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Analysis of Rural Settlement in the Czech Republic: A Case Study of Dolní Kounice

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Abstract
The study of settlement development, its components, and activities within rural space is one of the basic objectives of the Association for the Renewal of the Village and the Small Town (SOVAMM). This Association was founded in 1990 as a network of professionals and enthusiasts of vernacular architecture. The results of this research are summarized in a recent publication offering an overview of village and field pattern development, including a systematic analysis of farmstead and field plot modules. A key resource for this analysis is the Franciscan (also known as the 'Stable') Cadastre from the second quarter of the 19th century, alongside other historical sources. This paper also outlines the evolution of methodological approaches rural settlement studies, tracing their development from the beginnings in the 19th century. It presents the current analysis method used to examine the evolution of the spatial structure of rural settlement and illustrates its application in heritage preservation and spatial planning using the example of the small South Moravian market town of Dolní Kounice.

Keywords: *rural settlement; village structure; field pattern; Stable Cadastre*

1. Evolution of Methodological Approaches

Settlement history occupies a distinctive position among historical disciplines, much like the history of architecture. For a long time, little attention was paid to the development of "ordinary" building types and constructions, as well as rural settlements in the historic Czech lands. Until the mid-20th century, these topics generally attracted little academic interest.

The earliest attempts to study settlement development can be found in local historical journals, usually in an ethnographic context, in the late 19th century. From the interwar period, we should mention the historian J. V. Šimák's 1938 treatise on medieval colonisation in the Czech lands – the first large-scale work to address the structure of villages and their field patterns (Šimák, 1938). In terms of settlement geography, relevant works include those of F. Říkovský (Říkovský, 1939), J. Pohl (Pohl, 1935), and post-World War II studies by Z. Láznička. Láznička's publication *Types of Rural Settlements in Moravia* (Láznička, 1946) is particularly significant, as it, also addresses the development of field pattern and the potential for their gradual transformation from older systems to more advanced configurations within the same cadastral unit. In the post-war period, the work of architect Otakar Máčel stands out for both its broad conceptual scope and detailed analysis. His publication *Basic Problems of Urban Structure*

of Villages in Bohemia and Moravia (Máčel, 1954) emphasizes the importance of the relationship – and even the unity – between village and field patterns. In Máčel's later publications, co-authored with Jaroslav Vajdiš who contributed the chapter on the Slovácko region, the analysis of village structures is underpinned by knowledge of traditional rural architecture (Máčel & Vajdiš, 1958). From the 1950s to the 1990s, a number of editions of older cadastres were published. These include the *Berní rula* [Subsidy Roll] for Bohemia, the *Lánový rejstřík* [Land Plot Register] for Moravia and the Theresian Cadastre), all of which are crucial for understanding village development from a long-term perspective (Doskočil, 1953–1954; Chalupa et al., 1964, 1966; Burdová, P. et al., 1970; Matějek, 1981, 1983, 1984, 1994). Inventories of modern-era villages were also compiled and were summarized in a separate edition by Josef Křivka (Křivka, 1978). Finally, since the 1970s, several key publications emerged from the first systematic archaeological research on extinct medieval villages. These include *Svídna* by Zdeněk Smetánka and Pfaffenschlag by Vladimír Nekuda (Nekuda, 1975; Smetánka, 1988).

Research on rural settlements has naturally progressed across all scientific areas since the 1970s. Due to space limitation, we cannot examine these developments in detail here. Instead, we will briefly mention the activities of our association, SOVAMM (Association for the Renewal of the Village and the Small Town), and its members. An attempt to classify primarily mediaeval types of village structures was published by Jan Pešta, author of the multi-volume *Encyclopaedia of Czech Villages* (Pešta, 2000, 2003–2011). Karel Kuča, author of the *Encyclopaedia of Cities, Towns and Market Towns in Bohemia, Moravia and Silesia* (Kuča, 1996–2011), also developed a detailed classification of village structures for the *Landscape Atlas of the Czech Republic* (Makovčin et al., 2010). The results of previous long-term research are summarized in a recent publication by Jiří Škabrada, which provides an overview of the development of villages and field patterns (Škabrada, 2022). This research draws primarily – though not exclusively – on maps from the Franciscan (also known as the 'Stable') Cadastre from the second quarter of the 19th century. For this purpose, the research uses (in addition to other sources) mainly maps of the Franciscan (also known as the 'Stable') Cadastre from the second quarter of the 19th century. A key methodological issue is the informative value of the Franciscan cadastre maps themselves. This is repeatedly critically examined based on a number of particular situations, always with the help of confrontation with other historical data. In general, two approaches are applied to the basic analysis of the development of village and field structures: a progression from simpler to more complex forms and a possible reverse process influenced by natural conditions.

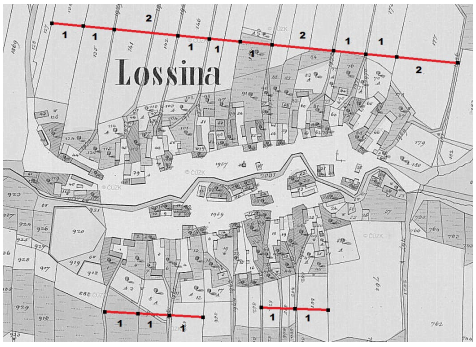

Fig. 1 – *Village of Losiná near Pilsen, founded in 1327 – an example of module identification (52 Prague ells) on the Imperial Obligatory Imprint of the Stable Cadastre from 1838* (Škabrada, 2022).

A new contribution of the publication is the systematic analysis of the modules of farmstead and field plots, as recorded on the maps of the Franciscan Cadastre, and the identification of measurements and their multiples used in the past. The basic module was the Prague ell (0,592 m), from which the Bohemian *Landseil* (literally "land rope") – measuring 42 ells and, from 1541, 52 Prague ells – was derived (Fig. 1). This

measurement was replaced in 1875 by the Austrian fathom (1,89 m). Additionally, the analyses of archaeological site situations, specifically the extinct mediaeval villages of Pfaffenschlag near Slavonice (Fig. 2) and Svídna in the Slánsko region, proved to be both interesting and insightful.

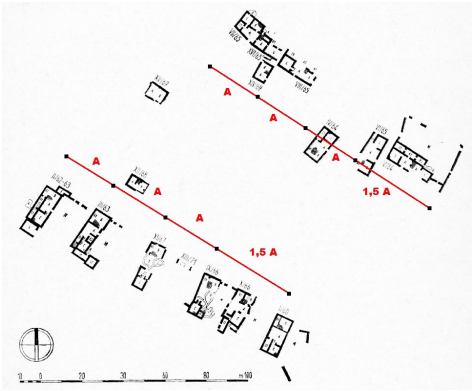

Fig. 2 – *Ground plan of the extinct mediaeval village of Pfaffenschlag near Slavonice (based on V. Nekuda, 1975, p. 39), with indicated plolt modules* (Škabrada, 2022).

2. Basic Types of Village and Field Patterns

The classification of village and field pattern types is not standardised in professional terminology. In this paper, we follow the typology proposed by Jiří Škabrada, including its chronological order. He identifies the following types:

1. **Rural settlement situations with Romanesque churches**, where - if supplemented by archaeological findings - we can at least trace the principles for the locating the villages in relation to terrain, cardinal points, and water source.
2. **Radial arrangement –** the oldest regular form of village and fields patterns appearing from the second half of the 12th century. These villages, typically small and consisting only of a few farmsteads, were characterised by a simple, direct connection between the farmstead and its arable land. The larger patterns of this type were probably formed only at the time when the emphyteutic system emerged – from about the mid-13th century onward.
3. **Villages founded on emphyteutic principles**, featuring regular arrangement of farmsteads and fields designed as equal units. The equal rights and obligations of the settlers were intended to be matched by equal conditions. These include, in particular:

- Valley linear villages (údolní lánové vsi): settlements formed in a long line along a watercourse, with parallel strips of land (historically called lán in Czech and Hufe in German) laid out roughly perpendicular to the watercourse. A single-row variant of this pattern occurs as a result of terrain constraints, and it is typically located on edges of broad valleys.
- Street villages: based on a similar principle, these structures continue a slightly older tradition of small-town and urban-type settlements. Many so-called market villages probably already adopted a street-type arrangement at the end of the early medieval period.
- Short single-row or two-row villages: ideal, fully homogeneous arrangements with strips of arable fields divided into sections. The main sections were located directly behind the rows of farmsteads, while other sections were distributed throughout the entire cadastre. This layout ensured not only equal land area for each farmer but also comparable land quality.
- Villages with a village green: villages organised around a regularly shaped rectangular or square green, again with sectioned strips of arable fields. This system probably reached its peak during the first half of the 14th century, when the largest villages of this type emerged.

- Mixed forms: combinations of the above types.

4. **Village foundations of the modern period:** the first major wave of village establishment and transformation in this period is associated with the aftermath of the Thirty Years' War; the second wave followed the agrarian reforms of the 18th and 19th centuries, the aim of which was a more efficient use of manorial land. Modern village structures are often versions of proven layouts from earlier periods, typically on a smaller scale and featuring modular arrangements of repeated structural units, often documented in surviving plans. In addition to the types we know from previous periods, we can distinguish:

- Clearings ("*paseky*"): villages laid out through the parcelling of cleared forest areas, creating a mosaic-like system covering areas of former forest. These villages, typically founded in higher-lying hilly areas, represent the final stage of agricultural colonisation.
- Transformations of abolished demesne farms.

3. Case Study: Dolní Kounice

The comprehensive analysis method used to examine the evolution of rural settlement spatial structure – as well as proposals for its preservation and spatial regulation – can be illustrates by the example of a small market town Dolní Kounice, located in the Brno-Country District of the South Moravian Region. The town is situated in the dramatic landscape of the deep Jihlava River valley. It is known for its Gothic-Renaissance château and the ruins of the Premonstratensian monastery *Rosa Coeli* with the Church of the Virgin Mary. Dolní Kounice has preserved its historic structure, including the older mediaeval part on the right bank of the river, which encompasses the monastery, the chateau, the town itself with its market square (developer from the original village in 14th century), and the former Jewish ghetto.

On the left bank lies the suburb of Závodí, which developed from the 16th century onwards along existing roads and a newly created axis leading to the dominant Baroque pilgrimage chapel of St. Anthony of Padua. The rest of the cadastre is composed of segmented strips of vineyards and fields.

Fig. 3 – *Dolní Kounice, view across the Jihlava River at the site of the old ford leading to Farní Street.* (Syrová, 2024).

The appearance of the town was significantly affected by the devastating flood of 1862, which also devastated the parish church, originally located on the riverbank at the ford (Fig. 3). The new church was subsequently built on the site of the former town hall and burgher houses, positioned along the axis of the square. Several insensitive interventions into the city's structure took place in the 1960s–1980s, including the demolition of the Upper Gate, the construction of a cultural centre on the site of the former hospital near the bridge, and the building of a bus terminal that required the partial demolition of the Jewish ghetto was demolished, etc.

Despite these interventions, the value of the preserved building stock, the urban structure, and the settlement's integration into the landscape still prevail.

3.1. Basic sources for standard analysis and their use

The written sources are summarized by Karel Kuča in the relevant chapter on Dolní Kounice in his *Encyclopaedia of Cities, Towns and Market Towns in Bohemia, Moravia and Silesia* (Kuča, 1996, p.714–719).

For the standard analysis that we routinely carry out for the purposes of spatial planning, we can use a number of commonly available map sources (most of which have gradually been digitised and made available online since 2008).

In the case of Dolní Kounice:

1. First Military Survey (1764–1768 and 1780–1783, rectified)

This survey was based on the Müller's maps from 1716–1720, which were rescaled to a larger scale of 1:28,800.

Officers of the Military Topographic Service rode through the country on horseback and mapped the terrain using the "a la vue" method – that is, they simply observed the terrain visually and estimated distances.

The survey was not based on a net of precisely defined triangulation points. For this reason, the survey results were less accurate.

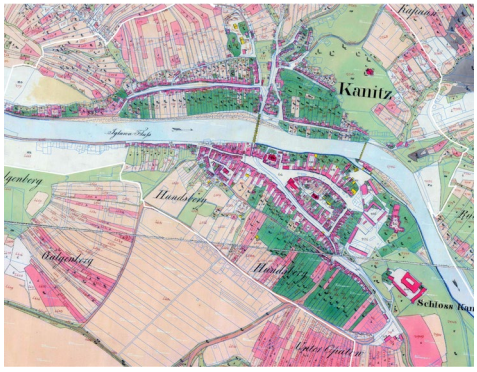

Fig. 4 – *Dolní Kounice, georeferenced Imperial Obligatory Imprints of the Stable Cadastre from 1826.* (Central Archive of Surveying and Cadastre, Prague).

2. Franciscan (also known as the 'Stable') Cadastre

These maps were created between 1826 and 1843; the maps of Dolní Kounice come from 1826, and for this reason, they capture the situation prior to the 1862 flood (Fig. 4). Cadastral maps were drawn up for each village at a standard scale of 1:2880, where one Viennese inch on the map represented 40 Viennese fathoms on the ground. Larger-scale maps were prepared for town and village centres.

Indication Sketches were derived from the preliminary original maps. An Indication Sketch was a portable, coloured map used to record changes as they occurred. The map displayed the names of landowners, house numbers, types of agricultural products, and the quality of each field. Objects were differentiated by colour – fields were shown in ochre, gardens in dark green, water in blue, fire-risk buildings in yellow, and fire-resistant buildings in pink, etc. In addition to the number allotments, a plot protocol was created – this register listed all fields, buildings, and their owners. On the basis of the plot protocol other written documents were created, particularly the main book of possessions (Besitzstands-Hauptbuch), which later replaced the land registers.

Descriptive numbers are an important piece of information on the sketches. House numbering was enacted during the reign of Maria Theresa in February 1770, with most municipalities carrying it out between autumn 1770 and 1771. Its closed series, in combination with later assigned numbers, allows us to identify buildings existing at the time of numbering and trace the later gradual development of the settlement.

- Original maps are precisely hand-drawn and coloured maps, with lithographic copies produced after completion. One of the printed copies was preserved as the so-called Obligatory Imprint. Other copies of the original maps were used to chart changes (a

revision / Reambulation was ordered in 1869). The originals therefore provide us with information about the later development of the settlement and cultural landscape.

- Imperial Obligatory Imprints were originally intended for archiving in the Central Archive of the Cadastre of Lands in Vienna. Following the formation of the Czechoslovak Republic, they were transferred to Prague as part of the separation of archives. In contrast to the so-called Original Maps of the Stable Cadastre, the Obligatory Imprints document the original state of the landscape, without showing later changes.

3. Second Military Survey (1836–1852)

In contrast to the First Military Survey, the Second Military Survey was based on triangulation net and also on the cadastral maps of the Stable Cadastre at a scale of 1: 2 880, resulting in much higher precision. In addition to larger-scale maps (1: 28, 800), general (1: 288, 000) and special (1: 144,000) maps were produced.

4. Third Military Survey

- The Topographic Sections of the Third Military Survey at a scale of 1:25,000 originate from the Third Austrian Military Mapping. The maps were published between 1872 and 1953 in the Austro-Hungarian Empire and later in Czechoslovakia and other successor states. The territorial extent of this series significantly exceeds boundaries of today's Czech Republic.
- Special Maps 1:75,000 from the Third Military Survey, originally produced as part of the Third Austrian Military Mapping. These maps were published between 1875 and 1952 in the Austro-Hungarian Empire and later in Czechoslovakia and other successor states.

5. Maps of the former land cadastre (1931–1956)
6. Maps of the Registry of Real Estates 1: 2,880 from the 1960s and 1980s.
7. Historical aerial photographs of the Czech Republic 1937–1996
8. Archive Orthophoto of the Czech Republic produced since 1996
9. ZABAGED® - Altimetry

- DMP 1G. Digital Surface Model of the Czech Republic of the 1st generation (DMP 1G). The model represents a depiction of the territory, including buildings and vegetation cover, in the form of an irregular network (TIN).
- DMR, DMT 5G. Digital Terrain Model of the Czech Republic of the 5th generation (DMR 5G)

Fig. 5 – *Comparison of the current state with the state captured by the Stable Cadastre, identification of extinct objects.* (Syrová, 2024, Obligatory Imprints of the Stable Cadastre from 1826, and ortophoto, Central Archive of Surveying and Cadastre, Prague).

The georeferencing of historical maps has not yet been completed for the entire territory. The first set should be the originals of the Stable Cadastre. Therefore, for a certain portion of the maps, manual georeferencing remains necessary. The above-mentioned archive maps, along with digital models of the terrain and surface, make it possible to identify extinct parts of structures and to assess the effects of orientation to cardinal points and terrain configuration in comparison to the present state.

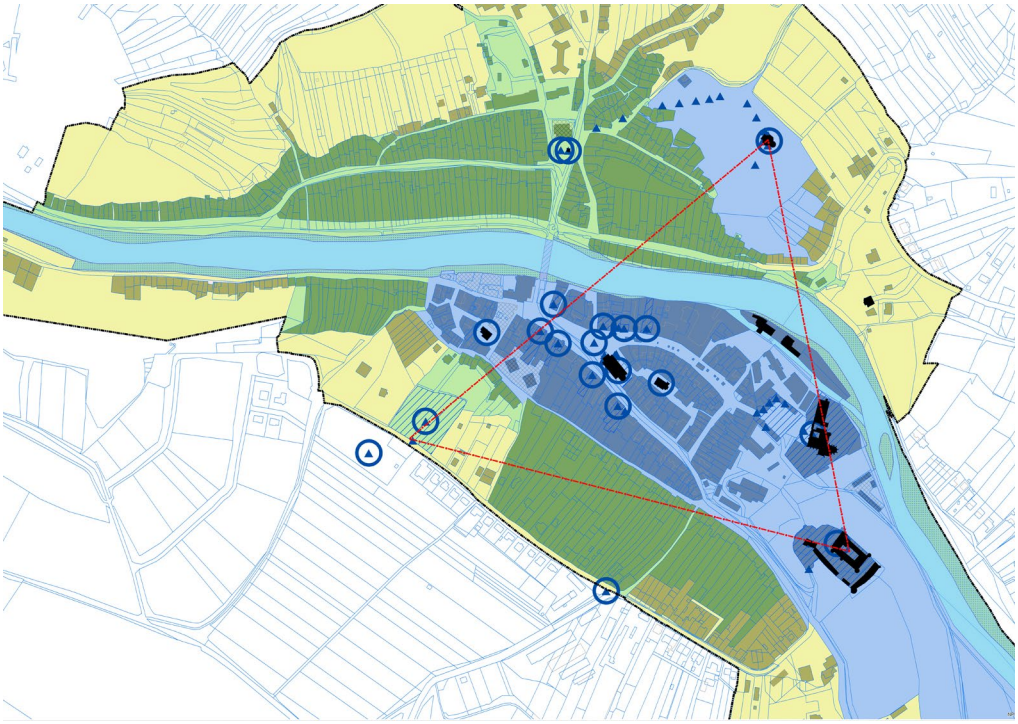

Fig. 6 – *Dolní Kounice, map of the designated conservation area with the basic classification of urban blocks and spaces into three categories - A – parts determining the character of the zone (blue), B complementary parts (green), C – related parts (yellow); visual landmarks (black) and axes (red); protected cultural monuments are marked with dots (blue triangles and circles)* (Syrová, 2024).

In the case of Dolní Kounice, this allows us to identify visual landmarks and axes, historical communication axes (particularly the north-south communication with the old ford across the Jihlava River) (Fig. 3 and 5), earth quarries, etc.

Naturally, the comparative analysis of these sources must be supplemented by field research. The fieldwork will include photographic documentation and, where possible, a survey of building interiors.

3.2. Results of the Survey

The results of the survey are summarised in three or four maps – with graphical analysis of the periods of construction, architectural value, conservation policy, and comparative analysis of the Stable Cadastre.

For settlements designated as a conservation area, this is a basic classification of urban blocks and spaces into three categories, which follows a methodology used since the 1980s (Vošahlík, 1981).

These categories (A – parts determining the character of the zone, B – complementary parts, C – related parts) together with the identified defects are the basis for establishing basic regulatory principles (Fig. 6).

4. Conclusions

The analysis of rural settlement structures is an important basis for spatial planning and heritage conservation. Old maps, in the case of the Czech Republic and other countries of the former Austro-Hungarian Monarchy mainly maps of the

Stable Cadastre, are irreplaceable in combination with completely modern sources such as the Digital Surface and Terrain Model for the study of village and field patterns. A great advantage of the last decades is their easy availability. We have tried to demonstrate their use here both in a comprehensive study of rural settlement throughout the Czech Republic and in selected examples from Dolní Kounice.

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