



**Traditional building-stones in the urban landscape on
the example of the Transdanubian Mountains
(Dunántúli-középhegység)**

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The applicant met the requirements of the PhD regulations of the Corvinus University of Budapest, he incorporated the observations and recommendations proposed in the workshop debate over his dissertation and the theses are accepted for the defence process.

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Goals

The general goal of my research is to catalogue the traditional building stones of the Transdanubian Mountain Range (Dunántúli-középhegység, the selected model area) and examine their geographic distribution and characteristic uses (to make a building stone register). Another aim is to study the interplay between the varied use of building stones and the character of the given area, settlement and landscape. On the basis of the findings I make recommendations on the protection of building stones specific to particular urban areas, on the degree and possible modes of this protection.

In the mountainous areas of Hungary the use of traditional building stones has often contributed to the overall appearance of the urban landscape. The geology of our mid-mountains is so diverse that building stones may differ from settlement to settlement.

The traditional architecture of different rural areas showed great diversity in landscape character up to the end of the 19th century. The primary consideration of both owners and builders was to be practical and to economize on the resources; the endowments of the environment were fully incorporated into the architecture. This meant adaptation to the climatic conditions, relief and building

materials provided by the immediate environment. In the 20th century and particularly after the world wars a powerful tendency to the contrary began which still determines relevant developments. I am convinced that the unique character of the Hungarian rural landscape should be an alloy of a cautious reliance on the system of proportions and forms of vernacular architecture and the use of local materials and building techniques. Consequently, I regard the protection of traditional building stones as of salient importance in the preservation of the uniqueness of the Hungarian landscape and its diversity.

Research method

- I carried out the detailed on-the-spot examination of the model area, studying the use of building stones in the settlements of the whole area (nearly 160 settlements and their environment). Using the method I had worked out I ranged the character shaping potential of the stones used. I represented the findings in tables, maps and textual description. Detailed photo documentations were made during field research.
- I studied thoroughly the special literature to learn the history of quarrying in each studied area and settlement, the traditional uses of stone, their economic and social significance.
- I clarified the technical specificities of the traditional stones of the area and the possibilities of their contemporary use in harmony with the building acts of today. I briefly summed up the geological features of each stone at issue.
- I examined and evaluated the pertinent legal environment; I also studied and evaluated the local building rules of the outstanding settlements in regard to stone use.

Theses

Thesis 1

Elaboration of the method to evaluate the potential of a building stone to shape the character of the urban landscape

I worked out a singular method to assess the building stones' capacity to shape the urban landscape. The novelty is that with its help the intensity and hence character forming potential of a building stone can be quantified for the given area.

There are three equally weighty aspects that determine a building stone's influence on the character of the urban landscape:

1. The **visual exposure** of the surfaces of stone objects in the studied area, which means the degree of emphasis they carry through their spatial position in the overall view;
2. The **quantity** of stone surfaces and structures in the studied area.
3. The **uniqueness, individual character** of the appearance (colour, surface texture) or traditional usage of the applied stone.

I ranged nearly 160 settlements and their surroundings of the model area along the dimension of the used stone's potential to influence the character of the urban landscape. On this basis I could define the

urgency of measures that are to be taken to protect the traditional stone use of the area at issue.

Thesis 2

Proving the salient importance of traditional building stones in the emergence of the specific character of an urban landscape

Having analyzed the profiles of the studied settlement, I concluded that the use of traditional building stones can decisively influence the character of the urban landscape; in several settlements the application of traditional building stones is the carrier of the local specificity.

When in a given area the value calculated by the procedure elaborated in the methodological section of the dissertation (Chapter: *Method of evaluating the visual effect of the traditional building stone upon the urban landscape*) is in excess of the 70 % of the total value (i.e. ranged into the categories of “saliently significant” and “significant”), the protection of the use of traditional building stones may substantially contribute to the conservation of the local architectural heritage, to the traditional character of the urban landscape. In such cases the use of building stones ought to be provided for in the local building acts. In 38 settlements of the target area I judged the use of stone “saliently significant” or “significant”. Perusing the local building regulations of these settlements I have

found that in merely 8 settlements were the local stones stipulated as compulsory building material.

Thesis 3

Synthesis of landscape and settlement types, the correlation between their character and the applied building stones

I have concluded that in rural environments deviation from or absence of the use of traditional building stones always damage the individual character of the urban landscape.

I found that until the mid-20th century the facilities (if any) in gardens and landscaped areas were exclusively made from stones quarried in the direct vicinity of a settlement. In a rural setting, the longest distance for quarried stone to travel was from neighboring settlements.

In rural areas the use of traditional building stones is determined by the geological features, owing to the strong environmental bonds of vernacular architecture. The anonymous architecture of the studied area¹ only used materials from quarries closest to the building site. My researches clearly verified that up to the mid-20th century the local or the closest quarry provided the stone for any object in garden and open space design.

¹ By anonymous I mean spontaneous rural architecture or the building activity led at most by master builders in villages and small towns.

When there was no suitable building stone in the direct surroundings of the settlement, some other material was used.

Before the mid-20th century, only the most monumental secular and ecclesiastic constructions included stones brought from longer distances; these stones were chiefly used for quality work (sculpture, architectural sculpture, interior decoration). Even in these cases the simpler carved stone structures of gardens and open spaces were made from local materials.

It can be declared that in a rural setting the use of other building stones than the traditional damages the character of local architecture and results in loss of value. This particularly applies to the import natural stone tiling so fashionable today.

Thesis 4

Proving the moderate effect of traditional or domesticated stones on the character of urban environment, on open space in towns

My investigations testified that in a city environment the contribution of traditional or domesticated stones to the landscape character in cities has a subordinated role beside other elements of the townscape. I found that the use of alien building stones does not necessarily erode the character of the landscape and architecture.

From the second half of the 19th century the use of building stones in towns was less dependent on geological endowments or the environment than on financial, economic aspects and the state of the construction industry. In cities large quantities of building stone shipped from faraway places can be met with. In the model area mainly the paved carriage-ways belong here for which basalt and some andesite from Nógrád and some Austrian granite were used. The large flagstones of the roads in the model area survived for nearly a century and became integrated in the special local character, therefore they ought to be preserved when possible. Nonetheless, it is possible to use new stone materials in urban environments when it does not harm the special character of the area. In the towns of the model area it would be possible and often necessary to unify the pavements using up-to-date materials. The introduction of a new

solution is acceptable when it is based on tradition, it is sustainable in technical and economic terms and its use in the area is consistent.

Thesis 5

Verification of the use of easily extracted and worked traditional building stones that can be carved and perhaps split but are less long-lasting than prescribed by today's strict engineering standards

The intensity of the use of studied stones led me to conclude that hard-to-extricate stones which are difficult to work and can't be split have little importance in open space design, while the easily quarried and worked, soft and easy-to-split stones are favoured even though they are less durable. I have arrived at the conclusion that the strict prescriptions pertinent to the durability of stones used for facilities in open space design can be ignored in justified cases.

The use of traditional stones in open space architecture is made difficult in our days by their technical specifications (solidity, frost-resistance, wear-resistance) not meeting the strict requirements. As a result, the quarrying of some local materials stopped or became uncertain, their acquisition is difficult. I have established that the uniqueness of the use of local stones owed in several cases to the

typical patination (different weathering processes, surface soiling) of the stones.

It follows that the use of traditional building stones in open space design whose technical specifications fall short of the rigorous engineering standards of architecture today should not automatically be discarded in the interest of preserving the traditional character of the urban landscape. Most recent standards put the lifespan of building materials at 30-50 years during which period the material is to serve the purpose of its use unchanged. This prescription should not be made compulsory for all landscape architectural objects .

Thesis 6

Verification of the correlation between the natural patinating, aging, surface weathering processes of locally important stones and the uniqueness of these stone surface textures

During my investigations I found that the natural weathering process of stones is an integral part of the usage of the given stone. Replacing this stone with some similar but far more long-lasting stone will result in the marring of the local character for the lack of the patina.

The natural aging, weathering processes of garden structures built in a traditional manner from local stone (e.g. oolitic limestone or sandstone structures) integrally belong to the character and life of the

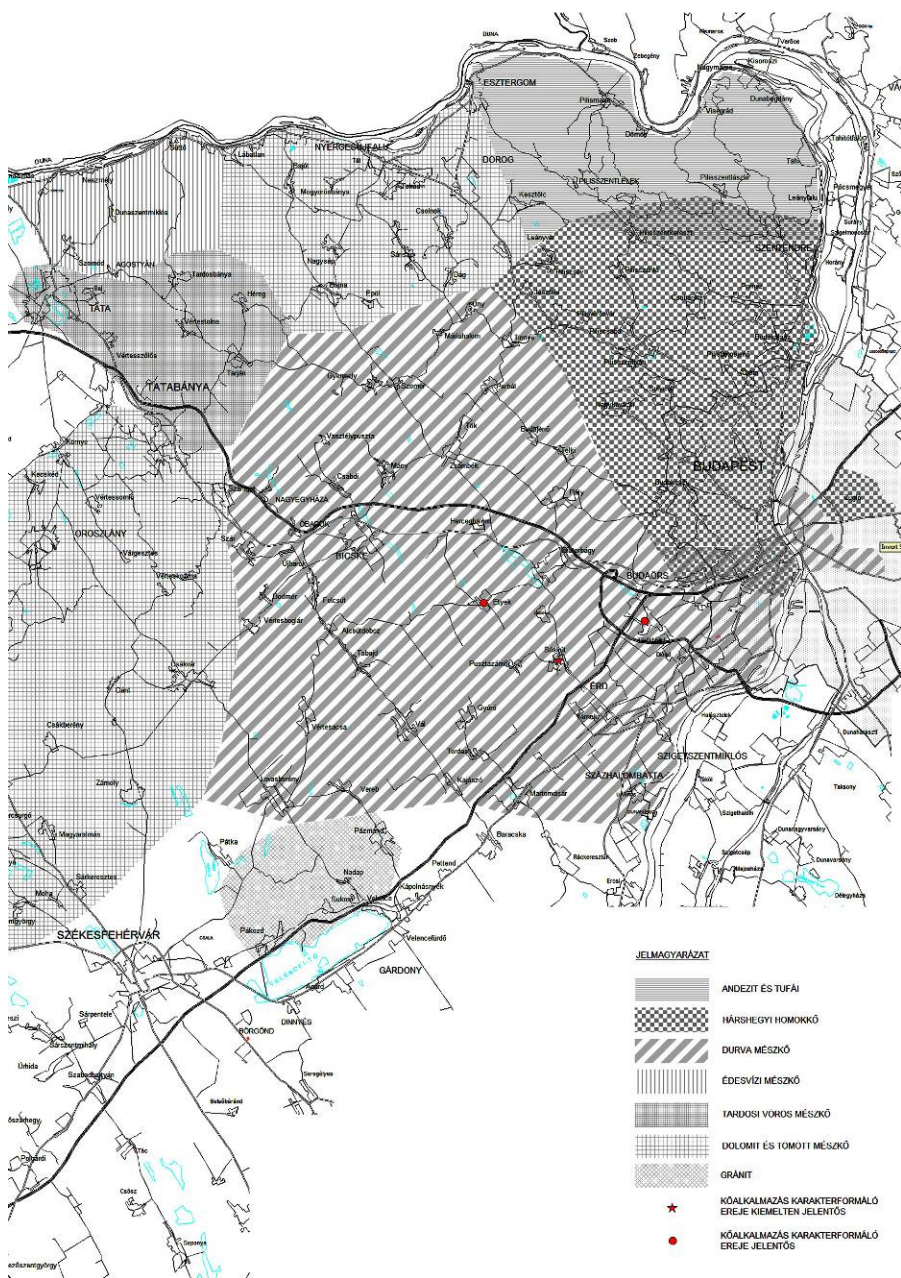
given structure. One phenomenon is the settling of plants on porous stone surfaces, for example. Replacing these types of stone with more durable variants results in the erosion of the local character and mars the traditional landscape of the settlement. The primacy of the protection of local heritage only allows replacement in justified cases (after thorough structural, static examination).

Thesis 7

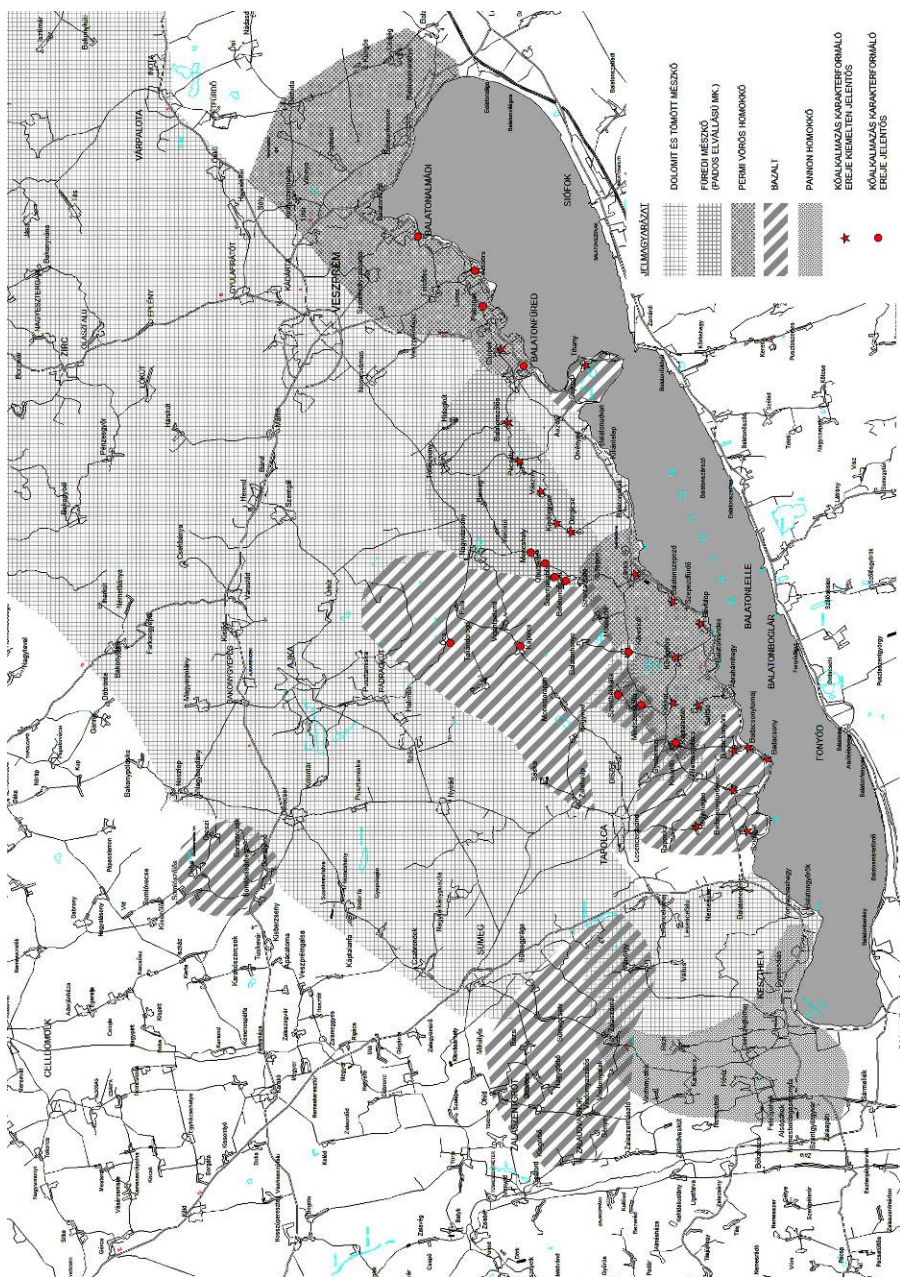
Compilation and evaluation of the building stone register of the selected model area

In my judgment the most important scientific outcome of my investigation is the register I made on the basis of the examination of the use of traditional building stones in the model area. It records the exact geographic spread of each building stone found in the area, the main technical parameters of the stones, their traditional applications and modes of their use in constructions, as well as the degree to which they contribute to the character of the landscape.

The register is a handy guide for architects and open space designers to select the most appropriate stone variant best suited to the locality and the project in the model area.



1. ábra: Geographic spread of building stones in the A Dunazug mountain and Visegrádi mountain.



3. ábra: Geographic spread of building stones in the Bakony mountain.

PUBLICATION OF THE AUTHOR IN THE TPOIC OF THE DISSERTATION

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