

INLAND WATERWAYS IN BRITAIN

THE debate in the House of Lords on February 17 on a motion of Lord Ammon's directing attention to the report of the Bowes Committee of Inquiry into Inland Waterways preceded by a few days the publication of the Government proposals in a White Paper (Cmd. 676). The debate, nevertheless, was welcomed by the Earl of Gosford, who, in replying on the debate for the Government, said that the various suggestions made will receive careful consideration. Lord Gosford pointed out that the main points in the Committee's report were that capital development should continue to be concentrated on the 300 or 400 miles of the more than 2,000 miles of inland waterways in Great Britain which carry busy and remunerative traffic. Another 900 miles carry some commercial traffic but are unremunerative, and the Committee recommends the rehabilitation to navigation of these waterways with the development of other uses and revenue. The remaining waterways have outlived their commercial utility and the Committee proposes a case-by-case review to assess their possibilities and prepare schemes for future treatment.

Lord Gosford indicated that the Government was fully aware of the many interests concerned in these proposals, including water undertakings, drainage and river boards, farmers, anglers, naturalists and amenity, but his reply foreshadowed the Government's proposals in the White Paper. They cover an interim policy over about two years in which some of the Committee's ideas can be tried out experimentally, but while endorsing the Committee's objectives in redevelopment and proposing to set up an Inland Waterways Redevelopment Advisory Committee, and accepting that legislation to facilitate redevelopment is needed, the Government is not prepared at present to commit itself to the detailed procedural machinery suggested. It also considers

that the cost of redevelopment should be borne by those who benefit from it.

The Nature Conservancy in its last annual report expressed the view that the findings and recommendations of the Bowes Committee providing for the setting up of a waterways redevelopment board to prepare schemes for redevelopment, but envisaging the participation as new owners of river boards or drainage authorities, water undertakings or local authorities, and, exceptionally, special trusts, are regarded as meeting adequately the Conservancy's needs. Lord Gosford, however, did not refer to the boards, although this question was specifically raised by Lord Latham in the debate. In the White Paper the Government accepts the view that proposals for costly schemes of improvement are not justified in present circumstances and that instead there should be a gradual extension of the work which has already been carried out. The Committee recommended that the Great Yarmouth Port and Haven Commissioners should be reconstituted on a wider basis of membership and with greater powers, and the Nature Conservancy appears to accept this view. Nevertheless, and although the Committee also urged that the demand now for the use and development of the rivers and Broads was greater than ever and their deterioration could be stayed and improvement ensured by a revision in the powers of the Commissioners and a small increase in their income, the Government is not prepared to introduce the recommended legislation without first thoroughly exploring the administrative proposals between the various interests concerned. Discussions between representatives, however, have already begun, including those of the National Parks Commission, although it may be noted that the Committee is not impressed by the arguments for making the Broads a national park.

THE NATIONAL OCEANOGRAPHIC COUNCIL

REPORT FOR 1957-58

THE annual report of the National Oceanographic Council for 1957-58* reviews progress in the two main fields of work of the National Institute of Oceanography: marine physics and marine biology. With a staff of eighty-four (not counting officers and crew of R.R.S. *Discovery II*) and with an annual expenditure of £201,000 mainly met by United Kingdom and Commonwealth Government grants, the effort has been chiefly devoted to studies of the interaction between atmosphere and ocean, water movement on large and small scales, biological fertility of the oceans, and the distribution of marine animals. Basic knowledge of physical and biological processes has also been applied to practical problems.

R.R.S. *Discovery II* spent two periods of nearly three months measuring currents in the Gulf Stream and working stations across the Atlantic in latitudes

48°, 32° and 24° N., as part of the Institute's contribution to the International Geophysical Year. A large part of the fuel was kindly provided by the Woods Hole Oceanographic Institution, and United States oceanographers and vessels collaborated in this international attack on the problems of ocean circulation. Deep-water isohalines, computed from the electrical conductivity of samples taken at a range of depths at stations about 8 miles apart, revealed greater irregularities in water properties and motion than had been inferred from earlier, less-precise observations.

The technique of tracking deep currents by means of neutrally buoyant floats, pioneered at the Institute, has stimulated similar measurements elsewhere, as well as theoretical studies of ocean circulation. Floats have now been made which will send out signals for a few hours each day for a month. The more practical needs of the fisherman and the fisheries scientist for a knowledge of sub-surface currents has also been

* Annual Report of the National Oceanographic Council, 1 April, 1957-31 March, 1958. Pp. v+39. (Cambridge: At the University Press, 1958.) 5s. net.

met by improvements in a simple but ingenious method of recording the orientation and inclination of a container moored in the current. Echo soundings made along 12,000 miles of the ship's track have included detailed surveys of the Porcupine Bank (from which rocks were collected) and large sand waves on the continental shelf to the west of the English Channel which attain 40 ft. in height and 3,000 ft. between crests.

Research on processes operating at the sea surface, in particular wind waves, has been mainly directed at finding a convenient way of measuring the directional distribution of wave energy and to the development of an adequate physical theory relating the wave spectrum to wind, stability, and other factors governing turbulent shear and the exchange of energy between atmosphere and ocean. Theoretical studies of the curvature of random surfaces and the distribution of intervals between 'crests' of random functions enable directional information to be derived from aerial photographs of waves. Other theoretical studies of far-reaching practical significance have been concerned with the estimation of the mean wave energy from the highest waves in a record; with the accuracy of wave measurements using accelerometers in buoys or ships; with the vertical components of motion of a ship heading into sea waves; with the relative merits of empirical formulae for wave and swell prediction; and with long waves and storm surges. Tidal records initiated by the Institute at Stornoway and Lerwick support the theoretical conclusion that surges arriving from the Atlantic are amplified on passing down the east coast and suggest that large surges are most likely when intense storm depressions travel from the south-west for a long distance along the continental shelf.

The Institute is still the chief protagonist of the wave-interference theory of microseism generation. While there is still need for clarification, it has proved possible to track isolated storms in the North Atlantic by analysis of microseism activity at Kew. There is a practical application in tracking storms and giving warning of heavy swell on coasts facing oceans that have little meteorological cover. An electronic seismograph has been constructed which allows exceptional magnification in the 3-10-sec. range. Other instruments in the course of development include an airborne radar sea-swell recorder and a pressure recorder of high precision which, when used to record waves, can be calibrated by tidal observations.

The Institute's biological work falls into three broad groups: the distribution and taxonomy of marine animals, particularly oceanic plankton, based to a large extent on the *Discovery* collections; the bionomics of whales; and the productivity of oceanic waters. Objects of study last year included: the alcyonarians (revision of the pennatularian genus *Umbellula*); certain families of the isopods (fifteen species, of which five and one family are new); deep-living chaetognaths (including a new species with a method of fertilization hitherto unknown in this group); the distribution and life-cycles of the Antarctic copepod *Calanoides acutus* and of the euphausiid *Euphausia triacantha*.

During a spring cruise to the Canary Islands, additions were made to the collection of photographs of oceanic animals, ranging from small planktonic forms to moderately large cephalopods, including a dramatic sequence at 500 m. in which a squid was attacked and eaten by another squid. Observations on the composition and numbers of phytoplankton and zooplankton, compared with those made in the same waters on previous cruises, emphasized the remarkable stability and constancy of the crops in this part of the open ocean in different years. During this and other cruises, particular attention has been paid to the factors controlling rates of assimilation of carbon in regions of dense and sparse phytoplankton, and to the significance of the ratios of chlorophyll *a* and *c* in coastal and oceanic regions.

Largely through the help of whaling inspectors and companies the Institute has been able to examine ear plugs and ovaries from several hundred whales. Ear plug laminations and the corpora albicantia in the ovaries are indices of age and provide valuable evidence on life-histories, rates of ovulation, and on year-to-year changes in the stock. Recovery of whale marks has consolidated and extended earlier inferences about distribution, migrations, and interchange between the south-west Atlantic and south-east Pacific in both directions.

Finally, it is encouraging to record that governmental aid has been increased to allow for expansion of staff, that four investigators from overseas have played a considerable part in the work, and that the effort devoted to the problem of fish detection is welcome evidence of increasing collaboration between the physicists and the biologists.

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THE ROCKEFELLER FOUNDATION

REPORT FOR 1957

THE annual report of the Rockefeller Foundation for 1957, in which appropriations totalled 42,798,916 dollars, including 8,298,260 dollars for medical education and public health, 5,255,235 dollars for biological and medical research, 5,621,400 dollars for the agricultural programme, 3,570,525 dollars for the social sciences and 5 million dollars to the American University of Beirut, stresses the broadening basis of co-operation among governments, with which the work of the Foundation has brought it into close contact at the local level in every continent. For half a century the Rockefeller boards have been intimately involved in the international community of science and scholarship, particularly

in the financial support of scholarship and science abroad, largely through the universities, but using various techniques. Special emphasis is laid on the value of the Foundation's fellowship programme, under which 7,432 men and women from 98 countries, including 1,306 from the United States, have held fellowships for advanced study in 80 countries: of these, 248 received awards in 1957, when 532 persons from 53 countries pursued their training or research in 104 institutions in 20 countries.

Discussing the characteristics of this international community of science and scholarship, the report emphasizes that it is open to all who wish to contribute ideas and its respect is bestowed on the basis