

WP4

Platy limestone as cultural heritage

Annex 3.1

HISTORICAL ANALYSIS OF THE USE OF PLATY LIMESTONE QUARRIES AND DELVES IN KRAS/CARSO

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The study is divided into three parts: the first part provides an overview of archaeological resources and analysis of available data, in the second part we consulted the Franciscan cadastre as the possible source of data connected with quarrying, delving and hoarding of limestone, the third is compilation of oral and other ethnographic sources that mention platy limestone.

1. Archaeological resources and use of stones in the archaeological periods

In the Kras/Carso region stone is not only one of the basic natural resources but also a key element of material culture. The way it was treated largely depends on economic development and the complexity of the society. Its development has caused an increased range of extraction methods and various use of stone, what is seen from the material remnants and written sources.

Although our study is focused on the Kras area, from the perspective of the archaeological analysis it is reasonable to consider the wider region, which includes beside Kras/Carso also Istria - geological and culturally this is in fact quite uniform area. This unity is manifested both in prehistoric times, when there appeared same or similar cultures (in terms of the use of stones specially interesting is "Castelieri culture") and during the Roman time, when this area was included in the tenth region of Italy (Regio X Venetia et Histria), as well in the Middle Ages, when, despite two competing state formations (Venetian Republic and the Habsburg Empire) rural countryside has lived in an unchanged manner and, between the 19th and the 20th century, when the area remained within one country (first Austrian Empire, then Austro-Hungarian empire, then Italy and later Yugoslavia) despite the change of state borders (Guštin 2011).

Uniform treatment is sensible also because of the scarcity of available data - archaeological studies are rare, and for various reasons it is difficult to record activities related to stone quarrying/delving and stonecutting. Only by combining and comparing the scarce data we can come to certain conclusions.

2. Prehistory

Although the area of the eastern coast of the northern Adriatic has been more or less continuously inhabited ever since the Paleolithic time, is for our study interesting ever since the intensive permanent settlement during the Bronze Age (2nd millennium BC). In that time in the entire area occurred hillforts, fortified settlements, (mostly) placed at hilltops, which constitute proto-urban centres, main seats of tribal elites, and at same time the fortresses with an important strategic location and control of the surrounding territory. Kras/Carso and Istria, ramparts and mighty walls were built of stone in dry wall technique, with two well-constructed frontlines and intermediate filler. They were, if necessary, restored, and expanded. The stone that was used as the building material originates from immediate proximity or even from the site itself. The stone material was obtained by cleaning of arable land, or, in cases of larger and more ambitious forts, with planning or terracing inside the settlement. In both cases, it is difficult to talk about organized quarries.

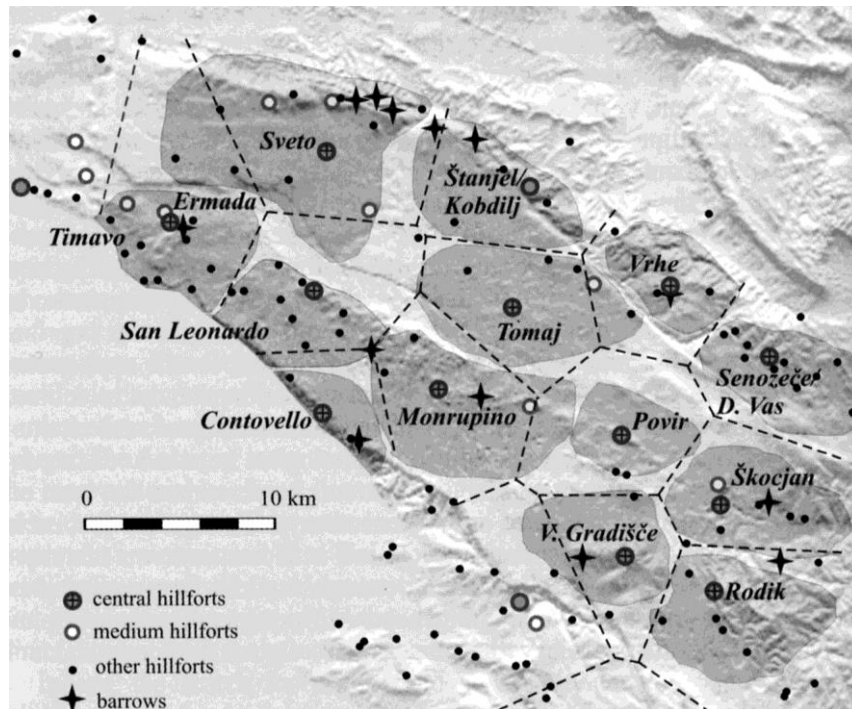


Figure 1

Network of bronze and iron age hill forts at Kras/Carso (after Novaković 2005).

Ramparts and walls surrounded central settlement as well as the smaller villages, outposts or animal pens for cattle, goats and sheep.

Stone was simultaneously used also for the construction of dwellings. Archaeologically documented are the walls of individual buildings within the certain Istrian and Kras/Carso hillforts (Buršić Matijašić, 2008, 100-107). They can be built on the isolated place or in rows in the interior of the terraces or leaning on the settlement walls. There is currently no evidence that this sort of dwelling had a roof covered with stone slabs; the reason for this is probably the availability of other materials and statically complicated construction needed for stone roof.



Figure 2

Monkodonja, a: western entrance to the hillfort, b: remains of buildings on hillfort terrace (after Monkodonja i Mušego 2009).

But the stone slabs are used since the Early Bronze Age onwards as a material for grave constructions. In the Bronze Age the grave consisted of one cell, which was made of vertically placed slabs, in which the corpse of the deceased was placed in contracted position. The entire coffin (cyst) is also covered by the stone slab. Since the grave structure was usually placed on the natural surface, it was subsequently covered with a further layer of the stone rubble and sometimes also surrounded by a circle of larger blocks. Result was stone mound, which has played an important cult role, and at the same time represented the distinctive element of the landscape, as they are usually placed at prominent locations - tops or ridges of the heights (Guštin 2011).



Figure 3

Mušego, reconstruction of stone tumulus with stone plates cist in centre (after Monkodonja i Mušego 2009).

In the late Bronze Age and Iron Age were similar, but smaller chests used as grave niches that were dug in graves, which stored the ashes of the deceased and grave goods.

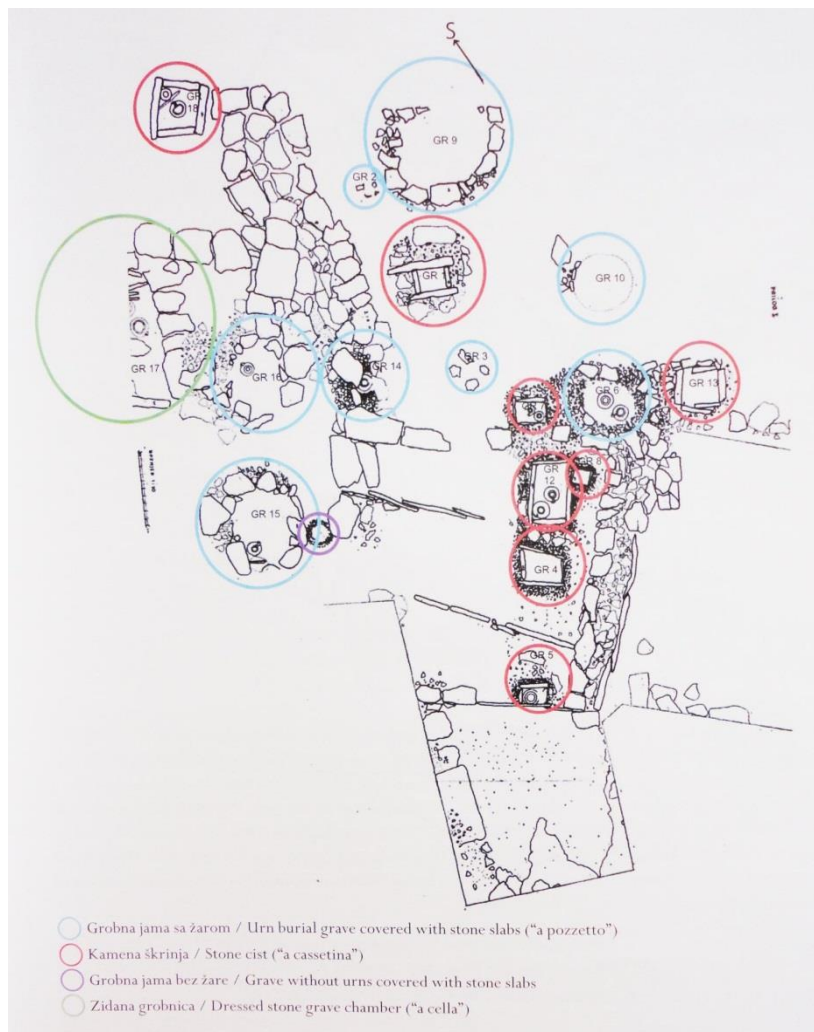


Figure 4
Graves Limska gradina, plan of necropolis with different types of grave constructions (after Cestnik 2009).



Figure 5
Socerb, grave made of stone slabs (after Moser 1903).

It should be noted that similar architectural elements (walls, stone objects ...) from grave constructions that consist of stone slabs are found not only in the environments where limestone is the prevailing sort of stone, but also where sandstone is dominating. People used both materials, depending on the availability in the area. However, the building construction itself, as it is seen from the archaeological findings and remnants of the building constructions, did not require the search and the exploitation of the optimal stone sort. Unfortunately we do not have any archaeological evidence about the quarries or delves from these distant periods.

We may assume that by the larger construction campaigns the entire community was engaged in the acquisition/extraction of material and construction. Presumably each family was in charge for obtaining the material for the construction of their houses or burial tombs. The existence of special crafts, connected with the stone processing or - anachronistic said industries - and the "trained professionals" cannot be assumed, but this does not exclude the existence of individuals with greater skill and experience in the treatment of stone.

3. Roman era

The situation has fundamentally changed in the second century BC, when the discussed area gradually came within the border of the uprising Roman Republic. With the arrival of the Romans have considerably developed the economy, construction techniques, architecture and standard of living. All this is reflected in stone quarrying, masonry and architecture. Larger public works required high-quality building materials as is marble, which was exported also from the distant provinces of the Empire. From the era of the Roman Empire, there are larger and smaller quarries attested all over the eastern Adriatic coast. Large quarries were under state - later imperial - control, employing (also) trained workforce, and had wide distribution of rough stone, semi- and final products.



Figure 6
Stonemason's relief from Pula (after Starac 2006).

The most notable were the quarries, which beside high-quality stone material enabled simple and inexpensive transportation. Several bigger cities with the great need for the building stone laid in the direct or indirect proximity to the sea, which enabled transport by the ships even to the most distant provinces or the parts of Apennine Peninsula. Well known are the Roman quarries Cava Romana in Aurisina/Nabrežina north of Trieste/Trst and Vinkuran south of Pula. Smaller quarries with traces of Roman extraction are attested or presumed also near Poreč and Rovinj in Istria (Djurić 2004).

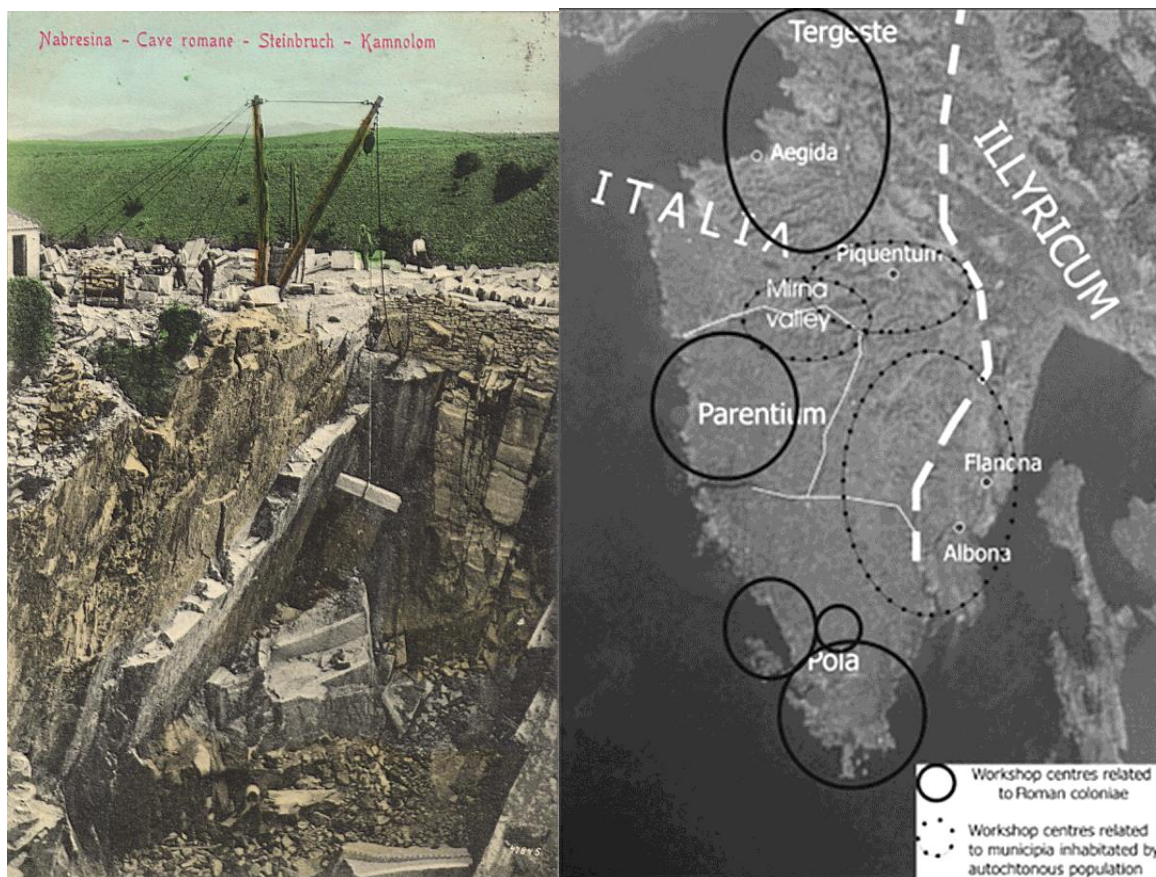


Figure 7
The postcard of Aurisina/Nabrežina-Cava Romana quarry.

Figure 8
Map of territories of different Roman stonecutters workshops (after Starac 2009).

In addition to stone as the building material for private or public buildings, some quarries produced also blocks for votive or funerary altars, tombstones, funerary steles and later for sarcophagi. Near the quarries have developed also stone-cutting workshops wherefrom the stone blocks or the semi- or final products were distributed elsewhere.

Even by the time of Roman period we cannot confirm the existence of the platy limestone roofs. In urban centres has certainly dominated clay tile decking (*tegulae*) and in the countryside straw or wood roofing. Nevertheless, stone slabs were continuously used as elements of tomb construction, what is characteristic especially for the indigenous communities or the graves of the average people (Moser 1903; Istenič 1987). Unlike older periods, graves build of slabs were in the antiquity sometimes reinforced with lime mortar. Due to the similar shapes, but more accurate dimensions, stone slabs were sometimes replaced with *tegulae* and in the case of the richer graves by more complex masonry works. In the Roman era was widely spread skeletal burial and therefore have developed sarcophagi. They were produced by specialized stonemason's workshops and could be very lavishly carved. The sarcophagi or at least the marble blocks or semi-products were exported and imported from distant provinces, the centres of the most distinguished sarcophagi were Attica with Athens, the capital Rome and Chiragan in Asia Minor.



Figure 9
Graves made of stone plates Rodik (after Istenič 1987).

5. Medieval time

The end of antiquity and the fall of the Roman power in the discussed area has led to substantial civilization setback. That caused the decline in construction activity and architectural knowledge, consequently also in quarrying and stonemasonry. Only few quarries (eg. Vrsar) continued with production and supplied some cities under Byzantine rule or influence on the Istrian coastal area and Ravenna. As the source material for new but modest buildings Roman ruins are frequently used - these are convenient because they are relatively close to the new cities and offer already shaped stone blocks. As a building material were used even tombstones and sarcophagi.

During the Middle Ages increased the difference between the urban and rural environment. In rural areas in the building activities only partially worked stone is re-used, while in the sepulchral architecture stone slabs replaced the stone-and-mortar tombs and sarcophagi. Local quarries and delves are used. Exceptions are some Istrian quarries with very durable stone that was extracted for the building constructions of Venetian Republic.



Figure 10
Gojače-Boršt, grave covered by stone slabs (after Svoljšak, Knific 1976).

While the stone-slabs graves are well-known both in Istria and in the hinterland, it is worth drawing attention to two archaeological sites where were attested stone slabs in the buildings. In Boršt in Vipava valley in the wooden building, dating between the 8th-9th century numerous slabs were found and interpreted as possible roof cover. Second case is the settlement from the 14th -15th century in Muggia/Milje, where stone house was covered with stone slabs.



Figure 11
Gojače-Boršt, layer of stone tiles from 9th century building (after Svoljšak, Knific 1976).

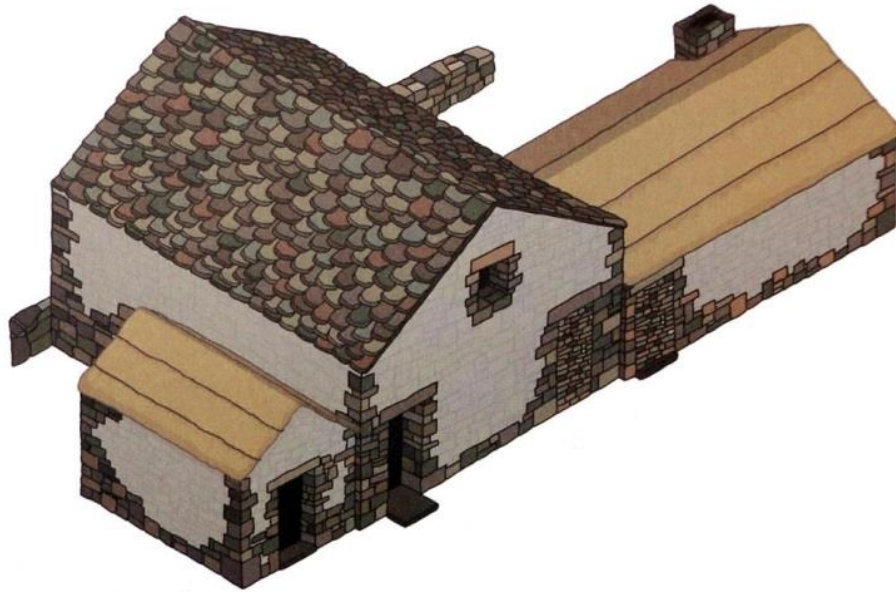


Figure 12
Muggia/Milje, drawing of the reconstruction of the 15th century-building complex (after Pieri s.d.).

5. The Franciscan cadastre and its meaning for the research of the quarries

Within the project we tried to research the presence of limestone quarries in relation to historic sources, chronology of use/reuse/abandonment, geographic location, connectedness to urbanized sites and craft centres, transport routes, interdependence with the socio-economic development of the region of Kras/Carso.

For the first half of the 19th century, from the period, to where the memories of today inhabitants can't reach, the only reliable historic source for the analysis is the Franciscan cadastre.

Regarding the exploitation of limestone as a raw material, we wanted to analyze data from the cadastre and compare them with ethnographic data and situation distinguishable on the ground.



Figure 13
Purasanta Angelo, “Steinbrecher von Triest”, 2nd half of the 19th century

Franciscan cadastre (following the reforms of the Austrian Emperor Franz I.) was in the first half of the 19th century created for a clear overview over the territory of the Habsburg Monarchy, especially with ambition to enable efficient and transparent tax assessment. Thus, it focuses mainly in the inventory of arable land and other surfaces that bring economic profit (pastures, woods). It consists of textual part, which basically represent descriptions of cadastral community and lists of cadastral parcels (land, buildings) as well as maps, with parcels carefully drawn, numbered and - in the original version - visually marked / painted in accordance with their intended purpose.

The Franciscan cadastre for the Austrian Littoral was made between 1818-1828. Today it is kept in the State archive in Trieste (*Archivio di Stato di Trieste*).¹ It's composed by maps and elaborates. Elaborates are divided into many parts, from the list of land and building parcels to general descriptions, revision reports etc. A complete cadastre represents a rich source of data for a variety of topics not necessarily related only to the basically intended purpose. However, it should be noted that the interviewers were mainly interested in primary goals. Textual parts show that despite ambitious common methodology quality of responses may vary depending on the interviewers and the commissions that assist them on the ground. Concrete obstacle is also a different preservation of archival sources. For some cadastral communities certain parts of elaborates are missing, the other lacking even the cadastral maps.

¹ <http://www.catasti.archiviodistatotrieste.it/Divenire/index.htm>

For reaching objective of our study we used three approaches:

- Analysis of the answers in the questionnaires, which served as support in the description of the cadastral community and the activities of its inhabitants,
- Analysis of parcels descriptions and illustrations in connection with possible delves,
- Analysis of data of roof covering types.

6. New findings on the quarries and quarrying related activities in the Franciscan cadastre

The most important for our research are the parts, which contain information on geographical, social and economic characteristics of certain cadastral municipalities – among them can be found some data on the stone excavations. Those parts are S/4 – the questionnaire dated to 1819/1820, S/5.17.20.21 – first pages are dedicated to the description of the cadastral municipality (dated to 1829/1830), S/15 – also descriptions of cadastral municipalities, but more modest (dated to 1828). The question (numb. 17) on quarries in the part s/4 is: *If in the municipality there are any lands or pastures on which quarries of stone can be found that can be elaborated, and what kind of annuities can these quarries produce, without any craft/art intervention?*²

The research has been done for 23 cadastral municipalities of the Kras/Carso region.³

On the territory of Sežana, Dutovlje, Tomaj, Kazlje, Merče, Povir, Divača and Lokev the answer to the question 17 from the part S/4 says, that in these municipalities ordinary quarries (Steinbrueche) exist, but from the inhabitants do not have almost no income from them. The ones that they are “industrially” used, give barely for a daily wage.⁴

² „Ob es nicht Gründe, oder allenfalls Buttweiden geben, die Steinbruche liefern, welche verarbeitet werden können, und welche Ertragnis dieselben ohne Dazwischenfunk der Kunst abwerfen?“ / „Se nella Comune non vi siano die terreni o tuttavia anche die pascoli sui quali si trovano delle cave di pietre che possono esser lavorate, e quali rendite possono produrre tali cave, senza intervento dell'arte?“

³ District Devin: Repen (Rupingrande), Gorjansko (Goriano);

District S. Daniele (Štanjel): Avber (Alber di Sesana) (including also village Ponikve), Gabrovica pri Komnu (Gabrovizza di Comeno) (including also Coljava), Hruševica (Crussevizza di S. Daniele), Kobjeglava (Cobbia) (including also Tupelče), Kobjdil (Cobidil S. Gregorio e Cobolli), Kopriva (Capriva del Carso) (including also Brje pri Komnu), Pliskovica (Pliscovizza della Madona) (including also Kosovelje), Tomačevica (Tomasovizza), Veliki Dol (Dol Grande), Volčji grad (Volci);

District Sežana: Dolnje Ležeče (Lesece di S. Canziano, Unt. Lesezhe) (including also Gradišče in Brežec), Dutovlje (Duttogliano) (including Kreplje), Divača (Divaccia), Kazlje (Casigliano di Sesana), Lokev (Corgnale), Mrče (Merče) (Merciano) (including also Žirje in Plešivica), Povir (Poverio) (including Brestovica), Sežana (Sesana), Skopo (Scoppo), Štorje (Storie) (including Podreže, Senadolice in Majcni), Tomaj (Tomadio).

Some of the descriptions for some cadastral municipalities do not contain all the three parts. S/4 does not exist for municipalities: Skopo, Veliki Dol, Volčji grad, Gabrovica pri Komnu, Tomačevica, Kobjeglava, Kobjdil, Hruševica, Kopriva, Pliskovica, Avber in Dolnje Ležeče. For these municipalities we have just S/5.17.20.21 and S/15. But S/5.17.20.21 does not exist for municipalities: Repentabor (it has a similar description – S/23), Tomaj, Skopo, Gorjansko, Kopriva, Lokev in Dolnje Ležeče (for the last one it exist only S/5.17.20.21).

⁴ The original text is: „Die ordinieren Steinbruche bestehen in der ganzen Gemeinde, welche aber gar keine(n) Nutzen abwerfen, und jene(n) welche dieselbe mit Kunst bearbeiten karg(k) den Taglohn verdienen geben.“ or

For the municipality of Volčji Grad the part S/15 mentions the use of quarries.⁵ From this information one could be presumed two things: That the inhabitants were using stones for their own use - in all these municipalities the houses and buildings for the different workshops are made of stone, often with the roof of stone slates; that the stone was used also for a modest “industrial” production. Unfortunately from this modest information we cannot gather for what kind of use the stone was and if and where the inhabitants transported it. The data from municipalities Kazlje, Divača, Povir explicitly mention carting (also in the direction of the main centre of the region Trieste), but we cannot know if the stone was one of the cargo.

There is no data on the existence of quarries on the territories of the municipalities Skopo, Veliki dol, Gabrovica pri Komnu, Tomačevica, Gorjansko, Kobjeglava, Kobjdil, Hruševica, Kopriva, Pliskovica, Avber, Štorje and Dolnje Ležeče.⁶ We could assume that there were *de facto* no quarries or they were not active at that time or that authorities who provided the documentation didn't register them as they were concentrated on the farming activities. The quarries could have also become active only later during the 19th century (as it's documented for instance for Avber). It's known that the most flourishing period of quarrying was the period between the 20-ties of the 19th century until the end of the World War I (the culmination of the “golden era” was the period from the construction of the Southern Railway in the year 1857 until 1918). Also new quarries were opened, which had to be near to the building sites. The railway was used to transport the stone faster, especially to the fast-growing multicultural city of Trieste/Trst, where the stone was transported on to other bigger cities and across the seas (Kernel, 2014, 195–196).

Interesting for the research are the data on stone extraction / stone quarrying, transport and the sale in Trieste for the municipalities Repentabor - Rupingrande, but also Kontovel, Prosek/Prosecco in Sv. Križ/Santa Croce. For the municipality of Repentabor it's reported: “Some of them are dedicated to quarrying (the original phrase from Italian language would be “excavation of stones”) for their job, which are transported and sold with profit in Trieste. Or “The only branch of industry being practised by these farmers during the days, when the agriculture work allow it, is the quarrying (“stone excavation”) of stone for constructions (“pietra da fabrica”) which are transported and marketed in Trieste.”

For the other municipalities it's written: “The branches of industry to which these inhabitants are dedicated beside the cultivation of farmlands are the following: a) a) Fishing, b) quarrying / the excavation of stone (“escavazione di pietra”), c) Sale of balast for ships, d) Transport of stones to Trieste for the sea transport.”⁷ It's worth noting the mention of stone as balast (“Zavorra”), because it means that the stone was used for the loading the (empty) boats.

„Die ordinieri Steinbruche sind /.../ gar keine Nutzenertrag, indem sie kaum den Taglohne zu Verdienen geben, wenn einige Insassen Steinbruche liefern.“ (just for Divača). For those two municipalities the other parts do not mention quarries.

⁵ „Alle Besitzer beschäftigen sich mit der Ackerbaum, und ausser der (nöthigen) Handwerke wird fast(?) kein Industrialgewerbe betrieben.“

⁶ The type of answer for all the municipalities is more or less the same: „Alle Besitzer beschäftigen sich mit der Ackerbaum, und ausser der (nöthigen) Handwerke wird fast(?) kein Industrialgewerbe betrieben.“

⁷ „Alcuni si prestano nell'escavazione di pietre per lavoro, le quali si conducono e si vendono con profitto in Trieste.” or „L'unico ramo d'industria praticato da questi agricoltori nelle giornate, che li lavori campestri lo permettono, e quello dell'escavazione di pietra da fabbrica, le quali vengono condotte e smerciate in Trieste.“. For the other municipalities it's written: „I rami d'industria, ai quali si dedicano questi abitanti oltre la

If we conclude: not only for the municipalities of Repentabor - Rupingrande, but also for the municipalities of Kontovel/Contovello, Prosek-Prosecco and Sv. Križ/Santa Croce, as all of them lie in the vicinity of Trieste in the Italian part of Carso, it is quite clear that stone quarrying was indisputably linked to economic activities – transport and trade in Trieste. In the direct surroundings of Trieste the quarrying must have had a strong economic significance in the first half of the 19th century, but again we can't discern if also the platy limestone extraction was involved.

For the rest of Kras/Carso (not only the settlements in the immediate surroundings of Trieste) where the quarrying is documented (municipalities of Sežana, Dutovlje, Tomaj, Kazlje, Merče, Povir, Divača, Lokev, Volčji grad), it is stressed that there is almost no income or at most for a daily wage. For Volčji grad it is explicitly noted that the inhabitants exploited the stone for their own use.

7. Marking of uncultivated parcels and absence of delves

From above said it can be seen that the stone quarrying and other activities related to stone were generally regarded as a supplementary activity of the rural population. Quarries, which would have been industrially exploited and entered as such in the cadastre, are practically non-existent. Cadastre was actually made a couple of decades or half a century too early to cover the expansion of quarry and stone-cutting activities caused by the construction of the Southern Railway and the consequent flourishing of Trieste as a rapidly expanding metropolis.

This is also reflected in the cadastral maps, where quarries (or rather stone delves) are practically not marked nor labelled. The reasons for this is multiple. Most of these are small surface delves located in areas less suitable for cultivating. Those areas were generally defined as pastures or forests. As a rule that were larger parcels where the dominant distinction "blanketed" delves (*kave/jave*). Another most likely reason (attested also by the recent situation) is often communal ownership of these areas, where material (eg. stone slates) was extracted by those who needed it for their own use. Such exploitation was less interesting for the purposes of the cadastre.

Still the maps and descriptions marked some uncultivated areas within the dense grassland or arable areas. These are often treated as separate parcels. They were numbered, measured and plotted. On the maps they are usually unstained and generally marked with the letter "ö" or "Oed" (*Ödland, Oedungen*) and in the description marked as "*incolto*". In more precise descriptions they are cited as *Steinbruch* or *Muchie di pietra*. At least in the Italian expression we can recognize piles of rocks, which arose as a result of the cleaning of arable land (*Griže, Gruble*).

coltivazione dei terreni sono li seguenti: a) la Pesca, b) la escavazione di pietra, c) Vendita di Zavorra, d) Condotte di pietre in Trieste per la via di mare.“

There is again the question why the designers of the map decided to mark these “stone piles”. Was it because they can get some economic activities from them or it is just to mark a piece of non-cultivated land in the middle of the cultivated land which is of “no use”, therefore no pastures or farming land which could be taxed. By comparing the size and the location of the “pile of stones” it can be at least presumed that some of them could present quarries or stone slate delves – at least the ones for which their parcels are larger and they are not placed in the middle of the farmland. (On table this more interesting parcels are bolded). This hypothesis was tested with the analysis of aerial images and lidar measurement⁸ for selected cases (cc Povir, cc Merče). It showed that on those parcels have actually preserved stacks of stones and rocks. This is evidenced also by their location on the border of arable land. If possible, they have been concentrated on spots that enable access by cart and removal of the stone debris.

However, under these locations we normally cannot expect delves, what is clear from a comparison of their position and location of platy limestone delves attested by field surveys and informants. In the cadastral community Avber are such uncultivated parcels identified in the south of the village, whereas the known delves are located to the north and northwest (Premrl 2003, list; WP3 list of quarries).

Whatever the mode of accumulation was, those rocks can serve as a source of building materials, for the preparation of road deposit or, where the platy limestone was in question, for obtaining the roof tiles.



Figure 14
Typical small quarry/delve on Kras/Carso before WW I (after Kras 1999).

⁸ http://gis.arso.gov.si/evode/profile.aspx?id=atlas_voda_Lidar@Arso

8. The analysis of the frequency of the use of stone roofs and the data on quarries/delves from the Franciscan cadastre

The further step of our research is to try to make an analysis of the accordance between the evidenced quarries/delves or “stone piles” in the Franciscan cadastre with the frequency of the stone roofs in the belonging villages. Was the roof made of stone slates common in the first half of the 19th century?

The description of the municipalities offer the data on the type and number of the roof covering – straw, stone slates or clay tiles. Again the question is why it was so important for the map designers to register that type of roof. It can be presumed that the selected type of roof reflected the wealth or the economic state of the house owner – therefore important for taxes.⁹ For sure the roof of straw reflected a lower social class, whereas the roof of stone slates a better social position, although the stone slates can be gathered for free on the owner’s parcel, so it’s not a rule. For sure the houses with roof made of stone slates must have been stronger, with heavier roofing substructure and were more resistant to the strong winds (burja/bora) and fire, so they indicated a better living standard of their inhabitants. Probably the wealthier houses in this time used the newest and the most modern product – the tiles. In the enclosed table in the original language (Italian) the situation is as follows:

- Village with the houses with the roofs only in stone slates: Štanjel (1);
- Villages with the majority house roofs in stone slates and others in straw and tiles: Dutovlje (including Godnje, Kreplje); Gabrovica by Komen; Kobjeglava (including Tupelče); Kopriva; Lokev (including Prelože - majority of stone slates and tiles); Pliskovica, Skopo; Tomačevica, Tomaj, Veliki dol, Volčji grad.
- Villages with part of house roofs in stone slates, part in straw and tiles: Brje pri Komnu (together with Tublje, Kregolišče – majority of tiles); Ivanji Grad; Komen, Merče (including Žirje, Plešivica – prevailing straw); Sežana (including Dane by Sežana, Šmarje, Orlek – prevailing tiles); Štorje (including Podbreže, Majcni, Senadolice)
- Villages with house roofs in straw and stone slates: Dane (including Kačiče – prevailing straw); Hruševica; Kazlje (prevailing stone slates); Kobdil; Krajna vas (prevailing stone slates), Ležeče (including Gradišče, Brežec, Betanja – prevailing straw); Povir, Gorenje
- Villages with roofs in tiles and others in stone slates: Divača
- Villages with prevailing roofs of tiles, than stone slates and a minimum of straw: Gorjansko (Nadrožica)
- Villages with house roofs only in straw: Barka, Brestovica, Rodik, Voglje (including Vrhovlje – 1 in tiles, rare in stone slates).¹⁰

All the outbuildings are covered with straw roofs, except in Štanjel, whereas part of them is covered with stone slates.

⁹ As early as the Roman times the roof - more precisely the number of *tegulae* - was the measure that enabled its owner to enter (or not) the municipality or state council (Kompore 2015)

¹⁰ Unfortunately the data have not been taken from the villages in the Carso area of Trieste, where the quarrying was explicitly reported.

It's noteworthy to mention that the first two categories where the roof of stone slates prevails are concentrated on the so called "Komenski kras" – The karstic area around village Komen, which corresponds to the Sežana formation limestone.

Was it that the roofs of stone slates were more frequent where the delves could be found?

The Franciscan cadastre cannot give us a precise answer. If we take the case of Štanjel, where all the roofs are covered with stone slates, there is just one parcel marked by "pile of stones" (632), while for Štanjel in the recent year there are no delves documented. Is it that all the stone slates derived from that "pile of stones" or this "pile of stone" does not denote anything? Dutovlje (with Godnje, Kreplje), where most of roofs are made by stone slates, mention only two parcels with "stone piles" (1880, 2473), while today one delve is registered – a continuation of a "stone pile"? It can remain just on the level of guessing. If we do the analysis in the opposite direction: Dane by Sežana has a big number of parcels with "stone piles" (54 (!)). Considering the location and size it could be presumed that a lot of them could be quarries/delves (29), while the number of the roofs in stone slates is of the smallest percentage comparing to tiles and straw (but including Sežana, Šmarje, Orlek). Lokev has a big number of "stone piles" (68), 4 of them could be delves/quarries and most of the roofs are covered with stone slates. Still today there is a delve documented in Lokev. So here we have a bit of more accordance.

Continuing the analysis in the opposite direction we can compare Rodik, where all the roofs are made of straw with the number of "stone piles". There were only 3 parcels signed with "stone piles" in the Franciscan cadastre and today there's one registered delve. If this was a delve why nobody used the stone slates from it, even not the owner? If we compare the "possible delve" (parcel 191) from the cadastre to the location of nowadays delve, located in Mrzlik in Brda, 1,5 km from the village in the direction of Artviže (*kava v Mrzliku*) (Premrl 2003), there is no accordance between them. The "pile of stone" in the Franciscan cadastre is not 1,5 km from the village, but just outside the village, under the hill of Čuk/Luza. The today's delve in Mrzlek, which is not far from Kobilja glava, signed in the Franciscan cadastre, is not even signed on the map and there is no special colour in this parcel – just for forest.

Can it be concluded that there were no delves in the village therefore no roof of stone slates? It's interesting to note also a parcel named Kamenščina – parcel of stones (but not delve), signed as pastures, but without any "pile of stones". It was a surprise to see that no house in Rodik was covered by stone slates, knowing that it was the home of one of the most known families of stonemasons and stone artists in the region – Felicijans. Anže Felicijan came to Rodik as a master stonemason in the 17th century and settled down. He constructed and made the stone slates for the roofs in Rodik and several churches in the surrounding region (see Premrl, 2005), but, interestingly, not for his own house and its surrounding. It is even written in the sources that his first son was born under the roof of straw (Premrl, 2005, 5).

Why even the house/houses in the village of one of the most known families of master stonemason was/were not covered with stone slates? Was it because there were no delves - even if today some of them are registered? Was it because one did not have a delve in his own

village or in his own parcel and the stone slates were too expensive to buy? Were the roofs covered with stone slates related just to the direct proximity of the delves?

Unfortunately we can't have a precise answer to all these questions, as the analysis of the Franciscan cadastre did not really show a clear connection between "stone piles" and delves. An increased number of the roofs covered with stone slates emerged in the first half of the 19th century in the region where the locations of Sežana formation are known and frequent. Therefore at least a small conclusion can be made – the roofs covered with stone slates were more frequent and depended on the direct origin of the stone slates/stone material from the village surrounding. Except for churches and church constructions it does not seem that ordinary people with an average income could afford to buy the stone slates, except if they could get them in some other way from their surroundings.

9. Other sources and ethnological data

Archival sources that mention the use of stone almost exclusively report construction of the churches or adjacent buildings. Such interventions were recorded in the payments and the data about them is – in the case when they have preserved at all – scattered through the archives of the individual parishes.

Good examples, which also mention roof covering with stone slates, are the data of construction and activities on St. Trinity church in Rodik. Between 1666 and 1724 its roof was probably covered by Anže Felicijan, which later (1677) built also the entrance porch with a stone roof. Over half a century later (1724) the church roof was repaired by Gregor Felicijan, Anže's grandson (Premrl 2005, 7, 9). Anže Felicijan, The Younger. built in 1663 also presbytery of St. Elijah church at Mihele / Draga.

Another examples of the 17th century building with known "authors" are church of St. Helen from Gradišče pri Divači, built in 1653, probably by master mason Gašper Perhave from Dolne Ležeče and brothers stonecutters Andrej and Ivan Cerkvenik from Gradišče pri Divači. Another example are the churches of Virgin Mary at Britof from 1644 and church of St. Peter and Paulus at Tomaj (1639–1640) that were built by masons Jernej Kraševac from Postojna and Matej Gorup.

Due to the extraction of stone plates for covering by non-professionals (but not necessarily their installation) and its use in rural architecture, the best source of information on the beds and delving of platy limestone (and other) stone tiles are folk memory and testimonies of informers. These and a few masters, who are still dealing with the laying, are transmitters of traditional knowledge of finding and preparing stone tiles. Interesting is guidance that unearthed tiles must rest prior to installation, to check how resistant are to atmospheric conditions (Priročnik 2012, 14). Similarly, for the apparent non-expert reader and laymen is written a short notice, published in 1861 in the "Novice" [News] newspaper: it

suggests that the test samples should be soaked and boiled in water to determine their (un)porosity and durability.¹¹

Gabrijel Jeram (interview 28. 4. 2015), the well known local expert of the Karstic quarries/delves told about the following locations of delves: Krajna vas, Mali dol, Divača – Radvanje, Gabrovica (1), Mali dol (2 or 3), Opatje selo, Pliskovica, Kazlje, Kreplje (the good stone slates), Slivje, Gabriče, Gorenje, Filipčje brdo, Podbreže-Sopada, Krajna vas, Filipčje brdo (excellent). He constantly collaborates with the expert of the stonemasonry in Kras, Božidar Premrl; in the collaboration was made also the list of delves (Premrl 2003) Jeram explained that if the layers are compact, the stone slates are good (grey); if the layers are not bound together well, they immediately cracked if they were knocked by the hammer. According to him wealthier farmers had roofs covered with stone slates (also when they had the delve on his parcel), the poorest had the roof of straw. But the delve could also belong to the “jus” – the village community. Somewhere the stone slates were dug and donated to the church.

Gabrijel Jeram explained that the roof was covered with stone slates which had just a slight inclination (otherwise the slates would slide down), almost horizontal, just the inclination to enable the water to drain down. A slate was covered by the other one 4/5, only 1/5 of it looked out. Such a roof was approx. 25 cm thick. Everything for the construction was from the domestic origin – stone slates, slacked lime, oak trees. Such a roof was strong against the *burja/bora* (wind) and could last for centuries.

One very good recently covered roof today is from Briščki, in the Trieste region. The stone masons were from Nasirec by Kozina.

Boris Čok, a known keeper of local tradition, comes from the families who owned quarries and wrote down about the quarrying tradition (2015),

According to their purpose five types of quarries existed, three of them were on the surface. The surface quarries stone was extracted to a maximum depth of two meters. Namely, in one of those the stone was acquired for *batuda* (crushed stone for roads), the other was for excavation of stone slates (for roofs, paving streets, canals, etc.) and the third type was meant for the construction of houses, garden walls, terraces etc. Depth quarries were for extraction of the better types of stone – for *skaluote* (rough big blocks; for construction of breakwaters, piers, foundations, “stopping” terraces (Slovene: “zadrževalne terase”) etc. and for more fine stones, which could be elaborated.

One of the rules was that a stone from the quarry had to “calm down” (Slovene: “umiriti”), because it has broken off from the mother wall and it's still alive for a time. Bigger it was (for instance for the well), more time had to lie down on the open space, at least for five moons. Smaller pieces (for instance for stairs) until three moons! Calculated in our time from five to three months. Only after this resting (Slovene: “pomiritev”) it could be elaborated.

What was shocking for the researchers of mythology was the fact that the pagan tradition existed parallel to the Christian. When the stonemason received the order to make the

¹¹ "Kako r a z s o d i t i : ali so škrlili ali škerli za streho dobre ali ne). Dobra škrlilna ploša (Dachschiefer) je lepo gladka, prelomljena se kaže gosta, trdna; sicer mora biti tanka, da ne teži preveč strešja. Barva ne dela nobenega razločka, ali so škerli sive, črne, zelene ali pa rudeče. Poglavitna reč je, da se ne sperstenijo rade in se ne lušijo. To se pa tako-le zve: Zvaga naj se ena ali dvojje plošč, potem pa naj se dajo kuhati četert ure v kropu. Potem jih vzemi iz vode, pa spet zvagaj. Tiste, ki niso sedaj veliko težje, so najbolje; zakaj to je znamenje, da se niso napile veliko vode, tedaj tudi ne bojo razpadle rade. Če pa ploše že v vodi razpadejo, niso celo nič vredne."

portal he asked if he wants the symbols “in the old tradition” or in the new, Christian one. Therefore all the symbols that are still visible nowadays have their pre-Christian tradition, but the meaning was hidden and often covered by Christian tradition and the real pre-Christian meaning was known just to the selected people.

Boris Čok notes that in the seventies years of the previous century, people of Kras/Carso and elsewhere began to "worship" new materials, and one of them was certainly concrete! Because of the new farm machinery they demolished old stone and elaborated portals to extend the entrance! They were replaced by concrete. They destroyed even stone wells and stairs and mixed them to the concrete. Fortunately, at the end of the previous millennium foreigners became to buy and restore the old Karstic houses in the old manner. Only then, Karstic people started to realize that if a foreigner appreciates the stone and its products, then also they should be proud on their heritage (Čok, 2015).

Depreciation, devaluation of stone on the Kras/Carso was noted also by the ethnologist Jasna Fakin Bajec (2011, 128-215). In the time of Yugoslavia the past was neglected, the stone became the symbol of retrogression, past poverty and the past of a foreign owner. The stress was on the industrialisation, new construction materials. The old stone architecture was depreciated. New “box” architecture (slov: “škatlasta arhitektura”) was constructed everywhere which was in discordance with the old “cloddy architecture” of the Karstic villages, the landscape lost its originality, the architecture and landscape became chaotic and new measures were introduced. The ethnologists agrees that it was the foreigners or people from the towns, cities like Ljubljana that brought the new perspective on the stone in the 80, 90-ies in the time of the formation of the Slovenian identity and state, when a new local identity was formatted. After a total disrespect in the time of Yugoslavia today the stone became in the time of Slovenia one of the cornerstones of the identity of people of Kras.

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