

two Intelsat 3 satellites. Skynet was built by the Philco Ford Corporation and is to be placed in a geostationary orbit over the Indian Ocean, where it is to relay messages through ground stations in Britain, Cyprus, Singapore, Bahrein and Gan. There are also two portable stations which can be airlifted, and stations on HMS Intrepid and Fearless.

#### RESEARCH COUNCILS

### New Faces Again

AFTER serving the statutory four years, Professors J. L. Gowans, W. Melville Arnott and D. G. Evans retired from membership of the Medical Research Council at the beginning of October. Under the MRC's new charter, granted three years ago, scientific members of the council are not eligible for reappointment until at least a year has elapsed, but retired members must usually wait much longer than that before being invited back. The three new members appointed by Mr E. Short, Secretary of State for Education and Science, are Professors A. S. V. Burgen, the Cambridge pharmacologist, Professor W. S. Peart, professor of medicine at St Mary's Hospital, London, and Professor R. E. O. Williams, professor of bacteriology at St Mary's and also dean of the medical school.

Mr Short has also announced the appointment of a new lay member of the council. Although it is no longer a statutory requirement that the council shall include a peer and a member of the House of Commons, tradition persists. Mr Laurence Pavitt, MP for Willesden West, who has had considerable experience of medical matters and who was National Organizer for the Medical Practitioners' Union from 1956 to 1959 and a member of the North West Metropolitan Regional Hospital Board from 1965 to 1969, succeeds Mr David Marquand. Lay members, unlike scientific members, can be immediately reappointed after up to a four year stint on the council, but Mr Marquand, acting as a stopgap, served for only a year.

#### SHIPPING

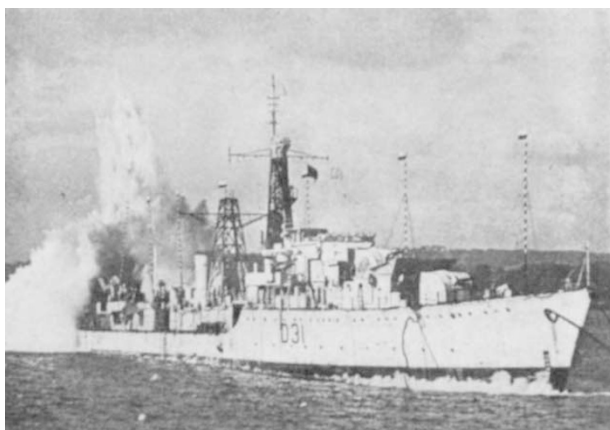
### Towards a Plastic Navy

from our Special Correspondent

BRITISH defence research laboratories have recently been opening some of their doors to the public, and the Naval Construction Research Establishment in Fife last week held its first ever open days. NCRE has its headquarters at Dunfermline, but the heavy work goes on at Rosyth naval dockyard, to the west of the northern landfall of the Forth Road Bridge. On a spit of reclaimed land, NCRE tests the effects of pressure and explosions on ship structures to its heart's content. Part of its equipment is a Heath Robinson barge which can be towed into the River Forth to see what effect explosive shocks have on naval machinery, and the establishment has before now blown up obsolete destroyers and submarines on their way to the breakers' yard.

Something like 10 per cent of NCRE work is civil, according to the superintendent, Mr K. G. Evans, and the establishment could probably do more, but it would have to be at the expense of defence research. What the establishment has to sell just now is the

results that can be obtained from an apparatus which tests almost full-scale models of hull sections. So far, the test frame has been used on a seven-eighths model of a frigate section and on two three-quarter scale sections of minesweepers, but the next tests early next year will be on a one-eighth model of a centre tank and associated wing tanks of a 250,000 ton super-tanker. The aim is to check a computer program which started life as an aid to warship design but which has been adapted by NCRE to the three-dimensional structural analysis of supertankers. NCRE is particularly proud of the program because it is quick, and therefore cheap, to run compared with earlier programs—£35 instead of £20,000 were the figures given last week. Once the tests are over next June, the program will be available to the shipbuilding industry through the British Ship Research Association. The next step in this Ministry of Technology sponsored research is to be the structural analysis of design studies for 400,000 and 1,000,000 ton tankers.



HMS Broadsword being blown up. The stern was broken off and severe whipping, which can be seen here, broke the ship's back.

The Mechanical Properties Division also believes it has knowledge valuable to the oil industry, especially now that a neoteric Manhattan project has shown that tankers can sail the north-west passage to the Alaskan oilfields. This is because the division makes a speciality of the study of brittle fracturing in steels, which tends to happen at temperatures from 0° to -10° C. Brittle fracturing became a problem in the first all-welded vessels—the American Liberty ships—because the cracks can propagate across welds, and the temperature at which it occurs goes up with thickness. For a six-inch-thick plate, brittle fracturing is apparently difficult to avoid even at +30° C. NCRE has a 1,200 ton machine which can test plates up to six feet square and helps to predict the temperatures and stresses at which fracturing starts, and the establishment claims that because of this research brittle fracturing is unknown in the Navy.

On the military side, the potentialities of glass-reinforced-plastic hulls are being investigated. Plastic ships have a number of advantages including high strength for low weight, transparency to radar, magnetic and acoustic detectors, and little tendency to corrosion, and a 140 foot long mine hunter is to be built out of glass-reinforced-plastic for the Navy.