THE NATURE TRAIL AT ÖJBERGET

A walk from the Öjbergsmossen bog to a giant's pot hole and over a devil's field to the dwarfed pine-tree-covered meteorite-crater rim of Söderfjärden

Equipment, dress. Normally regular outdoor clothing will do, but during wet periods rubber boots or waterproof hiking boots are recom-mended.

Markings. There are blue markers for the longer trail and yellow ones for the shorter.

Information boards
There is a large information board down by the ski cabin, a smaller one by Markvägen, as well as several small boards at the control up in the outlook tower. In addition to this, there are boards with figures and text at every control site.

Keep dogs on leash.

A friend of nature takes his/her **litter** to the proper place.

Stay on the trail, the nature is fragile.

General information

Maps. See back cover to find your way to Öjberget and the centre-spread for the nature trail

How to find your way to Öjberget. By car or bicycle to Sundom, follow signs to Öjberget (see map). By bus from Vaasa to Sundom; get off at UF-lokalen (the youth association centre - a big, red wooden building), which is 750 metres from the beginning of the trail.

Length and time. The trail is 2,5 km long and it takes at least 1.5 hours to walk it. The shorter and easier trail is 2 km long and begins at Markvägen.

Picnic sites, barbeque site. There is a picnic site above control site 5 and another one by the outlook tower (control site 13). There is a covered barbeque site down by the ski-cabin.

In case you get lost. Stay calm. You are most likely only at a short distance from the trail. Look for colour markers and control sites, comparing these with the map. Do not cross any paved roads.

First aid. Call 112.

Where can I purchase this information leaflet? At the Citizens' Service desk in the City Library, at the Leisure Activities Office (Vapaa-ajan virasto), the City Tourist Information Office and at the local store in Sundom.

The texts can also be found in the following web pages:
Center för lokal utveckling, **www.vasa.abo.fi/luc**
Sundom bygdeförening, **www.sundom.fi**
City of Vasa, **www.vaasa.fi**

Everyman's right and obligations in nature

Thanks to the everyman's right in Finland, you are allowed to move about freely on other people's property. You may, however, not cause any damage, inconvenience or unnecessary disturbance in nature. You may not enter people's yards. You are not allowed to build a fire without permission of the property owner, but you may pick berries and mushrooms. You may not take lichen, moss, birch bark or branches without duly permission. It is prohibited to litter and to damage vegetation.

General

ÖJBERGET

Öjberget is located in Sundom, at a 9 km distance from the centre of Vaasa (see map on back cover). Öjberget is a recreational area of the City of Vaasa and a centre for winter sports and exercise. Its nature is special in many ways. In addition to a description of the history and nature of Öjberget, this brochure contains a map (centre spread) and information about the control sites for the nature trail at Öjberget.

The nature trail is marked out in the terrain with blue markers. Along the 2.5 km route, there are 12 control sites that in words and pictures tell about the area, its development and nature, as well as about the impact of human activity. It takes at least 1.5 hours to walk the nature trail. There is also a shorter and more easily accessible trail that is indicated with yellow markers. It starts from the Markvägen road, where you can also find an information board.

Down by the ski-cabin, there is a general information board about Öjberget, Söderfjärden and Sundom. In the outlook tower there are info boards about what you see in different directions. From Markvägen, where there is also an info board, you can access the shorter and easier route for people who have difficulties in moving about in the terrain.

All information can of course not be found at the controls. By reading the brochure and by making your own observations, you can familiarize yourself with the special nature of Öjberget, enrich your knowledge of nature in general and learn to move around in nature without damaging it.

The nature trail at Öjberget was originally planned by biologist Ilkka Mäkelä and was completed in 1988. Within the framework of a POMO+ -project (national, municipal and private funding for rural development) a new outline, new controls, a new brochure with partly new texts and illustrations, as well as an information board and an outlook tower has been planned. The plans are realized with funding from the EU:s regional developement funds.

The project has been realized at the Centre for local development, Centre for continuous education at Åbo Akademi, Vasa. The texts are written by **Matts Andersén, Peter Edén, Ingvar Fagerholm** and **Liselott Nyström**, who has also done the illustrations. Frida Crotts translated the text into English. The Sundom Village Association, the Leisure Activities Office at the City of Vaasa, the Astronomic Association Andromeda and the Vaasa Environmental Association have also participated in the project.

Special area plan, Recreational area of the City of Vaasa

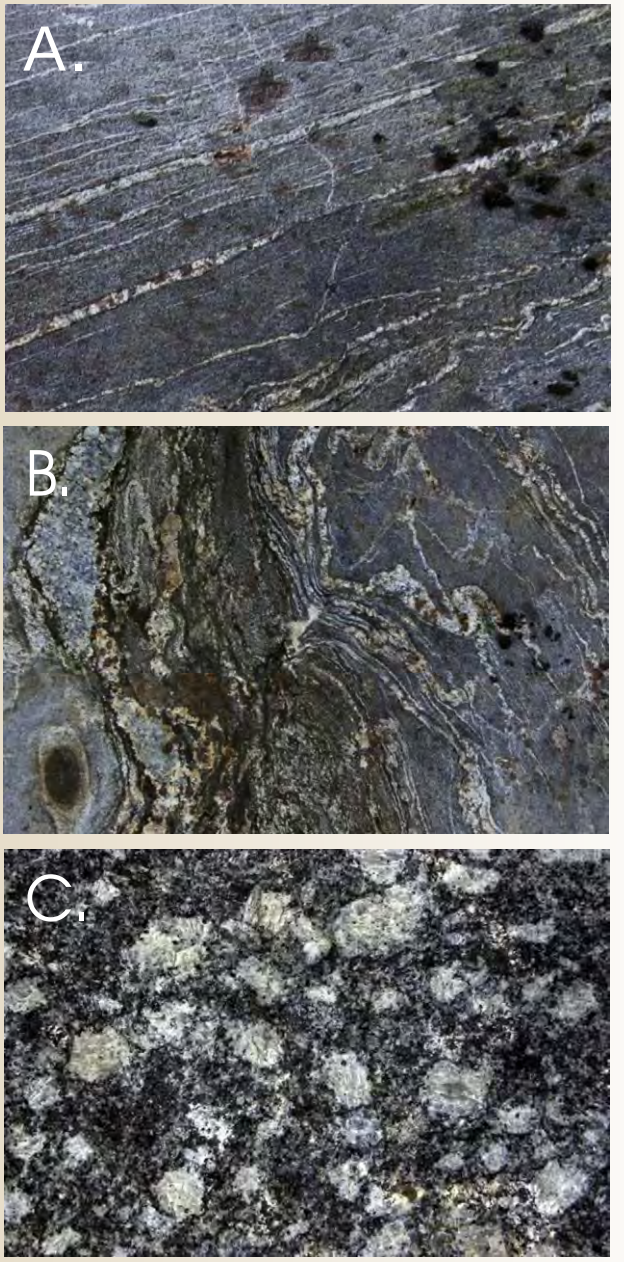
In 1997, the City of Vaasa made a special area plan for Öjberget as a part of the general plan. According to this document, the area is intended for outdoor activities, sports and recreation. The plan also stipulates that large parts of the area should be protected as a nature conservation area.

THE HISTORY OF ÖJBERGET

Geological development

Öjberget, or the "Island Mountain" as it would translate into English, is a unique ”mountain landscape” for the Ostrobothnian coast, with its highest point at an elevation of 50 metres. It has a long history that includes many revolutionary happenings. It all started with sand and mud settling in layers at the bottom of a sea about 2.000 million years ago. In the course of millions of years, these layers hardened into sedimentary rock (sandstone, clay stone). In the folding of the Svecofennian mountain chain about 1.885 million years ago, these sedimentary rocks were forced 15 kilometres down into the earth’s crust and were transformed under great heat and pressure into new types of rock (gneiss and granite).

Mica gneiss is the least transformed rock type in the area. Its colour is grey, and the original layering is easily seen. Narrow veins of light, melted material are common. Stronger vein formation transform mica gneiss into veined gneiss, in which layering can still be distinguished. In places, the sedi-



The most common rock types in the Öjberget area A. Mica gneiss. B. Veined gneiss C. Vaasa granite (diatexite).

mentary rocks underwent a total melting and at a later cooling the material was crystallized into diatexite, which is a grey rock type that normally has large, white grains of feldspar. It is traditionally called “Vaasa granite”.

All kinds of transitions between these three types can also be found. The melted material has often formed light, intersecting veins in partially transformed gneiss (see control 1). The brown, round or drawn-out “circles” (concretions) that can be seen in many places have been formed by precipitation of lime material when the sediments hardened to rock and have been preserved in the later transformation. Due to weathering and erosion over hundreds of millions of years, these rock types can be seen today at surface level.

The round crater of Söderfjärden ("the Southern Bay") was formed approximately 520 million years ago in a meteorite impact event, and the surrounding edges, including Öjberget, were elevated to a rim of mountains probably more than 1.000 m high. The crater was later filled with sediment and the rim was ground down. The area got its final shape as the result of several ice ages and the uplift from the sea.

Ice ages and land uplift

Fennoscandia and Finland have been covered by continental ice sheets several times during the past two million years. The continental ice first scraped off loose material and then polished the bedrock. Large amounts of the material were later deposited as a blanket of moraine. In this area the ice came from the north (from the direction of Vaasa) and evened out the northern slope and the crest of Öjberget (control 12). On the lee side (the southern slope), the mountain is still rough and the terrain rocky (the ascent between controls 4 and 5). Even large boulders were transported shorter or longer distances and such glacially transported boulders are a common sight on Öjberget (control 9). At the melting of the ice, ridges (eskers) were formed (control 1) as well as a giant's kettle (control 6). When the last continental ice sheet melted, around 10,000 years ago, the area was covered by a 250-metre-deep sea.

For hundreds of thousands of years, the continental ice had pressed down the earth’s crust, which, when

the pres-sure lightened, started rising to get back to its original level. In the beginning, this uplift of the land was fast, over 10 m in a hundred years, but the pace has gradually dec-reased and today it is approxi-mately 8 mm a year (80 cm / 100 years). About 4,500 years ago, the summit of Öjberget reached above water level (control 11).

Archaeological excavations have revealed charcoal, quartz flakes and burned bones beneath an erratic boulder. The bones were by the coal14 method proved to be 3,800 years old, which is late Stone Age. On this island, which at that time was far out in the sea, there has been a station probably for hunting seals and fishing. The boulder provided a shelter for the Stone-Age people, where they could prepare their meat on open fire. Today the site is about 46 m above sea level.

At the beginning of our calendar, the Öjberget island was already elevated to 30 metres above water level. At the end of the Iron Age, about 1,000 years ago, Öjberget was located in the centre of a large island, which extended from Sundom to Södernäset, "the South Peninsula". Today's Översundom and Yttersundom constituted separate islands. The land uplift eventually connected Öjberget to the main land and year after year the sea can be seen further and further away at the horizon. If the land uplift continues at the same pace as today, people will be able to go dry-shod to Sweden in a little over two thousand years.

In the course of the land uplift, different processes have eventually transformed the landscape and nature of Öjberget into what they are today. The breakers washed the highest and most exposed flat rocks clean (controls 5, 11, 12), but on some shores large quantities of stones were left as so-called devil's fields or rubble-stone fields (control 10). The material that was washed away was deposited as sand layers around the edges of Söderfjärden or as clay further out in the bay. There is also clay in the hollow west of Öjberget (controls 1 and 3), on top of which a mire has formed after the uplift from the sea (controls 1, 2).

The land uplift is illustrated by signs in the ascent between controls 4 and 5. By Mark-vägen, on the slope toward Söder-fjärden, there are also three rocks with indications about

Meadow-sweet
Filipendula pratense (L.) Maxim

the time elap-sed since the sea was at the level in question.

Flora and fauna

The flora of Öjberget can be divided into three main types: 1. the forests in the crest area of the mountain, impediments, devil's fields, and barren, sandy heathlands, 2. the dry, sandy heathlands of the slopes, 3. wetlands and wet, sandy heathland forests in the hollows.

Up in the crest area, the terrain is barren and the climate unfavourable. There are dwarfed pine-trees, lichen, heather, lingonberries and crowberries. Birch, mountain ash, aspen and spruce can also be seen. Small marshes with wild rosemary appear in hollows of the rock.

Down on the slopes, the conditions for the vegetation improve thanks to water that runs down from the top, transporting nutrients as well. The dominating forest type is dry, or moderately dry, sandy heath, where lingonberries grow. The share of spruce and broadleaf trees increases on the lower slopes. In the field area one can find blueberries and twinflower side by side with lingonberries and heather.

In the lowest areas, the woods are mainly composed of wet heathlands, where blueberries grow. All common tree types are represented: spruce, pine, birch, aspen, alder, mountain ash, bird-cherry, willow and osier. Dense spruce forests have almost no ground cover, although wood sorrel,

forest bracken and northern bracken can be found. Blueberry-type woods and grove-type broad-leaf woods present a great number of plant species. In the lowlands there are also overgrown meadows as well as mires and marshes.

Öjberget provides its fauna very diverse living environments thanks to the varying terrain. The bird fauna is especially varied. A large number of birds breed in hollow trees, and there are also a few rare species as well as some “wilderness species”. In the pine forests of the crest, the tree pipit and the spotted and pied fly-catchers are common species.

On the slopes and in the lusher woods and valleys, chaffinches, willow-warblers, robins and song-thrushes dominate. In the spruce woods there are tree-creepers and bullfinches, to mention a couple. In the grove-type woods there are e.g. garden warblers, blackcaps and scarlet rosefinches, but also wilderness birds such as the eagle owl, pygmy owl, black woodpecker and mistle-thrush.

The landscape and the nature have also been influenced and transformed by human activities. The most distinct traces are the downhill slope, the additional elevation of the crest, the gravel pits, the parking lots, as well as roads and exercise tracks. Other interferences are described in connection with several of the controls.

Later history, winter sports

In the past, the distinctive nature of Öjberget has made a strong impression on the inhabitants of Sundom and has given rise to numerous tales (The Iron Ring of Öjberget, the Öjberget Elves, the Siren of the Woods and the Mountain King). Before the draining of Söderfjärden in the 1920s, the meadows and fields around Nysvedsberget were used for agriculture and pasture. Today the land is no longer used for cultivation.

From the 1930s and onwards, Öjberget has been associated with winter sports. From that time there has been a ski-cabin, the Öjberget Cabin, and even a ski-jumping slope until 1961. Big, international ski-contests were arranged annually into the 1960s. The first ski lift was inaugurated in 1967 and since then downhill skiing has dominated, even though cross-country skiing has always been popular in the excellent terrain. The City of Vaasa owns the area and the buildings since 1971.

Aerial photograph of Söderfjärden with surroundings. (Medihuset/Anders Wiik 1998)

THE METEORITE CRATER OF SÖDERFJÄRDEN

Söderfjärden, just south of Öjberget, is a rare place with a vertiginously long history. The peaceful plain conceals many dramatic and unusual elements, worth while getting acquainted with. There are many reasons for seeing Söderfjärden, such as the following:

Söderfjärden was created by a meteorite impact about 520 million years ago and there is still a well-preserved crater bowl inside a circle of border mountains. "The most beautiful meteorite crater of Finland," measuring 5-6 km across and more than 300 metres deep, is filled with younger sedimentary rocks, e.g. Cambrian sandstone. There are eight other known meteorite impact

The view over Söderfjärden from Öjberget.

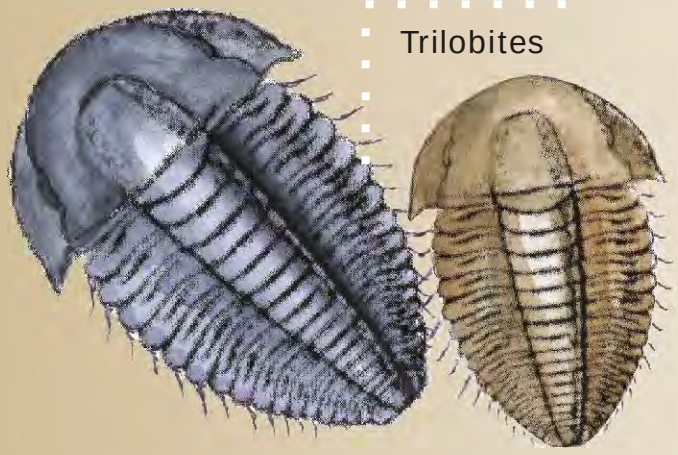
craters in Finland, but they are all water-filled, irregular lakes. Söderfjärden is a unique place on earth, since there are only some 180 known meteorite impacts on our planet.

Söderfjärden is an illustrating example of what happens when celestial bodies collide with earth: The blind bombardment from space, the explosive coming into being of the crater in a cloud of fire, steam and melted stone, followed by devastating consequences, extinction of life and shock-transformed material. Only nuclear explosions can be compared with such primordial force of the universe. A gigantic meteorite impact 65 million years ago, in present Mexico, most probably contributed to the extinc-

tion of the dinosaurs. Over the past few years, asteroids and comets that may collide with the earth have been in focus through films, newspapers, magazines, and scientific discussions.

Here we can study the history of earth from ancient to present times. In the course of millions of years of continental drift, the area has passed the equator at least twice. During the long history of the crater, life on earth has evolved from

The pump stations at Söderfjärden.



Trilobites

primitive organisms to the nature of today. In samples drilled from the very heart of Söderfjärden, there are embedded fossils of small invertebrates, e.g. trilobites and brachiopods. This gives perspective on the development of life.

In the deposits of the crater bowl there are traces of several ice ages. After the latest ice age, the land has risen from the sea, at a present rate of some 80 cm in a hundred years. Due to the land uplift, Söderfjärden mirrors the development over more than two millenniums. During the Iron Age, this was part of the outermost archipelago; remains of a dwelling in Sundom tell about a fishing position on an island far out in the sea. There is evidence of seine fishing in the Middle Ages. During the following centuries fishing got a lesser position while agriculture and pasturage increased on the slopes of the bay. A hundred years ago, sedge and seaside arrow grass were gathered as cattle-feed. Broad belts of reed gave roof material and pillow stuffing.

In the beginning of the 20th century, Söderfjärden became subject to a gigantic drainage project, the largest in Northern Europe. The outlet canal, Riddardiket or the Knight Ditch, was made deeper and several kilometres worth of ditches were painstakingly dug by hand, turning up spadeful by spadeful of the clingy mud. A special law, "Lex Söderfjärden" was instituted in order to safeguard the drainage. In

1926, the drainage was completed and large acreages were reclaimed. Söderfjärden became the kingdom of the Ostrobothnian barn. At the most, there were around 3000 barns, of which less than a hundred are left.

For close to 80 years, pumps have kept Söderfjärden drained. The older pump station has been made into a museum about the drainage. The newer pump station from the 1960s is also set up as an art museum that mirrors the development of Söderfjärden. The three monumental murals by Eivor Holm would place well even in a national art collection. The ceiling painting with a meteorite motif by Paula Blåfield and the harvest picture by Nils Nygren complete the unique art collection. In 2002 the collection was added on to with three more paintings by Nils Nygren, Kaj Smeds and Tapani Tammenpää.

Today, Söderfjärden is a pipe-drained plain with a total of 2 300 hectares (5,683acres!) worth of fertile farming land. Environmentally sound regulated pipe drainage was completed in the late 1990s. The agriculture of Söderfjärden is modern, alive and well. The area is also a paradise for birds. Cranes, for instance, rest here for several weeks in the autumn. In the autumn of 2002, close to 6000 cranes were counted in one single day, which means that Söderfjärden is by far their most important resting place in Finland. The cranes provide a good motivation for including Söderjärden in the Natura 2000 EU-programme, and owing to its agricultural traditions, the area is also classed as a nationally precious landscape protection area.

ASTRONOMY

Local astronomers often come to Öjberget and Söderfjärden to observe the night sky or to photograph it and the phenomena of the atmosphere, such as northern lights. The astronomic association, Vaasan Andromeda, has a couple of platforms for their telescopes on the summit of Öjberget. According to the specific area plan, there is a land area on the slope by Markvägen reserved for an astronomical observatory. The drawings and calculations are already made and the project will, hopefully, be realised in the next few years.

In addition to club nights on a regular basis and astronomy nights at Vaasa Opisto (an institute that offers night classes), Vaasan Andromeda arranges observation sessions when the weather is favourable and when something special such as comets, planets or shooting stars can be seen in the starry sky.

You can travel millions of years back in time and let your imagination flow when you observe the universe at distances of hundreds of billions of light years through Andromeda's telescope. The public observation sessions are announced in the local newspapers.

For closer details you can visit the Andromeda home page: **www.ursa.fi/yhd/andromeda.** You can also get to the page through **www.vaasa.fi**, then clicking on "links", "organizations" and "Vaasan Andromeda ry".

Internet:

Center för lokal utveckling,
www.vasa.abo.fi/luc/soderfjarden.index.htm
Sundom bygdeförening, **www.sundom.fi**
City of Vasa, **www.vaasa.fi**
Geology of Söderfjärden,
www.gsf.fi/paleo/files/soderfja.html

Reading:

Sundom bys historia I - Byn som steg ur havet. . Vasa 1994.
Pelle Kevin: Brochure ”Impact Söderfjärden”. Sundom bygdeförening
Peter Edén: Utvecklingsplan för Söderfjärden. Sundom bygdeförening
Peter Edén och Linda Södergran: Temaplan för utveckling av byarna i Söderfjärden-området. Center för lokal utveckling, Österbottens högskola
Öjberget. Delgeneralplan. Vasa stads planeringsverk.
Juha Kinnunen. Raportti Öjbergetin alueen luontoinventoinnista. Vasa stad, miljökontoret 1996

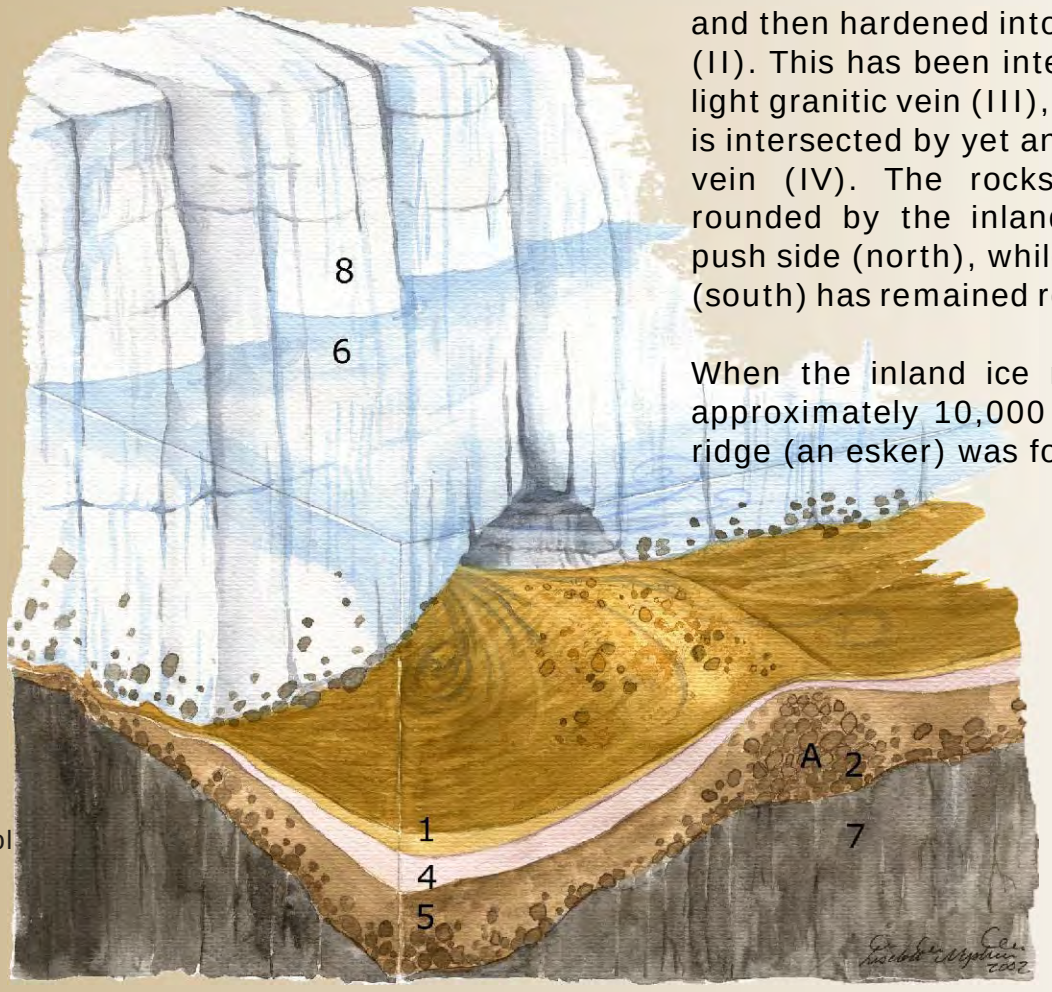
Other:

Movie ”The Story of the Meteorite Crater. Söderfjärden”
and a CD. Sundom bygdeförening.

The nature trail

1. The gravel pit, geological development

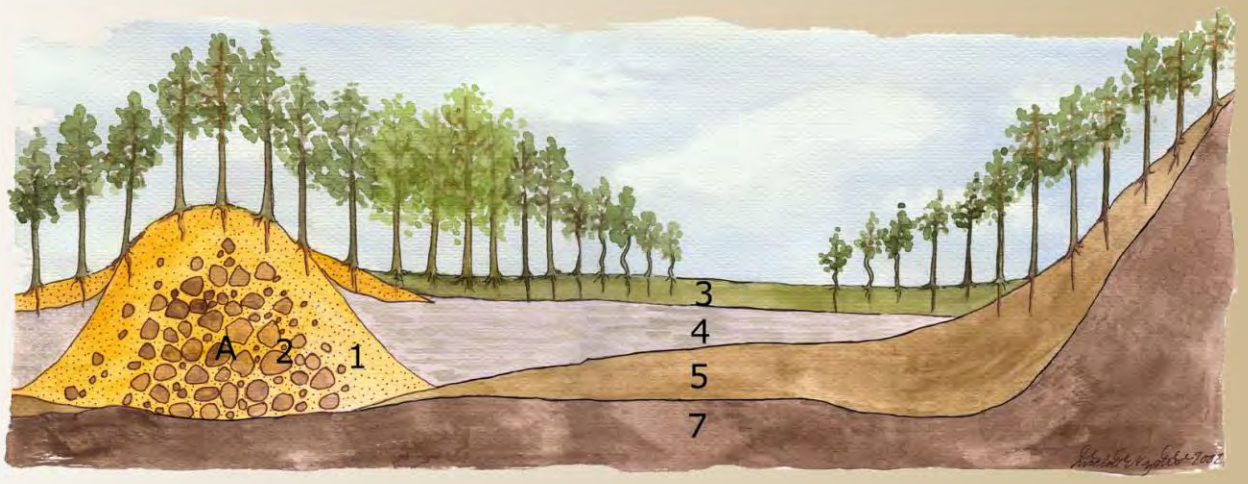
Here we see a flat rock, polished by the inland ice. It is composed of four different generations of rock (see markings on the rock), which were formed more than 1,800 million years ago. The dark fragments (I) are the oldest and consist of mica gneiss. The main part was formed by melted material that tore off fragments from the bedrock as it was surging from the interior of the earth and then hardened into grey granite (II). This has been intersected by a light granitic vein (III), which in turn is intersected by yet another similar vein (IV). The rocks have been rounded by the inland ice on the push side (north), while the lee side (south) has remained rough.



When the inland ice melted here, approximately 10,000 years ago, a ridge (an esker) was formed by ice-

Control 1

The gravel pit, geological development



river gravel and sand in a north-south direction (see figure). During the past decades man has dug away the gravel, which is why we now see a series of pits in the direction of the original ridge. At the northern end, toward the parking lot, you can see a layer of sand at the right-hand edge of the ridge. This could be a part of the original ridge, but more probably the waves of the sea have afterwards washed down the material from the higher parts of the ridge. Along the eastern edge of the pit you can see a layer of clay-silt at the bottom, which was deposited at the bottom of the sea after the ice age. On top of this, there is a layer of dark peat moss that was formed of decaying moss.

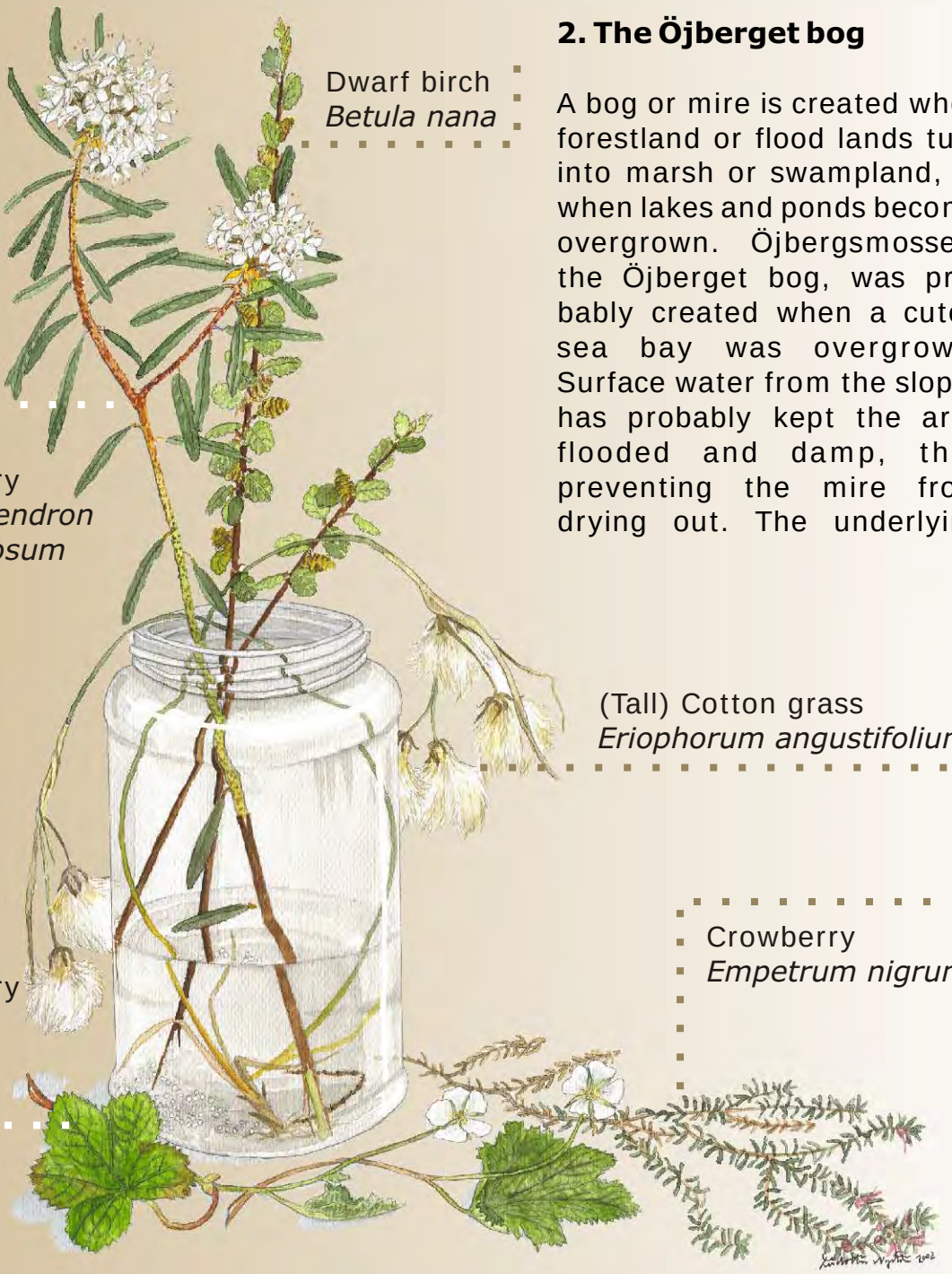
Ridges are excellent ground water areas. This area works as the city's ground water reservoir during times of crisis. Due to the gravel pits, however, the ground water rises up above ground level, which affects the water quality.

A	Ridge
1	Sand
2	Gravel
3	Peat
4	Clay, silt
5	Till
6	Sea level (preseeding page)
7	Bedrock
8	Ice sheet (preceeding page)

Control 1

2. The Öjberget bog

A bog or mire is created when forestland or flood lands turn into marsh or swampland, or when lakes and ponds become overgrown. Öjbergsmossen, the Öjberget bog, was probably created when a cutoff sea bay was overgrown. Surface water from the slopes has probably kept the area flooded and damp, thus preventing the mire from drying out. The underlying



clay makes the water stay. The growth of the mire, i.e. the layer of peat moss, probably started about 1,000 years ago.

The Öjberget bog used to be an open tree-less mire that was flooded every spring. Between the control and the gravel pit there is another type of mire: a bog with dwarfed pine trees. The surface of the bog is covered by tufts of haircap moss and bog moss. On top of the blanket of moss you can find cloudberries and trailing, thin-sprigged cranberries, as well as larger plants such as cotton grass and shrub-type plants with thicker stems, such as dwarf birch, wild rosemary and crowberries.

On the edge toward the gravel pit (control 1), there is a dense clump of wild rosemary and a few large common alders. Common alders of this size are becoming more and more rare.

People say that you can find the best Nordic forest berries on the mires. The most important kind is probably the cloudberry that has many names in Finnish: *lakka, hilla, suomuurain, valokki, nevamarja*, which tells something about its popularity.

Control 2

The cloudberry is a berry of Northern Finland; in the south, cranberries yield a much better harvest. Cloudberries grow on humid, but not excessively wet, surfaces with bog moss but they can also handle more barren growth areas. Sparsely treed mires and marshes with a little denser vegetation are some of the best cloudberry areas, but open mires can also yield good cloudberry harvests. The weather conditions, especially the occurrence of frost, is a contributing factor to which type of mire is the best cloudberry mire of the year in question. In late summer you can also taste cloudberries on the Öjberget bog.

Human activity, such as the gravel pit and a ditch across the mire, has changed the course of nature. The mire has become drier and the growth of trees has increased. The mire is developing into a forest.


VASA VAASA 9
Sundomvägen Sundomintie
Öjbergsvägen Öjbergintie
Föreningshus
Nuorisotalo
Kyrka
Kirkko
SUNDOM
SOLF SULVA 7
Solfvägen Sulvantie
MALAX 12
MAALAHTI
Gamla Öjbergsvägen
Vanha Öjbergintie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Skidcentrum
Hiihtokeskus
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Liselott Nyström
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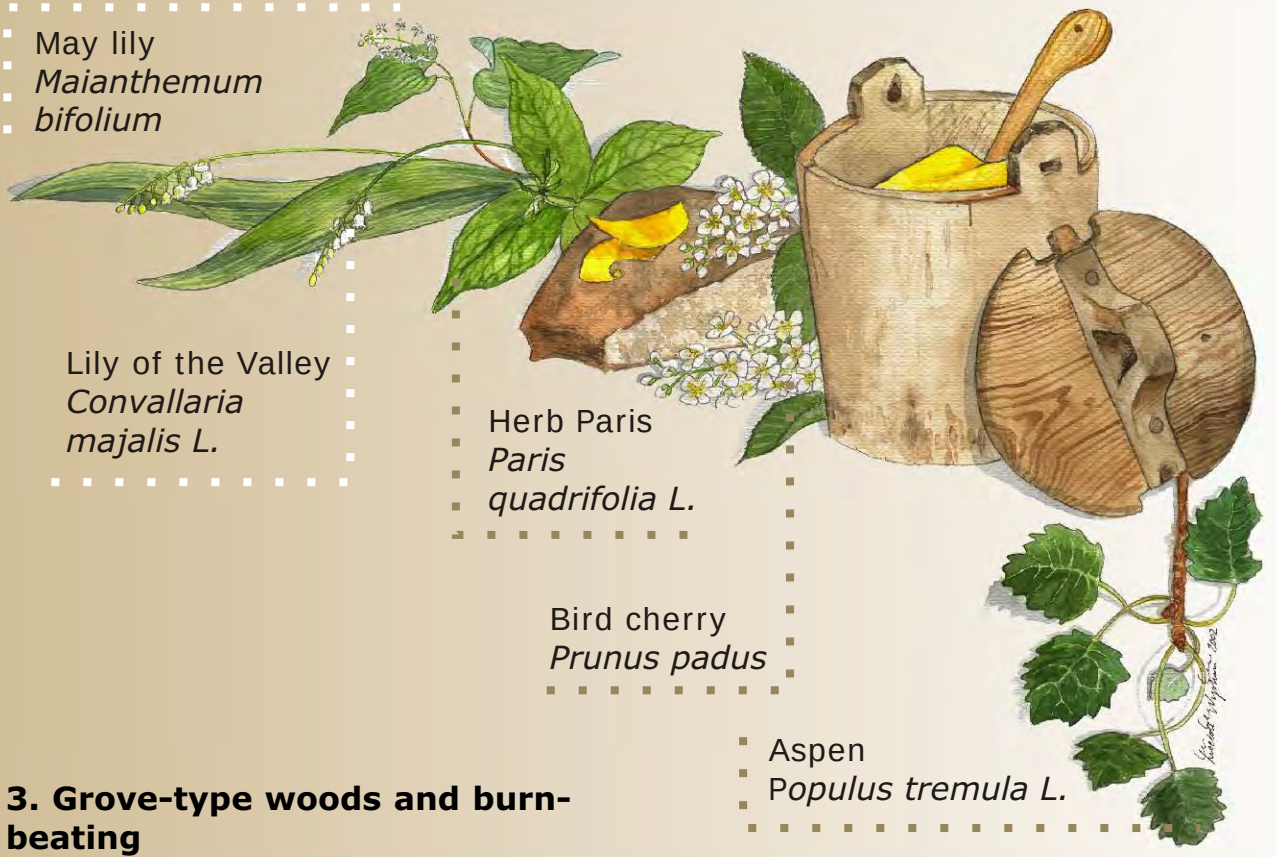


3. Grove-type woods and burn-beating

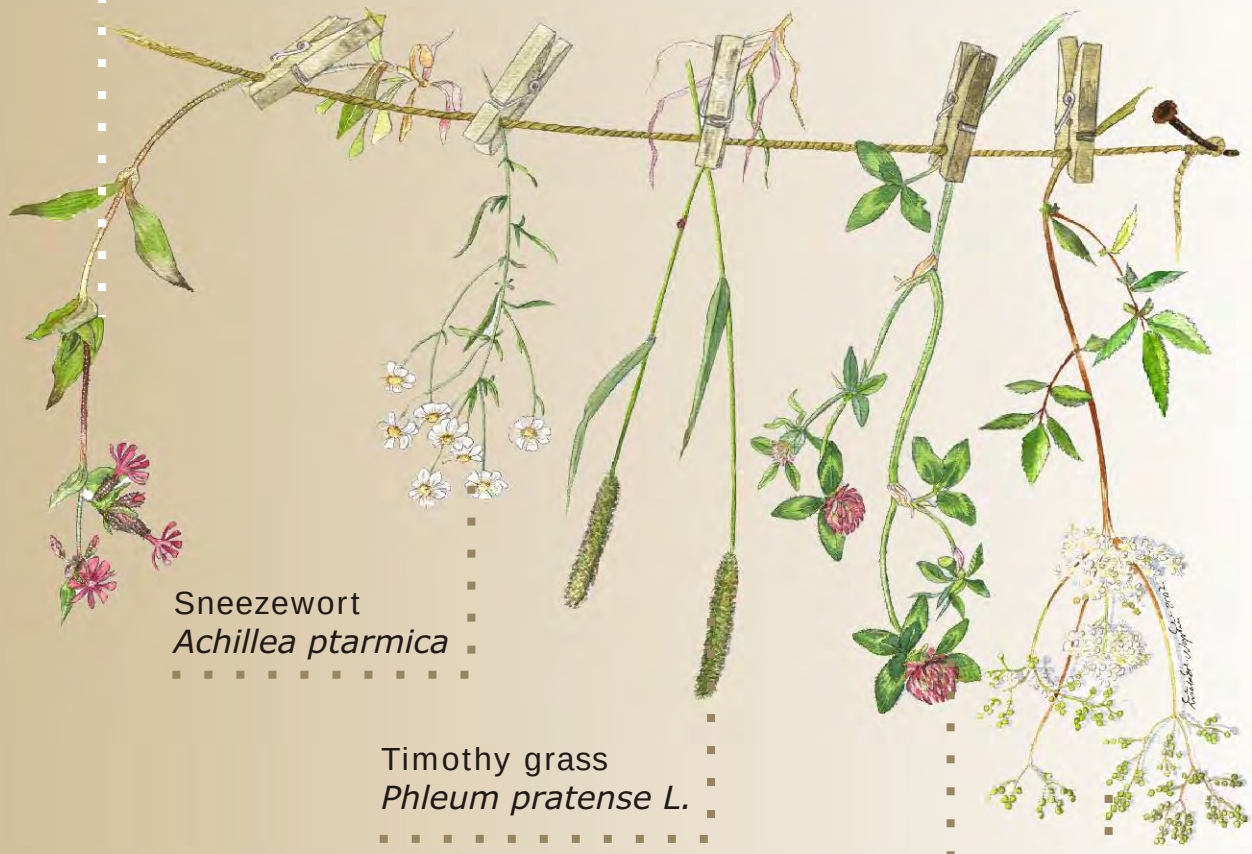
The area that you just walked through is dominated by vegetation that characterizes grove-type woods in our area, such as bird-cherry, mountain ash, lily of the valley, two-leaved maianthemum and one berry (also called Herb Paris or true love). These species require a rich, nutritious soil in order to thrive. Many insectivorous migratory birds, such as the garden warbler and the mocking-bird, also prefer grove-type woods.

Elk also like grazing the succulent undergrowth. The grovetype woods are often humid and sheltered from the wind, which makes them a paradise for mosquitoes! On more southern latitudes in our country, the trees found in the grove type woods are hardwood trees such as maple and linden.

Until the 18th century, burn-beating was commonly practiced also here in Ostrobothnia. This wild meadow

has probably, if one judges from its name Nysveden (newly burn-beaten land) been used for cultivating rye through burn-beating. This was carried out in the following manner: First you selected an even area in the forest, on which all trees and shrubs were cleared early in the summer. The brush was then left to dry over the summer - the drier the summer the better. In the late summer the field was ready to burn. The people took their positions by the fire, equipped with pine branches that they used to keep the fire under control. The rye could be sown in the ashes two days after the brush had burned down. It wasn't until late in the following summer that the rye was ready to be harvested. Then they cut, bound and shocked the rye. It was dried in the kiln and later threshed with flails until all the grains had fallen out of the rye ears. In the mill, it was ground into flour, out of which the housewife then could bake rye bread or make porridge. The straw was used e.g. to make straw roofs on the outbuildings.

Nysveden was burn-beaten in the early 1990s according to old methods in the project "From burn-beating to bread," conducted by Vasa arbis and The Sundom Village Association. Sundom local TV made a documentary about the project.



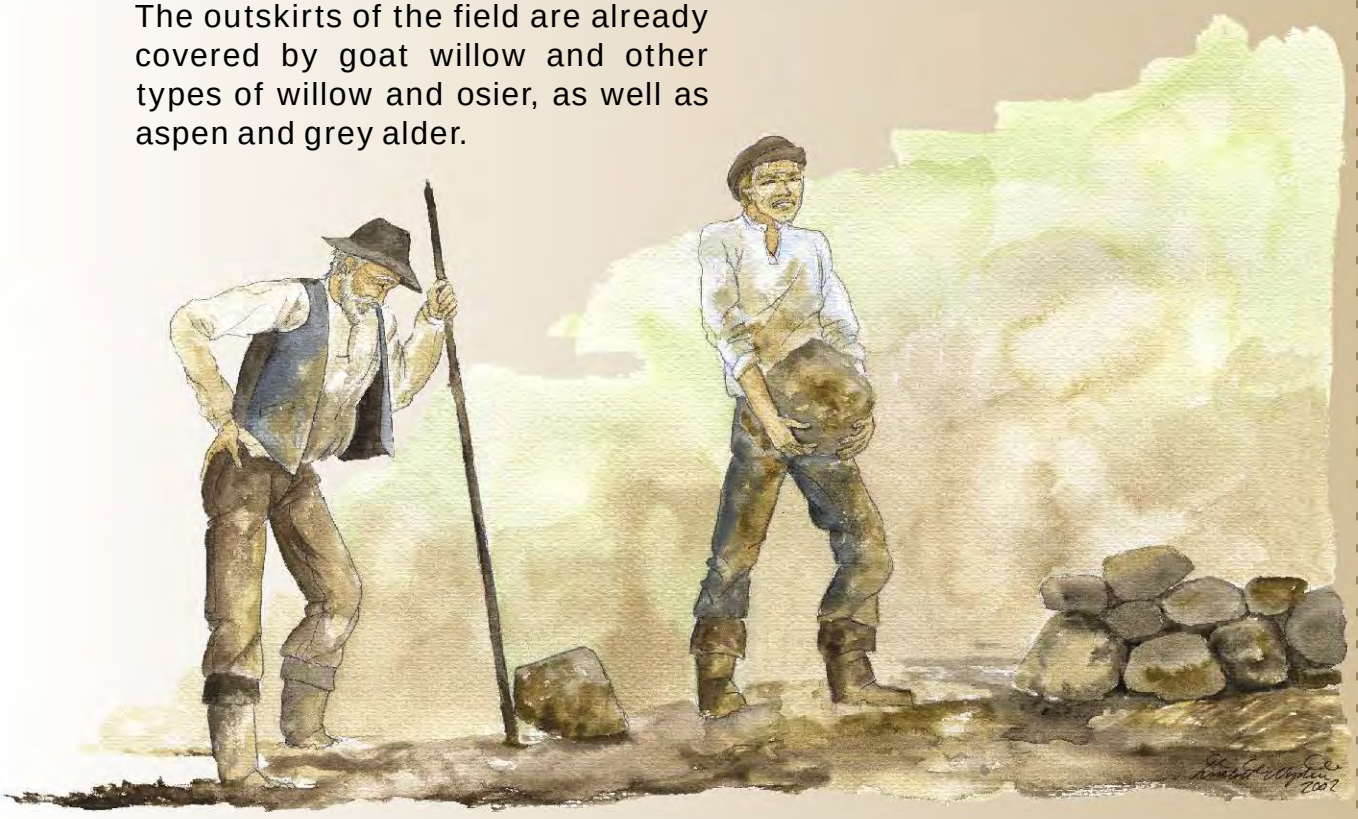
Control 3

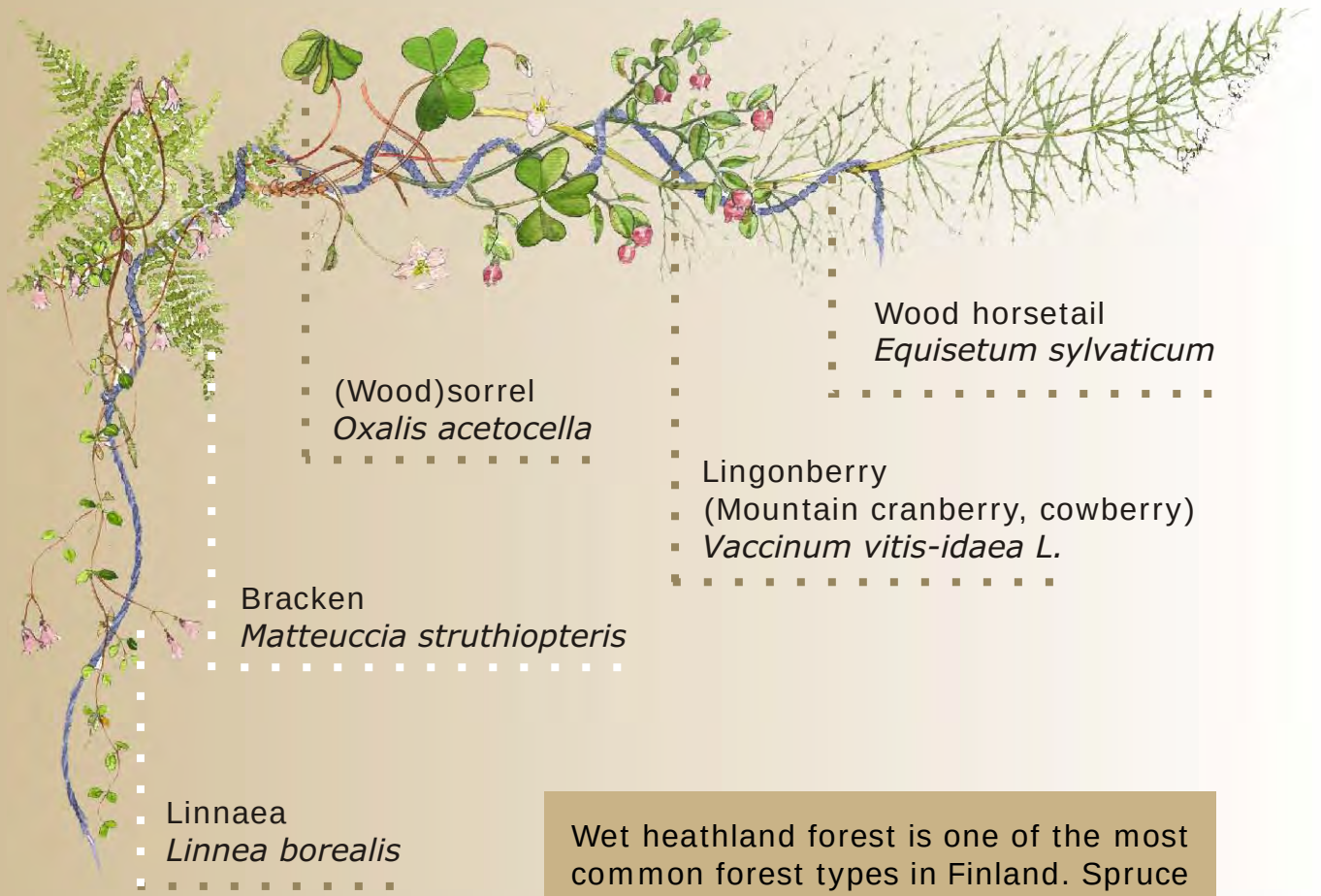
Since the latest burn-beating, the meadow has been taken over by a flora that is rich in herbs such as harebells, red campion, sneezewort, timothy grass, meadow-sweet and red clover.

4. Wet heathland forest, deserted fields

If you look behind, you can see an old patch of arable land, which, in the old days, was harvested for its hay that was so vital for the cattle. It was most likely timothy grass that was last grown on this field. Today, timothy is however, about to lose its place in the struggle for habitat. In the middle, the field has been invaded by meadow-sweet, fire-weed, hogweed, cow parsley, creeping thistle and couch grass. The outskirts of the field are already covered by goat willow and other types of willow and osier, as well as aspen and grey alder.

The old stone wall on the northern edge, which can be seen at a 40 m distance, bears witness to the hard work that was once done in order for the field to be arable. If humans stay out of the development of this area in the future, nature will eventually take back what it once had to part with.





Wood horsetail
Equisetum sylvaticum

(Wood)sorrel
Oxalis acetocella

Lingonberry
(Mountain cranberry, cowberry)
Vaccinum vitis-idaea L.

Bracken
Matteuccia struthiopteris

Linnaea
Linnea borealis

Wet heathland forest is one of the most common forest types in Finland. Spruce is the dominating tree type and it shades other vegetation with its dense branches. If you walk deep into an old spruce forest, you can feel the coolness due to the shading effect of the dense branches. Blueberries thrive in sparsely treed heathland forests, whereas if the branches get too dense, mosses will take over. Birds that like singing here are the song-thrush, the chiffchaff and the robin.

Control
4

Stay on the trail in this fragile environment.

5. Mountain vegetation

Mountain slopes are exceptional vegetation areas. Within very short distances, the growing conditions can change from one extreme to another, which can be seen in a varied, mosaic-patterned vegetation. On a mountain, you can find ledges that are dry as tinder next to mire-type hollows, or sunny, warm, southern slopes on one side and dark, shady, northern slopes on the other.

The changing of the seasons also makes its own contribution; a growing area that is warm and sunny in the summer can often be free from snow and extremely cold in the winter. The rocks of Öjberget were already covered by lichen when they were but a rocky skerry in the sea and the ice masses had ground off loose soil and nutrients from the cliffs.

The lichen have adapted to harsh climate conditions, where most other organisms cannot survive, and they can stand long periods of draught and cold. Their ability to survive even through the hardest times is due to different kinds of resting periods. These pioneers of the flora are composed of two different organisms: algae and fungi. The fungi component manages to extract water and nutrients from the barren rock, whereas the algae component assimilates nutrients using chlorophyll.

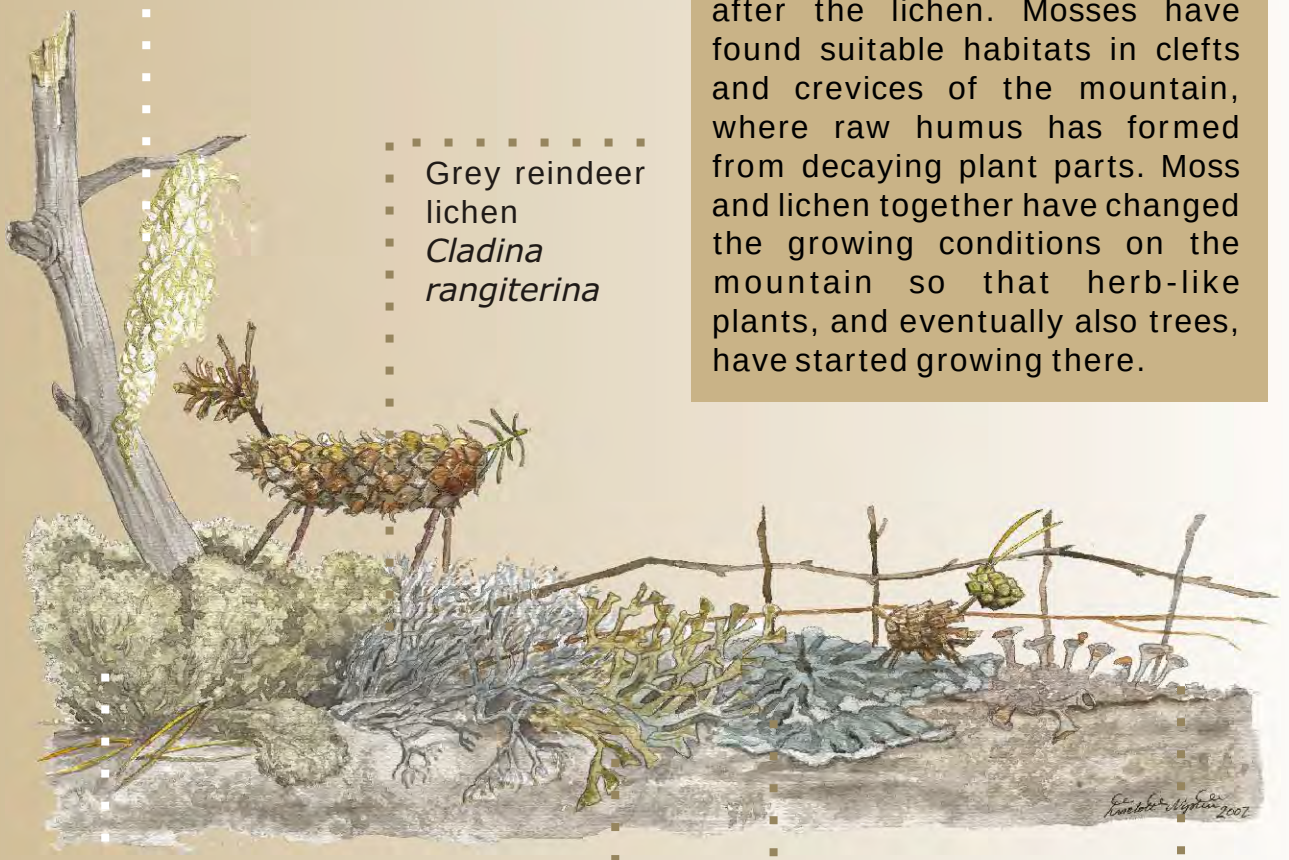
There are many different species of lichen around the control site, such as grey- and white reindeer lichen (window lichen), trumpet lichen, common coral lichen, as well as navel lichen, which are fastened to the rock through their navel. Many species only grow a few millimetres a year.

By the control site, the bedrock consists of Vaasa granite bedrock, which has cracked in a manner typical for granite-type rocks. The horizontal cracks in the same direction as the surface of the rock have caused the terrace-like formation. The slope was on the lee side of the continental ice sheet, which explains why irregularities and boulders have been preserved.

Beard lichen
Usnea filipendula

Grey reindeer lichen
Cladina rangiterina

Mosses and herb-type plants did probably not gain a foothold on Öjberget until thousands of years after the lichen. Mosses have found suitable habitats in clefts and crevices of the mountain, where raw humus has formed from decaying plant parts. Moss and lichen together have changed the growing conditions on the mountain so that herb-like plants, and eventually also trees, have started growing there.



White reindeer lichen
Cladina stellaris

Tube lichen
Hypogymnea physodes

Iceland lichen
Cetaria islandica

Trumpet lichen
Cladonia fimbrata

Control 5

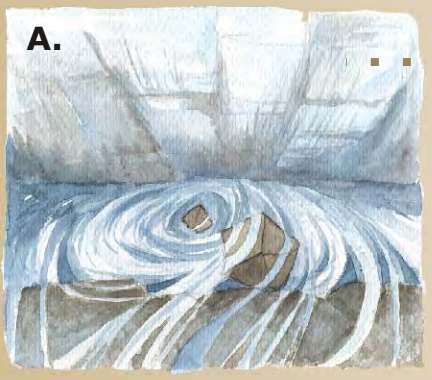
6. Giant's kettle and abrasion niches

The smoothly ground rocks and niches on this slope are probably the result of stones and gravel whirling in a meltwater stream or torrent during the ice age. They are possibly polished further by the sea waves.

In the course of the last ice age, probably during the melting stage more than 10,000 years ago, a heavy stream or torrent under the ice set big stones into a rotating motion in this place. With time, the whirling stones ground a deep hole in the rock = a giant's kettle. One of the walls in the giant's kettle was at some point pressed out by water or ice. Matts Andersén found this giant's kettle on Öjberget in 1984.

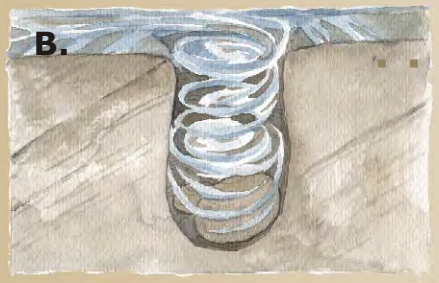
A typical giant's kettle is of an almost cylindrical shape and its bottom is rounded and even. The size can vary from small hollows to holes that measure several metres across and are more than 10 metres deep. In the old days people believed that giants had carved out the kettles to cook their food in.

Another possibility is that this is a marine kettle and abrasion niches formed by the strong sea breakers about 4,000 years ago. At that time there was no archipelago giving shelter against the breakers. Pebbles and gravel acted as abrasive in the same manner as when a giant's kettle is formed. But in this case the whole slope on this level should be formed in the same way. Because only a restricted part is ground, the forms were probably shaped in an ice-age stream and are possibly polished further when the sea was at this level.

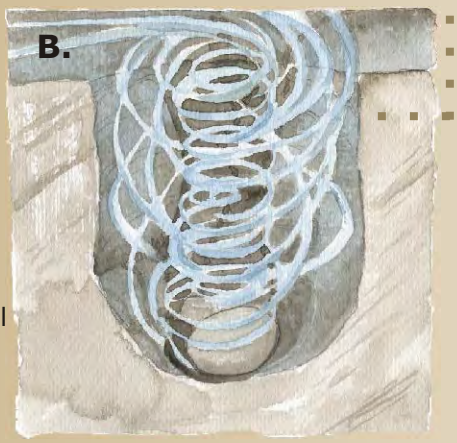


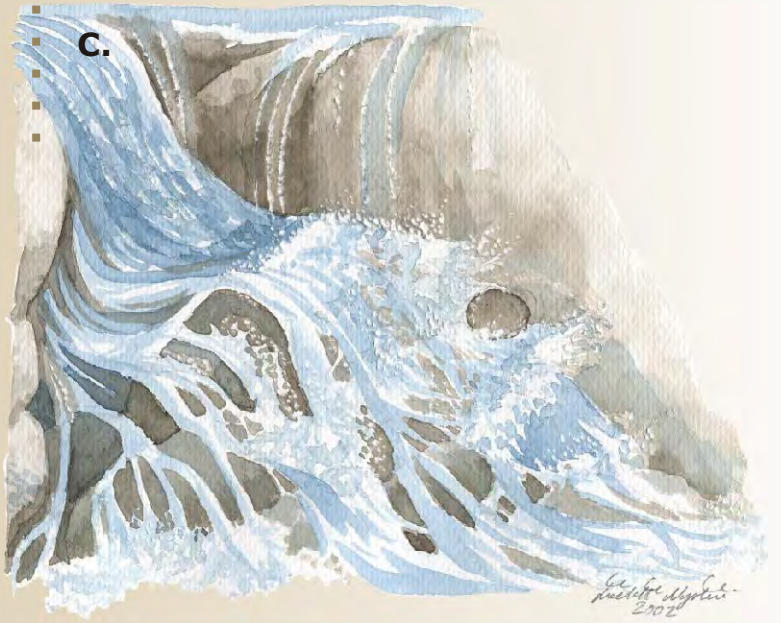
A. Meltwater running over uneven bedrock slopes under the ice. Stones are captured in whirls in depressions in the bedrock surface.

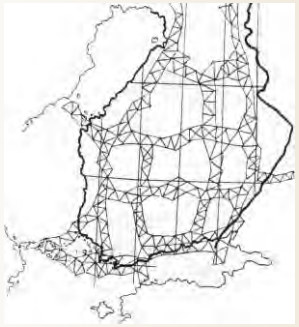
B. The whirling stones and the water grind a hole in the bedrock. The hole is growing into an even, cylindrical giant's kettle.



C. The walls in the giant's kettle are weak due to fractures in the bedrock. One wall is torn away by running water or ice.







7. Triangle-measuring tower

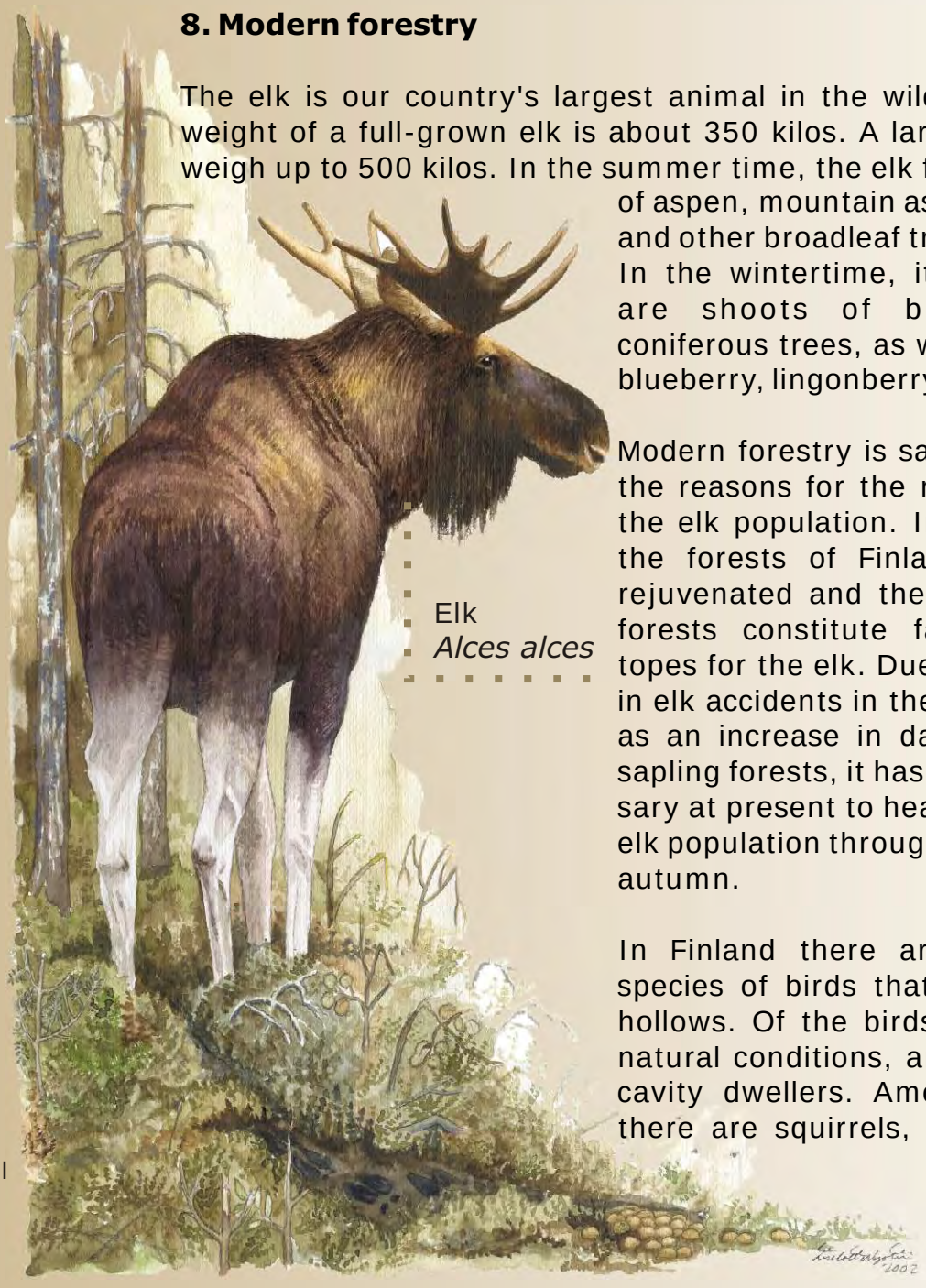
Below this sign you can still see rusty, broken, metal fastening devices. They used to anchor a so-called triangle-measuring tower. Such towers were found on high sites, as parts of the nation-wide triangle-measuring network. In the past, triangle-measuring towers were needed to enable an unbroken line of vision between different triangle points and thus determine the location and co-ordinates of different places. Up in the towers, there was a measuring rod and a tabletop, from which the measurements were made. At the top of the tower there was a sighting mark, which enabled you to take out the direction from the other centre-mark of the triangle-network, such as the water tower in Vaasa.

The tower that used to be in this location was used when the triangle-network of the City of Vaasa was made. You can find the centre-mark for the triangle-network at the old location of the tower. These points that were measured out for the triangle-network were used as a basis for measuring and mapping projects. The triangle-network of Vaasa is connected to the nation-wide triangle-chain via the centre-mark that is located in the water tower. The nation-wide triangle chain and the triangle networks were renewed in the 1960s and 1970s when the new base map was drawn.

Today, all similar measuring is done through the means of aerial photography. When aerial photography was put to use, the triangle-network became unnecessary and many of the towers were torn down. This tower was taken down in 1990, because it had become dangerous to ascend. The illustration is based on a photograph of the tower from the 1970s.

8. Modern forestry

The elk is our country's largest animal in the wild; the average weight of a full-grown elk is about 350 kilos. A large bull elk can weigh up to 500 kilos. In the summer time, the elk feeds on leaves of aspen, mountain ash, willow, osier and other broadleaf trees and plants. In the wintertime, its staple foods are shoots of broadleaf and coniferous trees, as well as sprigs of blueberry, lingonberry and heather.



Elk
Alces alces

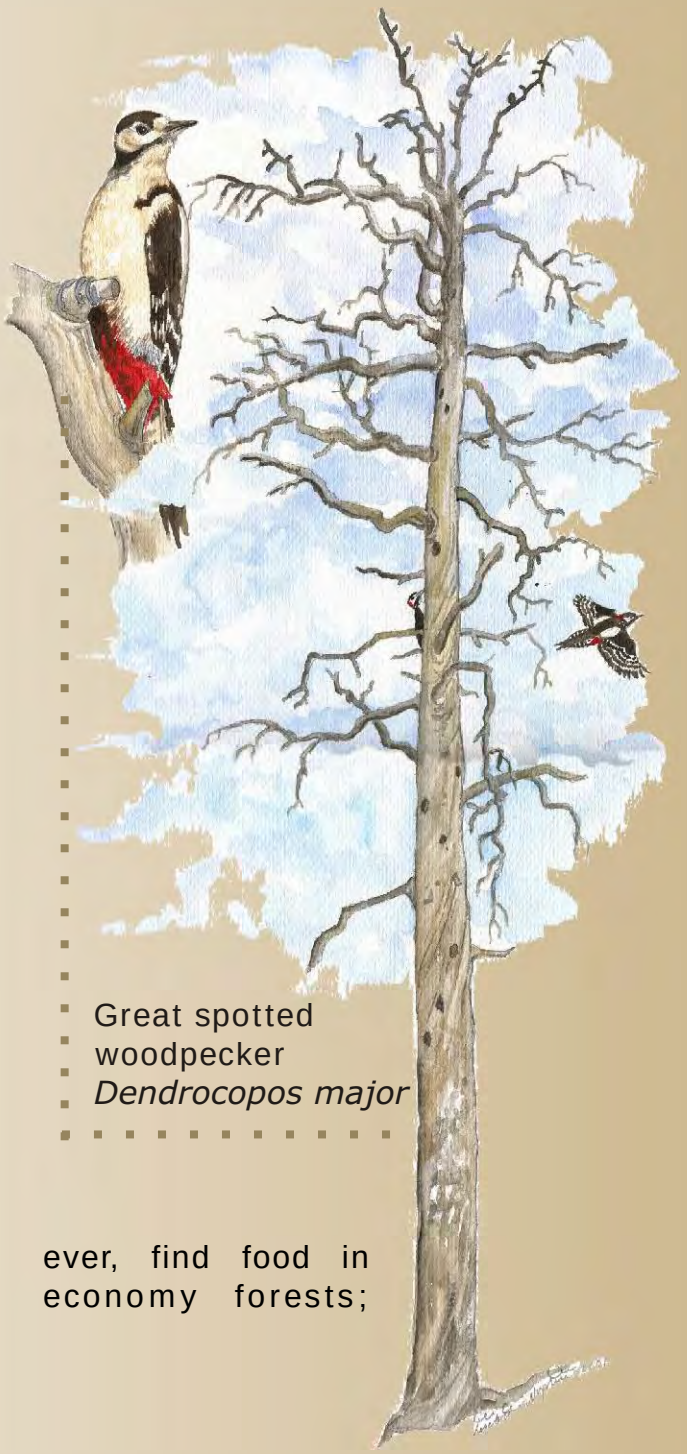
Modern forestry is said to be one of the reasons for the rapid growth of the elk population. In a short time, the forests of Finland have been rejuvenated and the newly planted forests constitute favourable biotopes for the elk. Due to an increase in elk accidents in the traffic, as well as an increase in damage done to sapling forests, it has become necessary at present to heavily reduce the elk population through hunting in the autumn.

In Finland there are some thirty species of birds that breed in tree hollows. Of the birds that breed in natural conditions, around 30% are cavity dwellers. Among mammals, there are squirrels, flying squirrels

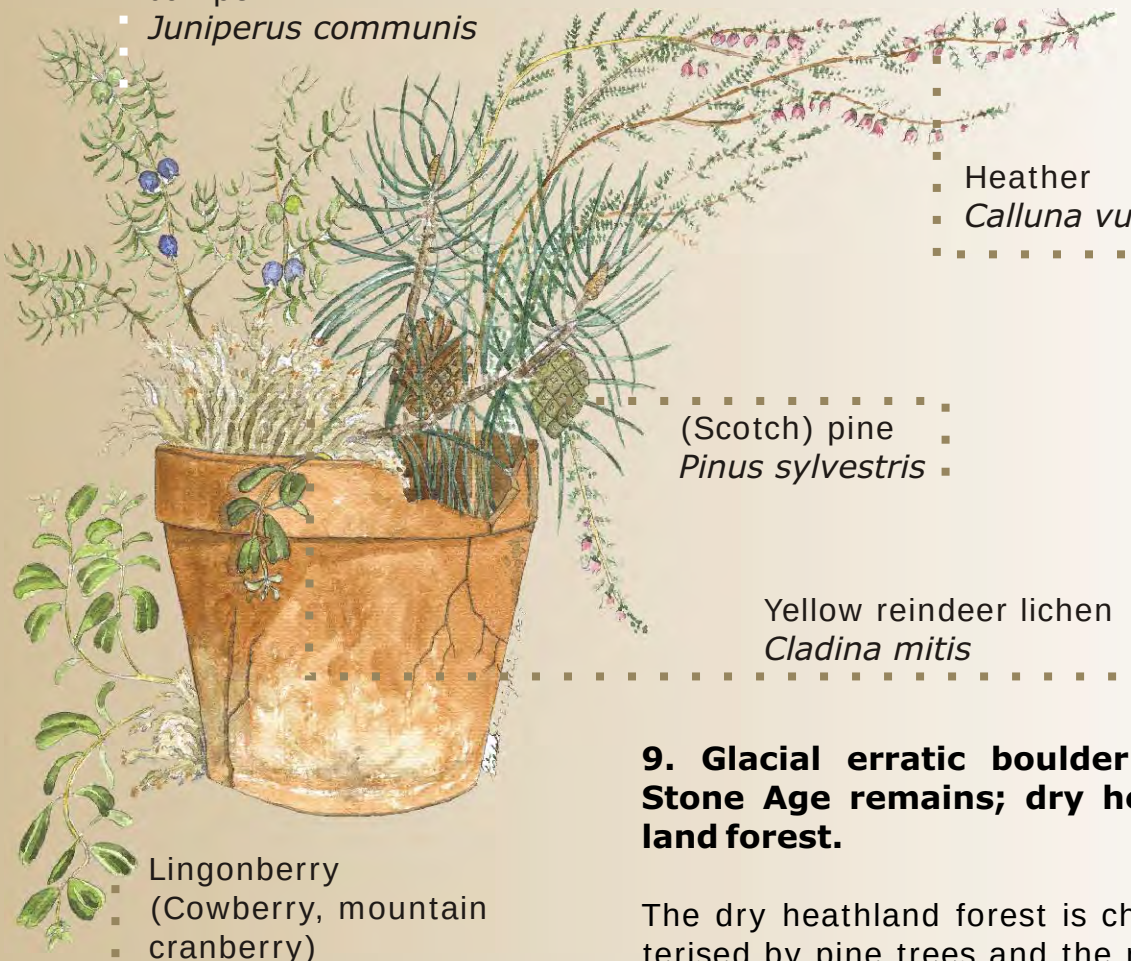
and martens that build their nests in tree hollows.

Most woodpeckers and titmice can only make holes in trees that have been softened by fungi. Aspen is the most popular tree type, but birch and alder are also commonly used. In old forests there is an abundance of fungi that soften trees damaged by storms, lightning or other forces of nature. Tree-creepers, for instance choose trees that have been split by lightning or that have narrow hollows for the dwelling. Woodpeckers normally excavate a new dwelling-hole every year. Other species often make use of such hollows, for instance the boreal owl, the goldeneye, the redstart and the pied fly-catcher.

The modern forestry, that we see an example of here, limits the living possibilities for the cavity dwellers. Old trees are not left in the forest and there is no time for such trees to develop that would be suitable and sufficiently decayed for the cavity dwellers. Today's forestry does not promote mixed forests with broadleaf trees or older forests. Some cavity dwellers can be helped by putting up bird-houses. All species cannot, however, find food in economy forests;



Great spotted woodpecker
Dendrocopos major



9. Glacial erratic boulder and Stone Age remains; dry heathland forest.

The dry heathland forest is characterised by pine trees and the relatively barren bottom and field layer. The bottom layer is dominated by different lichen such as grey and white reindeer lichen, whereas the field layer in most cases is dominated by lingonberries. In order to survive in the dry heathland forest, the plants must be adapted to a dry and nutrient-poor environment. The leaves of the lingonberry

Control 9

shrub are covered with a layer of wax to prevent evaporation. The roots of the pine tree have to reach very deep down in order to get to the humid layer of moraine that provides the vital water.

Glacially transported, erratic boulders are big boulders that were torn from the bedrock and transported by the continental ice hundreds of metres or even several kilometres, to their present location. They were trans-ported on top of or within the ice, which explains why they have largely conserved their original form and shape.

Archaeological excavations have revealed charcoal, quartz flakes and burned bones beneath this erratic boulder. The bones were by the coal14 method proved to be 3,800 years old, which is late Stone Age. On this island, which at that time was far out in the sea, there has been a station probably for hunting seals and fishing. The boulder provided a shelter for the Stone-Age people, where they could prepare their meat on open fire. Today the site is about 46 m above sea level.

Glacial erratic boulder and Stone Age remains; dry heathland

The devil's field

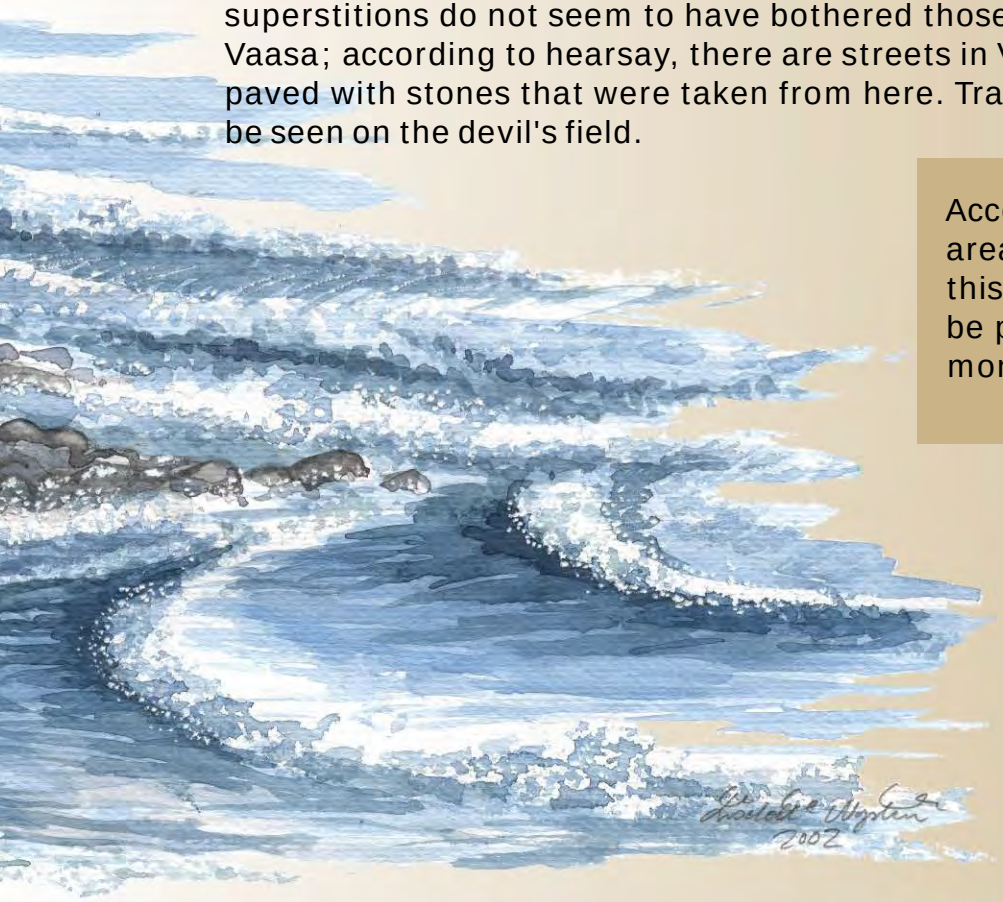
Control

10

10. The devil's field

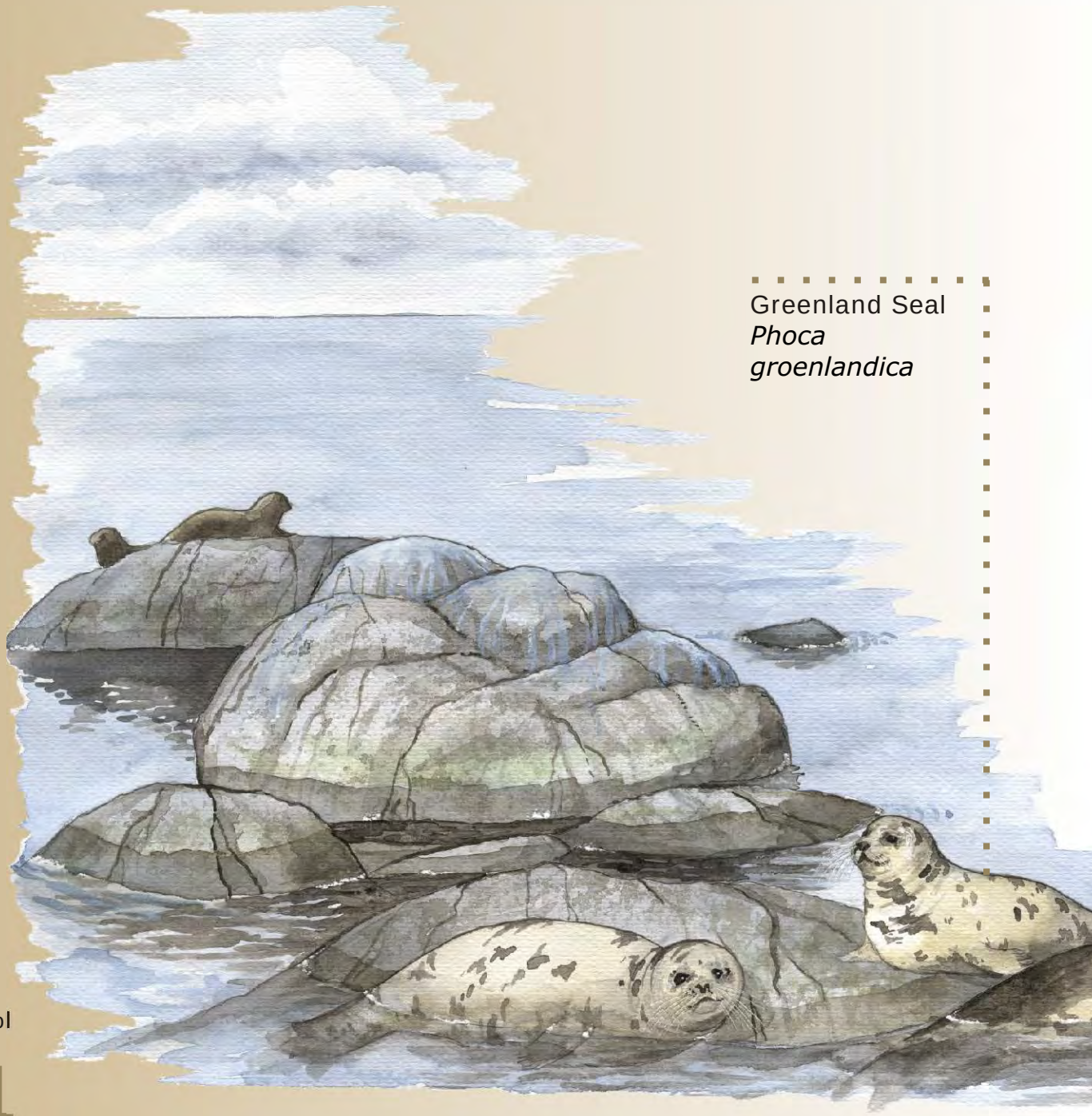
This devil's field (rubble stone field) was created over 4,000 years ago. When the surface of the sea was at this level, waves and breakers washed out sand and gravel from the moraine material deposited by the inland ice. The only thing left was a "sea" of stones, which got their rounded shape through grinding towards each other by the force of the waves.

The name devil's field can be traced to old superstitions about the origin of these stone fields. People believed that the devil himself had collected stones to a field, which he then cultivated. The difficulty in crossing the field might have been a contributing factor. The old superstitions do not seem to have bothered those who built the City of Vaasa; according to hearsay, there are streets in Vaasa that have been paved with stones that were taken from here. Traces from this can still be seen on the devil's field.



According to the special area plan for Öjberget, this devil's field should be protected as a nature monument.

Highest point, 50 m



Greenland Seal
Phoca groenlandica

Control

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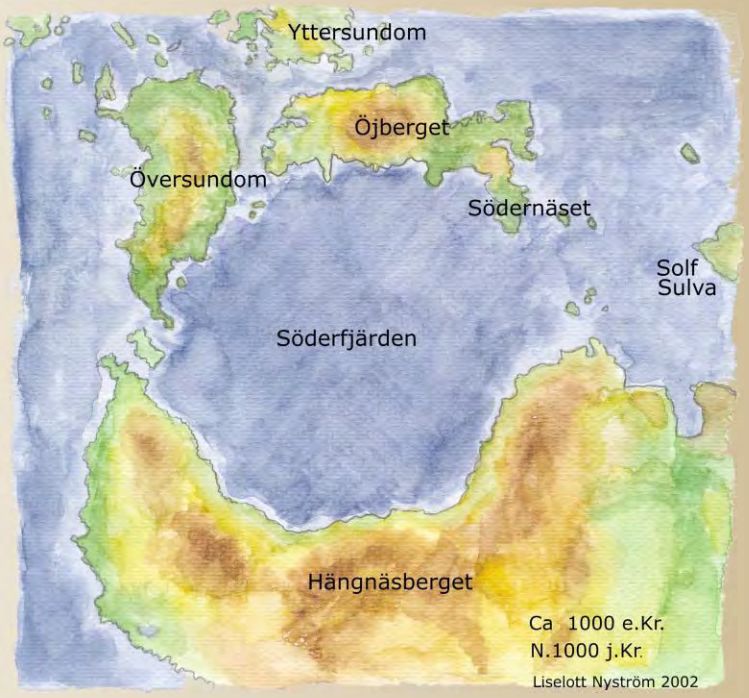
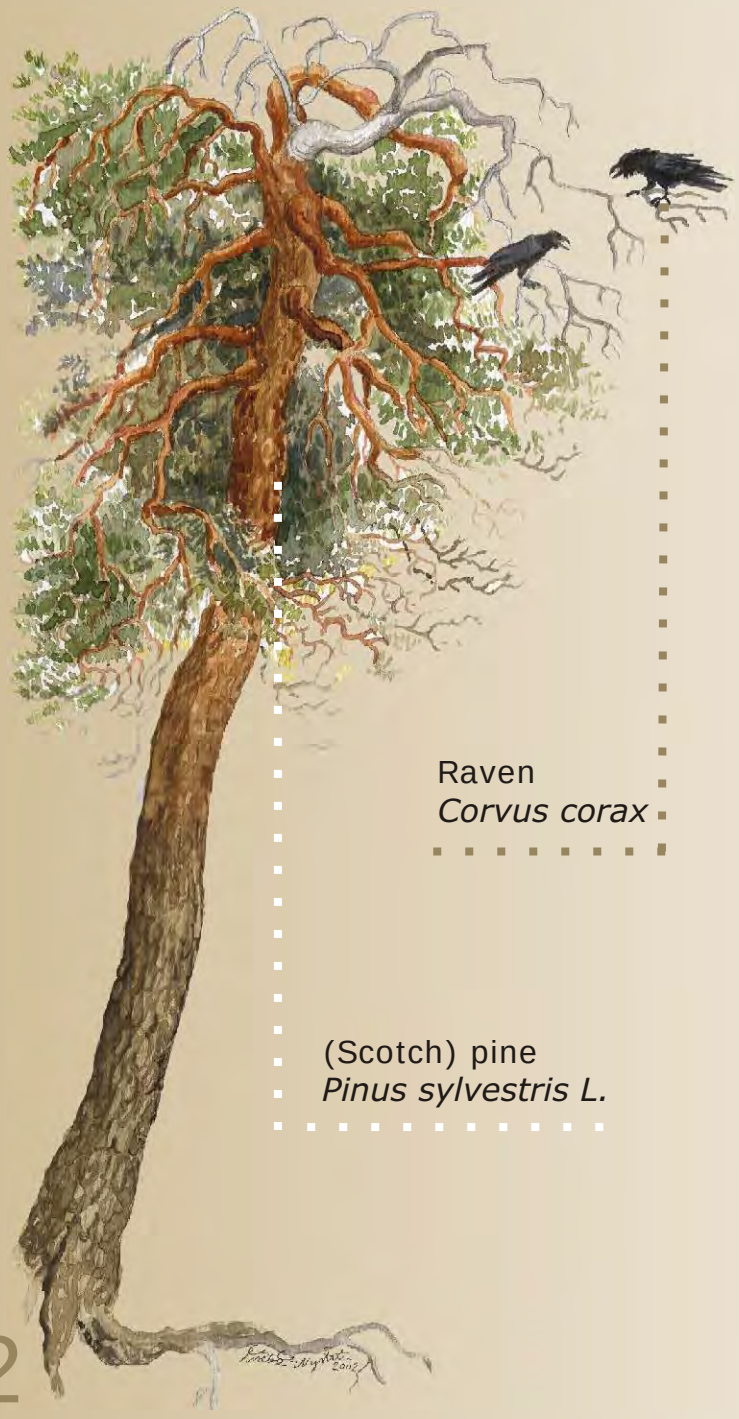
11. Highest point, 50 m

This is Öjberget's highest, natural point of elevation, which reached up above sea level approximately 4,500 years ago. At that time, it was a tiny, remote skerry, some 30 kilometres from the main land. On the other side of Söderfjärden, the Hängnäsberget mountain was simultaneously rising above the sea. In this period, the area had a large seal population, Greenland Seal, for instance (see figure). Today it is situated at an elevation of 50 m above sea level.

At the beginning of our calendar, Öjberget was already elevated close to 30 metres above sea level. Smaller islets emerged as companions to Öjberget in the areas around Södernäset, Svarvarsbacken and Översundom. At the end of the Iron Age, about 1,000 years ago, Öjberget was located in the centre of a large island, which extended from Sundom to Södernäset, "the South Peninsula". Today's Översundom and Yttersundom constituted separate islands.





12. The bare flat rock

The bedrock in this area is composed of typical Vaasa granite, which was washed clean by the hard waves of the sea more than 4,000 years ago. The continental ice has ground the crest and the northern push side even and rounded, whereas the southern lee side is uneven, cracked and rich in boulders

Old pine trees are a common occurrence on Öjberget, some of which are more than 400 years old. In these barren conditions they have remained dwarfed, but the characteristics for old trees are clearly visible. When a pine tree grows old, it stops growing in thickness at the base. Once it has died, the needles and smaller branches are shaken off and eventually the bark comes off.

The development from a living pine tree to a dead standing pine takes 35-40 years. The secret behind the durability of the dead standing pine is the sap. The outermost layer of the tree is composed of a covering that is hardened by sap. In

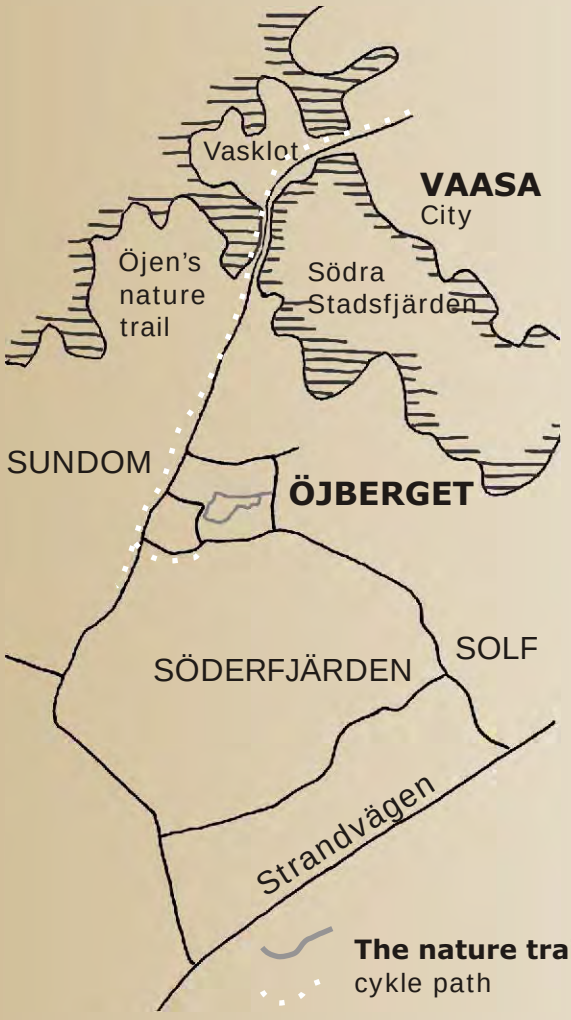
some cases, the sap has also impregnated the heart of the tree. The parts of the tree that have been filled by sap do not decompose. A dead standing pine can stand upright up to two hundred years. A dried, dead tree that is still standing up is characteristic for wilderness nature and should be preserved.

It is possible for anyone to check the quality of the air even without technical aids. Lichen that live on tree trunks and branches are sensitive apparatus for measuring the air quality. Lichen cannot survive in polluted air. The first ones to disappear are the horsehair lichen that grows on spruce branches, but others will slowly follow, one by one.

The Friends of Nature in Vaasa have conducted research on the lichen in 1973, 1983 and 1993, according to which the condition of the lichen was deteriorating until the early 1980s. The quality of the city air in Vaasa has improved thanks to development of fuels, fuel techniques and methods for purifying exhausts and discharges. Especially the sulphur discharges have decreased to be a fraction of the levels in the late 1970s.

In the late 1980s one could still find horsehair lichen in good condition on the pines and spruces in the vicinity of the control. This shows that the quality of the air on Öjberget has been good.

12



Please see map on the centre spread

For more information, see:
www.sundom.fi

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At the Citizens' Service desk in the City Library, at the Leisure Activities Office (Vapaa-ajan virasto), the City Tourist Information Office and at the local store in Sundom.

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