

thick marine and nonmarine clastic rocks, and locally many large folds, are attractive for exploration. These little explored basins are known to be petroliferous on Bristol Bay and the Gulf of Alaska and to contain major accumulations of oil and gas at Cook Inlet.

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GEOLOGIC MAP OF PACIFIC MOBILE BELT AND PACIFIC OCEAN

The first geologic map of the Pacific Ocean and the continents bordering it is the result of cooperation of the geologists from the USSR Ministry of Geology and the Academy of Sciences of the USSR. The map synthesizes geologic data obtained from many different countries. The principle used in map compilation is the determination of rock masses according to age and composition. The correlation of deposits of different ages will be shown in the Atlas of Biopaleogeographic Maps of the Pacific Superregion. In the Precambrian shield margins, local names are given. The map emphasizes the importance of Mesozoic and Cenozoic intrusive magmatism. The location of endogenic mineralization is connected with this magmatism.

Special attention is given to Cenozoic volcanic rocks. The following series are distinguished: alkaline and alkaline-earth, the series of high-alumina basalts, calc-alkaline, tholeiitic, and others. Various extrusive volcanic features are indicated by separate symbols. Radiometric age dates of oceanic basalts also are given.

The distribution of different recent complexes of sediments, clastic, argillaceous, and biogenic is shown in the ocean and marginal sea floors. The complexes, including admixture of volcanic material of different composition, have special symbols. In order to distinguish biogenic sediments, quantitative data on the most important sedimentary components (CaCO_3 , amorphous SiO_2) were taken into consideration. Some sampled pre-Quaternary deposits (Cretaceous-Neogene) and young volcanic rocks in the ocean-bottom areas are included on the map. Deep-drilling data (*Glomar Challenger*, etc.) are shown as enlarged columns, in which color indicates the recovered rock ages. The distribution of manganese nodules is contoured, phosphorite outcrops (mostly pre-Quaternary) also are shown.

The Pacific mobile belt and Pacific Ocean comprise a global mineralogenetic province. Thus, the Pacific ore belt, the Pacific sulfur-bearing belt, the Pacific oil-gas belt, and others are singled out. The geologic map, especially its new international publication, is intended to be the basis for predictional estimation of the Pacific region.

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HYDROGEOLOGY OF CHEJU VOLCANIC ISLAND, KOREA

A regional groundwater study was conducted on Cheju Island off the Korean coast. Cheju Island comprises about 1,800 sq km (696 sq mi) and is elliptical in shape, with the major axis 74 km long trending in an east-northeast to west-southwest direction; the minor axis, 32 km long, trends in a southwest direction. Mount Halla (1,950 m) is the highest and central crater. Average annual precipitation is estimated to be 1,500 mm (59 in.).

Apart from three streams fed by springs there are no true perennial streams among the 30 streams in Cheju. Thus the low drainage density indicates higher infiltration of precipitation.

Cheju Island is underlain by a succession of basaltic rocks, belonging to the "Inter-Pacific province," interbedded marine sedimentary rocks, and pyroclastic rocks of recent age.

Groundwater occurs locally as perched groundwater and is the source of some springs above the 700-m contour. The existence of a main groundwater table is recognized just above sea level in coastal areas but is assumed to be present farther from the coast. The groundwater tables mostly are unconfined but locally they may be confined by the presence of an aquiclude of local extent. Ninety percent of the springs in Cheju tend to be concentrated in the coastal area.

The porosity of basalts from jointing is assumed to be larger than that from vesicles because specific yield by a pumping test reaches 0.2 and is larger than the effective porosity of the same aquifer as measured in the laboratory.

The best aquifers in Cheju are feldspar olivine basalt and interbedded pyroclastic rocks. Transmissibility ranges from 156 to 20,000 cu m/d/m (1,300 to 1,600,000 gpd/ft) and is ascribed to the irregular development of joints and interconnecting vesicles.

Storage coefficients by pumping test are 0.15-0.3 but generally are assumed to be 0.2. In some coastal areas, as Sinchoon, a confined condition was recognized by the fluctuations of the phreatic water table in harmony with tides.

Analysis of groundwater indicates that the water quality is good for all purposes, domestic, agricultural, and industrial. All groundwater belongs to the calcium-sodium bicarbonate-chloride type with total dissolved solids ranging from 50 to 150 ppm.

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GEOHERMAL EXPLORATION IN NORTHERN CHILE

Interest in the economic development of geothermal energy has been restricted to Tarapaca and Antofagasta Provinces (18°00' S to 24°00' S) in northern Chile, where the energy requirements for industrial and mining purposes must be supplied by conventional thermal electric plants. These plants have been operated chiefly with imported oil.

Since 1968 the project to investigate the geothermal resources of the region has been carried on by the "Corporacion de Fomento de la Produccion" of Chile and the United Nations Development Program.

Geothermal investigations started with a detailed account of the thermal-springs areas of both provinces, and the most attractive geothermal areas were selected for further systematic surveys. The most important areas selected are from north to south: Jurase, Suriri, Puchuldiza, and El Tatio; all of them are in the High Cordillera of the Andes, at an elevation of about 4,300 m in areas dominated by volcanic rocks of late Tertiary and Quaternary age.

Geologic, geophysical, and geochemical investigations have been carried out at Puchuldiza and El Tatio geothermal fields. At El Tatio, six exploration holes (4 in. diameter) were drilled to a depth of 600-700 m.