THE DANISH "GALATHEA" EXPEDITION (1950-1952)

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In the coming autumn the Danish Government will equip a deep-sea expedition to undertake a two-year voyage round the world thus continuing the Danish tradition of investigation of the oceans.

The purpose of the Expedition is in the first place deep-sea research, and A. F. Bruun, Ph. D., of the University of Copenhagen, has been entrusted with the scientific leadership. Dr. Bruun thus continues the research work done by Danish scientists of international reputation, such as O.F. Müller (systematic collecting of marine animals), Japetus Steenstrup (investigation of the oceanic pelagic fauna), A.S. Orsted (the importance of plankton as a source of nourishment in the sea), Forchhammer (chemical composition of sea-water), Johs. Schmidt (reproduction of the eel), and many others. The main purpose is to explore the life at the greatest oceanic depths, which as will be known, cover well over one third of the surface of the earth with depths of more than 4000 m. down to the greatest depth known of about 10 500 off the Philippines. At the present day it is practically unknown whether organisms are to be found at a depth of about 7 000 m. and farther down, since only a single sample taken by the Swedish Albatross Expedition in 1948 is available; it only contained a few tubes of polychaetes and some small holothurians. Life conditions here must be greatly influenced by the enormous pressure which at a depth of 10 km. is more than 1000 atmospheres. In addition, water samples will be taken for determination of salinity, oxygen content etc., which in connexion with temperature measurements can give information of the course of the oceanic currents at these depths.

Like all other animal life the fauna at the greatest depths is dependent on vegetable nourishment, in this case from the uppermost hundred metres of the sea, where the sunlight can still maintain plant life ; therefore, the quantitative distribution of the animal life on the bottom of the oceans will be investigated according to the methods used by Danish scientists in the last fifty years in Danish and North-Atlantic waters. When such investigations are compared with the production of plants (phytoplankton) in the upper water layers, a picture can be formed of the productivity of higher animals in the different regions of the sea. These investigations of phytoplankton will be undertaken according to the most modern methods; among other things radioactive carbon will be used.

By using shark hooks, halibut hooks, nets and trawls it is hoped that large animals will be captured, such as large cephalopods and fishes which hitherto are very little known from specimens washed ashore ; these methods

seem to hold out prospects of the capture of completely unknown species. The flora of bacteria too at these enormous unexplored depths will be subjected to scientific investigations.

It goes without saying that the water layers above the greatest depths will also be explored in order to procure a basis for comparison; in certain areas, e.g. round largely isolated islands such as Easter Island and Pitcairn the coastal areas proper will be investigated.

Besides this biological working programme the Expedition will in addition collect mammals. birds, insects, etc. for the Zoological Museum of Copenhagen.

A very interesting experiment will be made in the geophysical field ; by means of specially constructed instruments the variations of the intensity of the magnetic field will be measured down to the greatest depths. These measurements, which may yield extremely interesting results, have never been tried before ; they may give a valuable contribution to the discussion on the Blackett hypotheses. The measuring instruments will be placed in globular containers of non-magnetic metal ; it is not only an extremely important but also a very difficult experimental task to construct these instruments and to devise a usable installation on board. Besides these measurements determination of magnetic variation will be made, which since the destruction by fire of the American brigantine Carnegie in 1929 has been done only on a small scale.

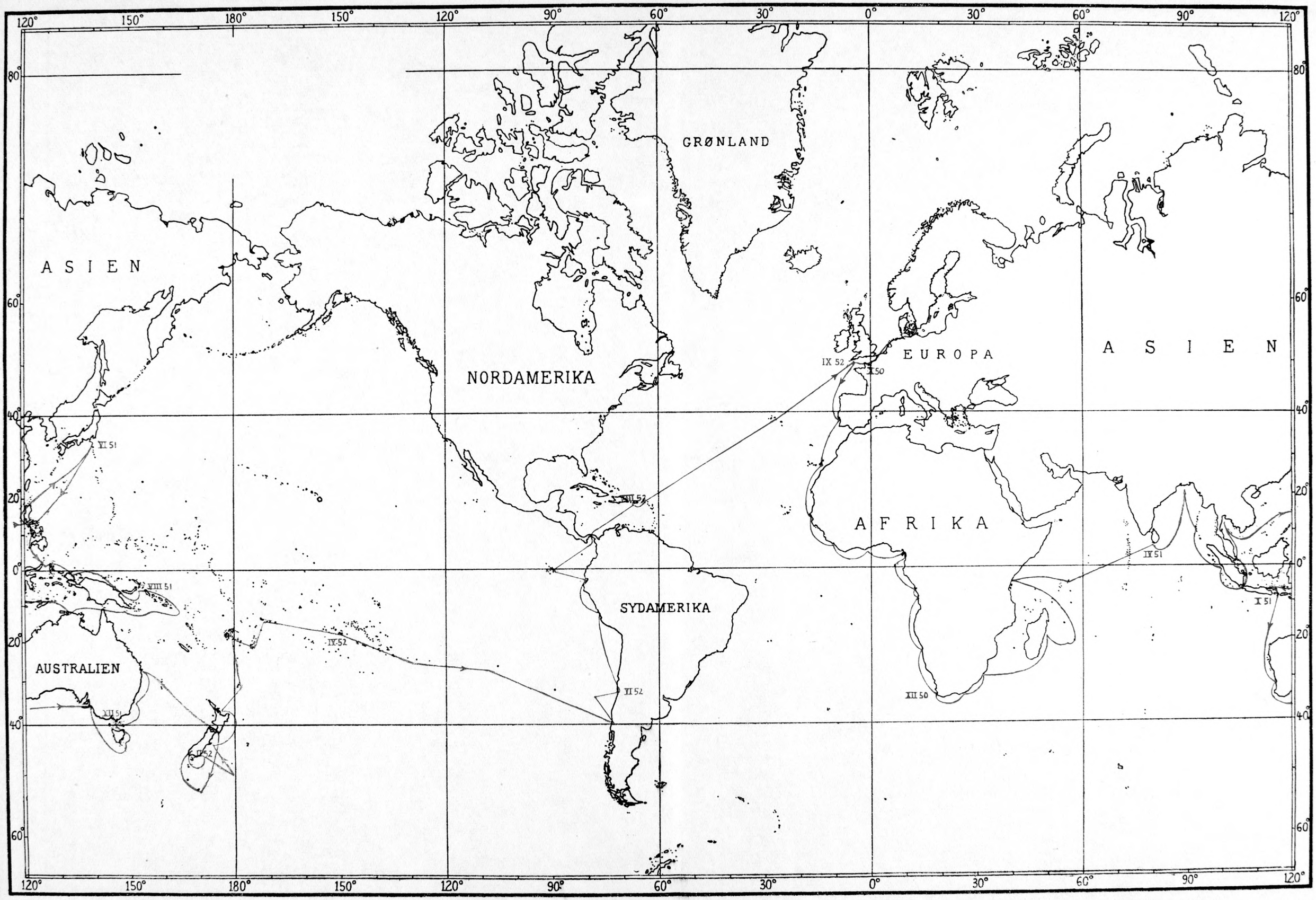
Investigations of magnetic variation will thus be made off Virgin Islands, Galapagos Islands, Easter Island, south of Campbell Island (New Zealand) and in several other places.

For handling the different instruments the ship will be equipped with a very powerful winch, and a steel wire, 12 000 m. long, has been specially made for the Expedition.

The ship of the Expedition is the former British frigate *Leith* which is being rebuilt at present at the Danish Naval Dock Yard; it has been given the name *Galathea* in memory of the first great Danish Deep-Sea Expedition made by the corvette *Galathea* in 1845-47. The ship will be provided with cabins for the scientific staff, and among other things a large laboratory will be equipped with all modern appliances; a fairly large freezing plant of Danish make will also be installed for preservation of scientific specimens. There will be modern navigation appliances (e.g. Loran) and a special echo-sounding apparatus of Hughes' construction.

The route is shown on the accompanying map and is roughly speaking as follows :

The African Atlantic coast, the area between South Africa and Madagascar, Mombassa, the Seychelles, Ceylon, the Bay of Bengal, the Indonesian Seas, the Philippines, Japan, New Guinea and the Solomon Islands, the sea



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round Australia and New Zealand, the Pacific Archipelago, the West coast of South America, the sea round the Antilles and back across the North Atlantic.

All along this route soundings will be taken, and investigations concerning unchecked reports on the charts will be made. The programme of these sounding measurements has been laid by the Danish Hydrographic Office in collaboration with the International Hydrographic Bureau in Monaco and the Hydrographic Offices of Great Britain and of the United States and will comprise such different areas as Sole Bank (48 1/2° N., 9° W.), Gleaner Reef (22 1/2° S., 174° W.), Bradley Reef (6° S., 161° E.), the Emden Deep off Mindanao and Victoria Bank (9° S., 131° E.).

The ship will be equipped as a naval vessel with a military crew, since, in connexion with the scientific work, official visits of courtesy will be paid to the numerous states at which the *Galathea* will touch during her two-year cruise.