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NATURAL LANDSCAPES OF SORTAVALA ARCHIPELAGO ISLANDS OF NORTHERN PART OF THE LAKE LADOGA ARTIFICIALLY-INDUCED BY OLD MINING WORKINGS

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northern Lake Ladoga area, Russia, artificially-induced landscapes, mining workings, mining-industrial heritage

Artificially-induced natural landscapes, produced by the interaction of natural processes and mining in the 1770s–1950s, make up a large part of modern landscapes in the northern Lake Ladoga area, Republic of Karelia, Russia. Mine workings have become a common part of modern landscapes in the region. They were formed in various periods of time in various physico-geographic environments and are preserved to a varying degree. Therefore, they are of great interest from the point of view of the evolution of artificially-induced complexes and tourism.

Dozens of mining workings in building stone (plagiogranite, gneiss, quartzitic sandstone, amphibolite and marble) and quartz and feldspar sequences, which operated in the 1770s–1930s on Sortavala Archipelago islands (Riekkalansaari, Tulolansaari, Vannisen-saari, Leirisaari, Pellotsaari and Kalkkisaari) in Lake Ladoga, were found and studied by the Regional Museum of the Northern Lake Ladoga area (RMLL) in 1993–2016. No human activities are now carried out there. They are now known as artificially-induced natural landscapes (AIL), part of Karelia's potential and real industrial and geological heritage and tourist attractions.

The artificially-induced natural landscapes of Sortavala Archipelago islands in Lake Ladoga are located in the northern part of the Priladozhsky orographic province (skerry zone) in the Northern Ladoga selga mid-taiga district of the West Karelian taiga-lake plain area (*selga* is a local name of low, long hills). They are confined dominantly to the steep shore slopes of abraded (eroded as deeply as crystalline rocks) selgas on Lake Ladoga islands. The landscapes were formed in various periods of time. They evolved to a varying degree in various geological and physic-geographic environments and are of considerable interest from the point of view of AIL evolution.

The distribution of workings (artificially-induced landscapes) on Sortavala Archipelago islands and over the entire northern Lake Ladoga area is generally controlled by the geological and geographic conditions of formation of commercial minerals and mining-engineering and economic-geographic conditions of quarrying (fig. 1).

Sortavala Archipelago islands consist dominantly of metamorphosed folded terrigenous rocks (Ladoga series, Lower Proterozoic, Kalevian: 1.95–1.83 Ga) such as quartzitic sandstone, quartzite, various crystalline schists, gneisses and granite gneisses. The rocks are either exposed on the earth surface or are overlain by a thin discontinuous unconsolidated Quaternary sedimentary cover (Bulach et al., 2002).

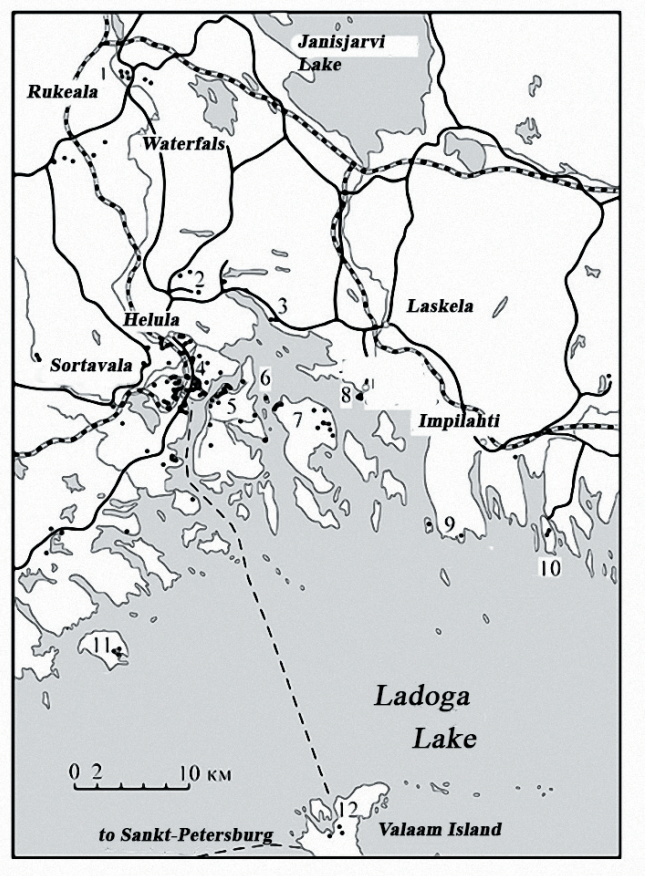

Fig. 1. Building stone quarries in the northern Lake Ladoga area; 1 – Ruskeala, 2 – Orjatlahti, 3 – Kirjavalahti, 4 – Sortavala, 5 – Riekkalansaari, 6 – Vannisensaari, 7 – Tulolansaari, 8 – Juven (Kalkkisaari), 9 – Impiniemi, 10 – Syskyänsaari, 11 – Putsaari, 12 – Valaam (Borisov, 2002)

Ryc. 1. Kamieniołomy kamienia budowlanego w północnej części jeziora Ładoga; 1 – Ruskeala, 2 – Orjatlahti, 3 – Kirjavalahti, 4 – Sortavala, 5 – Riekkalansaari, 6 – Vannisensaari, 7 – Tulolansaari, 8 – Juven (Kalkkisaari), 9 – Impiniemi, 10 – Syskyänsaari, 11 – Putsaari, 12 – Valaam (Borisov, 2002)

Igneous rock complexes in the region are dominated by sheeted intrusive grey plagioclase granite bodies (tonalite-plagiogranite series, Middle Proterozoic: 1.9–1.8 Ga) which form several occurrences and deposits of Serdobol granite, a wonderful building stone. Genetically and spatially related to these granites are numerous pegmatite veins quarried in the past for quartz and microcline used as raw materials for glass and porcelain production (Bulach et al., 2002).

In the past 80–160 years the old quarries in the Sortavala Archipelago, no longer affected by mining, have overgrown with moss, bushes and trees, changed their configuration as a result of scarp shredding and are filled with water. It looks as if nature is trying to "heal her wounds". Practically all the workings on Sortavala Archipelago islands have not changed greatly since their shutdown in the mid-19th century – 1930s. The sites are not always easily recognized in a natural landscape because they look like undisturbed rock scarps, but their artificial shape, spoil heaps and traces of blasthole drilling remind of past human activities. Some of the sites have a disputable origin.

The most remarkable artificially-induced natural landscapes of Sortavala Archipelago islands are described briefly below.

AILs on Riekkalansaari Island, 2 km east of Sortavala, form clusters on the shores of Uittosalmi and Vorssunsalmi (in the north) straits, in the Parole area and on Vasikkasaari Peninsula (in the east).

There are four quarries 4 km east of Sortavala, near Nukuttalahti, on the shore of Uittosalmi Strait, at the foot of abraded rocks, where Finns quarried decorative light-grey-bluish medium-grained gneissose plagiogranite (Serdobol granite) blocks for the construction of the Sortavala and tombstone production in the 1870–1930s. Color of this stone is shown in the fig. 2. Building stone, sent to St. Petersburg, was also quarried here for some time. A total of 2.5–2.8 thousand cubic meters of stone were produced in Nukuttalahti quarries. The average volume of the blocks was up to 0.5 m^3 and their maximum volume was 2.5 m^3 (Founding…, 2000).

The largest quarry, Nukuttalahti-1, is 5–20 m wide and 1–3 m deep. It extends along the foot of the rock for about 100 m. The neighboring quarry is about 12 × 45 × 4 m in size. All the workings are overgrown with mixed forest and moss. Heaps of defective blocks are partly preserved. Nukuttalahti granite was used to decorate many buildings in Sortavala like shown in fig. 3 and other towns and cities in the northern Lake Ladoga area. It was the most popular building stone in the northern Lake Ladoga area in the early 20th century. It was also widely used as a memorial stone.

Nukuttalahti-1 quarries are occasionally visited by tourists. The Regional Museum of the Northern Lake Ladoga Area has been conducting excursions in the area for high-school and university students since 1993. The quarries are likely to be granted an industrial heritage site status.

Ten semi-trench workings, 20 m^2 to 180 m^2 in area and 1–3 m in depth, where light-grey gneissose plagiogranite (Serdobol granite blocks, up to 0.5 m^3 in volume, was quarried for the construction of Sortavala in the late-19th-early 20th centuries)

are located 1.5 km west of Nututtalahti, stretching discontinuously for 1 km in the upper part of coastal rocks along Vorssunsalmi Strait. A total amount of over 650 m^3 of stone were produced in Vorssunsalmi quarries. A dark-grey gabbro-dolerite (sortavalite) dyke was intersected in a small working of the rock complex described on the strait shore. As Vorssunsalmi plagiogranite workings are scattered, small in size and not easily accessible, they are of no interest for tourists (Founding…, 2000).

Five semi-trenches, 10 to 45 m in length and 1.5–3 m in depth, which exposed a sulphidized mica schist and sandstone horizon (Ladoga series), were made at the foot of Mount Vorssunmäki while building a road along the shore in the early 20th century.

At the same time Finns quarried black amphibolite and amphibole schist (Sortavala series, Lower Proterozoic, Ludicovian) opposite Mount Vorssunmäki, in Krasnaya Gorka Town, on the shore of Läppäjärvi Bay and on the top of a rock hill. Traces of three small (area 10–100 m^2, depth 0.5–2 m) workings, in which Finns quarried stone for the construction of a dam and the basements of houses in the early 20th century, are preserved (Borisov, 2007).

Six workings, occurring as trenches and semi-trenches, 10–100 m^2 in length and 1.5–3 m in depth, in which about 450 m^3 of building and memorial stone (Serdobol granite) were produced in the 1920–1930s, were found on the east shore of Riekkalansaari, in a small area, 50 × 100 m^2, at Parola ecosite. The workings are now covered by forest like shown in fig. 4. Piles of granite blocks, prepared by Finns

Fig. 2. Serdobol granite
Ryc. 2. Granit serdobolski

Fig. 3. Former bank of Finland in Sortavala built of Serdobol granit
Ryc. 3. Budynek dawnego banku Finlandii zbudowany z granitu serdobolskiego

Fig. 4. Serdobol granite quarries at Parola
Ryc. 4. Kamieniołomy granitu serdobolskiego w Parola

for transportation in the late 1930s, stayed on the lake shore until 1992. As Parola granite quarries are small and remote, they are seldom visited by tourists.

Sixteen workings, in which quartz and feldspar were quarried for Russian glass and porcelain factories in the late 19th–early 20th centuries, cover an area of about 0.8 km^2 on the slopes and tops of mounts Murkinamäki and Petramäki at southern Parola. All the workings, located along 0.5 to 5 m thick pegmatite veins that cross-cut Serdobol granite bodies in Ladoga gneiss, look like trenches with strait, inclined and curvilinear walls. They cover an area of 3 to 150 m^2, vary in depth from 1 to 10 m and range in volume from 5 to 650 m^3.

The artificially-induced natural landscapes of Mount Murkinamäki, where seven pegmatite workings and spoil heaps with good samples for collectors occur over an area of 100 × 160 m^2, are most interesting for museum experts and tourists.

The largest working of Murkinamäki-1 complex (fig. 5) is a 28 m long, 1.5–6 m wide and 2–6 m deep trench with a partly collapsed granite roof. The working was tested at the foot of the mountain throughout the entire thickness of a pegmatite vein, which extends at an angle deep into the rock. The vein structure is well-defined in the trench walls. The vein consists of large light-grey, smoky and rose quartz and light-grey feldspar blocks with black tourmaline crystal inclusions. In the western part of the complex the working extends along the dip of the vein deep into the massif and becomes a shaft about 5 m deep, filled with water (Borisov, 2007).

Murkinamäki-2 is located on the top of mount. It is a trench, about 10 × 17 × 9 meters in size, filled with water by 1/3 of its volume. The drainage trench, thorough which water was discharged earlier, is well-preserved. The walls of the working con-

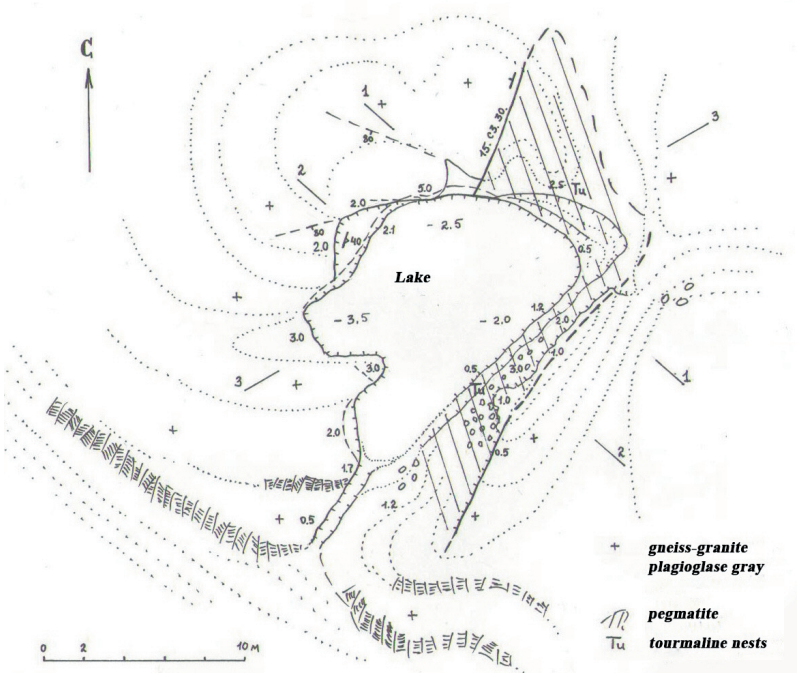

Fig. 5. Scheme of Murkinamäki-2 quarry
Ryc. 5. Szkic kamieniołomu of Murkinamäki-2

tain the remains of the worked-out pegmatite vein with coarse black tourmaline, rose and white quartz and light-grey feldspar pockets.

A total of about 1300 m^3 of stone, dominantly quartz, and microcline were produced in Murkinamäki quarry over a 25–30-year period.

There are two quartz workings in pegmatite veins on Mount Petramäki, 1 km southwest of Mount Murkinamäki. One of them was penetrated in the northern part of the mountain, in the upper portion of a steep rock slope. It is a trench, about 3.5 × 15 × 2 m in size. The other working, about 2 × 10 × 2 m in size, is a semi-trench on the western slope of the mountain. There are no trees in either working; they have only collapsed slightly and are now covered with moss. The spoil heaps contain quartz, feldspar and tourmaline highly valued by collectors.

An enjoyable artificially-induced natural landscape was revealed in the watershed of Mount Petramäki-East, near the shore. Two half-flooded trenches, about 5.5 × 15 × 10 m and 3 × 12.5 × 3 m in size, where quartz and microcline were quarried, cover an area of 30 × 60 m. Thin mixed forest now grows here. There are spoil heaps nearby.

Another quartz working is located east of Mount Petramäki, on the northwestern shore of Peräniemi Peninsula. It is a 12 m long, 1.2–2.2 m wide and 0.5–2 m deep trench.

The Regional Museum of Northern Lake Ladoga Area is planning to establish Murkinamäki Mining-Geological Park on Riekkalansaari Island (AIL Murkinamäki, Petramäki and Petramäki-East), up to 0.5 km^2, where quartz and feldspar were quarried. The largest workings of the complex will become a tourist attraction. The museum has been conducting educational excursions for high-school students to the quartz-feldspar quarries of Murkinamäki complex since 1994. Hundreds of schoolchildren, individual tourists and stone collectors have visited the area. Unfortunately, collectors inflict an irreparable damage to Murkinamäki AIL, raking the dumps and hammering the walls to extract beautiful black tourmaline crystals. This site has not yet been granted a mining-industrial heritage status (Borisov, 2007).

Twelve quarries, made as trenches and semi-trenches, have the area of 10 to 180 m^2 and ranging in depth from 0.5 to 2.5 m. They were found in southern part of Peräniemi Peninsula, on Vasikkasaari Peninsula, where occupied about 100–150 m^2 in area. In this place Finns produced dark-grey medium-grained biotite gneiss blocks, 0.2–0.8 m^3 in volume, in the late 19th–early 20th centuries. A total of more than 600 m^3 of stone were quarried at Vasakkasaari complex. Rock fragments are scattered all over the area which is now covered by thick mixed forest. After cleaning and improving the area, Vasikkasaari complex could be of interest for tourists who travel to Sortavala Archipelago (Borisov, 2007).

On Tulolansaari Island, located 8 km southeast of Sortavala, AILs occur near Point Uittoniemi (in the northwest) and on mounts Kangaskallio (in the northeast), Mustikkamäki (in the centre) and Ruotsenkallio (in the east).

North of Point Uittoniemi, over a distance of 500 m, in the upper part of the steep shore slope of a high abraded selga, there occur six quarries, where Finns produced dark-grey, almost black medium-grained, massive biotite amphibolite blocks which they used as a tombstone in the late 19th – early 20th centuries. Biotite amphibolite, occurring among Ladoga gneiss and schist, was produced by Kalevian volcanism. The workings occur as 1.5–5.0 m deep semi-trenches covering an area of 30 to 500 m^2. A total of over 2.5 thousand cubic meters of stone were quarried. The maximum volume of the blocks was 3–4 m^3. Rock fragments and defective blocks are scattered on the way from the quarries to the lake shore. The old quarrying area has overgrown with coniferous forest. The scarps of the trenches are covered by moss and lichen. Being far from popular hiking trails, Uittoniemi amphibolite workings are not visited by tourists.

There are two workings in the northeastern part of the island, on the gently dipping slope of Mount Kangaskallio: a 17 m long, 12 m wide and up to 2 m deep trench and a 20 m long, 8 m wide and up to 2 m deep semi-trench. Here, proprietor Matvey Ovechkin quarried dark-grey fine-grained micaceous quartzitic sandstone for local construction and for sale to St. Petersburg in the early 20th century. The sandstone was sometimes taken for a dark variety of Serdobol granite.

In the centre of Tulolansaari Island, on the top and at the foot of Mount Mustikkamäki, there are over a dozen small (10–50 m^2 in area and 0.5–2 m in depth)

plagiogranite (Serdobol granite) quarries which operated mainly in the late 19th–early 20th centuries producing building and memorial stone (Borisov, 2007).

The most interesting AILs on Sortavala Archipelago islands in terms of their size, typology and evolution, occur on Mount Ruotsenkallio on eastern Tulolansaari Island. Here, over an area of about 1 km^2, there are over 20 workings, in which Finnish and Russian quarrymen produced grey-bluish fine- to medium-grained massive and poorly gneissose plagiogranite (Serdobol granite) blocks in 1770 to 1914 for the construction and decoration of various buildings and structures in St. Petersburg and Petrodvorets.

The largest quarry # 1 (Main/Ruotsenkallio-1 quarry) operated in the past on the western branch of Mount Ruotsenkallio. It is a ca.100 m long, 15–40 m wide and 2 to 14 m deep trench, up to 16–18 thousand cubic meters in volume. The western part of the working has become a 70 m long, 45 m wide and 5–12 m deep lake. It is here that granite monoliths, 1 to 5 m^3 (maximum 10–12 m^3) in volume, were produced in the 1770s to the 1850s to decorate the Marble Palace (walls and cornice), the Kazan Cathedral (socle), Nicholas Bridge (abutments), the Hermitage (colonnades, atlantes and hermae) and other buildings in St. Petersburg. It seems that stone for columns and statues in Petrodvorets (Belvedere, Lions Cascade) also came from this quarry. The quarry is surrounded by high spoil heaps and is overgrown by thin pine forest. There are also dozens of small trial workings (Serdobol granite quarry on Tulolansaari Island) there (Borisov, 2007).

About 15 semi-trenches, 5 to 100 m^2 in area and 1–4 m in depth (Ruotsenkallio-2 workings), which form a distinctive terraced relief (fig. 6), were made 800 m east

Fig. 6. Old working on Tulolansaari Island
Ryc. 6. Stare wyrobisko na wyspie Tulolansaari

of the main quarry, near the top, along the strike of the Mount Ruotsenkallio slope. There, 19th century quarrymen cut out Serdobol granite blocks, 2–8 m^3 in volume. A total of over 5 thousand cubic meters of stone were produced in the workings. The area is now overgrown with thin pine forest and is covered by rock fragments and large defective blocks varying in volume from 0.5 to 4 m^3.

A semi-trench, driven by Ruotsenkallio-3 quarrymen, is located on the eastern slope of Mount Ruotsenkallio. It is 80 m long, 20 m wide, 2–3 m deep and about 2000 m^3 in volume. Piles of defective granite blocks, 0.5–1 m^3 in volume, are scattered over the area now covered by thin pine forest

Closer to the island shore there lies a small Ruotsekallio-4 working (trench), (6–8) × (45–50) × (1.1–2.5) m in size and up to 500-550 m^3 in volume, where dark-grey massive biotitic quartzitic sandstone slabs were produced for the construction of St. Petersburg in the early 20th century (Borisov, 2007).

Granite production in the quarries on Tulolansaari Island was conducted from the 1770s to the mid-19th century using a hammer-and-chisel method. A foreman selected a rock area, where the stone is uniform, compact and has not fractures, removed the vegetation and earth from the rock surface and marked the outlines of the block to be cut out. He then took a hammer and a chisel and carved grooves, about 7 cm in depth, up to 4–5 cm in width and, 25–50 cm in length. Boreholes, 15 to 30 mm in diameter, spaced 5–7 to 15–17 cm apart, were then drilled in the grooves manually and arranged in one line. If the rock had no horizontal fracture, delineating the monolith at the desirable depth, then horizontal boreholes were drilled. Metal wedges were then driven into the holes to cut out the monolith of required size.

In the late 19th century quarrymen began to use gunpowder for granite production. At first long grooves were made in the rock by powder blasting to estimate granite quality at depth. Several blastholes were then drilled between granite "beds" with iron drills, charged with powder over the whole length, filled with clay as cork and blasted simultaneously. The monoliths produced were cut into blocks of desirable size by drilling and wedges.

A 1.5 km long road from the Main Serdobol granite quarry to a pier at Möntselä was built in the 19th century to transport 10 to 30 t blocks to the shore. As the navigation began, stones were loaded onto sailing deck vessels called soima-bots. Such a vessel could carry 20 to 35 granite blocks, 0.5–1 m^3 in volume, or 10–15 blocks, 1–2.5 m^3 in volume (Borisov, 2007).

The artificially-induced-natural landscapes of Mount Ruotsenkallio, covering an area of 1 km^2, were declared a Karelia's mining-industrial heritage site in 2000 at the author's initiative. The Regional Museum of the Northern Lake Ladoga Area has been conducting excursions in the area for tourists and students since 1994. The museum is now preparing a project on establishing Ruotsenkallio Granite Park.

There is a small marble quarry on small Juven-Kalkkisaari Island, 15 km east of Sortavala, 3 km from Tulolansaari and 200 m from Lesozavod Town. The quarry occupies about 1/2 of the island (fig. 7).

Fig. 7. Juven Island on Lake Ladoga
Ryc. 7. Wyspa Juven na jeziorze Ładoga

The quarry is 100 m long, 35–45 m wide and 2.5 to 12 m deep. The oldest and deepest part of the quarry is filled with water. Over 10 000 m^3 of calcitic-dolomitic marble in the form of crushed stone, quarrystone and blocks were produced in Juven-Joen quarry in the 1770s to the 1800s. Juven decorative black-and-white striated marble with a green tint was used to decorate the Marble Palace, the Winter Palace, the Isaac Church, Mikhailovsky Castle, Count Apraksin's house and the Kazan Cathedral in St. Petersburg. Juven marble can also be seen in Tsarskoye Selo and Gatchina. In the mid-19th century Juven marble was used by monks to decorate churches and chapels, monastery square buildings and the altar in the Cathedral of the Saviour and Transfiguration, to build the walls of wells, etc. Juven marble was also used on Valaam Island to produce building lime from the 1770s to the early 19th century.

There are almost no trees and bushes in Juven marble quarry. There are no spoil heaps in the area because even crushed stone and other waste were utilized. One can get to the island from the continent by sailing across a narrow strait on a boat or by joining a guided motor boat excursion from Sortavala to Ladoga skerries and Tulolansaari Island. In 2000, Juven quarry was granted a mining-industrial heritage site status at the author's initiative. In the past five years the quarry has been visited by many tourists from St. Petersburg travelling to Hiidenselkä and Pellotsaari Island.

Other artificially-induced-natural landscapes of interest for the study, conservation and museums, occur on Vannisensaari Island, 5 km east of Sortavala. The southeastern shore of the island bear traces of light-grey medium-grained Serdobol granite (plagiogranite) quarrying for St. Petersburg over an area of 1.8 thousand square meters. A visitor can see a 70 m long, 20 m wide, 1.5–2.5 m deep semi-trench, several small trenches, rock fragments and defective blocks (Vannisensaari-1 work-

ing). A total of 2.5 thousand cubic meters of stone were produced. The blocks were up to 1–4 m^3 in volume. The quarry is likely to become Karelia's mining-industrial heritage site. Excursions to the area can be organized.

In the northwestern part of Vannisensaari Island, near the rock top, there are several small workings (semi-trenches), varied in 0.5–2.5 m in depth and 20 to 50 m^2 in area each. The total area of the Vannisensaari-3 workings is 2 000 m^2. Quarrying blocks for construction and tombstone production were attempted here in the 19th century. Rock fragments are scattered all over the area which is now overgrown by thick coniferous forest.

Artificially-induced landscapes (old quarries and mines) are also encountered on other Sortavala Archipelago islands such as Leirisaari (quartz, Serdobol granite), Lukasaari (Serdobol granite), Pellotsaari (Quartz), Karhusaari (marble), Havus (amphibolite) etc.

The Regional Museum of the Northern Lake Ladoga area and various tourist companies have been holding excursions to unique artificially-induced landscapes, such as Murkinamäki, Ruotsenkallio and Kalkisaari, for schoolchildren, students and tourists from various regions of Russia since 1994. However, only several thousands of people have visited the sites over the past 23 years.

The main reason for such a small number of visitors is insufficient funding available to the organizers of excursions. They need a lot of money to properly manage the heritage sites, to create comfortable conditions for tourists, to provide a better and safe access to the workings on the islands and to conduct museum studies (Borisov, 2007).

All of the above problems will be solved if Sortavala Archipelago islands becomes part of Ladoga Skerries National Park to be established.

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NATURALNE KRAJOBRAZY ARCHIPELAGU SORTAVALA W PÓŁNOCNEJ CZĘŚCI JEZIORA ŁADOGA SZTUCZNIE ZMODYFIKOWANE DAWNYMI WYROBISKAMI GÓRNICZYMI

jezioro Ładoga, Rosja,
krajobrazy sztucznie zmienione,
wyrobiska górnicze, dziedzictwo górniczo-przemysłowe

Krajobrazy sztucznie zmienione, będące wynikiem interakcji naturalnych procesów i górnictwa surowców skalnych, rozwijającego się w okresie około 1770–1950, stanowią znaczną część współczesnych krajobrazów w rejonie północnego wybrzeża jeziora Ładoga (Republika Karelii, Rosja). Wyrobiska górnicze stały się powszechnie spotykanym ich składnikiem. Powstały one w różnych okresach czasu, w różnych środowiskach geograficznych i są zachowane w różnych stanie. Dlatego też są one bardzo interesującym z geoturystycznego punktu widzenia przykładem ewolucji sztucznie indukowanych zespołów krajobrazowych.

W artykule przedstawiono syntetyczne charakterystyki wyrobisk oraz stan ich zachowania. Ukazano różnorodność pozyskiwanych tam odmian proterozoicznych skał, takich jak granity serdobolskie, gnejsy i łupki łyszczykowe, amfibolity, marmury i piaskowce kwarcytowe oraz pegmatyty kwarcowo-skaleniowe. Wskazano także przykłady aplikacji tych kamieni w budownictwie lokalnym (Sortavala), czy w Petersburgu. Ukazano znaczenie omawianych obiektów w turystyce (wycieczki organizowane przez Regionalne Muzeum Północnego Jeziora Ładoga) i dydaktyce (zajęcia terenowe studentów uniwersytetu w Petersburgu). Przedstawiono zabiegi prowadzące do ich zabezpieczenia, takie jak starania o objęcie ochroną pod postacią obiektów dziedzictwa przemysłowego, czy plany utworzenia Parku Geologiczno-Górniczego Murkinamäki oraz Parku Narodowego Szkierów Ładogi.