

Pacific marginal sea. As is to be expected in a region so irregular in hydrographic relief, shoals and pinnacle rocks are numerous, necessitating cautious navigation.

**Arctic.** The submerged plateau extending from the northern coast of North America is a major part of the great continental shelf surrounding the Arctic Ocean, on which lie all the Arctic islands of Canada, Greenland, and most of the Arctic islands of Europe and Asia. This shelf is most uniformly developed north of Siberia, where it is about 500 miles wide; north of North America it surrounds the western islands of the archipelago and extends 50 to 300 miles seaward from the outermost islands.

The floor of the submerged part of this continental margin is nearly flat to gently undulating, with here and there isolated rises or hollows. Most of it has an average slope seaward of about one half a degree, with an abrupt break at the outer edge to the continental slope whose declivity is commonly six degrees or more. From the Alaskan border eastward to the mouth of the Mackenzie River the shelf is shallow and continuous with the coastal plain on the mainland; the outer edge of the shelf, or continental shoulder, lies at a depth of about 35 fathoms and about 40 nautical miles off shore. This shelf is continuous with that north of Alaska and Siberia. Near the western edge of the Mackenzie River delta, the continental shelf is indented by a deep valley (the so-called Herschel Sea Canyon) whose head comes within 15 miles of the coast. Between Herschel Sea Canyon and Amundsen Gulf, the typical features of the continental shelf are replaced by the submerged portion of the Mackenzie River delta, which forms a great pock-marked undersea plain, most of it less than 30 fathoms deep, up to 75 nautical miles wide and 250 miles long.

North and east of the submerged portion of Mackenzie River delta, the continental shelf, while typical in form, is more deeply submerged than that off the mainland and Alaska. Its gently undulating surface is, for the most part, 200 fathoms or more below sea level, and the well-defined, nearly straight continental shoulder is for the most part over 300 fathoms deep, giving way to the smooth continental slope which extends without significant interruption to the floor of the abyssal Canada Basin at a depth of about 2,000 fathoms. The deeply submerged continental shelf extends along the entire west coast of the Canadian Arctic archipelago from Banks Island to Greenland. All of the major channels between the islands — Amundsen Gulf, M'Clure Strait, Prince Gustav Adolf Sea, Peary Channel, Sverdrup Channel and Nansen Sound — have flattish floors at about the same depth as the shelf and appear to enter it "at grade", although there are a few local irregularities that may be the result of glacial action. No deep indentations or canyons are known to cut the continental slope or continental shelf off the archipelago, except one sinuous canyon that heads off Robeson Channel at the northeastern end, close to the coast of Greenland. The submerged sides of the channels of the archipelago, and the slopes from the shoreline at the western edge of the islands to the inner edge of the deeply submerged shelf, are in many places marked by a series of steps or terraces.

The continental shelf bordering the Arctic Ocean as well as the adjacent mainland, particularly near the delta of the Mackenzie River, and the islands of the archipelago have been subjected to increasingly intensive scientific study and mineral resource exploration during the past 15 years. Co-ordinated and continuing programs of research and surveys have studied the bedrock geology, the development of the terrain, the sediments on the sea floor and the nature and history of the ice caps. Gravity, seismic, aeromagnetic, geomagnetic and geothermal investigations have obtained information on the physical characteristics and structure of the rocks beneath the surface, and the nature and stability of the crust underlying the islands, the continental shelf and the continental slope. A complementary program of geodetic, topographic and hydrographic surveys has provided the necessary background maps and charts, and information about both terrestrial and marine physiography for these studies. Along with the technical surveys and investigations in the physical sciences, there have been less intensive but very relevant studies of the biology of the Arctic lands and oceans. The result of all these activities is that a great deal of reliable scientific information in a wide range of subjects is now available for an area about which very little was known two decades ago.

#### **1.1.4 Islands**

The largest islands of Canada are in the North and all experience an arctic climate. The northern group extends from the islands in James Bay to Ellesmere Island which reaches 83° 07'N. Those in the District of Franklin lie north of the mainland of Canada and are generally