

‘Liban’ Quarry – Education Path Promoting Conservation Traces of Former Opencast Mining

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Summary

“Liban” quarry in Krakow has a rich historical past. Located in the city center of Krakow, it is a symbol of industrial development in the twentieth century, as well as prisons and places of memory of Nazi crimes. Rich in spatial forms produced during the extraction of limestone, in the countryside creates an oasis of peace and tranquility in the heart of the city. Developed path relies on the availability of scientific values to a wide audience of Polish and foreign. Development was created based on existing legal requirements and planning, taking into account the behavior of certain facilities and equipment as an integral part of the pit. In addition, the proposed method development will affect the growth of interest in the forgotten part of the industrial region of Krakow Krzemionki.

Keywords: “Liban” quarry, geotourism, nature path

Introduction

Currently on Polish territory is located about 881 quarries, of which about 363 are closed. These objects are very different not only in terms of properties of rocks (petrography, physico-chemical properties) but also the morphology. Workings remaining after extraction of igneous rocks are often many levels (usually from three to six levels), with steep walls and a large area (up to 100 ha). Often pit depth reaches 100 m. The operation of the raw material takes place in them mainly through explosives. The opposite of these quarries are mining rocks of sedimentary origin. They have a very varied morphology, the walls are

mostly low (up to 20 m height) and slightly sloping. Within the quarry often seen bWurrs, niches or scree with fine rock [Pietrzyk-Sokulska 2009; Poros, Sobczyk 2014].

The pits formed during operation observe the variability of colors and rocks and sedimentary processes, tectonic, karst weathering. Rubble and rock walls can be a place of observation and collection of minerals and fossils. Additional advantages of the excavation may be the occurrence of leaks from the walls or on the bottom of the water tank. Water reservoirs (especially in the former workings of sedimentary rocks) have a considerable depth and transparency of the water. Because

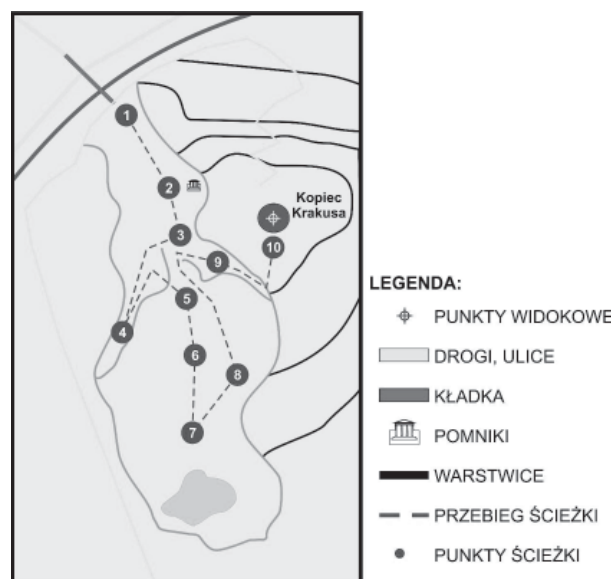


Fig. 2. The route of teaching path „Liban Quarry” [own ed.]

Ryc. 2. Trasa ścieżki dydaktyczno-przyrodniczej Kamieniołom „Liban” [opr. wł.]

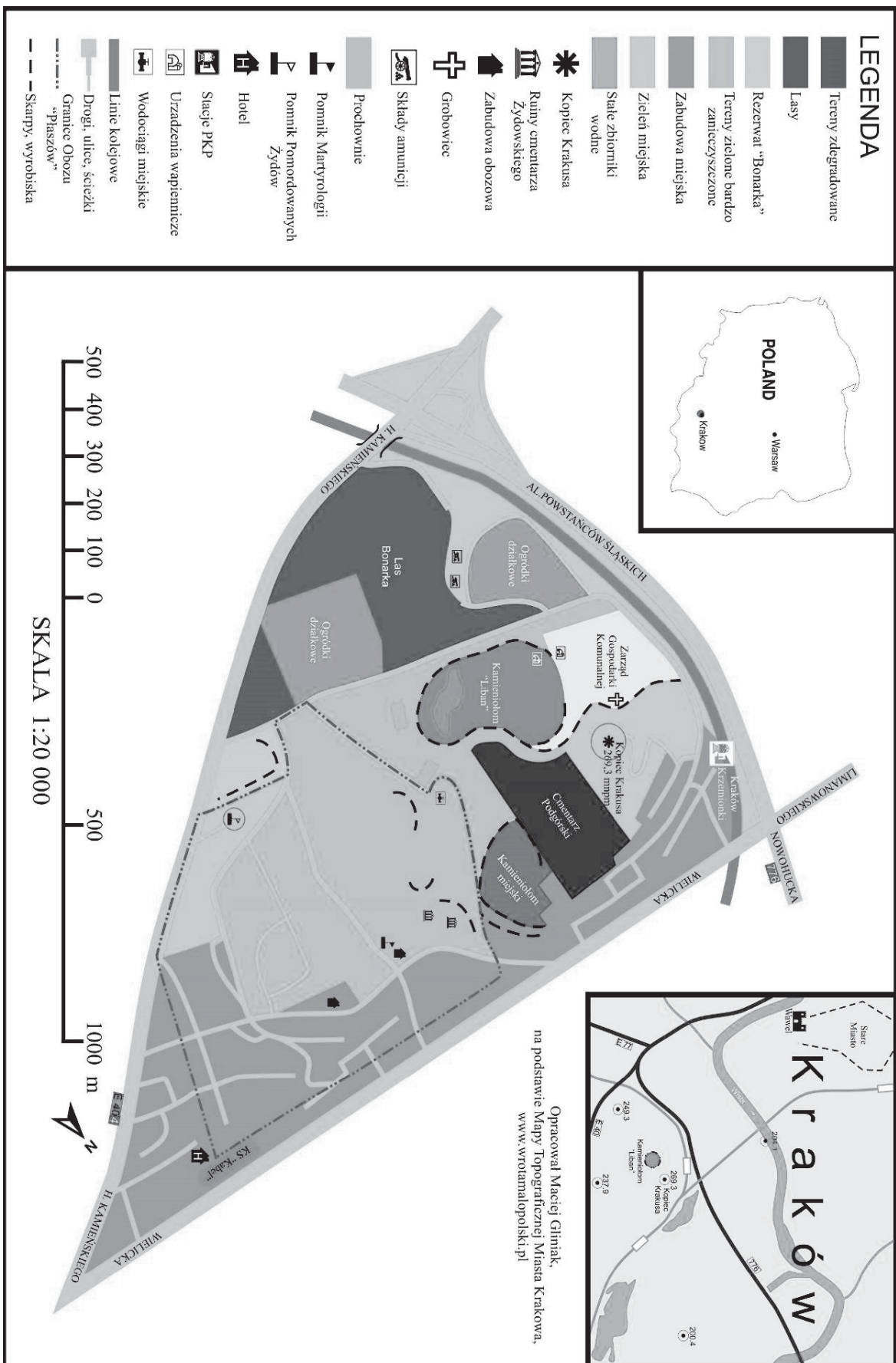


Fig. 1. Location of the „Liban” quarry [own ed.]
Ryc. 1. Położenie Kamieniołomu „Liban” [opr. wł.]

of its properties are good places for swimming or diving for example Zakrzówek quarry in Krakow [Dawidziuk 2004 Ubermann 2001].

Traces left on the walls of the quarry inform us about how life rocks. Walls, where minerals are mined manually smooth, vertical, low altitude. They contain traces of wedges. While the walls of the eksportacji mechanical, eg. Using explosives, are uneven with many cracks and burrs, and with traces of blast holes (Pietrzyk-Sokulska 2009 Gliniak 2012).

Natural and geographical characteristics of the "Liban" quarry

"Liban" quarry administratively located in the Podgórze District, and geographically belongs to the southern part of the Krzemionki foothills in Krakow (Fig. 1.e immediate vicinity of the excavation is Krak Mound (from the top you can watch the whole quarry). At the quarry area can be reached from the street for lane passing through the area belonging to the Board of Public Utilities in Krakow.

The quarry mined Upper Jurassic limestones, developed in the form of thick-bedded limestone. On the south-western wall within the limestone, there are clear karst forms - vertical wells with a diameter of a few meters. Currently, covers the lower part of the talus reaching almost to half-way up the wall, but the lifetime was found that

certain wells dragged to the bottom of the quarry. Wells filled with sand and clay, interspersed with blocks of seats and crushed Jurassic limestone flints dissociated from limestone and marl. Clays have a greenish color from intense green by celadon to olive. There is also the color of brown or rust. [Gradziński 1979 Szczepańska et al. 2005]

The basic assumptions of the project nature trail "Liban" Quarry

The nature trail around the grounds Liban Quarry is based on historiographical methods and vision of the local area. Location of the old workings is preferred due to the proximity of many interesting places associated with the sub-mountain Krzemionki: Market in Podgórze with the church of St. Joseph, Wojciech Bednarski Park, St. Benedict Fort, Inanimate Nature Reserve "Bonarka", Monument to the Victims of the Holocaust, the grounds of the former concentration camp Plaszow.

This tour is scheduled for approximately 1.5 hours. In the middle of it overcomes the route on foot length of approximately 1 km. Accessible by tram or bus (from the city center and the eastern part of Krakow - stop "Powstańców Wielkopolskich"). To get the quarry from the street By Tor. It is a small street parallel to the Powstańców Śląskich Avenue. The route has medium difficulty (Fig. 2).

Stop 1. Sztygarówka

After the entrance to the quarry from the street. For Tor, we find ourselves on the objects managed by the Department of Public Utilities in Krakow. On the right we see the neglected, the yellow "Sztygarówka" building (Fig. 3). Inside, you can create a museum with a permanent exhibition of geological and thematic temporary exhibitions.

Fig. 3. Sztygarówka building [own photo]

Ryc. 3. Sztygarówka [fot. wł.]



Stop 2. Monument working in Lebanon Labor Camp

Departing from "Sztygarówka" head to the left going into the quarry area. Pass by the workshop ZGK, after passing a small building just off the eastern wall of the quarry and see the tomb carved a niche in the rock of the obelisk.



Stop 3. Climbing wall "El Commendante"

Wall "El Commendante" (Fig. 4) with the not too distant from the site of the building would forge sport climbing in Krakow. On the wall is already set out a number of climbing routes. Building forge can be adapted for climbing club headquarters, where under the supervision of professional instructors can train your skills.

Fig. 4. Climbing wall "El Commendante" [own photo]

Ryc. 4. Ściana wspinaczkowa „El Commendante” [fot. wł.]

Stop 4. Observation Shelf

Another stop point is ledge which is located on the western wall of the quarry. In this area, I suggest setting the observation telescopes. Shelf surface is overgrown with trees and bushes, so the area requiring urgent attention - trim existing trees, planting more small shrubs, sound settings guardrails. On the blackboard illustrations put the most important bird species observed in the quarry.



Stop 5. How we make cement

After the departure from the vantage point of birds pass near the lime kilns (Fig. 5) and go down the metal stairs. We are located in front of the technological piece of cement production. Already facing the machine can be supplemented by another, from the mines in which the old equipment obsolete. Appropriately preserved and protected can be a museum of mining. On a plate put a description of modern methods of production of cement production scheme and photographs of old lime kilns.

Fig. 5. Lime kilns [own photo]

Ryc. 5. Piece wapienne [fot. wł.]



Stop 6. Decoration Film

Remains of the decoration after the film "Schindler's List" require order and security (barbed wire - Fig. 6). On the part of the bottom, you can decorate a small reconstruction of the plan of the film, put the information on the board who was Oskar Schindler, annotations about the camp "KL Plaszow" photos from the "List Shindler".

Fig. 6. „Schindler list” film decoration [own photo]

Ryc. 6. Dekoracje z filmu „Lista Schindlera” [fot. wł.]

Stop 7. Quarry nature

To the water reservoir can be reached on the road formed from the remains of the scenery for the movie "Schindler's List," Steven Spielberg - replicas of Jewish tombstones (Fig. 7). Do not come to the same reservoir, so as not to disturb the animals residing there. On the plaque set in the vicinity of the tank there is a description occurring plants and animals, as well as photographs of interesting species.

Fig. 7. Water reservoir at the bottom of the quarry [own photo]

Ryc. 7. Zbiornik wodny na dnie kamieniołomu [fot. wł.]



Stop 8. Wells karst

On the south-western wall inside are visible vertical limestone karst wells. Currently, the lower part of the cover scree extending to about half the height of the wall (Fig. 8). The depth of the well is at least 30 m. All are filled with sands and clays. Fossil karst wells from the same period are known from several places in the vicinity of Krakow (among others Tyniec Bodzów, Zabierzow or Gwozdziec). The process of formation, and then filling the well and associated systems karst channels occurred relatively quickly. Full well ceased to be active, and the next could emerge next well. These wells belong to one of the older generation of karst forms, but they are younger than most of the caves found on the slopes of the valleys near Krakow.

Fig. 8. Karst wells [own photo]

Ryc. 8. Studnie krasowe [fot. wł.]



Stop 9. Thermophilic grasslands

The wall on which there are thermophilic habitats, is also leaving the quarry (Fig. 9). On this ledge is marked "wild path". When creating a didactic route falls ensure safer exit from the quarry. This can be formed in several degrees of quality, secure them by mounting a wooden degrees.

Fig. 9. Thermophilic grasslands in „Liban” quarry [own photo]

Ryc. 9. Murawy kserotermiczne w kamieniołomie „Liban” [fot. wł.]



Stop 10. Krakus Mound

After leaving the quarry we go to the mound Krakusa. Information board set the fence for protection against falling down the slope. Krak Mound land does not belong to Quarry "Lebanon", but because of the scenic values (Fig. 1.) was placed as the last point of the path.



Fig. 1. of the “Liban” quarry from the Krakus Mound [own photo]

Ryc. 10. Widok na kamieniołom „Liban” z Kopca Krakusa [fot. wł.]

Summary

Post-mining facilities which include quarries, have a very high potential revitalization. Presented development concept is supported by the spatial development plans, as well as gives a quarry new functional dimen-

sion. Backed by social research, opinions indicate the need to create objects of an educational nature.

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Kamieniołom „Liban” – ścieżka dydaktyczna promująca ochronę dawnych śladów górnictwa odkrywkowego

Kamieniołom „Liban” w Krakowie posiada bogatą przeszłość historyczną. Położony w Dzielnicy Pogórze miasta Krakowa, znajdują się on w bliskim sąsiedztwie centrum miasta. Wśród krakowian ma on symbol rozwoju przemysłowego w XX wieku, ale także więzienia i miejsca pamięci zbrodni hitlerowskich. Bogaty w formy przestrzenne powstałe podczas wydobycia wapienia, otoczony zielenią tworzy oazę ciszy i spokoju w centrum ruchliwego miasta. Opracowana ścieżka zakłada udostępnienie walorów naukowych szerokiemu gronu odbiorców z Polski i zagranicy. Opracowanie stworzono w oparciu o istniejące wymogi prawne i zagospodarowanie przestrzenne, z uwzględnieniem zachowania niektórych obiektów i urządzeń będących integralną częścią odkrywki. Dodatkowo proponowany sposób zagospodarowania wpłynie na wzrost zainteresowania zapomnianą częścią przemysłową regionu Krzemionek Krakowskich.

Słowa kluczowe: Kamieniołom Liban, geoturystyka, ścieżka dydaktyczna