

logical and geophysical studies for the Channel Tunnel had proved very difficult and complicated. The surveys included the sinking of 73 boreholes, land borings, measurements of current, and weather studies. They were put in hand in agreement with the French Government following the Minister's statement on February 6, 1964, in an endeavour to find the best route for either a bored tunnel or a submerged tube. Besides the marine borings, site work completed last October, costing £2.1 million to be shared between the two Governments, had included several hundred miles of geophysical survey, ten land borings in England, nine land borings in France, measurements of currents and tides in the Channel, many varieties of new tests in the boreholes, and laboratory tests on samples of rocks. For the marine borings, two special platforms and four drilling vessels were used as well as many support ships, and besides five firms of consulting engineers, specialists in geophysics and palaeontology were engaged under the general direction of the Channel Study Group. A supplementary estimate of £845,000 represented the British share of the additional costs due to particularly difficult weather conditions, etc. A report on the survey was expected in March, and the report was likely to show the feasibility of the project. Discussions had also been proceeding between officials of the two Governments on the organization and finance of future stages of a Channel Tunnel project and how the juridical problems involved might be solved.

Concord Project

A FURTHER short debate on the aircraft industry in the House of Commons on February 9, in which Mr. R. Carr again emphasized the critical importance of deciding the stage at which decisions on a highly technical project should be firm, was concerned essentially with the *Concord* project. In replying on the debate, the Parliamentary Secretary to the Ministry of Aviation, Mr. J. Stoneham, said that there had been a slight increase in cost since the estimates were last presented to the House and the specification had been modified from 118 to about 130 seats. The estimates had also been revised by a new system providing a more accurate appreciation of the costs involved, and the assessment, which was being made the part-certificate of airworthiness, would also include considerable costs. There would be a ground test programme of unprecedented scope, including airframe testing with the research facilities at Farnborough. There had been no technical delay, nor any increase in cost resulting from the review of the project, October 1964–January 1965. Much work had been done on the noise factor and the first prototype should be flying early in 1968.

Royal Society Expedition to Tristan da Cunha

THE volcanic eruption that began on Tristan da Cunha in October 1961 and led to the temporary evacuation of the whole population, though not of the domestic animals and birds, was soon followed up by the Royal Society's Expedition in the early months of 1962. Geological and biological reports on this reconnaissance have been published separately. The latter includes the terrestrial botany of the whole island group (Tristan, Nightingale, Inaccessible, also Gough Island) by N. M. Wace and J. H. Dickson; the fauna by M. W. Holdgate; the effects of the eruption on the vegetation of Tristan by J. H. Dickson; and on the fauna by D. E. Baird (*Phil. Trans. R. Soc., Series B: Biological Sciences*, No. 759, 249 (October 7, 1965). Pp. 257–434 + plates 32–47. London: The Royal Society, 1965. 85s.; 12.75 dollars). The monograph brings together most of the previous information from other expeditions, with a well-documented analysis of the status of the plant and animal species, both native and introduced by man. Tristan has already more than twice as many invading species of flowering plants as native ones, though they are still largely segregated. The plant

communities are described. The faunal analysis is much less complete, but it also shows that there are more introduced species of invertebrates, such as worms, myriapods and beetles, than native ones. Direct damage to vegetation by lava flow and ash was much less than that from toxic fumes which affected a broad zone on the north and north-east sides of the island. The abandoned domestic stock were severely attacked by feral dogs, but the unusual conditions apparently have not severely affected native birds.

The Alaskan Earthquake of March 1964

ON the afternoon of Good Friday, March 27, 1964, Southern Alaska was struck by perhaps the strongest earthquake to have hit North America within historic times, the epicentre being about 80 miles east-south-east of Anchorage, the largest city of Alaska, which suffered damage estimated at about 300 million dollars. Anchorage normally houses a rather large contingent of geologists; and within two days of the earthquake a committee of these local earth scientists, the membership of which rose to forty, was empowered to outline "the necessary and immediate courses of action" to be taken by the city. The group contracted for aerial photography, a drilling programme, soil testing, and geological mapping, producing a preliminary appraisal within two weeks and a final report a month later. Probably no major earthquake has been so thoroughly investigated so soon after its incidence. Contemporaneously, the United States Geological Survey initiated a programme of longer-term investigations, and from the first of its reports to be published it seems likely that this shock will ultimately be more fully documented than any comparable catastrophe (United States Department of the Interior: Geological Survey. Professional Paper 542-A: *Effects of the Earthquake of March 27, 1964, at Anchorage, Alaska*. By Wallace R. Hansen. Pp. iv+68+plates 1 and 2. Washington, D.C.: Government Printing Office, 1965). Damage at Anchorage was caused by direct seismic vibration, by ground cracks, and by landslides, the latter moving on nearly horizontal slip surfaces related to zones of low shear strength and high water content in a glacial clay underlying much of the area. Old landslides predating the settlement of Anchorage and presumably triggered off by earthquakes have now been widely recognized in the vicinity. This first monograph in a continuing series is extensively illustrated and it forms an important addition to the basic literature of engineering geology.

Electrolytic Hydrodimerization

A SCIENTIFIC and technological breakthrough into a new field of electro-organic chemistry has recently been proclaimed by the Central Research Department of the Monsanto Company, St. Louis, Missouri, of which a brief account is given in *Monsanto Magazine* (Monsanto Company, St. Louis, Missouri, 45, No. 5, December, 1965). It is a fascinating story of tantalizing and frustrating research which appears to have been initiated some years ago by Soviet scientists, but their process was not economically feasible. The problem, put into simplest terms, was to convert a plentiful and relatively inexpensive compound, acrylonitrile, into a vital intermediate in the manufacture of nylon; in fact, the compound adiponitrile. The basic argument was that theoretically two molecules of acrylonitrile, if placed end to end and supplied with one more hydrogen atom apiece, would structurally form one molecule of adiponitrile, but hitherto research experiments had failed to discover a *modus operandi* for economically 'splicing' the two acrylonitrile molecules and at the same time adding the necessary hydrogen to complete the adiponitrile structure. This process, as now realized successfully, is an example of hydrodimerization. In the present case the chain of events was started by Dr.