With luck, the expedition should also be in a position to learn a great deal more about the long-term volcanic processes which have not merely chased away the handful of inhabitants but which have also given the island its characteristic shape of a lagoon three miles across.

The expedition's biologist will investigate the effects of volcanic ash on the local flora, and see if any vegetation has yet secured a footing on the newly formed island. Simultaneously, a hydrographic survey of the neighbourhood will be carried out by HMS Endurance. The party expects to reach Deception Island in November, and their work will keep them on the island for some months, although it is not intended that British personnel should stay there through the next Antarctic winter.

The US Antarctic Research Program also plans to send a team to Deception Island, to make a study of the effects of the eruption on the island's glaciers. The Americans intend to combine research with nostalgia. The survey ship they will use to support the glaciologists is a newly built wooden sailing craft modelled in name and style on Hero, the sloop which sailed southward from the island in 1820 to make the first American sighting of the Antarctic continent.

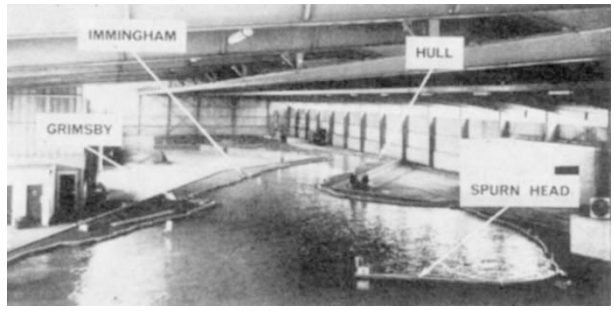
HYDRAULICS

Humber Modelled

As a part of the development of the four ports in the Humber estuary—Hull, Grimsby, Immingham and Goole—which are handling more than 25 million tons of trade annually, the British Transport Docks Board has spent £250,000 on a tidal model of the Humber. One of the first investigations to be undertaken with the model, which should play a part in the future of the Humber, will be on a dredging programme—already begun—to allow 200,000 ton tankers to call at the new refineries at Immingham.

The model is at the King George Dock in Hull and was opened last week by Mr Stephen Swingler, Minister of State at the Ministry of Transport. It represents the Humber estuary from 9 miles east of Spurn Head to the confluence of the Rivers Ouse and Trent, on a horizontal scale of 1 : 720. Thus the 55 miles of the Humber estuary are reproduced in a model 337 foot long. The tidal sections of the Rivers Trent, Ouse, Don, Aire, Derwent, Wharfe and Hull which contribute to the Humber are included in the model but in a compact form to save space. To reproduce the tidal flow in the estuary, the volume of water corresponding to the difference between high and low tide is stored in a tank to the seaward side of Spurn Head. The bottom of the tank is open and is submerged just below water level; water is released into the model and later drawn back into the tank by controlling the air pressure within the tank. The tidal cycle of 12 and a half hours takes 8 min 46 s, and a cycle of tides from spring to neap can be produced. A number of pumps generate the North Sea currents to the east of Spurn Head.

Most probably, the first questions to be tackled with the model will be concerned with the dredging of the Humber to facilitate the use of the estuary by the gargantuan tankers which are now coming into operation. Once this problem has been solved, studies of the movement of the sand and silt in the estuary will be carried out, leading to an investigation of the possibilities of reclaiming the area to the west of Spurn Head. The possibility expressed by the chief docks manager at Hull, Mr J. A. Lacey, of development along the lines of the Europort near Rotterdam is unlikely to come to fruition, however. Despite its superficial resemblance to the Rotterdam area, the



Tidal model of the Humber.

hinterland of the Humber, industrially important as it is, is nothing like as extensive as the hinterland of the Europort. At some stage, the model will also be used for experiments on the effects on storm surges and on the movement of sewage and industrial waste.

The docks board estimates that there will be enough problems to keep the model occupied for 20 years or so. As now constructed, the floor of the estuary is represented on the model by a moulding of mortar. In two or three years, this will be replaced by mobile material to represent the river sand and the 3 million tons of silt which are estimated to be in suspension in the estuary during a spring tide. River sand will be simulated by obeche wood cubes of side ½ mm, and the river silt by obeche wood flour.

OCEANOGRAPHY

Watching the Mediterranean

from our Special Correspondent

Monaco, September

THE Institut Oceanographique at Monaco, which since 1957 has been under the directorship of Captain J. Y. Cousteau, is in the peculiar position of being financially dependent on the state of the French tourist industry. When founded by Albert I of Monaco, the institute was endowed and also given premises, but unfortunately the endowment consisted of French Government securities, which since the 1920s have become virtually worthless. Today, roughly half of the income of the institute comes from contracts from French Government agencies for specific research projects. The other half derives from gate receipts from tourists visiting the aquarium, and has dropped by about 5 per cent because of the slump in the tourist trade last year. The plans for a Marinarium like Marineland in California are no nearer realization and, until they are, there is little likelihood of a great improvement in the institute's private income. Indeed, if the institute is to do more than survive, it will increasingly depend on French Government funds with a corresponding loss of some independence.

Apart from the museum and aquarium, the institute has three chief departments—biology, physics and chemistry and geology and geophysics. It also houses the IAEA Laboratory of Marine Radioactivity and the institute's research vessels are at everybody's disposal. Naturally, the institute is principally concerned with the Mediterranean and with physical rather than biological oceanography, but the biologists are surveying the populations of organisms on the continental shelves off Corsica and Tunisia. In collaboration with the Department of Physics and Chemistry, they are using continuous recording apparatus to measure *p*H, salinity, temperature and oxygen tension and to correlate these parameters with marine populations. There is also a project for recovering bathypelagic animals and maintaining them under the appropriate pressure and temperature for study in the laboratory.

The institute as a whole has a particular interest in radioactivity in the sea and, in conjunction with the IAEA laboratory and a Laboratory of Radioactivity financed by the Centre Scientifique de Monaco (which also provides one of the three carbon-14 dating services in France), the biologists are studying the metabolism of radioactive iodine, iron and chromium in seawater by marine animals. This work is closely related to that of the IAEA laboratory, which in the past has been solely concerned with the fate of radioactive materials disposed at sea. Extraordinarily little is known, however, about the consequences of marine radioactive pollution and there has been much argument about the practice of dumping in the sea. One way and another, however, it seems that the most forceful arguments against this method of disposal have been softened lately, but critics of the IAEA laboratory, who see little point in competing with national laboratories in this field, have had their way. In future, the IAEA laboratory at Monaco will spend most of its time trying to standardize methods for measuring marine radioactive pollution. One of the obstacles to international agreement is the diversity of measuring techniques in use.

The Physics and Chemistry Department at the institute is developing apparatus for continuously recording parameters such as salinity and *p*H, and there is also an ambitious project for measuring by neutron activation analysis ten trace elements in seawater in collaboration with the Centre d'Etudes Nucleaires at Grenoble. In collaboration with workers at Marseilles, the group is also working on gas chromatographic analysis of dissolved gases. The geophysicists developing and using seismic reflexion techniques have, during a survey of the sea floor between France and Corsica, recently discovered salt domes piercing fracture lines in the seabed similar to those in the Gulf of Mexico, and there is cheerful talk about the possibility that oil may be associated with these structures.

NATIONAL ACADEMY

New Job for Shannon

Dr James A. Shannon, who retired as director of the National Institutes of Health at Bethesda on September 1, has been appointed special adviser to the President of the National Academy of Sciences. Dr Shannon will advise the president and the council on academy programmes and activities, which involve medicine, biology and other sciences related to problems of human health and wellbeing. Among these programmes are the Board on Medicine, a group recently established to study the social functions of medicine; and the numerous committees which are concerned with controversial topics such as tissue transplantation, drug dependence and the biological effects of atomic radiation.

Dr Shannon has had a distinguished career in both medical research and in the US Public Health Service. During World War II, his work on malaria research and as consultant on tropical diseases won him the Presidential Medal for Merit, at that time the highest award for civilian service to government. Since then, Dr Shannon has gained several awards, among them the Rockefeller Public Service Award for the "sustained excellence of his service to the nation's scientific effort", and in 1966 the Presidential Distinguished Federal Civilian Service Award.

EUROPEAN ACADEMICS

British-Italian Collaboration

As part of the general move to promote closer links between scientists in Europe, the Royal Society and the Accademia Nazionale dei Lincei of Rome are engaged in discussions. At the invitation of the Lincei Academy, the president and other representatives of the Royal Society went to Rome for a discussion with Italian colleagues in January 1968. It was decided then to appoint a joint committee to consider possible ways of increasing scientific cooperation between the two bodies which might be of scientific and economic benefit to both Italy and the United Kingdom. The first meeting of the joint committee was held at the Royal Society on May 16, 1968, when Professors A. M. Angelini, G. Puppi and G. Sartori met Sir Harold Thompson, Professor B. H. Flowers, Professor H. Ford, Sir Ashley Miles, Professor J. Z. Young and other representatives of the Royal Society. Unfortunately two other Italian members of the committee (Professors R. Margaria and G. Montalenti) were prevented at the last minute from attending. The present level of exchange between Italy and the UK in the Royal Society European Programme was reviewed, and it was agreed that, in spite of recent increases, there was still some room for expansion, especially in fellowships from the UK and Italy. Efforts are being made to make the active centres of research in Italy better known in the UK.

One important innovation is that the discussions have led to the suggestion that British and Italian scientists who have good plans for collaborative projects should submit their grant applications simultaneously to the Science Research Council and the Consiglio Nazionale delle Ricerche respectively. Although it seems to have been recognized that discussion between British and Italian scientists would be of value in many fields, a few subjects have been singled out for encouragement. These included astronomy, biomedical engineering, computer software and polymer engineering. It was also suggested that steps should be taken on a European scale to study the needs of scientific research in both physical and biological sciences for good electronic equipment.