OCEANOGRAPHY

Hint of Oil in Lost Laurasia

A NEW sedimentary basin has been discovered in the Rockall plateau by the research ship *RSS Discovery*. Besides holding the possibility of oil, the basin may help to unravel something of the history of the Rockall plateau, which seems to constitute a missing piece in the reassembly of the ancient supercontinent of Laurasia.

The expedition, which set sail in August, was manned by oceanographers from Cambridge University and the National Institute of Oceanography and was financed by the Natural Environment Research Council (NERC). The basin, which lies about 300 miles north-west of Ireland, measures about 80 by 190 miles, and extends to a depth of about ten thousand feet below the sea floor. It seems to be very similar to those in the North Sea which contain natural gas. The Rockall basin, however, lies about 300 miles from the shore, and under about 3,500 feet of seawater, while the North Sea deposits are some sixty miles out, in a depth of about 250 feet. Even if hydrocarbon deposits were to be found in the Rockall basin, it would be no easy task to exploit them.

The geological interest of the discovery lies in the fact that the Rockall plateau is believed to be a fragment of continent left behind after North America and Greenland separated from Europe some 100 million years ago. When the continents are placed together in a pre-drift reconstruction, an unacceptably large gap is left between the margins of Europe and North America—Greenland which the Rockall plateau, if of continental origin, would conveniently fill. The discovery of the sedimentary basin makes the continental origin of the plateau much more plausible.

Fresh with the success of the expedition, the Natural Environment Research Council announced last week the establishment of a new research council, to be known as the Unit of Coastal Sedimentation. Based at Taunton, Somerset, the unit will study marine problems affecting the coasts of Britain, and in particular the reasons for sedimentation in various areas. This will assist in the dredging of ports and in gauging the effects of offshore disturbances such as the dumping of waste material or the removal of sand and gravel. The director of the new unit is Dr R. L. Cloet, who was formerly with the hydrographic department of the Ministry of Defence.

DUSTMEN'S STRIKE

Is Rubbish Unhealthy?

NOBODY really knows what risk an overflowing dustbin is to public health, if the conflicting opinions about the possible effects of the London dustmen's strike are anything to go by. The government has said that the situation remains safe, whereas the chairman of the Association of Public Health Inspectors, Mr William Parker, was quite convinced last week that there is a definite health hazard, mainly because of the flies. Much will depend on how long the strike continues—early this week the action had been called off in several London boroughs but had spread to cities in the provinces.

It is the sight and smell of the piles of refuse that

have caused the most immediate offence. Even in commercial areas the air has been pungent enough where restaurants have unloaded their rubbish on to the pavement, and in boroughs further east where there is dense housing large tips have piled up in the road—the picture shows conditions in Hackney. It certainly looks unhealthy, but the appearance may be worse than the reality.

One medical opinion is that the garbage itself is not directly harmful, and that problems arise only when there is a possibility that food may be contaminated through the transfer of matter by flies. There is, of course, plenty of scope for flies to congregate and breed in dumps containing rotting food, but the usual hygienic precautions should be enough to avoid disease.

The recent warm weather may have provided conditions suitable for a rapid increase in the fly population, but this can be controlled with insecticides. The only difficulty here would be the possibility of resistant strains emerging if the strike lasted, although the headline announcements of "superflies" are premature.

What is more troublesome is that rats could thrive on the food waste that is going into the streets. Again, there is no reason for thinking that the situation would get beyond control, and so far there are no signs of an alarming increase in the rat population. But with such plentiful food supplies the animals could become strong enough to survive in sewers for some time after the refuse has been carted away.

The controversy does even begin to look as though it is about the meaning of "health" rather than the implications of piling up garbage. No doubt a healthy environment is one without a dump on every doorstep, but there is not necessarily a risk to health provided that the usual precautions are followed. The fact that the tip illustrated is outside a school indicates that this is not always the case.

INSTRUMENTS

New Solar Telescope

from our Astronomy Correspondent

A \$3.3 MILLION solar telescope at the Sacramento Peak Observatory of the Air Force Cambridge Research Laboratories is now operational. The telescope is

described as the most important new instrument for solar observations to be built in the United States for a decade and its resolving power of 0.2 s of arc matches that of the most powerful telescopes in existence.

Sacramento Peak Observatory is at appropriately-named Sunspot, New Mexico, ten miles south-east of Alamogordo, 9,200 feet above sea level, and specializes in solar work. In particular, the observatory is concerned with the influence of solar activity on air force communications, and several years ago the air force initiated a research programme of solar forecasting. Radio blackouts caused by the absorption in polar regions of high energy protons from the Sun are

Solar telescope at Sacramento Peak Observatory (objective mirrors on top of the telescope have not yet been positioned in this photograph).

especially serious, but military activities can be affected in other ways. Solid state electronics on satellites can be damaged and satellite orbits can be altered by changes in air resistance induced by high energy particles. From March 1 next year the air force will have a system which, it is hoped, will predict solar bursts and the effect on the atmosphere. The basis of the system is a network of ground-based and satellite observatories feeding information into a complex of computers at Offutt Air Force Base, Omaha. No unambiguous claims are made about how good the forecasts are going to be, but some hints are dropped in an article on the system by the commander of AFCRL (D. J. Flinders, *Air University Review*, in the press). Long term prediction of flares seems to be almost impossible, and the best that can be done at present is to say that under certain solar conditions no flares are likely to occur for between three and five days. Prediction of the likely effect once a flare is seen is easier but still fraught with problems—not all flares influence the atmosphere. The travel time of radiation from the flare is important here and can be several days. AFCRL radio astronomers can help, and there is a certain spectral pattern in the centimetre range which means that there is an 80 per cent chance of high energy protons arriving within hours.

The new telescope and its \$1 million worth of instrumentation will be used for research into solar forecasting. One aim is to search for signs on the Sun which can be used to predict the occurrence of bursts. The telescope is 365 feet long, of which 227 feet is underground, and great care has been taken to remove instabilities in the image. Air currents within the telescope are eliminated by evacuating all of the light path to 250 torr, and by water-cooling the concrete walls of the tower, and light enters the system above most of the ground turbulence. The 321 feet long, 250 ton, evacuated tube which contains the optics is suspended like a pendulum and rotates on a mercury bearing to follow the Sun. Light enters the telescope through a 32 inch quartz window and is deflected to a 64 inch mirror near the foot of the tube which brings the image to a focus near ground level. The instruments at ground level include two large evacuated spectrographs which rotate with the shaft.

FISHERIES

Farming the Sea

from our Special Correspondent

FARMING marine fish has progressed from fiction to fact at Hunterston nuclear power station in Ayrshire, and at Ardtoe, on a remote loch in Argyllshire. In less than five years, the White Fish Authority has convincingly shown that it is possible artificially to hatch and rear large numbers of flatfish (Dover sole at Hunterston and plaice at Ardtoe) to a market size of about eight ounces weight in half the time it takes in the open sea.

This effort has been achieved with very limited funds (currently less than 10 per cent of the authority's annual research and development budget of just over £400,000) and in face of very little knowledge about the biology of marine fish and engineering aspects of running a marine fish farm in British conditions. The authority's experiments so far have been carried out with only a handful of professional staff, the majority of whom are engineers, stock breeders or agriculturists and not fishery biologists. Indeed, in practice, farming sole and plaice at high densities seems to have more similarities with intensive chicken and pig farming than with biological research and this may explain the project's success.

At present, the White Fish Authority is concentrating on intensive methods of cultivation in shore tanks, and in cages and net enclosures in the sea. It is finding that the fish can be most successfully reared in high densities—up to five or more fish per square foot of bottom—but as yet little is known about disease and sustained growth in these conditions.

The technique used at both Hunterston and Ardtoe is essentially a development of that pioneered at the Ministry of Agriculture's fisheries laboratories. At Hunterston, fish are grown in shore tanks fed with warm seawater discharged from the power station. After the eggs have hatched, the larvae are fed first with nauplii of the brine shrimp (*Artemia*); when they start to metamorphose, the fish are weaned by way of a cultivated red worm (*Lumbriculus*) on to a specially prepared solid food. The food, which is made largely from fish wastes, is given in larger pieces as the fish grow. At Ardtoe, the farm is in a small inlet of a loch cut off from the sea by a dam wall with sluice gates