

spicuous among marine worms are the calcareous tube-building *Serpula vermicularis* and *Amphitrite robusta*, the colonial *Eudistylia polymorpha*, and the free-swimming clam worm *Nereis virens*. Attached to subtidal rocks is the lamp-shell *Terebratalia transversa* (Phylum Brachiopoda). The curious worm-like *Phoronis vancouverensis* forms gelatinous masses on intertidal rocks. The echinoderm fauna of this region is probably the richest in the world. Conspicuous intertidal species are the leather star (*Dermasterias imbricata*), sea bat (*Patiria miniata*), the very large sunflower star (*Pycnopodia helianthoides*), and the common starfish (*Pisaster ochraceus*). Echinoids include the green sea urchin, the giant red urchin (*Strongylocentrotus franciscanus*), and the large purple urchin (*S. purpuratus*). The large soft-bodied California cucumber *Stichopus californica*, the reddish cucumber *Cucumaria miniata* and the white cucumber *Eupentacta quinquevittata* are also common.

The sea moss fauna of coastal Pacific Canada is extensive although not yet completely documented. Among the more common species are: *Cribrilina annulata*, *Tubulipora tuba*, *Filicisia geniculata*, *Alcyonidium polyommum*, *Dendrobeania curvirostris*, *Bugula pacifica*, *Tricellaria occidentalis*, *Scrupeocellaria californica*, *Reginella furcata*, *Dakaria ordinata*, *Microporella umbonata*, *Parasmittina collifera*, *Rhynchozoon tumulosum*, *Lagenipora spinulosa*, *Hippodiplosia insculpta*, *Eurytomella bilabiata*, and *Phidolopora pacifica*.

### PART III.—CLIMATE AND TIME ZONES\*

#### Section 1.—Climate

Just as there are great differences in the weather throughout Canada at any given instant, there are also many climates. These climates are similar to those in Europe and Asia extending from the Arctic down to the mid-northern hemispheric latitudes. Because Canada is situated in the northern half of the hemisphere, most of the country loses more heat annually than it receives from the sun. The general atmospheric circulation compensates for this and at the same time produces a general movement of air from west to east. Migrant low pressure areas move across the country in this "westerly zone", producing storms and bad weather. In intervals between storms there prevails the fair weather associated with high pressure areas.

Although the movement of migrant high and low pressure systems within the zone of the westerlies is the most significant climatic control over Canada, the physical geography of North America contributes greatly to the climate. On the West Coast, the western Cordillera limits mild air from the Pacific to a narrow band along the coast, while the prairies to the east of the mountains are dry and have extreme temperatures because they are shielded from the Pacific Ocean and are in the interior of a large land mass. In addition, the prairies are part of a wide north-south corridor open to rapid air flow from either north or south which often brings sudden and drastic weather changes to this interior area. On the other hand, the large water surfaces of Eastern Canada produce a considerable modification to the climate. In southwestern Ontario winters are milder with more snow, and in summer the cooling effect of the lakes is well illustrated by the number of resorts along their shores. On the East Coast, the Atlantic Ocean has considerable effect on the immediate coastal area where temperatures are modified and conditions made more humid when the winds blow inland from the ocean.

The following table gives temperature and precipitation data for typical stations in the various regions of Canada. Temperatures in this table refer to observations taken in a thermometer shelter which has been placed in a representative location with the thermometer bulbs four feet above the surface of the ground. Mean January and July tem-

\* Sections 1 and 2 of this part were prepared by the Meteorological Branch of the Department of Transport, Toronto. A comprehensive study on The Climate of Canada, also prepared by the Meteorological Branch, was carried in the 1959 Year Book, pp. 23-51. Supplementing that textual material, detailed tabulations of climatic factors for 45 individual meteorological stations across the country were carried in the 1960 Year Book, pp. 33-77. A reprint is available from the above source giving the complete textual and tabular data. A special article on The Climate of the Canadian Arctic appears in the 1967 Year Book at pp. 55-74, an augmented reprint of which is also available from the Meteorological Branch.