

influence of the ocean, brought far inland by remarkable coastal physiography, has had marked effect on the lives and character of the inhabitants. The serried Atlantic and Pacific Coasts provide excellent harbours for great fishing fleets and are natural sites for the ports required for transshipment of primary and manufactured products.

To present a comprehensive description of these adjacent seas the good offices of oceanography, geology, marine biology, meteorology, and many other sciences would have to be invoked, but in the space allotted it would be impossible to deal with so many aspects. The basic factor in any utilitarian study of the oceanic-continental margin is the physical relief of the sea-floor, a subject which has greatly developed in recent years. As an arbitrary limit must be set, the scope of this subsection will be restricted to a consideration of some of the more salient features of the hydrography of the marginal seas surrounding Canada.

The Dominion authority for conducting hydrographic surveys is the Hydrographic Service of Canada, under the administration of the Surveys and Engineering Branch of the Department of Mines and Resources.\* The work with which it is charged includes the charting of coastal and inland waters, the investigation of tides and tidal streams, and the recording of fluctuations of the waters comprising the Great Lakes-St. Lawrence waterway. This Service produces and circulates the official Canadian hydrographic aids to navigation: charts, volumes of pilots' and sailing directions, tide tables and related nautical publications.

The hydrographical descriptions of the marginal seas are dealt with under the headings, Atlantic, Arctic and Sub-Arctic, and Pacific, in the following paragraphs.

**Atlantic.**—Incursions of the sea in the Atlantic Coast are formed in depressions between crests of the Appalachian Mountain Range as it dips into the ocean. Seaward from the shore protrudes the submerged Continental Shelf, the zone which effects the transition from continental to oceanic regions. In contrast to the narrowness and comparative smoothness of submarine plateaus in many parts of the world, the shelf extending off the Atlantic Coast of Canada is distinguished by great width and diversity of relief. From the coast of Nova Scotia it extends 60 to 140 miles; from Newfoundland 120 to 270 miles. In the latter region, the oceanward edge of the submerged plateau is over 600 miles from the Canadian coast, the shelf there being taken to embrace within its confines the Island of Newfoundland. Owing to the great paucity of soundings the width off Labrador is uncertain, but indications are that it varies from about 150 miles at Belle Isle to 50 miles at the entrance to Hudson Strait. Northward it merges into that of the Polar Sea.

The outer edge of the shelf is known as the Continental Shoulder. There, the sea-floor drops suddenly to the main oceanic basin, several miles deep, the steep declivity being referred to as the Continental Slope. Depths of the sea over the top of the Shoulder vary considerably in different regions and, in consequence, this boundary line between continental and the deep oceanic features cannot be universally defined in terms of a constant bathymetric contour. Off the Canadian and Newfoundland coasts, soundings of from 100 to 200 fathoms are reached before the shelf suddenly gives way to the steep declivity leading to abysmal depths.

From the relations between widths and depths as given above, it is evident that the over-all gradient of the Atlantic Continental Shelf is slight. It is far from smooth, however, the whole area being studded with such impressive forms as shoals, plateaus, banks, ridges and islands. The deeply indented Atlantic coasts of Nova Scotia and Newfoundland are fringed by scraggy islets and rock shoals. Off Nova Scotia

\* See special article at pp. 14-18.