sixth form, and with the help of marking machines the results could be with the university selectors in good time.

The results could be helpful to schools in that teachers would know whether their personal assessments of students are in line with general standards. No definite policy has yet been formulated on the question of whether the sixth former should be told the results of his test. If the tests indicate an aptitude in a particular direction, it would be useful and only fair for candidates to be told their results, for this might affect their choice of university subject. If and when broader curricula are introduced, and the option for arts or science remains open throughout the sixth form, advice on aptitude might be even more welcome than at present. If continuous assessment of pupils by their teachers is introduced instead of A-level examinations, then academic aptitude tests administered by a single body would be one way of maintaining uniformity of standards.

University Statistics

THE latest volume of statistics collected by the University Grants Committee from universities in Britain (*Returns from Universities and University Colleges, 1965–66*. Cmnd. 3586, HMSO, £1) is more than twice the price of its predecessor, but, to compensate, it is nearly four times as big—192 pages instead of 54. These *Returns* have been published comparatively much later than earlier issues. The 1964–65 statistics, for example, were out by October of the following year. The latest statistics have been delayed by a further six months. This delay, however, may be a result of some changes in the collection of university statistics introduced in the academic year 1965–66. For example, the timing of the count of staff and student numbers was changed so as to bring it into line with the pattern used in all other sectors of educational statistics. In previous years the count took place at the end of the academic year; in 1965–66 the

count was taken at the end of the autumn term. This change has had an appreciable effect on the statistics of part-time students but not on the numbers of full-time students and of staff. Only those part-time students in universities at the end of the autumn term are recorded now—this has resulted in a drop in their numbers in 1965–66 compared with the previous academic year. Other changes in the 1965–66 statistics have included the reclassification of the staff and students into more detailed subject groups, and the inclusion of all academic staff : those financed entirely from university funds as well as those receiving money from outside sources. All this extra and more detailed information explains the bulkiness of these statistics. The new arrangement also makes direct comparisons with previous years more difficult.

A further difficulty is that, for the first time, the former Colleges of Advanced Technology and the Heriot–Watt College are included in the UGC's list of forty-four university institutions in receipt of exchequer grants. In many ways, the 1965–66 figures confirm those published in *Statistics of Education, 1965, Part Three*, compiled by the Department of Education and Science (HMSO, 1967). In fact the next issue of *Returns* from the UGC (for 1966–67) will be amalgamated with the *Statistics of Education* from the DES. Lord Robbins's prediction of 173,200 full-time students in universities and CATs in 1965–66 was not confirmed by the actual numbers in that year. His estimate was, in fact, about 4,000 too many—there were only 169,486 full-time students in Great Britain in 1965–66. Contrary to general opinion, Lord Robbins's estimate for the academic year 1966–67 was also too high—186,900 when actual figures were about 184,200. The change-over from his figure being too high to being too low is, however, taking place this academic year. Provisional figures of full-time university students from the UGC (from figures compiled in October 1967) show that there are about 199,700 university students at the moment—Robbins estimated that there would be some 196,500.

Out of the 169,486 students in 1965–66, there were 28,428 postgraduate level students (including those taking postgraduate courses in teacher training). In Britain as a whole postgraduates represented some 17 per cent of the total student population; in England and Wales alone, the proportion was about 18 per cent, while in Scotland it was about 9·5 per cent. The provisional figures for 1966–67 and 1967–68 do not show any marked increase in the proportion of postgraduates among university students—it is around 17 per cent for Britain as a whole, while figures for England and Wales, and Scotland, are about 19 and 10 per cent respectively.

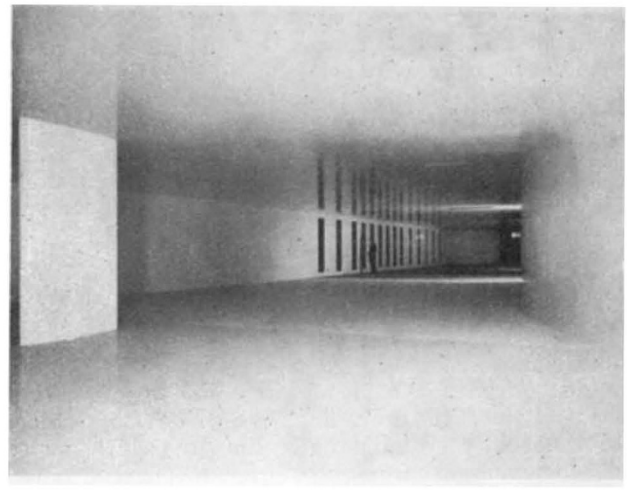
The number of overseas students has continued to increase (9·4 per cent in 1965–66), but as a percentage of the total student population represents a marked decline from the peak of 11·5 per cent in 1961–62.

The recurrent income of universities in the year under review amounted to £164·7 million. If the former CATs and the Heriot–Watt University are omitted this represents an increase of £22 million over 1964–65. Income from fees is continuing to fall, amounting to only 7·4 per cent of the total. Recurrent expenditure of universities in 1965–66 amounted to £160 million, of which 36·5 per cent was spent on salaries and 10·1 per cent on wages of departmental staff. Departmental maintenance, and research and other types of specific expenditure, took 11·8 and 14·0 per cent, respectively. Some of the headings for the recurrent expenditure have been changed and so valid comparisons with previous years cannot be made.

Designing for Wind

THE largest wind tunnel available in the United Kingdom for the study of industrial aerodynamics is now in operation at the Marchwood Engineering Establishment of the Central Electricity Generating Board. This is an appropriate place to find a large wind tunnel, for the CEGB was the victim of the most celebrated civil engineering failure in recent years—the collapse of the cooling towers at Ferrybridge *C* power station in 1965. The CEGB is quick to point out that the wind tunnel was planned before the Ferrybridge collapse, although it has come into commission more recently. The tunnel, which cost £100,000, should be particularly useful for studies of large arrays of cooling towers, or scale models of entire structures such as power stations; other wind tunnels in the United Kingdom are too small for this kind of investigation.

The picture shows the great size of the working area in the slow section of the tunnel. This section is 80 feet long, 30 feet wide and 9 feet high, and air speeds of up to 50 feet/sec can be reached. It comes as something of a surprise, however, to be told that the real purpose of the tunnel is for research at very low wind velocities, of only a few feet per second.



The large wind tunnel at Marchwood (CEGB).

The difficulty here is that atmospheric disturbances outside the wind tunnel can seriously influence the wind speed within the tunnel—this has been overcome at Marchwood by drawing the air into the tunnel through an elaborate baffle which smooths out the disturbances. The tunnel is the shape of a bottle, the neck of which serves as a fast region 16 feet long, 7 feet wide and the same height as the slow section. In this region speeds of 200 feet/sec can be reached.

Industrial aerodynamics differs in various ways from the sort of work carried out with aircraft. In the case of tall structures, the top of the building, which penetrates through the atmospheric boundary layer, is subject to greater stress than the lower parts