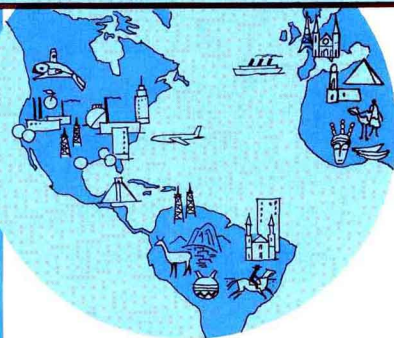


HERE AND THERE IN VOLUME 13

AT ODD TIMES when you are just looking for "something interesting to read," without any special plan in mind, this list will help you. With this as a guide, you may visit faraway countries, watch people at their work and play, meet famous persons of ancient and modern times, review history's most brilliant incidents, explore the marvels of nature and science, play games—in short, find whatever suits your fancy of the moment. This list is not intended to serve as a table of contents, an index, or a study guide. For these purposes consult the Fact-Index and the Reference-Outlines.



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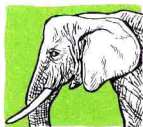


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IASI (*yá'shē*), or **JASSY** (*yás'ē*), **Rumania**. The city of Iasi in northeastern Rumania is situated on the Bahlui River near Rumania's border with Russia. The city's known history dates back to the early 1400's. At one time it was the capital of the principality of Moldavia.

Today, under the socialist economic system, Iasi is the administrative center for the surrounding Iasi district.

The city's most important industries are food processing and the manufacture of textiles and chemicals and pharmaceuticals. Agricultural products grown in the Iasi district include wheat, maize, sunflower seeds, sugar beets, potatoes, and grapes. The area is noted for its fine wine.

Iasi has long been an important cultural and educational center. In addition to a university the city has several institutes of higher learning, including a medical and an agricultural institute, research institutes, and a branch of the Academy of the Socialist Republic of Rumania.

Architectural landmarks and places of interest include the Church of St. Nicholas, constructed in the 15th and 16th centuries; the Church of the Three Hierarchs, dating from the 1600's; and the Palace of Culture, built in 1907. Iasi also has several museums, a botanical garden, and a symphony orchestra. (See also Rumania.) Population of the city (1966 preliminary census), 160,889; of the district, 1,067,968.

THESE ARTICLES ARE IN THE FACT-INDEX

Ibagué, Colombia
Iberia
Ibert, Jacques

IBERVILLE, Pierre le Moyne, sieur d' (1661-1706). In colonial days a daring French Canadian spent his life trying to win America for France. He was Pierre Iberville. His skill as a colonizer strengthened France's claim to all the "Louisiana country."

Iberville has been called the first great Canadian. He was born in Montreal, Que., July 16, 1661. He had ten brothers and three sisters. His father, sieur Charles le Moyne, taught his sons frontier skills. At 14 Pierre was commissioned in the royal navy. After some years of service he returned to Canada, eager to help drive the British from America.

Iberville was 25 when an undeclared war against the British fur trade began. He quickly joined a band of French Canadian adventurers under sieur de Troyes. After a trek of 900 miles, they raided James Bay, and Iberville helped capture three forts of the Hudson's Bay Company. In 1689 war was officially declared (see King William's War). Iberville led three more daring attacks against British posts in the Far North. He also directed the destruction of Schenectady in New York and seized St. John's, Newfoundland. In 1693 he married Marie Therese Pollet de la Comte Pocatiere. They had two children.

Iberville's greatest military exploit took place on Hudson Bay in 1697. His small fighting ship, the *Pelican*, met three British warships. He sank one and captured two. Then the *Pelican* was wrecked in a storm. But Iberville with his half-frozen crew captured the British stronghold, Fort Nelson.

After the war, Iberville was commissioned to locate the mouth of the Mississippi and to establish a colony. In 1699, after exploring the lower stream, he set up a colony at what is now Ocean Springs, Miss., near Biloxi. This became France's foothold in the "Louisiana country." A year later he built a post near the site of present-day New Orleans.

When war began again in 1702, Iberville commanded the French West Indian fleet. He captured the islands of Nevis and St. Christopher in 1706. A few months later, he died of an attack of yellow fever in Havana, Cuba.

IBEX. The ibex is a wild goat. Its home is in the most rugged and hard-to-reach heights of the Alps and Pyrenees and the mountains of Asia and Arabia. It lives above the line of perpetual snow, descending only at night to graze in the highest forests. The Alpine ibex (also called the steinbok) was

ASIATIC IBEX

The male ibex has a beard and splendid curving horns. It lives with the female during the winter mating season.



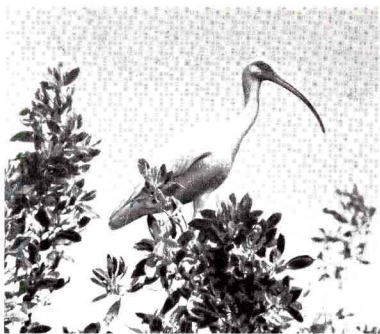
once threatened with extinction as a result of over-hunting. It has become re-established in the Alps, largely through the efforts of the Swiss League for the Protection of Nature. Laws forbid hunting it. The Asiatic ibex is still abundant.

The ibex stands about 40 inches high at the shoulders and is about 4½ feet long. The splendid horns of the male are 30 inches long in the Alpine species. In the Asiatic animals they may be as much as 60 inches long. The horns rise from the crest of the skull in a long, graceful backward sweep. On the front they are marked with bold cross ridges. The forelegs are shorter than the hind legs. This makes it much easier for the animal to climb up steep slopes. The hair is ashy gray in the summer. In the bitterly cold winter of the high mountains the coat grows heavier, and long yellowish brown hairs cover the gray undercoat.

Ibexes feed in separate herds of males, and females with their young. The older animals usually live alone and at higher levels. Each herd posts a sentinel which watches for danger. The sudden upward leap of this sentry sends the entire herd in headlong flight up the mountainside. In late fall the animals pair off. Then the great horns of the males are put to use as they battle for the females. The mates remain together through the winter, until the single young is born in the spring, 90 days after breeding.

The scientific name of the Alpine ibex is *Capra ibex*; of the Asiatic ibex, *Capra sibirica*; of the Arabian ibex, *Capra sinaitica*.

IBIS AND SPOONBILL. Like a storm of great snowflakes, the white ibises circle over a Florida swamp, settle down on the water lettuce and violet hyacinths, and then spout suddenly upward again as though a gust of wind had seized them. Occasionally in the midst of this great white swirl a few of the rare rose-pink spoonbills may be seen.



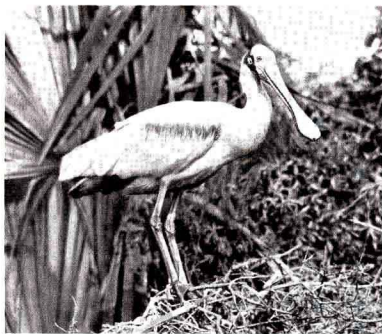
KNOW THEM BY THEIR BEAKS

With its long downward-pointing bill the white ibis (left) probes for food in the marsh bottom. It is a white bird with red face.

Ibises and spoonbills are closely related tropical wading birds. They live in colonies along bays and salt-water lagoons of southern seacoasts and on interior marshes, where they feed on shellfish, frogs, and small fish. Both birds stalk about the swamp with an air of haughty dignity. Like the cranes, they fly with neck and long legs outstretched. The spoonbill's flight is an easy, uninterrupted flapping. The ibis alternates the wing strokes with short glides.

The spoonbill gets its name from its large, flat, spoon-shaped bill. When it feeds, it submerges its bill and, with mandibles open to scoop in whatever may come its way, swings the entire head and body from side to side as it moves forward, like a man mowing grain with a scythe. The roseate spoonbill is found in Florida and on the Gulf coast. This bird is almost three feet long. The wings and under parts are a delicate rose-pink, tipped with rich crimson. The plumes at the base of the neck are crimson, the upper neck and back are white. (For picture in color, see Birds.) The nest is a bulky platform of sticks in small trees. The three to five eggs are white, blotched with olive-brown.

The ibis has a long, slender, downward-curving bill with which it probes in the mud for food. It makes its nest of rushes and weed stalks, attaching it to reeds and low bushes. About 30 species of ibis are distributed over the warm parts of the earth. Four species occur in North America. The most abundant is the white ibis. As many as 35,000 individuals have been counted in a single Florida rookery. The adult bird is about two feet long. Its plumage is purest white, with glossy black wing tips. The face, bill, and legs are red. Immature birds are a dull grayish brown with white head and neck and white underparts. The sexes look alike. The birds nest across the southern United States from Florida to California. They have also been found as far north as the marshes of Long Island, southern Illinois, and Great Salt Lake.



The roseate spoonbill (right) uses its odd bill to scoop in food which it stirs up as it swings head and body through the water.

Much less common are the eastern glossy ibis and the white-faced glossy ibis of the Western states. They are dark-colored birds of a rich purple-green, with dusky bill and legs. The scarlet ibis of tropical South America has sometimes been seen in the Gulf states. The sacred ibis of Egypt lives in the Nile Valley. It was revered by the ancient Egyptians, who embalmed it at its death.

The North American ibises are sometimes called curlews. However, the true curlews, although their bills are similar, are *short-legged* waders. The so-called wood ibis is a stork (see Stork).

Ibises and spoonbills form the family *Threskiornithidae*. The scientific name of the white ibis is *Guara alba*; eastern glossy ibis, *Plegadis falcinellus*; white-faced glossy ibis, *Plegadis guarauna*; scarlet ibis, *Guara rubra*; sacred ibis, *Ibis aethiopia*; roseate spoonbill, *Ajaia ajaja*.

THESE ARTICLES ARE IN THE FACT-INDEX

Ibn Batuta, Abu Abdullah
Mohammed
Ibn Saud

Ibo
Ibrahim Pasha



IBSEN, Henrik (1828–1906). The first great modern playwright was Henrik Ibsen, a Norwegian. His plays show a wide variety of styles. They range from the realism of 'Hedda Gabler' to the fantasy of 'Peer Gynt'. They are all linked by Ibsen's fight for the recognition of individual rights in an increasingly socialized world.

Ibsen was born March 20, 1828, in the small port town of Skien, Norway. He was one of six children. When the boy was eight, his father went bankrupt. For the next eight years the family lived on a small farm near Skien. At 15, Henrik was apprenticed to a druggist in the town of Grimstad. It was a lonely life, and the boy soon turned to writing, especially poetry.

In 1849 Ibsen entered the university at Christiania (now Oslo), but he soon dropped out for lack of money. For years after, his life was hard. He did routine writing for newspapers and managed a small theater. He traveled in Germany and Denmark to study scene design. He also wrote poetry and unsuccessful plays.

Finally in 1864, aided by a small government grant and the help of friends, Ibsen left Norway to live in Rome, Italy. Two years later his first successful play 'Brand' was produced. People liked it and wanted more from him. His next play was 'Peer Gynt' (1867). This playful fantasy is very different from 'Brand'. 'Brand' is the grim story of a minister who renounces

the compromises of his time in favor of a "true-to-one's self" life. 'Peer Gynt' is the tale of a world traveler who gets involved in all sorts of remarkable adventures. Wild as the story is, its point is clear—that a second-rate life has little meaning and purpose.

Then followed 'The League of Youth' (1868), about political corruption, and 'Emperor and Galilean' (1873), a plea for a new kind of Christianity. 'The Pillars of Society' (1877) and 'A Doll's House' (1879) deal with social reforms based on first principles of honesty and freedom. 'Ghosts' (1881) is a tragedy of disease that affects the mind. It is perhaps Ibsen's greatest play.

Among his later plays are 'An Enemy of the People' (1882), a comedy with serious undertones; 'The Wild Duck' (1884), combining reality and poetry; 'Rosmersholm' (1886), dealing with the conflict between conscience and desire for freedom. 'Hedda Gabler' (1890) is a powerful domestic tragedy ending in suicide. Among his last plays are 'The Master Builder' (1892) and 'When We Dead Awaken' (1899).

Ibsen finally returned to Norway in 1892. He was rich, honored by the world, and loved by his own people. His plays were translated and staged in many countries. He died in 1906. (See also Drama.)

ICE. When water becomes cold enough, bits of it freeze into six-sided, needlelike crystals called *frazil*. These increase and interlace until they form solid ice. In ice the closely packed crystals can no longer be seen as separate bodies.

Water expands as it freezes. Thus ice is lighter than water and rises to the surface. A cubic foot of ice weighs 56 pounds; a cubic foot of fresh water about 62 pounds. On ponds, rivers, and lakes the surface ice tends to prevent the water below from freezing. Under this top layer of ice fish and other water creatures can keep alive during the winter.

Occasionally at the bottom of ponds or rivers, stones or other objects become much colder than the surrounding water. Ice forms upon them in spongy masses called *sponge ice* or *anchor ice*.

When water vapor in the air freezes it usually forms the light fluffy crystals we call snow (see Snow). At high altitudes it may turn into microscopic particles of solid ice. These make up the cirrus type of cloud (see Clouds). Hail is simply snow crystals partly melted and frozen again (see Hail).

Snow and ice crystals act like all crystals. They have a hard time forming without some tiny solid particle for a nucleus, such as a grain of dust. Hence in absolutely clean air, water vapor may be chilled below the freezing point (*supercooled*) without turning into ice. An airplane entering supercooled air helps the vapor turn into ice. It is often seen as a vapor trail behind jet planes when they are flying high.

Water vapor suddenly freezing on trees, vines, wires, and fences may pile up in heavy masses called *glaze ice*. "Ice storms" of this sort can cause heavy damage to property. (See also Freezing; Water.)

THE ICE AGE—Thousands of Years Ago and Today

ICE AGE. The people who may have been living in central North America 20,000 years ago saw ice and snow the year round. The men hunted along the edge of a great wall of ice that extended across the continent from ocean to ocean. In summer the women fished in chill streams that flowed from the melting ice. Anyone who ventured to climb the wall saw ice extending northward without a break.

These people were living in the grip of the latest Ice Age, a period when all of Canada, much of the United States, and most of northwestern Europe lay buried beneath sheets of ice hundreds or even thousands of feet thick. But these people did not live in bitter cold. The average temperature was only 10 or 12 degrees lower than it is today along the border between the United States and Canada. Moreover, this cooler average and the very Ice Age itself were caused largely by cool summers rather than by bitter winters. There was not enough heat in the warm months to melt away the previous winter's snow and ice. So they piled up year after year, until they covered the northern country.

The biggest difference between the country near the edge of the ice sheet and the same country today was in the vegetation and animal life. The cold prevented the growth of trees, grasses, and most flowering plants. The ground was covered with mosses and lichens, and in the warmest weeks a few fast-blooming plants sprang up such as we find in the Arctic today (see Arctic Regions). The principal animals were wild reindeer, or caribou, musk-oxen, and mammoths, which could paw through snow to get food, and meat eaters, such as bears and wolves.

Today, some geologists say, this Ice Age is finally coming to an end. Inhabitants of Greenland live near the edge of a glacier that covers most of the island. The Antarctic is almost completely covered by a vast ice sheet. These enormous glacial areas are called *ice caps* (see Greenland; Antarctica). The slow-moving rivers of ice that fill valleys in the Alps and other high mountain ranges are called *valley glaciers*. (See also Glacier; Alps.)

Why Scientists Believe in an Ice Age

Why do scientists believe that ice once covered so much of North America? The answer begins with Louis Agassiz, who was born in 1807 in Switzerland (see Agassiz). Agassiz became a teacher of natural science, and he knew much about the glaciers of his native Alps. He observed how they rubbed the valley floors and sides, carried rocks, and left mounds of gravel as they melted. He noticed also that boulders of granite could be found hundreds of miles from any solid granite formations. Finally, bedrock far from the Alps showed grooves and scratches (called *striations*, from the Latin for "furrows"), such as would be made if glaciers had pushed small rocks over it. But if the glaciers had been big enough to do this, they must have covered most of northern Europe.



Johns Hopkins Glacier empties into Reid Inlet in Alaska's Glacier Bay National Monument. This active glacier and others in the park began to recede about 150 years ago.

Other Traces of the Ice Age

Geologists use modern glaciers as a guide in studying the old Ice Age. These show how the piled-up snow changed to sandlike grains near the surface and to ice below. When the ice became about 150 feet thick, it pushed out at the edges. The creeping ice rubbed away small hills and carried their gravel, sand, and clay into the valleys. These deposits are called *glacial till*. Streams from the melting edges of the glaciers scattered sand and gravel in long, crooked mounds called *eskers*. Drifts that piled up under the ice now appear as low hills called *drumlins*.

During this flow the ice carried boulders and soil southward until it reached a climate warm enough to melt it completely each summer. As it melted, it dropped its burden upon a sort of rubbish heap, called a *moraine*, along the line of melting. When warmer summers drove this line northward, the moraines were left. Today they are seen as broad, gently sloping mounds across the landscape.

Wherever the ice retreated, the water from the melting edge had to find new channels, for the old river valleys were filled with drift. Much of the flow was caught behind the moraines, and the waters spread out to form lakes. As the levels of these lakes rose, they overflowed at low places and often joined one another in long chains connected by small streams. A glance at any map of the northern United States and southern Canada will show this wealth of connected lakes and streams. The lakes range in size from small forest pools to the Great Lakes (see Great Lakes).



SOUTHERN LIMITS OF THE ICE IN NORTH AMERICA

The white areas are those that were covered by ice sheets in the past. The Kansan and Nebraskan sheets overlapped almost the same areas, and the Wisconsin and Illinoian sheets covered approxi-

mately the same territory. In the high altitudes of the West are the Cordilleran ice sheets. An area at the junction of Wisconsin, Minnesota, Iowa, and Illinois was never entirely covered with ice.

As geologists studied this sort of evidence throughout the world, they decided that Agassiz's simple "Ice Age" really consisted of four periods; that is, the ice formed and advanced, then melted back toward the poles, four different times. They believe this because they find moraines and other deposits from each period, and in places these lie one over another, so that the younger can be distinguished from the older. In the United States, each of the four cold periods, called *glaciations*, is named for a state that was reached by its ice, as shown in the accompanying table. The intervening warm periods, called *interglacial* phases, are named for localities where relics from them were studied. In Europe, the glacial phases are named for the little Alpine river where they were studied and the interglacial periods are indicated by hyphenating the names of the glacial periods that preceded and followed.

	IN AMERICA	IN EUROPE
First Glaciation	Nebraskan	Günz
Warmer Period	Aftonian	Günz-Mindel
Second Glaciation	Kansan	Mindel
Warmer Period	Yarmouth	Mindel-Riss
Third Glaciation	Illinoian	Riss
Warmer Period	Sangamon	Riss-Würm
Fourth Glaciation	Wisconsin	Würm
Warmer Period	Modern or Post-glacial	Modern or Post-Würm

From the direction of the grooves or striae in the bedrock, it has been established that in North America the ice always spread out from the same three centers or ice caps. These were named after the regions they covered: Labrador, Keewatin, and Cor-

dilleran, as shown in the map on the next page. The thicknesses of the ice sheets in various places were measured by the height of the striae on mountain sides.

Many types of animals that formerly inhabited North America were driven out or destroyed by the successive invasions of ice. Among them were the huge elephant-like mastodon, the saber-toothed tiger, members of the camel and llama family, and several species of horses.

Patient study has helped geolo-

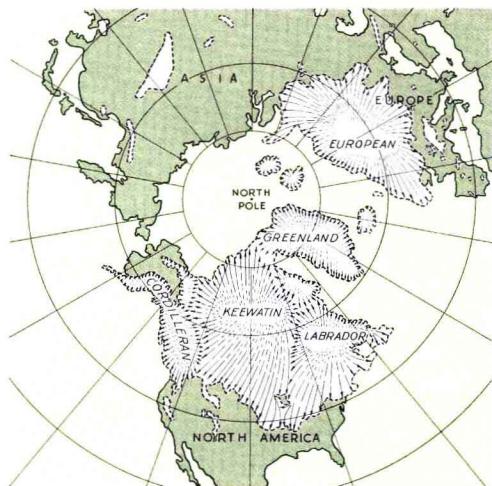
gists to estimate how long ago each of the four ice sheets covered North America and Europe. In general it seems that the Nebraskan ice sheet covered North America perhaps 2,000,000 years ago, the Kansan sheet 1,250,000 years ago, the Illinoian sheet 500,000 years ago, the Wisconsin sheet 100,000 years ago. The warm period called the *Yarmouth*, between the Kansan and the Illinoian glaciations, lasted much longer than any other period, warm or cold.

The latest, or Wisconsin, sheet probably began to melt at its edges about 40,000 years ago. The ice cap centered over Labrador drew back from the Niagara Falls region about 36,000 years ago and left New England clear about 28,000 years ago. The Keewatin ice cap, longer and thicker, did not leave Minnesota until about 15,000 years ago. Europe's ice blanket melted from central Germany 17,000 years ago, and from Sweden 13,000 years ago.

How the Ice Age Has Affected Modern Life

The immense amount of glacial drift inherited from the Ice Age has influenced the character of soil and the development of agriculture (see Soil).

Other changes were caused by the tremendous weight of the ice sheet. It was about two miles thick over much of North America. This placed 400 tons or more upon every square foot of surface. The earth's crust sank under this load—from 300 to 800 feet in areas like New England. Here the land has not yet risen to its former level, and many ancient valleys are now under the sea, forming bays and inlets. Chile and Norway present other "drowned coasts," with many fiords filling valleys which old glaciers gouged out.



CENTERS FROM WHICH ICE SPREADS OUT

The map shows five great ice caps from which the ice moved outward during the Ice Age and to which it retreated later. Three of these are in North America.

The estimated 12 million square miles of thick ice sheets were formed, of course, of water drawn from the oceans. This lowered the oceans several hundred feet below their present level, all around the world. Old, low shore lines have been found by sounding beneath the sea off the Hawaiian Islands, Bermuda, and elsewhere. A huge amount of water still remains locked in ice over Antarctica and Greenland. If this should melt, it would raise the oceans about 200 feet.

Scientists tell us men moved southward and northward, as the ice sheets advanced and melted back. In Colorado and near by, flint arrowheads have been found embedded in the bones of mammoths and other Ice Age animals, now extinct. During the last cold period in Europe, men lived in caves

where they left stone relics of many kinds (see Man).

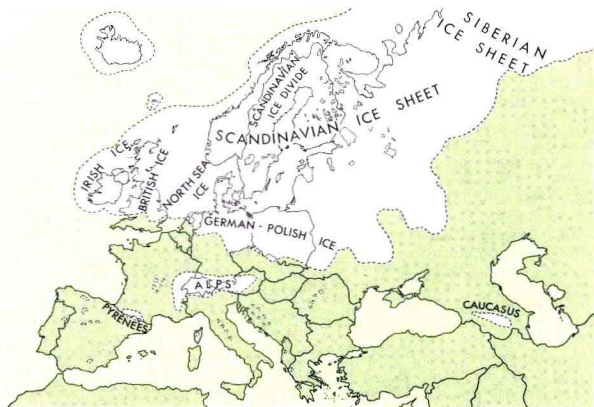
Evidence of Earlier Ice Ages

The latest Ice Age, with its four phases, is by no means the only one in the earth's long history, according to geologists. They believe that two Ice Ages occurred, one in eastern Canada, and another in China, South Africa, Norway, and North America during Proterozoic times (see Geology). During the Paleozoic era, the Coal Age with its luxurious swamp growth seems to have been closed by the most severe ice age the world has ever known. Even tropical lands in India and Africa show evidence of ice sheets. South America may have been ice-capped from the Brazilian jungles southward.

Causes Are Mysterious

Ice ages arrive, as we have seen, when the climate over a region becomes cooler. Summer heat fails to melt away winter ice and snow. Why did these events occur in the earth's history?

Some scientists have tried to explain this by variations in the movement of the earth around the sun. But no variation has ever been found which fits both the theories of astronomy and the record of what has happened on the earth. Others have guessed that blankets of dust or of carbon dioxide got into the air and cut off part of the sun's heat. The newest



HOW THE ICE SHEETS SPREAD OVER EUROPE

Europe, like North America, had four periods of glaciation. Successive ice caps reached limits

which differed only slightly. The area covered by ice at any time is shown above (in white).

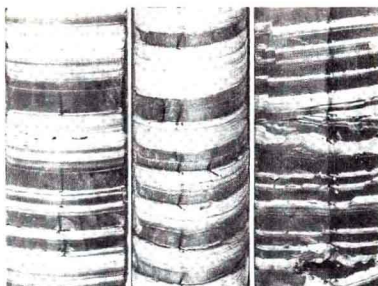
theory was advanced in the early 1930's by the British meteorologist Sir George C. Simpson. He suggested that, as in the case of some stars, the sun's temperature may have varied greatly in past ages. His theory still requires added factual support.

Calendars in Clay Deposits

A useful discovery for studying the history of the Ice Age was made by Baron Gerard de Geer of Sweden. He devised a system for estimating the length of the Ice Age by examining the soil deposits on the bottoms of ancient glacier-fed lakes. These deposits were left by the outflow of water from melting ice. Their composition differed with the seasons. Coarse sand settled in the summer because of heavy melting. Thinner layers of fine clay were deposited over the sand during the winter. The combined deposit (summer and winter) for a single year is called a *varve* (Swedish for "layer").

Study showed that varves differ in thickness for different years. A varve deposited in a moist year is thicker than a varve deposited in a dry year. Wet and dry years tend to occur in groups. It was found that the varves in all the lakes of a region showed a similar pattern. A year-by-year count of Ice Age time could be obtained by studying deposits made as the ice cap receded over several lake beds. Distinctive patterns appeared near the tops of deposits in southerly lakes. Farther north these patterns were found near the bottoms of new lakes. By moving northward and studying the varve patterns in successive lakes, it was possible to estimate the dates during which the retreat of the ice cap occurred.

Baron De Geer and his pupils made reasonably complete year counts in Europe. One pupil, Ernst Antevs,



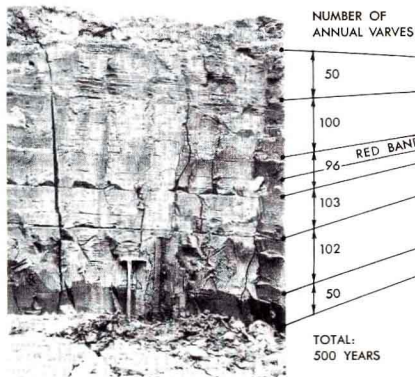
VARVE COUNTS FROM GLACIAL CLAY DEPOSITS

These samples were removed from three rivers in the eastern United States. A light band is a summer deposit. A dark band is a winter deposit. A light band and a dark band form a varve.

made a similar count in North America, from Long Island Sound to Hudson Bay. Their work helped to provide dates for the latest glaciation.

Estimated End of the Ice Age

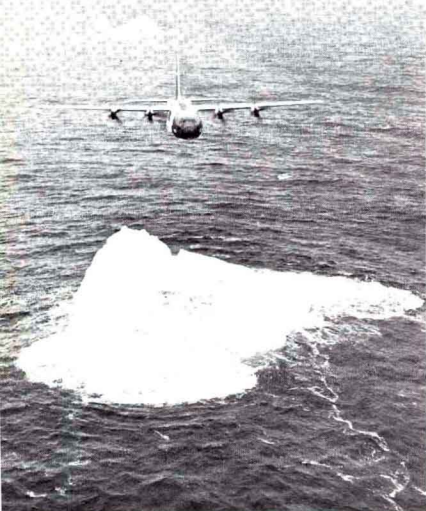
De Geer estimated that the Ice Age ended with the melting of ice from a fork in the upper Angerman River in northern Sweden. By this time, present-day climatic conditions had appeared over most of Europe. Based on his studies and method of calculation, De Geer concluded that the Ice Age ended about 6740 B.C. This estimate allowed for an uncertainty of a few hundred years. Scientists accept this span of time as reasonably accurate, but there is disagreement concerning methods used to arrive at the estimate.



MATCHING VARVES TO ESTABLISH A CALENDAR

A succession of wet and dry years leaves a distinctive structure of thick and thin varves in clay deposits. Varves in two different locations can be compared. In the deposits above, varves laid down over a period of 500 years are compared by a

connecting scale. Although the deposit on the left is deeper than that on the right, both have the same number of varves. A peculiar red band that occurs in such deposits aids in making comparisons and establishes a year-by-year record.

**ON ICEBERG PATROL**

A United States Coast Guard ice-patrol airplane flies over a row of icebergs off the coast of Labrador, preparatory to dropping dye on the berg in the foreground.

ICEBERGS. Floating icebergs are at once the dread of sailors and the wonder of all who see them for the first time. They are the broken-off ends of glaciers that slide into the sea. They vary in size from small, flat "growlers" to mountains of ice a mile or more across and more than 200 feet above the water.

The part below water is about seven times as large as the part above. This is because the iceberg is made of fresh-water ice, weighing about seven eighths as much as sea water. In fresh water the iceberg would sink down until about nine tenths was below the surface (*see Ice*). The underwater part of an iceberg may extend far to one side of the visible part, so a ship that sails close may strike it. This happened to the steamship *Titanic*, which went down near Newfoundland April 15, 1912, with a loss of some 1,500 lives.

When these wanderers of the sea are free from the fog that so often surrounds them, they shimmer in the sun with dazzling beauty, reflecting the tints of sea and sky. As they drift, many assume fantastic shapes—such as castles, arches, or domed mosques. At

night the bergs glow with a peculiar whiteness called "ice blink," caused by the reflection from the crystal surface of feeble light rays.

New icebergs are being formed constantly. Most of those in the north Atlantic break off from the continually advancing fringes of Greenland's great ice-cap. Here in the early spring thaws, great processions of floating ice islands begin their journey southward. Sometime in April, May, or June an average of 400 reach the northern Atlantic steamer routes.

When afloat, icebergs melt rapidly in the salt water. High waves and heavy swells hasten their destruction. As they dissolve they may split in two, roll over, or slough off great fragments with a gigantic roar. Some bergs, however, are so huge that they travel 2,000 miles or more before disappearing.

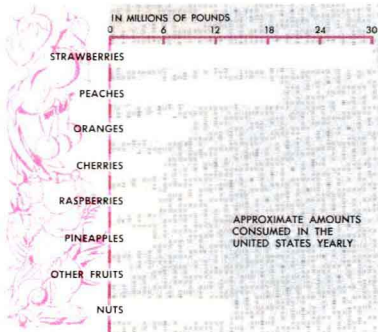
Two routes are particularly dangerous: one through the Strait of Belle Isle into the Gulf of St. Lawrence; the other along the Grand Banks. Since 1914 vessels of the United States Coast Guard have conducted the international service of ice observation and ice patrol in the North Atlantic. The service is financed by the maritime nations. Reports of the positions and movements of icebergs encountered are broadcast by radio. The Hydrographic Office also issues bulletins charting the iceberg region and pilot's charts showing safe "tracks" across the ocean for shipping in each season (*see Navigation*). The Coast Guard equips its cutters and planes with radar and loran to fix the location of icebergs. In addition, underwater sound equipment and sensitive instruments that register variations of 1/10,000 of a degree in temperature help to locate bergs. (*See also Glacier*.)

MARKED FOR TRACKING

Labeled with streaks of indelible vermilion dye dropped from the airplane above, this berg's rate of drift and deterioration can be observed for the purpose of maritime safety.



FRUITS AND NUTS USED IN ICE CREAM



ICE CREAM. A favorite American food is ice cream. More than 14 quarts of this frozen dessert are consumed per person each year in the United States.

Unfrozen ice cream is a liquid "mix" consisting of milk and cream, sugar, and often eggs. A small amount of stabilizer may be added to help prevent the formation of ice crystals. After the mix is made in a huge tank it is pasteurized.

The hot mixture is pumped from the pasteurizer through the homogenizer, where particles of butterfat are distributed evenly throughout the batch. The smooth blend then flows over refrigerated pipes or between plates in a closed cooler. Here it is chilled rapidly to about 40° F. in order to prevent the growth of bacteria.

When the mix is cold it is sent to refrigerated tanks, in which it is stirred automatically and held at 30° to 40° F. From here the batch goes into flavor tanks, where vanilla, chocolate, or other liquid flavorings are added.

Freezing and Packaging

Most ice cream plants use a continuous freezer. The mix is pumped through a tube surrounded by subzero ammonia and freezes soft almost instantly. Scrapers keep the batch from freezing to the walls of the tube. Fruits or nuts may be added either during or after freezing.

The next step is packaging the soft ice cream. This is often done by machines which fold, fill, and close paraffined paper cartons. Machines also package bricks, cups, individual servings in cartons, and other specialties. After packaging, the ice cream is sent to the hardening room, where freezing is completed. Bars to be chocolate-coated are first frozen in special molds as they travel down a long brine tank, emerging frozen hard in about 15 minutes. The racks of bars travel by conveyors through a chilling chamber to the chocolate trough, where they are dipped, re-chilled, and bagged.

Types of Ice Cream

Soft ice cream, a popular product, is drawn from the freezer without hardening. *Frozen custard* is cooked to a thick consistency before freezing.

Most ice cream contains 12 per cent butterfat. *Ice milk* has about 4 per cent butterfat. *Sherbet* contains fruit juices, milk, sugar, and stabilizer, with a butterfat content of no more than 2 per cent. *Ices* are made of fruit juices, sugar, and stabilizer, without milk.

The History of Ice Cream

Chilled mixtures of fruit juices, milk, and honey were enjoyed as early as 335 B.C. in the court of Alexander the Great. Nero had snow brought from the mountains for his frozen desserts. Centuries later Marco Polo brought from China to Venice a recipe for chilled milk desserts.

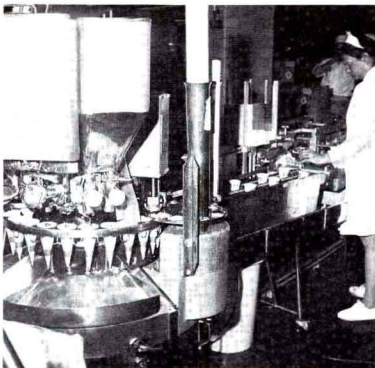
From Italy the milk dessert's popularity spread to France and England. It was brought to America by the English colonists.

The first known American advertisement for ice cream appeared in 1777. Not until 1846, however, did a housewife named Nancy Johnson add gears and a crank to a small tub to make a hand-cranked freezer. She did not patent her idea. William G. Young improved the freezer and patented it in 1848.

In 1851 Jacob Fussell began the wholesale manufacture of ice cream. He owned a milk plant in Baltimore, Md. In summer he had more cream and milk than he could sell. To use this surplus, he began making ice cream. Before this, only caterers had made the dessert, and the price was about 60 cents a quart. Fussell could manufacture and sell the product much more cheaply. A plaque now marks the site of the first ice-cream plant, in Baltimore.

The sugar cones used in this ice cream specialty are filled, topped with nuts and chocolate, and sealed automatically.

Sealtest Foods





Akureyri with a population of less than 10,000 is the second largest city of Iceland. Located on the northern coast, it is an important shipping port.

ICELAND—Ancient Island Republic

ICELAND. The story of Iceland is a bright chapter in the history of civilization. This remote island in the North Atlantic has the oldest of existing parliaments. The Icelanders created it in the year A.D. 930, and it quickly adopted a code of laws. Its upper house had judicial powers. Iceland also had the first jury system. Within the next century, the Icelanders took another advanced step, creating mutual insurance against loss of property.

In no country is the general level of education higher, and nowhere is there a more widespread love of good literature. Crime is all but unknown, and Iceland's cooperative societies and liberal social-insurance laws are models.

Visitors to Iceland marvel at the achievements of its people—only 200,000 (1967 estimate)—when they see the bleakness of this "island of ice and fire." It thrusts up from the sea about 180 miles east of Greenland and 500 miles northwest of Scotland. Its

Machinery makes lighter work for these farmers in Iceland, where grass is widely cultivated for hay to feed livestock.



Icelandic Photo & Press Service

tip lies on the Arctic Circle. The many fjords give it good harbors and a long coastline (3,700 miles). Iceland is approximately the size of Kentucky, but only one quarter of its 39,768 square miles is inhabitable.

The valleys of the fjords and the narrow coastal plains in the west and south are almost the only places where men do live. Mountains rim the island like a jagged crown. Hvannadalshnukur (6,952 feet) on the southern coast is the highest point. The central plateau is a windswept desert of sand and lava, ridged by mountains and strewn with glaciers and snowfields that never melt. An eighth of all Iceland is buried under snow and ice. Swift rivers form waterfalls whose power is used to generate electricity.

More than a hundred volcanoes, some still active, make Iceland one of the most volcanic regions of the world. Eruptions are rare. However, when Mount Laki broke out in 1783, it ruined so much pastureland that most of the livestock perished and about a fifth of the people died in the famine that followed.

The volcanic rocks heat countless hot springs and geysers. The largest is the famous Geysir (from *geysa*, Icelandic word meaning "to rush forth furiously"), from which the world's geysers take their name (see *Geysir*). The warm waters are piped to heat buildings and hothouses, in which vegetables, fruits, and flowers grow the year around. In some places water is piped through the soil to warm it for growing green crops.

In minerals Iceland is poor. It has no iron and its only fuels are peat and lignite. Its deposits of Iceland spar, a kind of crystal used in optical instruments, seem exhausted (see *Light*). Virtually all building materials have to be imported, except sand and gravel for concrete and stone.

Though it is just below the Arctic Circle, Iceland has a moist, marine climate, for it lies in the outer edge of the Gulf Stream. Summers are cold but win-



Icelandic Photo & Press Service

Many Icelanders find employment in the fisheries and fish-processing industry, for most of their country's exports are fishery products. A herring catch is cured here.

ters are mild. At Reykjavik, the largest city, in the southwest, the July temperature averages 48° F., about the same as at Nome, Alaska, which is in the same latitude. The January temperature, however, is 32°, against 3° at Nome. The south has a heavy precipitation, about 53 inches a year, and the mountains receive much more.

How the People Live

About a sixth of the people live on farms, and only about half of one percent of the total area is cultivated. On a typical farm of some 640 acres only about ten acres can be worked. Most grains will not ripen in the short, cool summers. Turnips, potatoes, and hay are almost the only crops.

Since grass grows well, the farmers raise stock. They pasture the cattle and small, sturdy horses or ponies on the farm and send the sheep to forage in the mountains. They raise winter fodder in a hayfield, called a *tun*. Most farmers have trucks and farm machinery, but a few continue to use ponies for farm

work. To make extra money, farm folk gather eider-down from the wild eider ducks' nests. Men and boys work on fishing boats in the spring.

work. To make extra money, farm folk gather eider-down from the wild eider ducks' nests. Men and boys work on fishing boats in the spring.

Icelanders once built their houses of stone, with turf roofs. Now most of them build with concrete or imported timber and iron roofing. The living room is called *bath-stofa*, recalling the days when a bathing basin was sunk in the earth floor. Mutton, fish, and milk are the most important foods. Most farm products are used at home. Wool, skins, hides, salted or frozen mutton, and some types of cheese are exported.

Fisheries and Fish-Processing Industry

With so poor a soil, Icelanders could hardly live if it were not for the generous sea. The fisheries and fish-processing industry provide a living for about 14 percent of the people and about 90 percent of the country's exports are fishery products. In proportion to population the annual catch is enormous—more than six tons for each inhabitant in 1966 or about 200 tons per active fisherman. Icelandic waters are also fished by other nations, especially Great Britain and Germany. These waters usually produce about a fifth of the total European catch.

Refrigerated trawlers carry some fresh cod and herring to European markets. Most of the catch, however, is prepared in Iceland for export. The herring may be salted, spiced, or sugar-cured. Cod is either dried or cut into fillets for quick-freezing. Now many factories make herring meal and oil and refine cod-liver oil.

Ports and Transportation

About 85 percent of the people live in towns or villages. Two fifths (79,202) live in Reykjavik, the capital and chief port. Its harbor is ice-free the year around. Except for the absence of trees, Reykjavik looks much like any growing city in the United States. It has manufactures of clothing, foodstuffs, and equipment for the fishing fleet—nearly all from imported materials. In the north the chief port is Akureyri (population, 9,943).

In this land of mountains and long winters, transportation is a major problem. There is no railway,

are returning from upland pastures to community sorting corrals. They provide food, clothing, and cash.



Icelandic Photo & Press Service

ICELAND

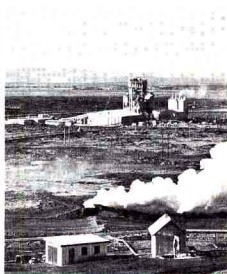
but year-round airplane service and coastal shipping connect the chief towns. A motorbus highway links Reykjavik and Akureyri, but most of the roads are unpaved and unfit for winter use. Nearly every farm has a telephone. The government radio station at Reykjavik is a major source of weather reports for Europe and for North Atlantic shipping and flying.

Aside from the descendants of early Celtic settlers, the people are Scandinavian. Nearly all were born in Iceland. Immigration is discouraged. Late in the 19th century many Icelanders migrated to Canada and the United States. Nearly all the people belong to the established church, the Lutheran.

Like other Scandinavians, Icelanders are reserved, but kindly and hospitable. Most of them have given up the old national dress for modern clothes. The young people are fond of athletics and sports. They wrestle, skate, ski, swim in hot-spring pools, and dance. Gliding in homemade gliders is popular.

A Book-Loving People

More books are read in Iceland than in any other nation, in proportion to population. Education is compulsory for children from 7 to 14. There are several technical schools. At Reykjavik is the University of Iceland (1911), a coeducational institution with



THE BENEFITS OF THERMAL SPRINGS

Strokkur (left), one of Iceland's spouting hot springs, is a thrilling show for children and adults alike. The tempting bananas (top left) were grown in a greenhouse heated by water piped from hot springs. Part of the power source for the diatomite mine (top right) at Lake Myvatn is also geothermal. The United States and Iceland joined in this venture to mine diatomite, a substance formed from the siliceous shells of microscopic water plants, which has many industrial uses. In Reykjavik, geothermal heat warms a swimming pool (above).

Icelandic Photo & Press Service



HISTORIC COSTUMES OF ICELAND

The national costume is no longer in everyday use in Iceland, but festivals bring out family heirlooms such as these. Note the embroidery on the woman's dress and the handwrought jewelry.

schools of medicine, law, theology, and philosophy, and a famous library.

The Icelandic language closely resembles Norwegian. It has made two great contributions to the literature of the world. First is the *saga* (the Icelandic word for "story"). The Icelandic sagas are stories of ancient heroes, combining fact with legend. Second is the preservation of Scandinavian mythology and traditions (see Scandinavia). It was Iceland's poets and historians who first put these into written form. One of the honored names in world literature is that of Snorri Sturluson (1178-1241), who wrote the Prose Edda (or Younger Edda), a collection of myths and a manual of instruction for poets.

Why did the people of this lonely land achieve so high a level of culture? Part of the answer is that in the isolation of the long winter darkness they whiled away the hours by composing poetry and telling stories. Beginning in the 10th century, professional bards (*skalds*, "poets") traveled from farm to farm. Later, most homes held "evening wakes," to hear some member of the family read aloud. Even on remote farms, children learned to read and write early.

More Than a Thousand Years of History

When the Vikings first visited Iceland in 861, it was already the home of a small Irish colony. The history of Iceland as a nation, however, begins in 874, when Norse colonists reached the island, preferring exile to the tyranny of King Harald the Fair-haired. As they neared land, their chieftain, Ingolf Arnarson, threw the sacred columns of his wooden high seat into the sea and vowed to settle permanently wherever they drifted ashore. Three years later he found them where Reykjavik now stands. These col-

onists were joined by other chiefs and their households. Some of these had fled to Ireland first and so brought Celtic families with them (see Northmen). A liberty-loving people, they met in neighborhood assemblies, *things*, to make local laws. In 930 they established a general assembly, the *Althing*, and about the year 1000 they adopted Christianity.

In the 13th century Iceland lost its hard-won freedom. It fell under the rule first of Norway and then of Denmark. Until late in the 19th century the country was ridden by misfortune. Its trade was exploited by Danish monopoly; volcanic eruptions and earthquakes laid the land waste; plagues killed many people.

In 1874 the undaunted Icelanders obtained the beginnings of home rule. They soon reasserted their

AIRVIEW OF THE CAPITAL

New housing and university facilities are prominent in this view of Reykjavik. To the left of the ponds is the old town cemetery. The old town center is to the rear.



Icelandic Photo & Press Service



PATRIOTIC CELEBRATION IN REYKJAVIK

Iceland observes National Day on June 17, the birthdate of Jón Sigurðsson, 19th-century statesman who sought to obtain

self-government for his country. At the capital, ceremonies take place here near his statue in the central square.

Icelandic Photo & Press Service

historic ability to work for the common good. They established their first co-operative society in 1882, gave women the right to vote in local elections in the same year, and enacted an old-age pension law in 1890. In 1915 women obtained full suffrage. In 1918 Iceland again became an independent nation. It retained the king of Denmark as its nominal monarch but reserved the right to sever this tie after 1943. By popular vote in 1941, Iceland decided to do this.

In 1944 Iceland became a republic. The parliament (still called the *Althing*) meets yearly. Its members elect one third of their number to the upper house; the remaining two thirds form the lower house. The president, elected by popular vote, serves four years.

World War II gave Iceland strategic importance. Since Iceland has no army or navy Britain occupied it in 1940 to keep Germany from seizing it. In 1941 Iceland asked American forces to take over. They built weather stations and defense bases. In 1949 Iceland signed the North Atlantic Treaty.

In 1963 a new volcanic island erupted out of the ocean off the south coast of Iceland. It was named Surtsey. Iceland joined the European Free Trade Association on March 1, 1970, becoming the eighth member of that organization (see International Trade).

ICHNEUMON FLIES. These graceful four-winged insects are not flies but are relatives of wasps, ants, and bees. The females lay their eggs on or near the eggs and larvae of harmful insects. The ichneumon larvae feed on the other larvae and kill them.

Ichneumon flies vary in size, but all have long, slender abdomens with long legs which trail gracefully as the insect flies through the air. From the abdomen



THE SECRET FOE OF OTHER INSECTS

The larvae of the yellow Ophion destroy the caterpillars of the Polyphemus moths after they have made cocoons.

of the female extends a threadlike egg-laying organ called an *ovipositor* ("egg depositor").

They belong to the family *Ichneumonidae* of the order *Hymenoptera*. More than 1,600 species have been described. A large genus is the *Megarhyssa*, which measures ten inches from the tip of the antenna to the tip of the ovipositor. The long ovipositor is used to reach wood-boring larvae.

THESE ARTICLES ARE IN THE FACT-INDEX

Iceland poppy
Ice plant

ICHNEUMON (*ik-nū'mōn*). This is the common name for weasel-like animals of Africa, Asia, and southern Spain that make up the genus *Herpestes*. The Indian species is known as the mongoose (see Mongoose). The name ichneumon is applied especially to the Egyptian species (*Herpestes ichneumon*), also called "pharaoh's rat." It destroys snakes, rats, mice, crocodile and bird eggs, and poultry. The word *ichneumon* is from the Greek. It means "tracker."

THESE ARTICLES ARE IN THE FACT-INDEX

Ickes, Harold L(e) Claire
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Icteridae
Ictinus