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Research Article

Geotouristic attractions of Oulu and Rovaniemi regions (Northern Finland)

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ABSTRACT

This paper discusses the geotouristic attractions of northern Finland region, where the area is located near the Arctic Circle. This region is characterized by interested natural beauty and numerous of the boreal species and animals. Finland is located at the Baltic Shield, where the discussed area have a very interesting rocks exposures. Perydotites in Oulu and migmatites in Rovaniemi and other old rocks can be seen on the surface of the earth which is possibility studied a various processes associated with magmatism, and metamorphism. It is present the numerous Pleistocene forms, in this part of the country's well readable. Oulu is an industrial and the academic city and Rovaniemi tourism and despite such a character of these cities, the Finns managed to keep close to nature in these centers.

Keywords: Geotourism; Finland; Lapland Granulite Belt; Baltic shield.

1. INTRODUCTION

Finland is the north-eastern part of Scandinavia, bordering to Sweden and Norway in the North and Russia in the East. From the south shore of the bay is limited to the picturesque skerry coast of Finland, that is full of small islands. Towards the West, in turn, it is the Bothnia Bay belonging to the Baltic Sea. Geologically Finland is located within the Baltic Shield, showing the crystalline rocks of the Precambrian East European Cratonic Platform (Fig. 1). Besides numerous crystalline rocks of different ages and origins often heavily smoothed by the action of the ice sheet (mainly in the Pleistocene) in Finland, many are readable post-glacial forms. The country is located within the temperate-cold is characterized by highly variable amplitude of the length of the day, depending on the season (the country also has its own territory in the Arctic, the Arctic Circle north) and long winters that can last until the end of April in the North.

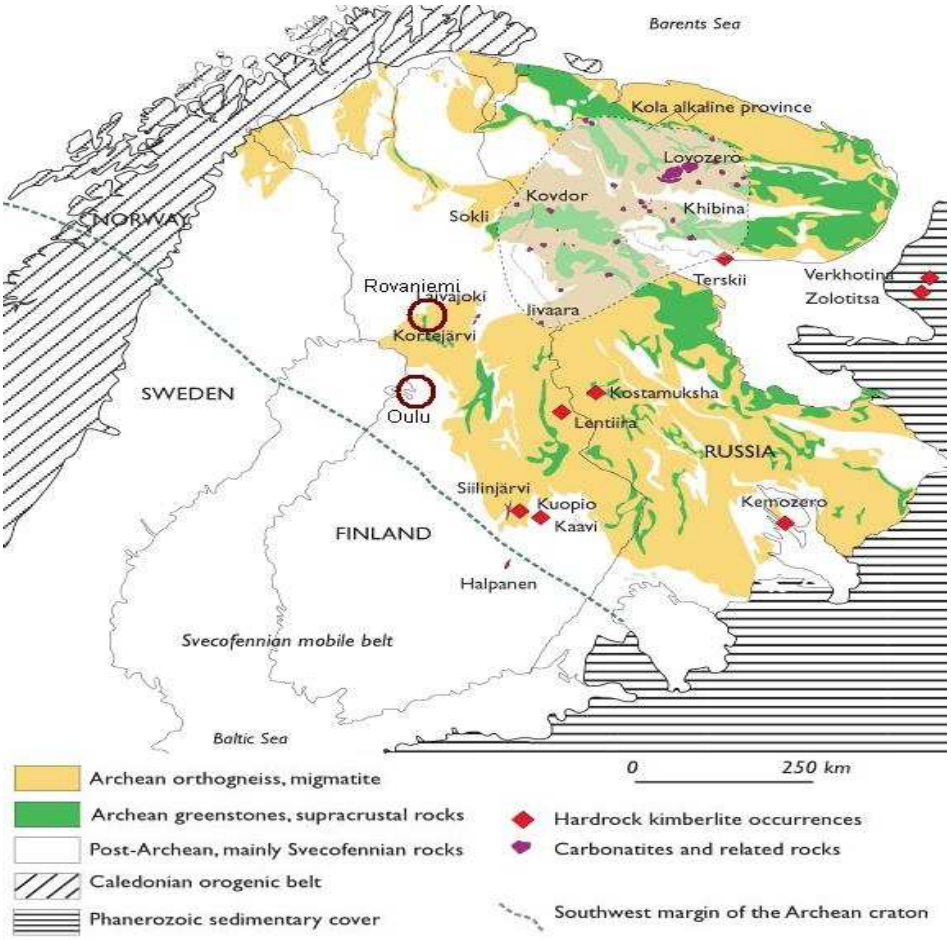

Fig. 1. Geology map of the northern part of Baltic Shield (Lehtinen et al. 2005).

Despite the very cold climate in Finland even around the Arctic Circle is managed coastal beaches and is built leisure and recreational facilities. In the northern part of Finland, crystalline rocks can be found. These are classified as precambrian rocks, similarly to neighboring Karelia and the Kola Peninsula. There are granite, sometimes older than 3 billion years, and intrusive rocks such as Lapland granulite belt [1-4], Tornio Narankavaara built with gabroid intrusions enriched in PGE mineralization and many younger intrusions in the metal (e.g. Sokli).

2. METHODS

After field observations with photographic documentation, selected rock samples were analyzed under microscopic observation in transmitted and reflected light and using electron microscopy at the snap-EDS Laboratory of Optical and Electron Microscopy, Department of Geology and Lithosphere Protection, Earth Sciences and Spatial Management Faculty of UMCS in Lublin. Biogenic materials were consulted with the Institute of Agrophysics Polish Academy of Sciences in Lublin.

3. RESULTS

The advantage of Finland is of course winter sports, in which case the country is well-prepared, in the northern parts of the country are marked ski trails and roads and roads for snowmobiles, no matter from paved roads for cars and bicycle paths. The country has a very high standard of care for the environment state, hence the numerous, however minor limitations in the use of natural resources and their possible full recovery (e.g. many types of bins, reusable towels in public restrooms-disinfected on a regular basis, blocking the tap hinder removing the full flow of hot water, etc.). This is accompanied by high environmental awareness of residents. Another advantage is the fact that Finns hardly gather mushrooms, do not hunt the animals, which causes that in cities (which deliberately left out a number of areas of forest), are commonly virtually tame wild animals (many reindeer, hare, enabling to approach

to small distance). All these factors taken together, constitute a major attraction for tourists who coming from highly transformed the environment has a chance to take a break from civilization, however being at the same time surrounded by the highest standard of conveniences. The goal of this was to present and discussed two regions located near the Arctic Circle, Finland. These are Oulu – the academic city and Rovaniemi typical tourist town (Fig. 2).

Typical rocks of northern Finland are mainly various types of metamorfites. They can be found in many places as exposed on the soil surface layer. In some cases, glacial deposits are covered. In general, these rocks form a small hill, smoothed by glaciers. Due to the nature of these rocks, often make naked covered with sparse vegetation rarely revealed. This greatly facilitates conducting field observations and allows to track changes in geology along many kilometers.

Fig. 2. Typical landscape of northern Finland in Oulu (up), and in Rovaniemi (down).

The opportunity to observe old precambrian rocks at the surface, formed the base of the continent is a great attraction for tourists.

Oulu is a city of more than 150 thousand inhabitants. It is located in the North part of Finland on the Bothnia Gulf shore of the Baltic Sea. The city exists since at least the twelfth century and initially was associated with the Swedish settlement (old granaries remaining and the substructure of the castle are the representatives of those times). In the following centuries the city belonged to the Russians, after which there are remaining wooden houses the city center. Nowadays, Oulu is a academic town, where The University of Oulu form the center of new technologies. Besides that, the city has its port and industry. Oulu is very well maintained, clean, has its own botanical garden at the university. The University is divided into several campuses connected by corridors and to move one can use a special scooters. The central part of the university is a library and mess-hall, where they meet the staff and students of various departments. This solution makes is that the university is a compact complex of buildings, which is easy to get, that may be fruitful in interdisciplinary collaboration.

As far as the purpose of leisure tourism of Oulu there is the beach well developed (there are designated places for sunbathing, and a hotel with a swimming pool and water slide). The city has numerous cycle paths, allowing for quick and easy contact between different neighborhoods. Surprisingly the care for the safety. The cycling paths are usually collision-free with road underpasses, so that they are really safe for users! Another advantage is the high environmental awareness of citizens. In areas, where settlements have been built there are natural forest areas, which results in the appearance of small animals in the city. The clean environment state is shown by a number of lichens and fungi growing sometimes almost in the city center. The relatively high standard of living that makes houses in Finland are not specifically separated, without, in residential areas, bicycles left in front of the store, there are many common social space (e.g. laundry, ski), all this things contribute to improving the quality of life (Fig. 3).

Fig. 3. Typical photograph from the Oulu (the block of flats and historical center).

Fig. 4. Typical peridotites from Oulu (up - thin section, down - polarized light).

In Oulu, many sorts of migmatites are exposed and therefore form Oulujoki riffles. The riffles are revealed on the river that debouche into the sea in the Old Town surroundings. In the northern part are apparent gabbroides and ultrabasic rocks found. There are variety of secondarily modified peridotites (Fig. 4).

Rovaniemi is the city located at the northern Arctic Circle. It is the capital of Lapland, with about 20 thousand of residents. This is a typical tourist town, living with interest what is the seat of St. Nicholas decorated on a grand scale, located on the Arctic Circle line (a few miles outside the city center), with its shops, museums, post and throughout the hotel and catering complex. The settlement here dates back to the Neolithic, thanks to its position (on the trails leading from Karelia to Sweden and the southern part of Finland). Currently, the city has extensive tourist facilities, which is due to the large numbers of tourists.

There are various types of hotels built in the city and in the surrounding areas, primarily focused on recreation in the winter. Due to the location of the snow cover in the region is in arrears for April which promotes winter sports. In the city besides road bike, hiking and skiing are marked special way for snowmobiles. It is also a ski jump platform located in Rovaniemi. What is noteworthy, there are many reindeer approaching close to the city center in the evening and walking in the nearby wooded hills. In these hills tourists can find many well-marked trails with shelters servants to spend the night, and delineated the possible places on fire. In some places are built special wooden turrets, significantly improving faith to observe the vantage points (Fig. 5).

Exposed in the area of Rovaniemi migmatites are clearly visible especially in the area of the trench road to the airport.

Fig. 5. Typical photograph from Rovaniemi (up - St. Claus Village, down - reindeer in city park).

A short distance from the city one can meet the rocks of Lapland Granulite Belt (represented by garnet amphibolites and granulites, Figure 6). These rocks represent a zone of conflict between the block and the series of Karelian and Kola [5-7] in an area stretching nearly 100 km to the North from Inami lake till the border with Norway.

4. CONCLUSIONS

Northern Finland natural and rural facilities invites tourist to visit. Specific slightly cooler, crisp climate and vegetation are certainly interesting advantages of this place. In Finland, there is a lot of lakes in the northern part near Lapland Granulite Belt numerous hills sometimes a height exceeding 100 meters above sea level.

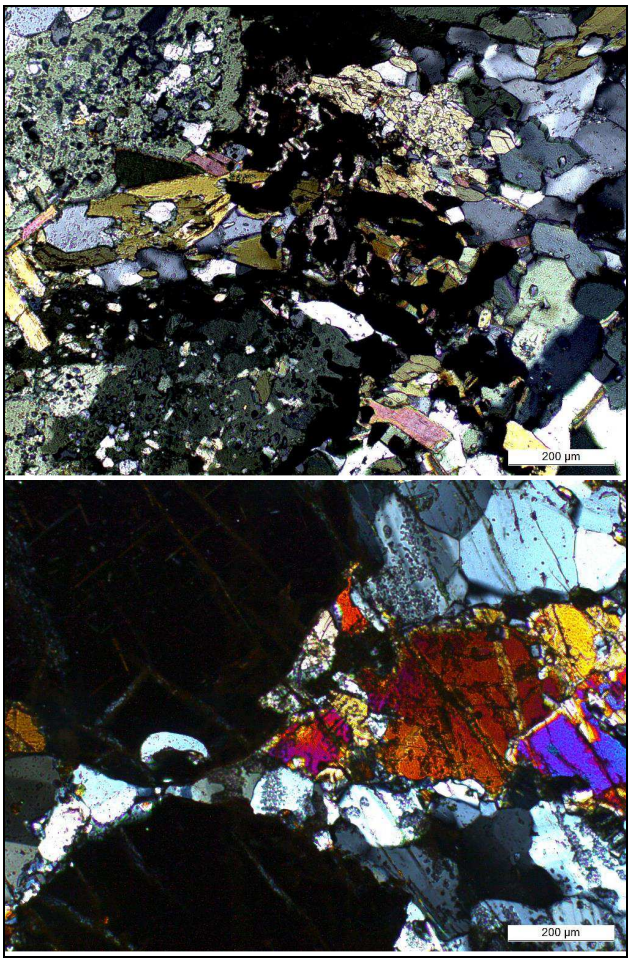

Fig. 6. Typical migmatites from Rovaniemi (up), and granulites from Lapland Granulite Belt (down; thin section, polarized light).

This region is developed for tourism at a high level. There are special routes, trails, hotel and gastronomic infrastructure. Tourist information is multilingual, so this region is available for every-one. The country is a tourist-friendly and offers a wide range of active and passive recreation. It is worth visiting especially in the summer, when there are fewer tourists and as warm temperatures and polar day will result in a long journey. In the undergrowth while (in August), you can find many berries and cloudberry. In autumn one can enjoy the landscape changes resulting from the preparation of the plants for the winter. Then the mixed forests envelop the play of colors in the undergrowth there are many mushrooms. In winter you can enjoy the reindeer and come to the adobe of St. Nicholas to spend a few nights in a specially built tourist village. Spring, in turn, there are a number of flowers which give the area fresh multicolored nature. In the area of northern Finland, there are numerous outcrops

of crystalline rocks belonging to the Baltic Shield craton. The opportunity to study such a wide range of rocks belonging to the old composits of the base of the continent *in situ* is a great attraction. Tourists coming to Finland from areas where there are a younger pieces domineering on the surface can admire totally different landscape. It also allows geologists to observe firsthand a number of processes that are in other places only known from deep drilling.

AUTHORS' CONTRIBUTION

MAH and OJ: Conception and design, Acquisition of data; MAH: Development of methodology, Study supervision; MAH, KO: Analysis and interpretation of data, Writing of the manuscript; KO, OJ: Review and revision of the manuscript; KO: Administrative, technical or material support. All authors read and approved the final manuscript.

TRANSPARENCY DECLARATION

The authors declare no conflicts of interest.

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Tourism and Cultural Heritage

Review Article

A review of selected monuments in Tallinn, cultural heritage and geo-touristic context

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ABSTRACT

Tallinn is the capital of Estonia, is located in the northern part of the country on the Baltic Sea, and has an interesting geological structure of the substrate, which has contributed to the impact on the architectural construction of the city (the widespread use of Ordovician limestone in the construction of houses and fortifications). The city is located within chilly temperate climate. Its history dates back to the XIII century and over the centuries it from hand to cancer. Originally founded by the Danes, was also ruled by the Swedes, Germans, Russians and Estonians. This contributed to the impact of these cultures on urban planning of the city.

Keywords: Tallinn, Historic monuments, Old city, Klints, Ordovician limestone.

1. INTRODUCTION

Tallinn is the current capital of Estonia. The town is located in the north of the country on the Bay of Tallinn, which is part of the so-called Gulf of Finland. The city has more than 400 thousand inhabitants. Tallinn is situated on the Baltic Sea and has strong relationship with trade. By this is the city of the strong influence of many cultures. In addition to Estonian and Finnish can be seen in the architecture of the city cultural influences Danish, German, Russian and many others. In general, the landscape is dominated by the old town with a monumental city walls soaring towers and church Paleozoic isolated hill on which the castle is localized (Fig. 1). 2002 was held here 47th Eurovision Song Contest 2002. In 2011, the city is awarded the title of European Capital of Culture. Since 2013 for the residents of Tallinn there is no charge on buses and trams.

Fig. 1. City panorama from the St. Olaf church tower.

2. HISTORY OF THE CITY

Initially the settlement belonging to Estonians and also inhabited by Finnish merchants, it was con-

quered by the Danes, who founded the city of Lübeck law. In the Finnish and Estonian Tallinn name translates to "the Danish city" (Taani linn). Danes are building one of the largest medieval city fortifications, about 2.5 km long city walls to a height of 16 m and having 45 towers. Soon, in 1285 Reval (another name of the city) becomes a member of the Hanseatic Germans settle ushering member of this city, who with a member of Estonia is bought by the Teutonic Knights. Town with northern Estonia is ruled by the Swedes and the Russians 1710, who had hosting of the city until 1918 when Estonia regains independence and after World War II enters the Soviet Union, and in 1991 to be newly declare its independence, and 2004 to become part of Union [1-7].

Fig. 2. The natural slope of Ordovician limestone klint and a part of the fortifications.

3. THE GEOLOGY OF THE CITY

Due to its location in the vicinity of Tallinn Peribaltic Syneclise, the city can boast of interesting geology, geomorphology, reflecting well the region. Directly on the shores of the Bay of Tallinn outcrop rocks belonging to the Cambrian period (and in the eastern part of the bay - Vendian). City and especially the upper old town is set on a small isolated hill composed of Ordovician limestones (Figs. 2, 3). It is worth mentioning that the Baltic Klint is a clear dividing line between lying north of the Baltic shield him from lying south platform covered with younger sediments. Klint is clear in the construction of Europe, stretching from the island of Öland in Sweden in the west to Lake Ladoga in Russia in the east. It consists of a steep slope with a height of up to 48 m. In the area of Tallinn Klint is composed of sandstones light cream color (hard surface crumbling) forming shoals thin interbedded clay rocks. Lying on them Ordovician limestones light creamy fine bed unveiling also create many line the coast of Estonia. There are numerous fossils in them, such as bryozoans, corals, brachiopods, arthropods (trilobites) and echinoderms (crinoids), which formed at the warm sea. This limestone due to its availability and ease of molding blocks is often used in the construction of various monuments of the city (eg. city fortifications). Light cream Ordovician carbonate rocks are well visible in the many buildings from various cities of the period [8].

Fig. 3. Ordovician limestone with fossils of snails.

4. CLIMATE OF TALLINN

Tallinn is situated in the cool temperate climate with dominant low temperatures, strongly mitigate by the influence of the sea. The average temperature in January is -3,4°C July while 17,2°C. Average rainfall is about 500 mm, and the growing season is about 190 days. Due to the much cooler climate than e.g. in Poland, tourist in Tallinn can observe such oddities as blooming peonies at the turn of June and July, and the strawberry

season is just beginning in this period [9].

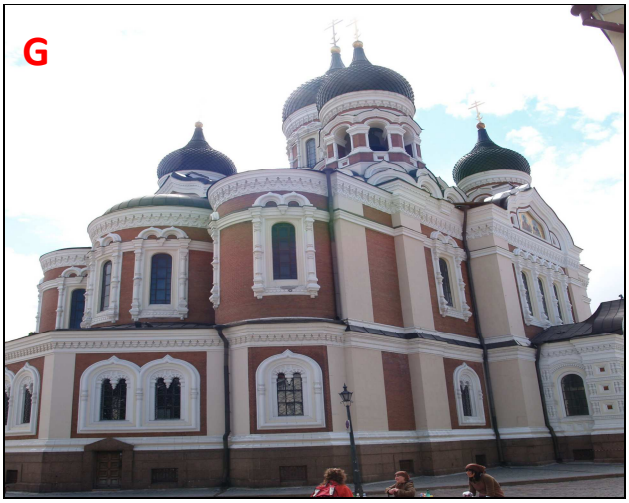
5. SELECTED HISTORICAL MONUMENTS

Tallinn as any European city has a number of numerous monuments from the time of its creation (from XIII century), after years today. These monuments testify to a variety of architectural styles prevailing at that time in the city and cultural influences settlement.

Undoubtedly, the oldest part of the city is the castle hill with preserved fortifications XII and XIV century period [10]. There is also the cathedral of the tombstone of 1585 dedicated to Pontus de la Gardie, the Swedish governor of Estonia. From this period are preserved city walls (partly restored; Fig. 5A), and numerous churches located in the center. Examples are the churche of St. Mary's Cathedral, founded in the first half of XIII century, with numerous chapels and epitaphs (Fig. 5C), the Church of the Holy Spirit, St. Nicholas, St. Michael, who later was renamed the church (in 1716) with a Baroque iconostasis of 1720, and the church of St. Olaf (XV century) with a Gothic tower with a height of 159 m (Fig. 5D), probably one of the highest of those buildings in Europe and the world. The market monument from this period is the Gothic town hall from the XIV and XV century (Fig. 5B) and Great Guild House (Fig. 5E), built in the XV century, in the Gothic style (now the Historical Museum). In the city there are also many medieval houses and granaries [5-7, 11].

In a different style built in 1718 is Kadriorg Palace, designed by Italian Nicolo Michettiego (served as the summer residence of Peter the Great, Fig. 5F) [12]. A little later the cathedral of St. Alexander Nevsky in the typical style of building the church (Byzantine-Russian, Fig. 5G) [13].

From this period comes from a variety of houses in Tallinn, including a 1904 neo-Gothic bank, theater from 1910 built in the modernist style and art house from 1934, which represents the functionalist style. From the interwar period must first replace the lump referring to the Palace building Kardrigorg Presidential Palace (Fig. 5H), built in 1938, as well as many other similar buildings.



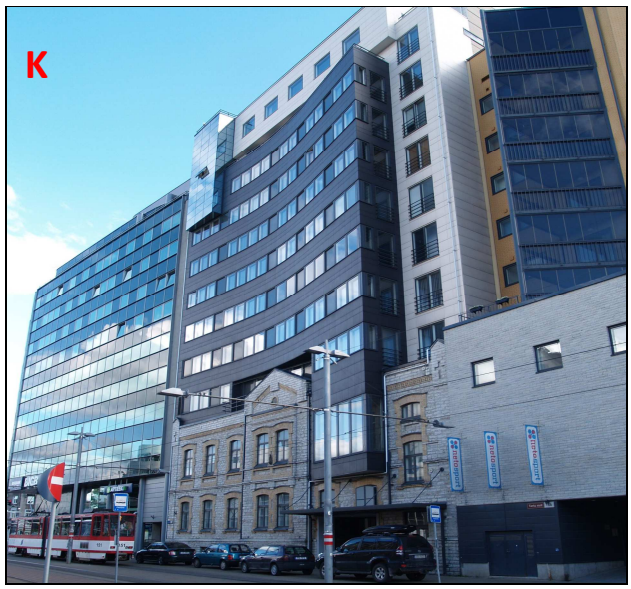


Fig 5. Examples of different architectural styles in Tallinn.

A. Fortifications from the turn of the XIII and XIV centuries, B. Hall of the XIV century, C. St. Olaf's Church believe the height of 125 m, D. The interior of the Cathedral of St. Mary of the XIII century, E. Guild Building (Historical Museum) from XV century, F. Castle from the XVIII century, G. Orthodox St. A. Nevsky Cathedral from the XIX century, H. Residence of the President of Estonia from the early XX century, I. Socialist realist house from Soviet times, J. Modern XXI century skyscrapers, K. Adaptation of the XIX century home in a modern office building.

There can be seen also numerous buildings referring to the period between the wars (functionalism) and the post-war (socialist realism, Fig. 5I) against which stand out firmly skyscrapers built at the turn of the XX and XXI century Scandinavian style (Fig. 5J, K). Some of them in a rather interesting way adopt older buildings, combining modernity earlier styles [2, 14-16].

6. CONCLUSIONS

Tallinn is the multi-cultural city and a major tourist attraction. The city is a UNESCO World Heritage Site since 1997. Within the city are very interesting geological structures, which are reflected both in the orography of the city (geomorphological) and its architecture. In among the sights of Tallinn, there are many varieties and styles creating a curious marriage of Western culture to the east. Multitude of architectural styles corresponds to the multicultural city that is visible both in its history and modern times.

TRANSPARENCY DECLARATION

The author declares no conflicts of interest.

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