

ALASKA

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Reprinted from Fifteenth Edition

ENCYCLOPEDIA BRITANNICA

Pp. 409-414

1983

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Alaska

When it became the 49th state of the United States in 1959, Alaska increased the nation's area by nearly 20 percent. The new area included vast stretches of unexplored land and untapped resources. But when Secretary of State William H. Seward negotiated its purchase from Russia in 1867, it was known as "Seward's Folly." Since its acquisition, its settlement and exploitation have been hindered by its distance from the rest of the nation, the climate and terrain, and the slowness of communications. Many problems still stand in the way of immigration and economic development, and Alaska continues to be the country's last frontier. About 43 percent of the more than 400,000 inhabitants reported in the 1980 census lived in and around the city and borough of Anchorage. The capital is Juneau, 573 miles (922 kilometres) to the southeast in the Panhandle region. A new capital site at Willow, however, was chosen by referendum in late 1976, and its development was under way by the early 1980s.

Itself a landmass of subcontinental proportions, Alaska lies at the extreme northwest of the North American continent and is the largest peninsula in the Western Hemisphere. Its 586,412 square miles (1,518,800 square kilometres) include some 15,000 square miles of fjords and inlets, and its three faces to the sea have about 34,000 miles of indented tidal coastline and 6,600 total miles of coast fronting the open sea. The marine borders are the Arctic Ocean on the north and northwest, Bering Strait and Sea on the west, and the Pacific Ocean and Gulf of Alaska on the south. The land boundaries on the east cut across some 1,150 miles of high mountains to separate the state from the Canadian Yukon Territory and province of British Columbia. Rimming the state on the south is one of the Earth's most active earthquake belts, associated on the mainland with zones of volcanic activity. In the Alaska Range north of Anchorage, Mt. McKinley, at 20,320 feet (6,194 metres), is the highest peak in North America.

In the years following statehood, Alaska emerged as the first real proving ground of the country's stated resolve to find a balance between the effective development and management of its natural resources and the preservation of its irreplaceable wilderness and public recreation areas. Under the Statehood Act of 1958, about 27 percent of Alaska remained under federal jurisdiction as national forests or parks, wildlife preserves, Indian reservations, and the like. Another 70 percent remained vacant public-domain lands. By 1984, about 100,000,000 acres (40,470,000 hectares) of this, plus tidelands and other land equities, were to be selected by the state for community, recreational, and commercial use. In January 1972 the state filed for withdrawal of 76,600,000 acres of this optional land from the public domain, adding to 24,600,000 acres previously selected and leaving about 2,000,000 acres yet to be selected.

In the early 1980s the problem of development versus preservation was symbolized by the unresolved land withdrawal issue, the Alaskan Highway gas-pipeline project, native Alaskans' land claims, noncommercial whaling by

native peoples, and related issues. The conflicts of the 1970s between conservationists and petroleum companies over the Trans-Alaska Pipeline from the oil-rich North Slope on the Arctic Ocean to Valdez in the south and beyond appeared to have been only another incident in the century-long effort to find a balance between conservation and development in this enormous land. (For information on related topics, see the articles ALASKAN MOUNTAINS; NORTH AMERICA; UNITED STATES; UNITED STATES, HISTORY OF THE; VALLEY OF TEN THOUSAND SMOKES.)

THE HISTORY OF ALASKA

Explorations. As early as 1700, native peoples of Siberia had reported the existence of a huge piece of land lying due east. An expedition appointed by the tsar and led by a Danish mariner, Vitus Bering, in 1728 determined the new land was not linked to the Russian mainland, but because of fog it failed to locate North America. On Bering's second voyage, in 1741, the spectacular peak of Mt. St. Elias (18,008 feet) was sighted, and men were sent ashore. Sea-otter furs taken back to Russia opened a rich fur commerce between Europe, Asia, and the North American Pacific Coast during the ensuing century.

Early settlement. The first European settlement was established in 1784 by Russians at Three Saints Bay, near present-day Kodiak. It served as Alaska's capital until 1806, when the Russian-American Company, organized in 1799 under charter from the emperor Paul I, moved its headquarters to richer sea-otter grounds in the Alexander Archipelago at Sitka. The company governed Alaska until its purchase by the United States in 1867. Alaska's first governor (then termed chief manager), Aleksandr Baranov, was an aggressive administrator whose severe treatment of the native Indians and Eskimos led in 1802 to a massacre at Sitka.

A period of bitter competition among Russian, British, and American fur traders was resolved in 1824 when Russia granted equal trade rights for all. The near extinction of the sea otter and the political consequences of the Crimean War (1853-56) were factors in Russia's willingness to sell Alaska to the United States. The Russian minister made a formal proposal in 1867, and, after much public opposition, the purchase was approved by the U.S. Congress, and the U.S. flag was flown at Sitka on October 18, 1867.

Political growth. As a U.S. possession, Alaska was governed by military commanders for the War Department until 1877. During these years there was little internal development, but a salmon cannery built in 1878 was the beginning of what became the largest salmon industry in the world. In 1884 Congress established Alaska as a judicial land district, federal district courts were established, and a school system was initiated.

In 1906 the first representative to Congress, a nonvoting delegate, was elected, and in 1912 Congress established the Territory of Alaska, with an elected territorial legislature. Alaskans voted in favour of statehood in 1946 and adopted a constitution in 1955. Congressional approval of the Alaska statehood bill in 1958 was followed by formal entry into the Union on January 3, 1959.

Mining booms. Other significant events in Alaska's history included early gold discoveries on the Stikine River in 1861, at Juneau in 1880, and on Fortymile Creek in 1886, and later the stampede to the Atlin and Klondike placer goldfields of adjoining British Columbia and Yukon Territory in 1897-1900. Gold discoveries followed at Nome in 1898 and at Fairbanks in 1903. The gold rush made Americans aware of the economic potential of this previously neglected land. The great hard-rock mines in the Panhandle were developed, and in 1898 copper was discovered at McCarthy. Gold dredging in the Tanana River Valley was begun in 1903 and continued until 1967.

Economic growth. A dispute between the United States and Canada over the precise boundary between British Columbia and the Alaska Panhandle was decided by an Alaska Boundary Tribunal in 1903. The U.S. view that the border should lie along the crest of the Boundary Ranges was accepted. Between 1898 and 1900 a narrow-gauge railroad was built across the precipitous White Pass

Russian
pioneering

Area and
boundaries

Establishment of
the
territory

to link Skagway and Whitehorse in the Yukon, and shortly afterward the Cordova-to-McCarthy line was laid up the Copper River. Another milestone was the 538-mile Alaska Railroad connecting Seward with Anchorage and Fairbanks in 1923. In 1935 the government encouraged a farming program in the Matanuska Valley near Anchorage, and dairy herds and crop farming became established there and in the Tanana and Homer regions.

In 1942, during World War II, Japanese forces invaded Agattu, Attu, and Kiska islands and bombed Dutch Harbor on Unalaska. This aggression prompted the construction of large airfields as well as the Alaskan, or Alcan, Highway linking Dawson Creek, British Columbia, and Fairbanks with more than 1,500 miles of road. Both proved later to be of immense value in the commercial development of the state. A devastating earthquake in March 1964 affected the northwestern Panhandle and the Cook Inlet areas, destroying parts of Anchorage; a tsunami wave that followed wiped out Valdez; the coast sank 32 feet at Kodiak and Seward, while a 16-foot rise destroyed the harbour at Cordova.

Oil discoveries in the Kenai Peninsula and offshore drilling in Cook Inlet in the 1950s created an industry that by the 1970s ranked first in the state's mineral production. In the early 1960s a pulp industry began to utilize the forest resources of the Panhandle. Major paper-pulp mills were constructed at Ketchikan and Sitka, largely to serve the Japanese market. The discoveries in 1968 of petroleum on lands fronting the Arctic Ocean gave promise of relief for Alaska's economic lag, but problems of transportation across the state and to the "South 48" held up exploitation of the finds. In 1969 a group of petroleum companies paid the state nearly \$1,000,000,000 in oil-land revenues, but the proposed pipeline across the eastern Brooks Range, interior plains, and southern ranges to Valdez created heated controversies among industry, government, and conservationists. In November 1973 a bill passed Congress and was signed, making possible construction of the pipeline, which began in the following year. The completed 48-inch (122-centimetre) pipeline, 789 miles long, came into operation on June 20, 1977.

THE NATURAL AND HUMAN LANDSCAPE

The immense area of Alaska has a great variety of physical characteristics. Nearly one-third of the state lies within the Arctic Circle and has permanent frost and treeless tundra. The southern coast and the Panhandle at sea level are fully temperate regions. In these latter and in the adjoining Canadian areas, however, lies the world's largest expanse of glacial ice outside Greenland and Antarctica. Off the extreme western end of the Seward Peninsula, Little Diomed Island, part of Alaska, lies in the Bering Strait only 2.5 miles from Soviet-owned Big Diomed; both nations have shown a tacit tolerance of unintentional airspace violations, which are common in bad weather.

Environmental regions. Alaska is composed of nine distinct environmental provinces.

The Panhandle. Much of the mainland Panhandle, a narrow strip of land 25 to 50 miles wide lying west and south of the St. Elias Mountains, is composed of the Boundary Ranges. There are several large ice fields, and the peaks include Mt. St. Elias, from whose summit the Alaska-Yukon border swings due north. The western extension of this mountain chain is the Chugach Range, a giant arc at the northernmost edge of the Gulf of Alaska. Many remote valleys and high ridges are still unexplored, and the relief and glaciation inhibit exploitation. The coast is characterized by frequent and intense oceanic storm systems that have produced dense rain forests on the coastal mountain flanks. In the valleys rivers produce devastating annual floods.

South coast and gulf islands. The south coastal archipelago and the Gulf of Alaska islands include the Alexander Archipelago in the Panhandle region, with 11,000 islands, plus Kodiak Island and its satellites south of Cook Inlet. These islands, extensions of the southern region, are lower, less rugged, and less glaciated. All receive extraordinarily heavy rain and are affected by encircling waters warmed by the Kuroshio Current.

Aleutian Range and islands. This region includes the narrow Alaska Peninsula and the 1,100-mile-long Aleutian chain that separates the North Pacific from the Bering Sea. The chain includes 14 large islands, 55 significant but smaller ones, and thousands of islets. The largest are Unimak, Unalaska, and Umnak; these three also have the largest permanent populations. On the occasionally clear summer days, active volcanoes and such glacier-covered peaks as symmetrical Shishaldin Volcano (9,372 feet) on Unimak can be seen. Such magnificent views represent the Aleutians at their scenic best. Usually, however, the weather is wet and stormy, the winds cutting, and the fog all-pervading.

Alaska Range. A curving interior cordillera, the broad Alaska Range connects the Aleutian Range across the southern third of mainland Alaska to the Wrangell Mountains, which abut against the vast complex of the St. Elias Mountains. The Wrangell Mountains have large active volcanoes and high valley glaciers. The flanks of this subarctic range are largely tundra-covered.

Interior basins. The low-lying region between the Alaska Range in the north and the Chugach-Wrangell-St. Elias mountains to the south enjoys a relatively temperate climate. The lower valleys contain good farmlands, such as the fertile Matanuska area, and it is there that most of the people of Alaska live.

Interior Alaska. The central plains and tablelands are a vast region west and north of the Alaska Range; they reach as far north as the Brooks Range. The area is rolling and dissected by numerous streams tributary to the Yukon River. The plains extend from the Canadian border to Norton Sound and the Yukon Delta on the Bering Sea. It is characterized by river flats and truncated upland tablelands. A region with abundant game, it is an important nesting ground for waterfowl, including great numbers of migrating birds.

Brooks Range. A major mountain chain north of the central plains and extending from the sea nearly to the Yukon border, the Brooks Range gradually slopes northward to a narrow linear coastal plain bordering the Arctic Ocean and westward to lower hills north of Kotzebue Sound. There are a few high Arctic glaciers, and the area is semiarid. The lower flanks and valleys are tundra-covered, with permafrost features.

Arctic plains. The coastal lowland north of the Brooks Range, sometimes called the North Slope, is the home of great herds of caribou. The environment is truly polar, with the seacoast frozen eight months a year and the ground permanently frozen except for a thin zone of summer melting. It is treeless, though in summer grasses and Arctic-alpine flowers abound. A large navy petroleum reserve is located there, and the Prudhoe Bay oil fields are found in the east.

Sea islands. The islands of the Bering Sea represent a small but unique Arctic maritime environment, typified by St. Lawrence, Nunivak, and St. Matthew islands and the Pribilof group. These tundra-covered islands are surrounded by sea ice in winter and serve as protected refuges for the world's largest herds of fur-bearing seal and sea otter, as well as sea lion and walrus. A large herd of domesticated reindeer is tended by Eskimos on Nunivak Island.

Climates. The wide-ranging geographical provinces and the great physiographic relief, extending from sea level to more than 20,000 feet, provide Alaska with much climatic diversity. Summers are mild, and midwinter along the coast is often clear and dry. It is thought likely that an approximately 90-year cycle of climatic change may bring another cold interval toward the end of the 1900s. Five general climatic zones may be delineated, excluding the great mountain ranges.

Temperate oceanic. Southern coastal and southeastern Alaska, the Gulf of Alaska islands, and the Aleutians have average temperature ranges in the summer of 40° to 60° F (4° to 16° C) and in the winter of 40° to 20° F (4° to -7° C). Rainfall varies locally from 60 to 160 inches (1,525 to 4,065 millimetres), and the Panhandle and southern islands are covered with Sitka spruce and other evergreens. The Cordova-Valdez region has the state's

Shishaldin
Volcano

Discovery
of oil

Physio-
graphic
diversity

Tempera-
ture and
rainfall

highest precipitation, 200 inches or more. At Valdez 200 inches of snow is not uncommon. Precipitation is less in the Aleutians, but even there about 250 rainy days occur annually.

Subtemperate. The interior basin ranges from 45° to 75° F (7° to 24° C) in summer and 20° to -10° F (-7° to -23° C) in winter. The region is drier than the coast and only slightly colder in winter, with Anchorage receiving about 25 inches of precipitation annually. The pleasant conditions and proximity to the sea have made the area the centre of the state's population.

Maritime Arctic. The islands and coast of the Bering Sea have summer temperatures of 40° to 60° F (4° to 16° C) and winter temperatures of 20° to -10° F (-7° to -23° C). Tempering influences of the Pacific dissipate north of the Pribilof Islands, and Arctic sea ice often reaches this area.

Interior continental. The central plains and uplands range from 45° to 75° F (7° to 24° C) in the summer and -10° to -30° F (-23° to -34° C) in the winter. Average rainfall is 10 to 20 inches, though less than 10 inches is common.

High Arctic, or polar. The ameliorating effects of the Arctic Ocean keep temperatures of the North Slope—35° to 55° F (2° to 13° C) in the summer, -5° to -20° F (-21° to -29° C) in the winter—less severe than those of the interior plains. About five inches of precipitation nonetheless remain on the ground as snow about eight months a year. The 24-hour sunlight of summer can produce strong buildups of radiant energy, sending temperatures to 90° F (32° C).

THE PEOPLES OF ALASKA

English, Russian, Spanish, and French place-names reflect early European exploration, but equally as prominent are dozens of names carried down from the pre-Western era. The name Alaska itself is derived from the Aleut *alaska* and the Eskimo *ālakshak*, both meaning "mainland."

Aboriginal peoples. Long before Bering's voyages the Tlingit Indians lived in the southern and southeastern coastal area; the Aleuts on the Aleutian Islands and the Alaska Peninsula; and the Eskimos on the Bering shore and the Arctic Ocean coast. The interior natives were the Tinneh Indians, whose language was Athabascan, that of the Plains Indians of the interior continent to the south.

The Indian groups are presumably descendants of the earliest immigrants from Asia, perhaps more than 15,000 years ago, with the Alaskan Indians reflecting the migratory wave that reached as far as the southern extremity of South America. Eskimos and Aleuts appear to be much later immigrants, having arrived perhaps 3,000 to 8,000 years ago. Rather than going south, they remained in the islands and coastal regions of the far north. All groups are involved in the debates over public land grants.

Tlingits. The coastal Tlingits, who lived by fishing, hunting, and gathering, were wealthy, artistic, and fierce. They built oceangoing war canoes and roamed as far south as Puget Sound in pursuit of conquest and slaves. Their grass basketry was superb, they were expert carvers, and they built large wooden houses with magnificent decorative panels. They developed a rigid clan and caste system and respected a hereditary monotheistic religion and a pantheon of lesser spirits. Their religious spirits were everywhere in nature, in the sea and in the forests. The souls of the dead were delivered to "the spirit's home" in the ice country of the mountains where the living dared not venture.

A smaller tribe of lighter-skinned and occasionally red-haired Indians, the Haidas, lived on the Queen Charlotte Islands in British Columbia and on Prince of Wales Island in the Panhandle. Their culture was similar to the Tlingit, but anthropologically they showed an infusion of Hawaiian or Polynesian blood. Only a few hundred natives still speak the Haida tongue.

Aleuts. Unlike the Tlingits, who placed their dead in trees, the Aleuts buried their dead in volcanic caves. Their culture was quite different in artistry, reflecting their comfortless and barren islands. They, too, wove fine grass baskets and wore beautiful hooded jackets of bird skins

with feather inserts. They were a gentle people who lived in crude sod houses, called *barabaras*, that were built partly underground. Early Russian hunters massacred many Aleuts and made others veritable slaves. Their population, decimated by cruelty and greed and ravaged by disease, dropped from 20,000 to less than 2,000 between 1791 and 1867. In the early 1980s, only about 3,000 natives were living in the Aleutians, subsisting by fishing and seal hunting in the Bering Sea.

Eskimos. The term Eskimo means "eaters of meat." Like their Aleut cousins, Eskimos are believed to be descendants of migrant Asians. They probably crossed the Bering Strait after it ceased being a land bridge, between 8,000 and 3,000 years ago. Most Eskimos now live in such settlements as Kotzebue, Shishmaref, Wainwright, and Barrow, but their forebears were nomads, constantly roaming the Arctic in search of meat. In language and physiognomy they are similar to the Eskimos of Siberia, northern Canada, and Greenland, but quite different from the darker skinned Athabascans and the coastal Tlingits.

About 18,000 Eskimos live in Arctic Alaska, compared with about 11,000 in Canada and 22,000 in Greenland, but only about 1,200 live in Siberia. Good humour and a hospitable attitude have helped them adjust to their rigorous environment. The Alaskan Eskimo formerly lived off the land and resided in tents in summer, settling into semipermanent driftwood timber and sod huts in winter. Most now live in permanent frame houses. Their early religion centred around the concept of a soul within a three-faced spirit system depicting future life, a basically optimistic view of present life, and the ever present possibility of evil. The Eskimo attributed souls to all animate objects, such as animals. Their beliefs were similar to those of the Aleuts and Tlingits, except that they believed that human souls lived in the sea after death. When an Eskimo died, his body was sewn into a caribou skin and left under a pile of stones. As in ancient Egypt, Eskimos put food and weapons by the body of their deceased for use in the afterworld. Today, as is true of the Aleut and Indian, most Alaskan Eskimos are Christians, and aboriginal religious practices, except in a few rare instances, are extinct. Eskimos, who are skilled carvers of walrus ivory, wood, and steatite, or soapstone, have few equals as artistic craftsmen. Unlike other native groups in Alaska, they continue their native crafts vigorously, many making a living plying their artistry for the tourist trade.

Tinneh. The Athabascan Tinneh were hunters and salmon fishermen along the Yukon River and its tributaries. Some work part-time on construction crews in this economically developing area. The Tinneh tribes never had clans or much cohesiveness, and they were assimilated more easily into contemporary life. Many of them migrated to the coastal areas and intermingled with the Tlingits, bringing the two groups close together in character and culture.

Demography. The wave of youthful immigrants attracted from the "South 48" beginning in the 1960s suggested a faith in the burgeoning opportunities in a still-frontier environment. The discovery of oil fields and the emergence of Alaska as an international air crossroads added impetus to the influx of the 1940s and 1950s, a period of new settlement and expansion that raised the population from 70,000 to 226,000. Prior immigration—the first wave of which occurred in the decade before World War I as an aftermath of the gold rush—was a response to Alaska's initial concentration on its mineral, fish, and timber resources. Of the 1980 population about one-sixth, or 64,000, were Eskimos, Aleuts, and Indians. The remaining citizenry included about 80,000 military personnel and their families, and a melting pot of mixed American, Russian, Japanese, Chinese, Filipino, and other nationalities.

In addition to the 43 percent of Alaskans living in the southern interior basins around Anchorage, most of the remainder live in the Panhandle region, where Juneau is the major city and the administrative centre of the state, and in the interior plains around Fairbanks. Tiny pockets of people are scattered in small villages, the most sparsely occupied being the Arctic plains, the Bering shores, and the Aleutians. Only slightly more than 20 percent of the

Eskimo settlements

Native population and cultures

Population distribution

white population was born in Alaska, and about 104,000 people have immigrated since 1950. Many frontier conditions persist: a male-to-female ratio of 5 to 1 in 1910 was reduced by 1976 to near equality, but bars are frequently as numerous as churches.

THE STATE'S ECONOMY

The Alaskan economy is conditioned strongly by the state's frontier stage of development, but its formerly inadequate tax base for state and municipal growth ended with the development of the North Slope oil fields. High costs of labour and transportation still tend to discourage outside investment, however. The development of the state's natural resources has assisted markedly in the transition from a federal military to a private, self-supporting economic base.

Sectors of the economy. *Government.* From 1940 to 1960 the federal government invested nearly \$2,000,000,000 in the development of military bases in Alaska. Nothing else in Alaska's history has produced such long-term results, bringing thousands of residents into the territory and creating jobs and a vast array of transportation and communications facilities extending to remote corners of the state. The defense installations continue to add much to Alaska's economy.

Agriculture. More than 3,000,000 acres of tillable land are available for farming, but much clearing has yet to be done. Most acreage is near Anchorage and on the Kenai Peninsula, though there is some near Fairbanks, and stock ranching is practiced on Kodiak and Unimak islands. As a result, most foods must be imported, tremendously increasing the cost of living. Closure of the Homestead Act, ending settlement of the native land claims issue, has further curtailed development of new land. In spite of a short growing season, the long hours of summer sunlight are adapted to the successful production of wheat, oats, rye, barley, potatoes, and hay, and all cool-climate vegetables.

Fishing. Fishing has been Alaska's most constant source of revenue. Fish are found mostly in waters off the southern coasts, salmon being the main product. The centre of the world's salmon-packing industry is at Ketchikan, and it flourishes also on Kodiak Island and at Bristol Bay ports in the southern Bering Sea. The industry since about 1950 has represented about \$300,000,000 annually. Fleets also bring in quantities of halibut, herring, sablefish, Dungeness crab, king crab, and shrimp. A serious threat to fish conservation and a source of continuing international friction in the North Pacific has been the unregulated incursion of Soviet and Japanese fishing vessels into Alaskan waters.

Forest products. Most of Alaska's timber resources are in the Tongass and Chugach national forests, in the Panhandle and on the southern coast, respectively. Pulp is an important industry in Ketchikan and Sitka. About 561,000,000 board feet (1,325,000 cubic metres) of timber was harvested annually in the late 1970s, and the sector has great potential for further development.

Furs. Pribilof sealskins represent nearly 60 percent of the state's \$8,000,000 annual fur production. Other furs, largely from controlled farms, are processed as well. A new industry in the 1960s was the production of reindeer hides from a herd on Nunivak Island that was managed by the Alaska Native Association. By the late 1970s the total value of reindeer-hide production was about \$7,000,000 annually.

Hydroelectric power. Alaska's immense waterpower reserve is virtually untapped. The largest project is at Eklutna, near Anchorage. A hydroelectric development near Juneau, completed in the early 1970s, delivers power to the Panhandle area. In many communities diesel and coal plants produce much of the required municipal power.

Mining. Petroleum was first extracted and refined between 1917 and 1933, but the development of the Kenai oil field in 1961 made the petroleum and natural-gas industry Alaska's most important mineral production. Oil seeps were known as early as the 1880s in the North Slope region, which by the early 1980s had become a field

of major economic importance to both the state and the nation. By the early 1980s Alaska ranked second only to Texas in oil production, producing almost 20 percent of the total U.S. supply of crude oil.

Alaska's gold production declined drastically from the 1940s through the 1960s because of rising labour and transportation costs. By the 1980s only a few small operations still remained. Copper mining as a major industry ended with the closing of the Kennecott Mine in 1938, although a few new prospects elsewhere show promise. Coal has remained an important industry, with the mines yielding some 700,000 tons annually. Known coal reserves amount to more than 100,000,000,000 tons, of which 70 percent is low-grade fuel. An important activity is the extraction of sand, gravel, and clay to serve the construction industry.

Since 1880 more than \$2,000,000,000 in hard-rock ore minerals have been mined in Alaska, gold, copper, and silver accounting for 95 percent of this amount. Prospecting continues, with modern scientific technology and aerial exploration. The areas of maximum mineral potential lie in the Panhandle, the Chugach and Alaska ranges, and the Seward Peninsula.

Tourism and transportation. Alaska has had an upsurge of tourism. Travellers can now cover large areas by airplane and road. The influx is partly the result of the 500-passenger, 100-car ferries that operate as the Alaska Marine Highway. One ferry system connects Kodiak with mainland Seward and the Alaska Railroad; another links Cordova and Valdez.

High costs of transportation continue to sap Alaska's economic development, largely because the major transportation links, both internal and external, are by air, which provides the fastest way to cross Alaska's great distances and formidable terrain. Two dozen airlines serve Alaska, with daily service from the "South 48" and Canada, Europe, Hawaii, and Japan. Nearly 400 airfields, seaplane bases, and emergency strips are in use throughout the state, and few villages are without service at least by bush pilots. About 10,050 miles of roads, most of them surfaced, are in use. The Alcan Highway and its Haines cutoff connect Alaska's internal road network to the outside and provide relatively easy access for tourists. Some road construction was so severely damaged by the 1964 earthquake that it was abandoned. In 1969 a 356-mile haul road from Fairbanks to Prudhoe Bay was completed. It connects with the existing highway system to provide a winter-only overland route from the ice-free southern ports to the Arctic Ocean. Other major projects completed by the early 1980s included the partial opening of the Dalton Highway, extending north of the Arctic Circle, and the completion of a road linking Skagway and Whitehorse, Yukon Territory.

The government-owned Alaska Railroad runs for 498 miles, linking Seward, Anchorage, and Fairbanks. The privately owned White Pass and Yukon route, a narrow-gauge railroad, links Skagway and Whitehorse. Ocean shipping connects Seattle, Vancouver, and the trans-Canada railhead of Prince Rupert to towns in the Panhandle and westward to Cordova, Valdez, Seward, and Kodiak. Ocean vessels also run during the ice-free midsummer months to Nome and Barrow and to the oil regions of the Arctic coast. A natural-gas pipeline, which was completed in 1961, runs between the Kenai gas fields and Anchorage. The Trans-Alaska Pipeline delivers North Slope oil to Valdez.

In the mid-1950s the Alaska Communication Cable was installed between Seattle and Alaska. Radio telephones connect all interior communities.

ADMINISTRATION AND SOCIAL CONDITIONS

Governmental structure. The state constitution was adopted in 1956. A 1971 amendment set the minimum voting age at 18. The governor and secretary of state are the only executive officers and are elected by the same vote. The 40-member House of Representatives and 20-member Senate are elected for terms of two and four years, respectively. The Supreme Court has a chief justice and four associate justices. There are four district courts.

Transportation networks

A single federal district court, replacing the territorial courts, sits alternately in Juneau, Anchorage, Fairbanks, and Nome.

Public financing is through various personal income and business taxes. As a part of the Act of Admission, Congress granted Alaska certain revenues from the sale of furs and of federal lands.

State and borough governments have difficulty in providing the usual range of services because of the limited extent of the economy and a high unemployment rate. The vast area and the difficult terrain increase these problems.

Responsibilities for native peoples. Activities on behalf of the native population have turned largely on the U.S. Bureau of Indian Affairs (BIA), which assists Alaska's natives in achieving economic and social self-sufficiency. Despite a number of helpful programs, most of Alaska's natives have remained at the bottom of the economic and social ladder—suffering from unemployment, low income, and poverty. The native peoples were educated first by missionary groups, though by the time of statehood the BIA had assumed most of the responsibility for education. Funds are provided for vocational training and the development of job opportunities and for welfare, social work, and medical and health needs. The BIA also assists natives in organizing their villages under federal and state laws. Some oil revenues from native lands have been applied in self-help programs. Settlement of the native land claims in 1971 may improve their economic plight.

Education. Education is compulsory through the eighth grade or until age 16 and is administered by a state board and a commissioner of education. There are several federal schools on military bases. The University of Alaska, founded in 1917 and located at College, near Fairbanks, is the only state university, but there are community colleges in Anchorage, Juneau-Douglas, Kenai-Ketchikan, Palmer, and Sitka. Alaska Pacific University in Anchorage, Inupiat University in Barrow, Alaska Bible College in Glennallen, and Sheldon Jackson Junior College in Sitka, a two-year college for native peoples, are the only other institutions of higher learning.

Welfare and health. The elderly, dependent children, and the blind are aided by the state, and a special fund benefits sick and disabled fishermen. The state also operates a psychiatric hospital, a tuberculosis sanatorium, a youth camp, and a prison.

Medical and health clinics and hospitals available to the general public are provided by municipal and borough governments or private agencies, or are run as church-operated facilities. Health standards have been raised markedly since 1950 through visits by U.S. Public Health Service nurses and doctors to the remote villages. The large number of airfields, the radio communications network, and the extensive use of bush pilots operating through the state make it possible for most persons, even in the remote villages, to reach medical facilities when there is serious need.

CULTURAL LIFE AND NATURAL ENVIRONMENT

Cultural preservation. Alaska's past, including the arts and crafts of its native peoples, figures heavily in Alaskan culture. Juneau is the site of the state's historical library and state museum. The university has a large museum, as do other communities, including Sitka, Haines, Valdez, and Skagway. Eminent Alaskan artists have included both whites and Eskimos. Native ivory and wood carvings are well known, and the nearly lost art of totem carving has been revived in part through private and public stimulus.

Natural preservation. Wildlife refuges and ranges abound throughout Alaska, with more than 19,000,000 acres managed by the U.S. Fish and Wildlife Service. The federal Bureau of Land Management also holds about 25,000,000 acres for waterpower development.

One national park, one national historical park, and two national monuments comprise another 7,500,000 acres. Denali (formerly Mt. McKinley) National Park was established in 1917; it has a diverse abundance of wildlife, including brown and grizzly bears, caribou, and moose. Katmai National Monument (1918), on the Alaska Peninsula, includes the Valley of Ten Thousand Smokes, an

area of active volcanoes that in 1912 produced one of the world's most violent eruptions. Glacier Bay National Monument (1925) features magnificent fjords, as well as glaciers that are retreating slowly. Sitka National Historical Park (1910), with a large totem pole collection, commemorates the stand of the Tlingits against early Russian settlers. The Tongass and Chugach national forests in the southeast and south central regions, respectively, are also federal public land reserves. The U.S. Department of the Interior has continued to study the need for withdrawing further regions from public domain into reserves. In 1980 a presidential bill allotted more than 104,000,000 acres from federal holdings to national parks, wildlife refuges, and wilderness areas.

Environmental use and study. The sporting industry, including guide and outfitter services and boat charters, continues to be a colourful activity. Alaska provides the nation's only significant Arctic wilderness, and much research is done in glacier, mountain, tundra, and polar oceanography fields by federal, state, and private agencies. These projects, too, bring income to the state. The University of Alaska carries out extensive research on Arctic problems through its Geophysical Institute, Institute of Marine Science, Institute of Arctic Biology, and other groups. At Barrow the U.S. Naval Arctic Research Laboratory opened in the 1940s to conduct Arctic research, including sea-ice and oceanographic studies. Since 1946 an international glaciological and environmental research and field-sciences training program has been conducted on the Juneau Icefield.

PROSPECTS

To visitors from other U.S. states, Alaska's contrasts and uniqueness make it virtually a foreign land, for nature has endowed it with abundant natural resources and a special beauty of land and character of people. Among the factors that are likely to influence the development of Alaska's resources in future years are the economics of national and international supply and demand, the reevaluation of national ideals and priorities, and the shifting character of political and social institutions. The development of one resource can clearly affect, even destroy, the use of another. This type of competition among resources to satisfy the uncertain demands of a pluralistic public will require application of the best concepts in general systems management.

Much of this northern land remains virgin territory, and the ideas of land use alongside conservation are not yet too late. What Alaska does will be watched with great interest, for it symbolizes the long-range concern in the environmental challenge to all nations. The success of Alaska's environmental task and the effective solution of related economic, political, and social problems have important implications for the balance between man and nature that will eventually be required in every corner of the globe.

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(M.M.M.)

Alaskan Mountains

A northwestward continuation of the western cordillera, or Rocky Mountains, and the Pacific coastal ranges of North America, the Alaskan mountains give their state a rugged and beautiful terrain across nearly its entire expanse. They include the highest peak in North America. The ranges are characterized both by glaciers and by continuing volcanic activity. Little explored for vast stretches, the mountains are believed to contain, or lie close to, immense untapped mineral resources whose exploitation is hampered by the terrain and the climate. For details on related subjects, see the articles YUKON RIVER; ALASKA.

Major groups. The northernmost of the three major Alaskan mountain groups are the Brooks Range and the Arctic foothills, extending the Rocky Mountains in an east-west arc from the Canadian border across northern Alaska. Central Alaska is characterized by highlands and basins drained by the great Yukon and Kuskokwim drainage systems. This area has been likened by some to a moister version of the arid region known as the Basin and Range Province—an area that takes in nearly all of Nevada and portions of all contiguous U.S. states—although the precipitation and resulting vegetation there have rounded the rugged topographic expression of mountains and valleys.

Southern Alaska is dominated by an arc of mountain ranges encircling the Gulf of Alaska and the northeastern Pacific in a broad sweep. This Pacific mountain province is subdivided into several groups. The large Alaska Range merges southwestward into the Aleutian Range and the Aleutian Islands. Separated from the Alaska Range by the Talkeetna and Wrangell mountains, the Kenai-Chugach mountains border the Gulf of Alaska and merge, to the south and east, with the St. Elias Mountains at the Canadian border. These, in turn, merge with the mountains of the coastal ranges, which form most of the Alaskan Panhandle.

Scientific study. Alaska has been mapped topographically from aerial photographs, at a relatively high level of detail; the underlying geology, however, has been mapped only sketchily. The U.S. Geological Survey, as part of the general reconnaissance mapping program of the late 19th century and the first half of the 20th century, did most of the geological work. Since the 1950s areas of potential mineral and transportation value have been mapped on a more detailed basis by state and federal agencies. Various university research parties contributed to the data; much geological mapping work was also done by private mining and petroleum companies, but this work was rarely made public.

The physical environment. *Northern mountains.* The Arctic foothills, just north of the Brooks Range, consist of low east-west trending ridges and rolling plateaus with irregular isolated hills. They rise from 600 feet (180 metres) in the north to 3,500 feet (1,100 metres) in the south. Except for the east-flowing Colville River, most drainage is northward. The entire area is underlain by permafrost, a permanently frozen, rock-hard soil, and no glaciers are present. This region is as structurally complex as the higher Brooks Range immediately to the south, but formed of less resistant rocks. The youngest rocks, in the northern section, are sediments from the Cretaceous Period (136,000,000 to 65,000,000 years ago). They are folded, faulted, and overthrust toward the north. Sediments from

the Devonian Period (beginning 395,000,000 years ago) to the Cretaceous Period form the southern section of the foothills. They are tightly folded and also overthrust northward.

The Brooks Range is the highest mountain range within the Arctic Circle. It includes groups of mountains extending about 600 miles (1,000 kilometres) from the Canadian border to the Chukchi Sea. These form several groups of mountains, individually named. Average altitudes range from 3,000-4,000 feet in the west to 5,000-6,000 feet in the east, with a high point of 9,239 feet (2,816 metres) in Mt. Michelson. The entire area has been glaciated, as is evidenced by the rugged topography. Several small glaciers are still present in the east, fewer in the west.

The range forms the drainage divide between waters flowing northward into the Arctic Ocean, those flowing westward into Kotzebue Sound, and those flowing south into the Yukon and its tributaries and emptying into the Bering Sea. Several major rivers have cut back into the range to form low passes, the best known being Anaktuvuk Pass, at an elevation of 2,200 feet (670 metres) in the central part of the range. The Dietrich River Pass has been suggested as a corridor connecting the oil-producing areas of the north slope with interior Alaska and the south.

The backbone of the range is composed of sedimentary and metamorphic rocks—respectively, rocks formed from deposits of various organic or inorganic materials and rocks heavily compacted and made more crystalline by the action of heat, pressure, or water. They were formed in the Paleozoic Era (from 570,000,000 to 225,000,000 years ago). Younger sedimentary rocks, of the Permian Period (from 280,000,000 to 225,000,000 years ago) and the Mesozoic Era (from 225,000,000 to 65,000,000 years ago) flank the range. The mountains were lifted by major upward foldings in the Earth's crust, called orogenies, beginning in the Late Jurassic Period (190,000,000 to 136,000,000 years ago). The process persisted in periodic uplifts throughout the Cretaceous and into the early part of the Tertiary Period (from 65,000,000 to 25,000,000 years ago). It was again strongly deformed and uplifted in the late Tertiary. The folding, faulting, and major overthrusting toward the north during these orogenies were modified by erosion and glaciation. Most of the area is underlain by permafrost. There are a few lakes in rock basins.

Central ranges. The mountains of central Alaska, extending from the Canadian border to the Bering Sea, are lower than the ranges to the north and south. They are drained almost entirely by two river systems, the Yukon and the Kuskokwim. The intricately dissected uplands are divided into three areas: the eastern highlands, the western highlands, and the Seward Peninsula.

The eastern highlands, consisting of several separate chains, have an average altitude of 4,000-5,000 feet, with a few mountains rising 1,000-2,000 feet above these uplands. Some peaks in the east are as high as 6,800 feet (2,075 metres). No glaciers are present in the region, and permafrost is discontinuous. The underlying rocks are highly deformed metamorphic and sedimentary and of volcanic origin dating from the Precambrian (4,600,000,000 to 570,000,000 years ago) and Paleozoic eras. The higher parts are commonly composed of small, resistant segments of granite that were forced, or intruded, into the other rocks while in a molten state.

The western highlands, also subdivided into several smaller groups, are somewhat lower, rolling, and monotonous mountains, with northeast-trending ridges. Numerous isolated, nearly circular groups of mountains rise above these ridges. The rocks include tightly folded Paleozoic and Mesozoic sediments and volcanics and Tertiary intrusions. Although no glaciers are now present, the Ahklun Mountains are the largest glaciated area in interior Alaska, and the Wood River-Tikchik region has beautiful parallel glacial lakes and is considered one of the most scenic areas in the state.

The upland area of the Seward Peninsula, which is only a few miles across the Bering Strait from the Soviet Union, is made up of broad, convex hills and ridges, with

Average altitudes

Brooks Range

Scenic glacial lakes