surveys of land under federal jurisdiction, such as the northern territories, national parks and Indian reserves. It also executes such surveys on behalf of administering departments, collaborates in the demarcation of provincial boundaries, prepares descriptions of electoral districts and generally provides land-surveying services to other departments.

The Surveys and Mapping Branch is Canada's major agency for preparing aeronautical charts of airports, airways and radio and other aids for air navigation. As a service to map-makers, prospectors, engineers, foresters, and town planners, the department maintains a National Air Photo Library in Ottawa containing all air photographs taken by or for the federal government. The library is responsible for storage, documentation and handling of airborne remote-sensing photography and Earth Resources Technology Satellite imagery. Geological surveys provide an inventory of the potential resources of Canada, and aid in the discovery of mineral deposits, and in other aspects of the national economy influenced by geological factors. Large reconnaissance projects are mounted in northern regions, and detailed investigations in the southern areas. Geological maps are published separately or as part of scientific papers. Geophysical surveys result in maps showing such features as variations in terrestrial magnetism, gravity and seismology. The Geological Survey outlines local magnetic variations indicating mineral deposits, while the Earth Physics Branch maps the earth's total magnetic field. Seismic observatories throughout Canada compile and update earthquake zoning maps of Canada. A gravity map of Canada is also available.

1.2 Geology

Canada is composed of some 17 geological provinces that may be grouped under four main categories — continental shelf, platform, orogen and shield. The geologically youngest provinces, the Atlantic, Pacific and Arctic continental shelves are made up of little-deformed sediments and volcanics, mainly of Mesozoic and Cenozoic age, which are still accumulating along the margins of the present continental mass. The St. Lawrence, Interior, Arctic and Hudson platforms are formed of thick flat-lying Phanerozoic strata covering large parts of the crystalline basement rocks of the continental interior, the extension of the Canadian Shield. The Appalachian, Cordilleran and Innuitian orogens are mountain belts of deformed and metamorphosed sedimentary and volcanic rocks mainly Phanerozoic and Proterozoic in age, intruded by granitic plutons. They were produced during the various Phanerozoic orogenies 50 to 500 million years ago. Of the seven provinces comprising the Precambrian Canadian Shield, the Grenville, Churchill, Southern and Bear embrace the orogenic belts produced during the Proterozoic orogenies, 900 to 1,800 million years ago. The remaining three, the Superior, Slave and Nutak provinces, were deformed during the Archean Eon, and include the oldest continental crust known in Canada, 2,500 to 3,000 million years old. The Precambrian orogenic belts have many features in common with those of Phanerozoic age but are so deeply eroded that the mountainous parts have been reduced to plains or lowlands and in many places the basement crystalline rocks upon which the sediments and volcanics initially accumulated are now exposed.

The land and freshwater area of Canada is 3,852,000 sq miles (9 976 634 km²), but unique among the nations of the world, Canada also includes within the confines of this area some 858,000 sq miles (2 222 210 km²) of marine waters. The rocks beneath have geological features akin to the adjacent regions on-shore. In addition, the submarine area of the bordering continental shelves is about 523,000 sq miles (1 354 564 km²) and of the continental slopes, 563,000 sq miles (1 458 163 km²). Altogether, this embraces 5,526,000 sq miles (14 312 274 km²), about 3% of the surface of the globe.

For an account of Canada's geology see the *Canada Year Book 1973* pp 8-14.