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BRITANNICA  
JUNIOR  
ENCYCLOPÆDIA

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# BRITANNICA JUNIOR ENCYCLOPÆDIA

*For Boys and Girls*

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Prepared under the supervision of the editors of

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## KEY TO PRONUNCIATION

It is of especial importance that an encyclopaedia for children give the pronunciation where the boy or girl might go astray. In all such instances the pronunciation in BRITANNICA JUNIOR ENCYCLOPÆDIA is clearly marked. The accent is shown by the mark ('). The sounds for the different letters, when not self-evident, are as follows:

ā as in *pale*  
ē as in *care*  
ă as in *bat*  
ā as in *farm*  
ā as in *task*  
a as in *ball*  
ē as in *be*  
ē as in *met*

ē as in *her*  
ī as in *mice*  
ī as in *tin*  
ō as in *cold*  
ō as in *not*  
ō as in *for*  
oi as in *oil*  
ōō as in *loot*

ou as in *out*  
ū as in *use*  
ŭ as in *run*  
ŭ as in *pull*  
ū as in French *début*, German *über*  
g (always hard) as in *gay*  
j for g as in *gentle*  
K for ch as in German *Bach* or Scottish *loch*

ñ (nasal) as in French *bon*  
th as in *think*  
th as in *thee*  
t as in *picture* (Sound varies  
from t to ch)  
z as in *pleasure* (Sound varies  
from z to zh)



THE UNIVERSITY  
OF CHICAGO

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*Let knowledge grow from more to more and thus be human life enriched*



*Burt Glinn—Magnum*

Terracing is widespread in Japan, where flat farmland is scarce but many people must be fed. By careful cultivation, as on these hills of Shikoku Island, Japanese farmers obtain good crop yields. See JAPAN, ASIA.



**IBADAN** (*ē bū'dän*), **NIGERIA**, is the capital and largest city of Oyo State of Nigeria. It is one of the largest black-populated cities in Africa. Ibadan is in the southern part of Nigeria about 100 miles from the Gulf of Guinea. The climate is hot all year with an average temperature of about 80 degrees Fahrenheit.

Most of the people are Negroes called Yorubas. Ibadan has been described as a blue city because the Yoruba women always wear dark blue clothing. In spite of its large size, Ibadan looks like a huge group of small villages. The roads are not paved and most of the houses are made with mud walls and corrugated iron roofs. Some modern two-story houses have been built of cement blocks.

Ibadan was founded about 1830 as a Yoruba military camp. It is a commercial and industrial center connected by a railroad with the port of Lagos. There are few modern industries in Ibadan and farming is still a major occupation. There are many craft industries such as weaving, dyeing, and metalworking. The University of Ibadan is Nigeria's chief school of higher learning.

The city is governed by an elected council. The population in 1973 was 800,609.



*New York Zoological Society*

The ibex is a kind of wild goat. It is about 40 inches high at the shoulder.

**IBEX** (*ī'bēks*) is a kind of wild goat. Several kinds live in the high mountain meadows, rocks,

and slopes of Europe and Asia. They are built like goats with the forelegs slightly shorter than the hindlegs. During the winter season the ibex is covered with yellowish brown hair, but in the summertime its short fur is ashy gray. All have handsome horns that arch high from the forehead in a backward curve.

The Alpine ibex is about 4½ feet long and stands about 40 inches high at the shoulder. Its horns may measure 50 inches along the ridged and knobbed outer curve. The larger Siberian ibex has horns which may reach 60 inches. The Spanish ibex of the Pyrenees and the Asiatic markhor have horns which are twisted in half-spirals, giving them a more truly goatlike appearance.

Except during the mating season, males and females live separately in small flocks. The way they travel up and down the cliffs and crags seems impossible. Sometimes they jump as far as 40 feet. The lambs are able to follow their mothers within minutes after birth.

To get within shooting distance of an ibex is a great challenge to any sportsman, and so ibex have been heavily hunted. The Alpine ibex has become rare but a few still live in the Piedmont valleys of northwestern Italy where the Italian government protects them.

**IBIS** (*ī'bis*) is a medium to large-sized wading bird related to the stork. It has a long slender bill that usually curves downward, and long orange-red legs. There are 28 species that live in all the warm parts of the world. They feed on fish, reptiles, crustaceans, insects, and some vegetable matter.

The most common of the North American species is the white ibis, while the most unusual is the scarlet ibis. The white ibis has pure white plumage, except for the tip of its tail, which is black. The scarlet ibis, which nests in Venezuela, sometimes comes as far north as the Carolinas. The roseate spoonbill, a common bird of the Florida and Texas coasts, is almost as brightly colored as the scarlet ibis.

Ibises nest close together in large colonies in mangrove thickets and in thick tropical growths near water. Three to six whitish eggs are laid



Allan Cruickshank from National Audubon Society

The white ibis is about two feet tall.

on a flat mat of twigs and branches. The glossy ibis, found in both Europe and North America, does not nest in large colonies.

The ibises of Africa were worshipped and given royal burials by the ancient Egyptians. Many of their mummies were found in pharaohs' tombs. The sacred ibis now lives in the Sudan, south of Egypt, in Madagascar, and on the Aldabra Islands.

**IBSEN** (ib's'n), **HENRIK** (hěn'rik) **JOHAN** (yō hăn') (1828–1906). Henrik Ibsen was a great Norwegian poet and playwright whose plays started a new trend in drama. At first audiences were shocked by his realistic plays presenting serious problems in people's lives. But by 1900 other dramatists were also writing this type of "problem plays."

Born in Skien, Norway, Ibsen grew up in poverty after his father's business failed. Ibsen's days of poverty appear in his famous poetic drama *Peer Gynt*. (See SCANDINAVIAN LITERATURE.) When he was 15, he became a druggist's assistant. He read a great deal, and in 1847 he began to write poetry. In 1850 he went to the University of Christiania (now Oslo) as a medical student.

When a play of his was produced that year, Ibsen decided to make writing his career. He

became director of a new theater at Bergen which had been set up to encourage Norwegian drama. This work proved to him that he wanted to be a dramatist. In 1864 Ibsen went to Italy. When his poetic drama *Brand* was produced in 1866, he was granted a poet's pension. He lived in Germany from 1868 to 1891, and in Christiania from then until his death.

Ibsen collected his lyric poems in 1871, and that year marks the end of his work as a poet. His later plays were written in prose. In *A Doll's House* Ibsen wrote about a family. The theme of this play was that a wife and mother owed something to herself and her own development as well as to her family. A great deal of argument developed over the theme. It was a step in freeing women from older traditions, but it also led to Ibsen's being criticized. Ibsen's next two plays, *Ghosts* and *An Enemy of the People*, were written to answer his critics. *The Wild Duck*, *Hedda Gabler*, *The Master Builder*, and *When We Dead Awaken* are other of his plays that are well known.

**ICE** (īs). Ice is a solid. When the temperature is cold enough, liquid water becomes solid ice. Water vapor from the air changes to snow flakes which are ice crystals. Moisture in a house may form beautiful patterns of ice crystals on cold window panes. In an ice storm, cold rain sometimes freezes on twigs and wires, often loading them to the breaking point. Hail is ice. Ice may form a heavy coating on the wings of an airplane and be very dangerous. A pond or lake often becomes covered with a hard surface of ice. If the cold weather lasts long enough, this layer may become thick enough to skate on. In some regions it becomes thick enough to be cut into large blocks. These are stored in ice houses for use in refrigerators during warm weather.

Several interesting things happen when the water in a pond is cooled. At first, the top layers of water cooled by the cold air become denser (heavier) and sink. This goes on until the water at the bottom reaches 39 degrees Fahrenheit. Below this temperature, water expands and so colder water remains on the surface above the denser and warmer water below

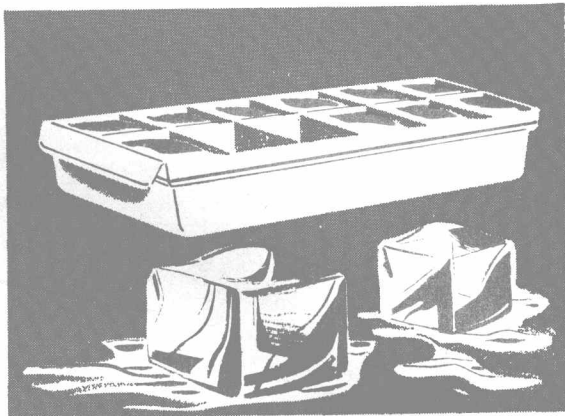
it. At 32 degrees Fahrenheit the surface freezes over and the covering of ice grows thicker as more and more heat is taken from the water by the colder air.

When water freezes, it gives up much heat. (See REFRIGERATION.) Every pound of water when it turns to ice gives off as much heat as would be needed to raise the temperature of one pound of water by 144 degrees Fahrenheit. The same amount of heat must be added to melt a pound of ice. This is the reason why a pan of water does not suddenly freeze solid on a cold night. For the same reason, a block of ice does not suddenly melt on a warm day. (See FREEZING AND MELTING.)

Water expands greatly when it freezes. Nine quarts of water make about ten quarts of solid ice. Because of this, an ice cube floats in water with about nine-tenths of its volume beneath the surface. If you were to fill a glass with ice cubes and then add enough water to make the glass brim full, you would see some of the ice standing above the top of the glass. But if you now let the ice melt undisturbed, no water runs over the edge of the glass. The extra volume filled by the ice is no longer needed by the water as it melts. Great icebergs in the ocean sometimes look like mountains and are dangerous to ships. But they would look eight or nine times as large if we could see the rest of them which is hidden beneath the surface. (See ICEBERG.)

Ice near the freezing point may be melted by adding pressure, but it refreezes quickly when the pressure is released. When you squeeze a snowball, you melt some of the ice crystals but they freeze again to make a hard ball when you stop squeezing. But on a very cold day, the snow does not pack so well because you cannot exert enough pressure to make the tiny crystals melt. This refreezing of ice is called *regelation*. Regelation is important in the slow moving of glaciers down mountain valleys. (See GLACIAL PERIOD.)

You can cut through a block of ice and yet leave it unharmed. Simply hang some heavy weights by a strong wire resting on top of the block. The wire slowly cuts through the ice. Under the wire, the ice melts because of great

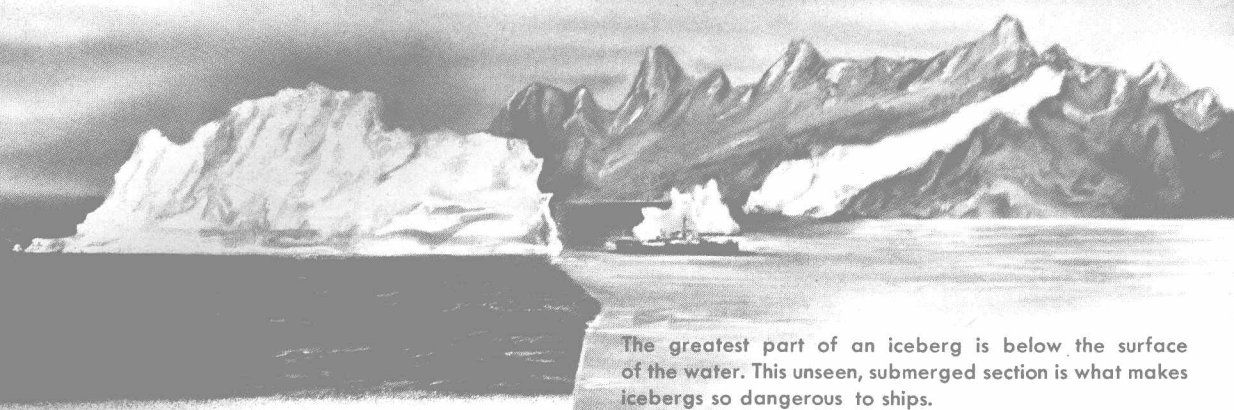


The hump on top of a cube of ice is evidence that water expands when it freezes.

pressure. Above it, the water refreezes and leaves the block as strong as ever. You can see where the wire has passed because it leaves behind a surface marked by many tiny air bubbles in the ice. This experiment works in a warm room, but if you try it out of doors on a day below 32 degrees Fahrenheit, you will find that the wire does not cut through the ice. The pressure may only lower the freezing temperature less than 1 degree.

Because of expansion, ice puts forth great force when it freezes. Rocks are often split by water freezing in tiny cracks or crevices. This is important in the slow breaking down of the mountains. In the quarries of Finland, workmen split great blocks of rock by filling cracks in the rock with water and allowing it to freeze. If water freezes in the pipes of a cold house, the pipes may be split open. Automobile radiators and engine blocks are sometimes ruined by freezing, unless they are protected by an anti-freeze, such as alcohol. Alcohol mixed with water lowers the freezing point. The amount it is lowered depends on the volume of alcohol added. The addition of any impurity, such as salt, to water, lowers the freezing point of the mixture. By mixing enough salt with ice or snow, a temperature as low as -6 degrees Fahrenheit may be obtained. Sea water freezes at 27 degrees or 28 degrees instead of 32 degrees Fahrenheit because of the salt it contains. Some cities throw salt on snowy streets to melt snow.





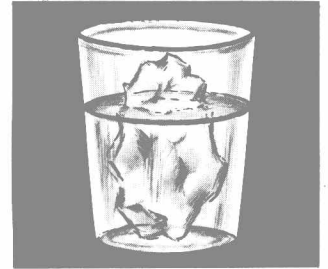
The greatest part of an iceberg is below the surface of the water. This unseen, submerged section is what makes icebergs so dangerous to ships.

**ICEBERG** (*is'bērg*). In polar regions great rivers of ice called glaciers creep outward from the interior ice caps and push down valleys to the sea. There the end of the glacier breaks off and forms a floating iceberg. Some glaciers do not reach the open sea but end in deep, steep-sided valleys called fiords, down which the icebergs float in a stately procession to the ocean. In other places the interior ice cap itself spreads outward to the sea. It may form a great wall of ice rising 100 feet or more above the ocean for a long distance along the coast. In both Greenland and Antarctica such floating ice caps push into the sea at many points. These glaciers may yield even larger icebergs than the glaciers ending in fiords.

The ends of some glaciers are worn or melted back by the waves so as to leave a submerged ice foot below the surface of the water. Such ice feet break off from time to time and rise suddenly to the surface.

But generally the glacier rises steeply from the sea in a great ice cliff from which huge masses break off and fall with a noise like thunder, followed by a terrific splash. Such ice falls and the waves they create are very dangerous to small boats near the glacier. (See **GLACIAL PERIOD**.)

Icebergs vary greatly in size. Small ones up to 20 or 30 feet across are often called "growlers" by seamen. Icebergs which may be measured in hundreds of feet are very common, and giant bergs from a quarter mile to half a mile across are often encountered. Glacial ice, including its embedded stones and soil, is only nine-tenths as heavy as sea water, so that only one-tenth of the iceberg projects above sea level and nine-tenths is submerged below.



Ice weighs about nine-tenths the weight of an equal volume of water. A piece of ice, therefore, floats with about nine-tenths of its volume submerged.

Bergs which rise 150 feet above the sea may extend 1,000 feet below. The amount of ice in giant icebergs is almost unbelievable. Many weigh from 100,000,000 to 200,000,000 tons, and some probably weigh several times that much.

The waves tend to melt and erode the water line on an iceberg so as to make a smooth notch called a flotation mark. As embedded stones (picked up long before by the glacier) are melted from the bottom of the iceberg, its center of gravity is shifted, and often old flotation marks are thus tilted.

No two icebergs are alike, and all are fascinating to the photographer. Although most of the glacial ice is white, shaded parts of the iceberg and cracks or ice caves show beautiful shades of pale green, blue, and purple. Melting by waves and sun, together with the fall of broken ice blocks, may make an iceberg into a fantastically beautiful floating castle with towering pinnacles and perhaps ice arches or caves below. Sailing vessels used to visit icebergs to secure supplies of fresh water from pools on the rough surfaces.

Because they extend so far below the ocean

surface, icebergs drift with the ocean currents, instead of following the variable winds. Eventually most icebergs are carried to lower, warmer latitudes where they melt and strew their soil and stones on the sea bottom. Icebergs west of Greenland eventually are carried southward in the cold Labrador Current, but few last long after meeting the warm Gulf Stream east of Newfoundland, Canada.

Such icebergs are a menace to ocean vessels when they drift into shipping routes. On the night of April 14, 1912, the steamer *Titanic*—a giant luxury liner on its maiden voyage from England to the United States—struck an iceberg off Newfoundland and sank, early the next morning, with a loss of 1,513 lives. Since that disaster, an international ice patrol has been maintained in the iceberg danger zone of the North Atlantic shipping lanes. The vessels are furnished and manned by the United States Coast Guard, but several nations contribute to the operating costs. The patrol warns ships by radio of the location of icebergs and pack ice, and even breaks up small bergs with dynamite. Such vigilance will probably prevent tragedies like that of the *Titanic* from occurring again.

**ICE CREAM** (*krēm*), a favorite dessert, is a frozen food containing cream or butterfat, flavoring, sweetening, and sometimes eggs. Va-

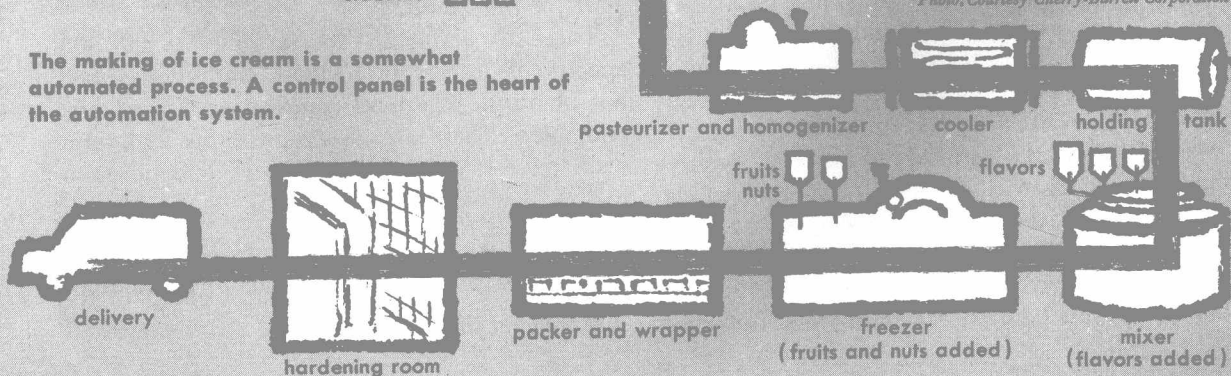
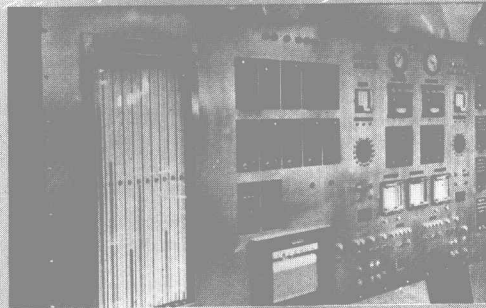
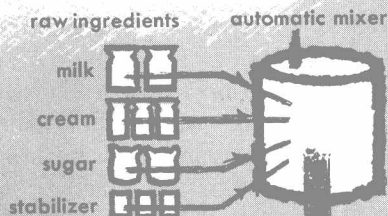
nilla, chocolate, berries, fruits, and nuts can be added as flavoring. Ice cream is about 80 to 85 per cent cream and milk products, 15 per cent sugar,  $\frac{1}{2}$  to  $4\frac{1}{2}$  per cent flavoring, and  $\frac{3}{10}$  per cent stabilizer. Stabilizer is added to keep the ice cream smooth. Pure gelatin may be used for this purpose.

The ingredients are collected, mixed, and pasteurized (bacteria and other germs destroyed). To produce a smooth texture, the milk-fat globules are broken up. This process is called homogenization. The mixture next is held for a short period at low temperatures. An automatic freezing process whips the product to make it smooth and creamy and to prevent ice crystals from forming. Flavors may be added during or after freezing. While the ice cream is soft it is shaped into bars and coated with chocolate and other flavors. Most ice cream is packaged in cartons ranging in size from individual servings (dixie cups) to pints, quarts, and larger sizes. The packaged ice cream is placed in hardening rooms at temperatures ranging from zero to 20 degrees below zero. The ice cream is left in these rooms at least four hours before it is ready to be delivered to stores.

Sherbets, ices, and other frozen desserts are

## HOW ICE CREAM IS MADE

The making of ice cream is a somewhat automated process. A control panel is the heart of the automation system.



made in a like manner except that more fruit juices and sugar and less dairy products are used. In the home, frozen desserts can be made in two ways. A small mixer, electric or hand operated, may be used. Another method is to freeze ice cream in the freezer trays of an ordinary refrigerator. The mixture must either be whipped before freezing, or the trays must be removed to permit whipping when the mixture is partly frozen.

The Venetian explorer Marco Polo is credited with bringing the recipe for ice cream to Italy from the Orient. For centuries, in Europe, the recipe was kept secret and used only for nobility. In the United States the commercial manufacture of ice cream was started in Baltimore, in 1851. However, ice cream was not widely available until the development of mechanical refrigeration after 1900.

**ICELAND** (*ís'länd*) is a large island republic in the North Atlantic Ocean between the Scandinavian Peninsula and Greenland. The island is shaped like a rough oval with a peninsula jutting out in the northwest. The northern part of the country touches the Arctic Circle. Iceland has an area of 39,768 square miles.

### Physical Features

Iceland is a mountainous country. Many of the peaks are active volcanoes. The best known, Hekla, last erupted in 1947. Glaciers and snow fields cover more than 12 per cent of the island. Vatnajökull in the southeast is a huge ice field 90 miles long and 60 miles wide. The highest mountain in Iceland, Oraefajökull (6,950 feet), is at the southern edge of this glacier.

The island's coasts are deeply cut by fjords and bays. The only lowlands are along the coasts. Hot springs are found throughout the country. The warm water from these springs is used to heat homes, swimming pools, and greenhouses. The best known is the Great Geysir. It is so famous that a variation of its name, geyser, has been given to all other erupting hot springs. Iceland has several large rivers, many with huge waterfalls. Because of their very strong currents, however, most of them are useless for navigation. Lakes are numerous, but most



Locator map of Iceland.

of them are small.

The climate of Iceland is cool and humid. The temperatures are higher than most other areas in the same latitude because of the influence of the warm waters of the Gulf Stream. At Reykjavik, the capital, the average for the coldest month is about 31 degrees Fahrenheit, and for the warmest about 52 degrees. The weather is unstable, sometimes changing severely from day to day. Earthquakes occur often.

Iceland receives large amounts of rainfall. It ranges from 85 inches and higher in the south to 16 inches in the north. Fogs are frequent along the south coasts.

At one time, Iceland was covered with woods. Man and nature have destroyed them, however, and now only a few patches of dwarf trees remain. Most of the country is covered only by thick moss, low bushes, and grasses. Areas of bare rocks, marshes, or sandy wastes cover parts of the island.

There are about 240 species of birds and 800 species of insects in Iceland, but animals are not plentiful. The most common are foxes, rats, and mice. There are also some mink and reindeer. Several species of fish, seal, and porpoise live in the coastal waters.

### The People

Groups of Vikings settled in Iceland in the last quarter of the 9th century. After that time,



Icelandic Photo &amp; Press Service

Children in Reykjavik, Iceland, enjoy a swimming pool heated by natural geothermal hot springs.

few people left the island to live elsewhere, and few other people went there to live. The present people are almost purely Icelandic (descendants of those first settlers). As in the Scandinavian countries, most of the people have fair hair and fair skin. There are no Eskimos.

Iceland is a sparsely settled country. The people live on only about 20 per cent of the total land area. Few live in the interior. Almost all the towns are on the coastal lowlands and in the valleys. Reykjavik with a population of 83,500 (1979 estimate) is the only large town, and is the country's industrial and commercial center. All the other towns have populations of less than 10,000 people.

Most Icelanders are members of the Evangelical Lutheran church. There are also small groups of Roman Catholics and Adventists. The language of the country is Icelandic.

### How the People Make a Living

**Fishing.** Although agriculture employs more people, fishing is the most important industry in Iceland. The waters around the coasts are among the richest fishing grounds in the world. In addition to other fish, they are filled with herring in summer and with cod in winter.

The fish usually are sold fresh or frozen. Some are sent to the canneries. Others go to the factories where fish meal and cod liver oil are made. Fish and fish products make up most of the country's exports, but some meat and wool also are exported.

**Agriculture.** About 13 per cent of the Icelanders earn a living from farming. Some of the volcanic soils are rich, but the climate is cool and the growing season is so short that only certain hardy plants can be grown.

Hay is the chief crop, and oats, barley, potatoes, cabbage, and turnips do well. Farm machines are in common use. The most important part of farming is livestock raising. The grassy, treeless countryside is well suited to grazing. Icelandic farmers carry on dairy farming, raise sheep, cattle, horses, pigs, and poultry.

**Manufacturing.** The manufacturing industry is not well developed in Iceland. There are almost no mineral resources. Power is furnished by hydroelectric and geothermal plants. Most manufacturing is centered at Reykjavik, where there are canneries and other food-processing plants. Other factories produce clothing, shoes, electrical appliances, aluminum, soap, paints, and books. There are several shipyards.

### Government, Education, and Transportation

From 1262 to 1944, Iceland was ruled by kings. In 1944 the country adopted a constitution making it a republic. The chief executive is the president, who is elected by the people for a term of four years. The real executive power, however, is in the hands of the ministers who make up the cabinet. The cabinet is headed by a prime minister. Both the president and the ministers are responsible to the *Althing*.



The *Althing*, the legislative body, is made up of 60 members and is the oldest legislative assembly in the world. It was established in A.D. 930 and has met ever since except for a brief period from 1800 to 1843. The *Althing* is divided into two houses, the upper and lower. Members are elected by the people for terms of four years. Iceland is a member of the United Nations and the North Atlantic Treaty Organization (NATO). It is one of the few countries of the world that has no armed forces.

All Icelandic children between the ages 7 and 15 years must attend school, which is free. The country has one university, the University of Iceland, founded in 1911 at Reykjavik.

In the remote areas, horses are still the chief means of transportation. There are no railways. Roads have been built, but many are not paved. Coastal shipping links the chief ports. Air routes have become important in connecting the various parts of the island.

### History

The actual settlement of Iceland began when Ingolfur Arnarson, a Viking, landed on the island with a group of Norwegian settlers, about A.D. 874. They settled on the site of what is now Reykjavik. As the years passed, they were joined by other Norwegians. Some settlers also arrived from Great Britain and intermarried with the earlier settlers.

These early Icelanders set up a commonwealth. Near the end of the 10th century, Christian missionaries came to Iceland. In 1000 the *Althing* made Iceland a Christian country.

The people of Iceland kept their customs and old legends. The skalds and rune makers told stories of the past. These sagas, as they are called, were passed on from one generation to the next. Snorri Sturluson spent years gathering the legends of the skalds. In 1222-1223 he finished writing the *Younger*, or *Prose, Edda*, one of the most notable literary works of the medieval period. (See EDDAS; SAGA.)

Iceland was an independent commonwealth until about the middle of the 13th century. At that time it came under the rule of the king of Norway. After Norway was joined to Denmark in 1380, Iceland was ruled by the Danish king.

For the next five centuries, Iceland's history was filled with troubles. There were earthquakes, fires, and famines. Volcanoes erupted, and the country was ravaged by the plague known as the Black Death. Political and economic problems also troubled the country. In 1800 the *Althing* was abolished by the Danish king. Jon Sigurosson became the leader of the movement that demanded more rights for the people. The *Althing* was reopened in 1843 and, after many years of struggle, Iceland was granted its own constitution in 1874.

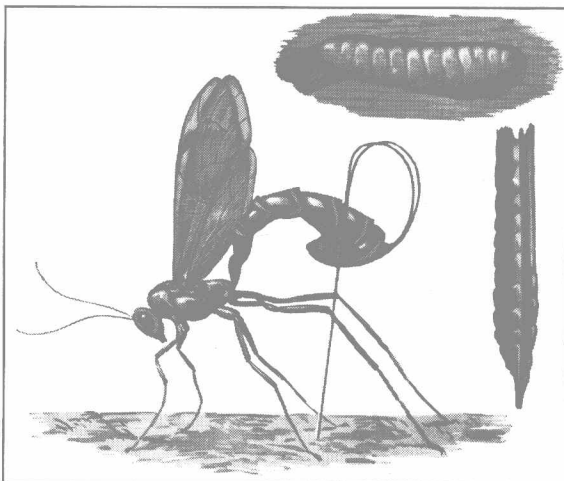
By 1918 the nation was recognized as an independent state, but it was still headed by the king of Denmark. In 1940 after Germany invaded Denmark, Iceland broke its connection with Denmark. In 1944 the Icelandic government formally established itself as a republic with Sveinn Bjornsson as its first president.

The population in 1974 was estimated at 216,600.

**ICHNEUMON** (*ik nū'mōn*) **FLY** is not a fly but a member of the order Hymenoptera, to which bees, wasps, and ants belong. Ichneumons are parasitic, that is, they live on other living organisms. (See PARASITE AND SAPROPHYTE.)

Of about 6,000 species in the United States, the best-known is the longtail. This ichneumon's *ovipositor* (for depositing eggs) is twice

The female ichneumon fly has a slender tail-like egg-laying organ, with which it can pierce hard wood. Above right: The larva of the ichneumon fly. Below right: the egg-laying organ enlarged nine times.





the length of the body. With it the female drills into the wood of a tree, down to the burrow of a pigeon horntail. Eggs laid in the burrow hatch into *larvae*, which feed upon the young horntail (*grub*). After the grub dies, the ichneumon larvae remain in the burrow until adulthood.

Ichneumons range in size from the ten-inch longtail to a small species of a fraction of an inch. Some have the ovipositor inside the body; others have it outside. Some fly at night; others by day. They are many different colors—brown, black, or red.

Each species has its own *host* (insect upon which it feeds). Hosts are caterpillars, sawflies, beetle grubs, wasps, horntails, and even other parasites. Generally, ichneumons are useful in controlling insect pests harmful to plants.

**IDAHO** (*i'dä hō*), **UNITED STATES**, is in the northwestern part of the country. On the north it is bordered by British Columbia, Canada. On the south is Utah and Nevada, on the east Montana and Wyoming, and on the west Washington and Oregon.

The name Idaho is from the Shoshone Indian words *ee dah how*, which mean "the sun comes down the mountain."

Most of Idaho is rugged mountains cut by many streams and rivers and dotted with several lakes. The central part is a wilderness, one of the largest and wildest left in the United States. Much of the state is heavily forested, but in the south and southwest are dry, barren areas. The climate varies with the elevation.

The state has been called a sportsman's paradise because of the large amount of wild game and fish. Resorts and recreational areas are scattered throughout the state.

Idaho is mainly an agricultural state, with most of the people living in the rural areas. The few larger centers of population are widely separated by the natural barriers. The wilderness region is largely uninhabited.

### Landscape

Idaho is chiefly a mountainous state, with an average elevation of 5,000 feet above sea level. There are 22 mountain ranges in the state.

Most of Idaho is drained by one of the chief tributaries of the Columbia River, the Snake River. The river enters Idaho at the eastern border. It follows an arc through the southern part of the state and then heads north to form part of the Idaho-Oregon boundary. After traveling this course for about 800 miles through the state, it leaves at Lewiston, the lowest point in Idaho, 720 feet. For almost the length of its course, the Snake flows between steep canyon walls, hundreds of feet high. The many waterfalls and rapids of the river make it useless for transportation.

The entire state is made up of two land regions: the Columbia Plateau and the higher Rocky Mountains. The Columbia Plateau is an upland plain covering most of the southern portion, and a strip along most of the length of the western boundary. The plateau generally follows the course of the Snake River and slopes from 6,000 feet at the eastern edge to 2,200 feet near the Oregon border. It is broken by *buttes* (steep, isolated hills) and *domes* (wider, lower hills). The southwestern part of this region is dry desert plains.

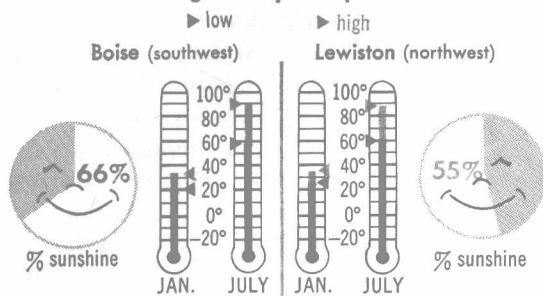
The Rocky Mountain Region covers the northern and central parts of Idaho. The chief mountain ranges include the Coeur d'Alene Mountains and the Bitterroot Range, cover-

A chuck wagon follows sheepherders into a new camp in the Sawtooth Mountains.

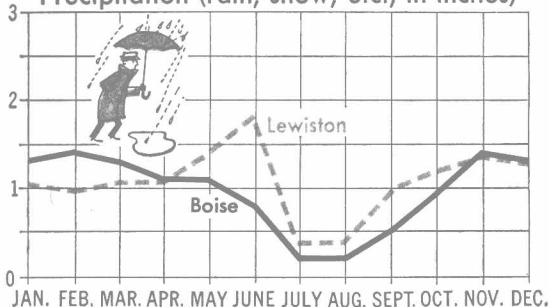
*Courtesy Bureau of Reclamation*



## Average Daily Temperature



## Precipitation (rain, snow, etc., in inches)



ing the northeastern edge of the state. In the center are the Salmon River Mountains and the Clearwater Mountains. The Sawtooth Mountains are in the southern part of the region along with the Lost River Range and the Lemhi Range. The highest point, Mount Borah (12,662 feet), is in the Lost River Range. At the foot of the Sawtooth is well-known Sun Valley.

The valleys of the northern part of this region, in the panhandle, are broader and lower than those of the central section, and the peaks do not rise to such great heights. Narrow valleys, steep canyons, and high peaks make the central section so wild and rugged that in many places it cannot be entered except by pack horse.

The soils of Idaho are generally fertile except for the sandy desert soils of the southwest. Much of the land has to be irrigated in order to grow crops. On the arid plains of the south are sagebrush and desert grasses.

There are a great many lakes, reservoirs (man-made lakes), and rivers in the state. Many lakes of the wilderness region have not yet been explored or named. Lake Pend Oreille, the largest in Idaho, is one of the larger fresh-water lakes in the United States.

## Climate

Because of the great differences in elevation, there are great differences in the climate of Idaho. The average annual temperature varies from about 36 degrees to 55 degrees Fahrenheit. The dry areas of the south have a mild climate, with temperatures climbing over 100 degrees at times. This weather is mild enough for growing many kinds of fruit. But most of the mountain areas have cool summers and severe winters. The mountain barrier on the northeast protects the state from the severe cold waves that sweep down from the north onto the Great Plains.

The average annual rainfall ranges from 25 inches in the north to 8 inches on the dry plains of the Snake River. In parts of Idaho very little snow falls, whereas in the mountains it often measures seven to ten feet.

## Animal Life

Few states can match Idaho in the number or kinds of animals. Large game, such as deer, elk, moose, antelope, mountain sheep, mountain goat, and bear, is common in the forests. Cougar, bobcat, and lynx are found in mountainous areas. Buffalo (bison) once roamed the dry plains along the Snake River, but coyotes and jack rabbits are now more common.

Fur-bearing animals—wolf, fox, raccoon,

Big game, such as elk (wapiti), attracts tourists.

*Courtesy Bureau of Reclamation*





*Courtesy Soil Conservation Service*

**American Falls Dam and Reservoir, near Pocatello.**

skunk, coyote, badger, marten, weasel, rabbit, otter, mink, muskrat, and beaver—are trapped for pelt and sport.

Game fish of all sorts are plentiful in Idaho. These include trout, salmon, bass, catfish, bluegill, and the giant sturgeon.

There are many game birds, such as grouse, pheasant, dove, prairie chicken, sage hen, quail, and partridge. Because Idaho is on the flyways (air routes) from Canada and Alaska to the southlands, great flocks of waterfowl, especially geese and ducks, stop in the state to nest and rear their young.

### Resources

Heavy forests cover more than one-third of Idaho. The forests, mostly evergreens, support an important lumbering industry. In the wilderness area, the timber is largely untouched.

The state is rich in mineral resources. It is first among the states as a producer of silver and antimony. It ranks second in the production of lead. Among the many other important minerals mined are phosphate rock, copper, gold, tungsten, and zinc.

The lifeblood of Idaho is water. The many lakes and rivers supply the necessary irrigation for farming. Dams and reservoirs store water used for crops and for generating electrical power.

### Unusual Features of Interest

Hells Canyon, sometimes called Seven Devils Gorge, is part of the Grand Canyon of the Snake River. It is in the area of the Seven Devils Mountains, which are seven peaks standing in a semicircle. Thousands of feet high, these peaks are notched in such a way as to resemble giant teeth. Hells Canyon is the deepest and narrowest gorge on the North American continent.

In the beautiful Hagerman Valley, a thousand springs gush from the canyon walls of the Snake River for two miles. These are "mystery springs" whose source is thought to be the Lost River that disappears underground about 100 miles to the north.

Idaho's only national monument, Craters of the Moon, near Arco, is a great expanse of lava, cinder cones, and more than 60 volcanic craters. The weird and fantastic formations look like the moon's surface; therefore, they have been named Craters of the Moon. Thirty miles south of Burley is the Silent City of Rocks, where giant masses of rocks resemble the crumbling ruins of an ancient city.

Health resorts have grown up around Idaho's hundreds of hot and cold mineral springs. Some homes in Boise are heated by water piped in from nearby hot springs.

**The Sunshine Mine, largest silver mine in the country.**

*Courtesy Idaho State Chamber of Commerce*



