Oceanography

Excitement on the seabed

THE US oceanographic and geological community has been "set alight" by a quarter-million-square-mile survey of the Pacific Ocean floor off the west coast of the United States — a survey, completed three weeks ago with the British side-scanning sonar system GLORIA, of the 200-mile exclusive economic zone (EEZ) declared by President Reagan last year under the international Law of the Sea. The survey, says Dr Jim Gardner of the US Geological Survey (USGS) at Menlo Park, has for the first time provided a "road map" of the whole area stretching from the Mexican border in the south to the Canadian in the north, and outwards into the Pacific from the edge of the narrow continental shelf. This map reveals some 200 previously unknown volcanic sea-mounts, "spectacular canyons" 300–500 km long — apparently carrying meandering rivers of sediment along the ocean floor — and almost every kind of plate tectonic boundary.

Economically, the sea-mounts may offer sources of strategic minerals, and the canyons and ocean-floor fans will interest the oil industry both as models of older sources of oil, and as possible drilling sites. There are no indications of sea-floor manganese nodules, but these were not expected so far north.

The survey, says Gardner, who headed the American side of the US-British team that did the work, will lead to half-a-dozen priority research projects for more detailed investigation, and already \$60 million is inscribed in the USGS budget for fiscal year 1986 (yet to be approved) to pay for the work (over five years). This will be done jointly with universities, Gardner says.

In Britain, the excitement matches Gardner's, with the extra twist that the mission's success offers a real opportunity for British enterprise. GLORIA was developed at the Institute of Oceanographic Sciences (IOS) at Wormley, Surrey, and has a uniquely long range, which makes it extremely cost-effective for the survey of the 200-mile EEZs which almost every nation has declared since the 'Law of the Sea' agreement. According to Neil Kenyon of IOS, who with another British oceanographer Douglas Masson took charge of the British side of the recent GLORIA mission, GLORIA can perform an area survey 10 times faster than any competing system. It can survey an area half the size of Wales every day at a cost of \$5 per square mile, IOS claims.

As a result there is now likely to be a flood of interest in using the torpedo-like instrument to survey EEZs around the world. Already USGS is negotiating for a further five years' work with GLORIA, says Gardner, starting next year in the Gulf of Mexico, and later covering Alaska and Hawaii; and, says Dr Tony Laughton, the

director of IOS, to judge by reaction from the recent second international hydrographic technical conference in Plymouth, there are already indications of real interest in many other countries.

But that leaves IOS with an interesting problem. There is only one GLORIA. The USGS programme, if agreed, would occupy it nearly full-time. Apart from the interest of other nations, IOS scientists must have their own time with the instrument. And IOS funds, provided through

GLORIA — geological long-range inclined ASDIC — is an acronym of an acronym. Dating from the second world war, ASDIC stood for "anti-submarine detection investigation committee". The acronym came to be used to describe the acoustic echo system developed in Britain to detect German U-boats. The achievements of GLORIA represent a 40-year development of ASDIC. The photograph shows GLORIA being launched from the Farnella research vessel — a converted trawler.

the Natural Environment Research Council (NERC), are so short it would seem impossible to find the financial and human resources to build a second instrument, costing around £1 million. "If we were a commercial company, we would borrow money to build a new GLORIA on the prospect of making a profit", said Lawton. And, says IOS administrator Dr Tony Rees, "with ten GLORIAS we could cover the world in ten years".

Treasury rules, under which NERC (and hence IOS) operate, make borrowing difficult. But since the present government is in favour of enterprise, Dr Lawton is hopeful something might be arranged. Other possibilities he is considering are to establish a private company to exploit GLORIA or to license the technology to an existing company. However, too much has been published about the instrument for it to be patentable, he thinks. The potential profits are large. But IOS will have to strike the right balance between commerce and science, says Lawton. "It clearly poses some big problems in terms of our role."

Robert Walgate

European solar energy

Off to sunny Sicily

Brussels

HELPED by the European Commission, a consortium of European companies will next month launch an experiment, in Sicily, to test four types of photovoltaic cells "in the field" for the first time. According to Commission officials, the data collected could play an important role in developing cheaper and more efficient solar cells.

The project will compare fixed and sun-tracking systems of monocrystalline and polycrystalline silicon modules, and two alternative modules: flat-plate amorphous silicon cells and concentrator gallium arsenide cells. The electricity produced by the 5 kW systems will be used in small local applications. The companies involved in the design and manufacture of the components are the Italian companies

BA gets under way

THE 146th annual meeting of the British Association for the Advancement of Science (BA) opened at the University of East Anglia in Norwich on Monday, with over 3,000 visitors expected — 700 more than last year's conference in Brighton. In recent years the BA has been seeking a new identity; it may have found it at Norwich in a mix of science popularization, science politics (whither Britain?), due concern for the place of science in the developing world, and increasing efforts to link science and industry in the minds of its visitors.

To paraphrase the outgoing president Sir Alastair Pilkington (the glassmaker) the BA represents an effort to put science to work in Britain: it has a utilitarian, constructive goal. According to the incoming president, biochemist Sir Hans Kornberg — a man closer to the cuts that British science has suffered recently — next year's BA meeting at the University of Strathclyde will see a greater emphasis on basic science (and perhaps a little more polemic on its behalf) than at Norwich.

But BA officers are very pleased with the £450,000 that Norwich has raised locally to support the meeting (covering more than half its costs) and with the buoyancy of the BA young scientists scheme (BAYS), with its 130 local branches (ever increasing) which hold local meetings throughout the year. And this year there is a new departure: the BA is launching a glossy new magazine, *Link-up*, edited by John Stansell, which will aim to link university science with industrial problems.

Robert Walgate