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LATE MEDIEVAL AND EARLY MODERN  
MODIFICATIONS OF REGULAR OPEN FIELD  
SYSTEMS IN BOHEMIA

*Introduction*

Research undertaken in post-war Western Europe has contributed substantially to our knowledge of medieval agricultural landscape layouts.<sup>1</sup> Exceptional results have been achieved, especially in the United Kingdom, where considerable parts of medieval fieldscape have been preserved due to processes of enclosure. There is also a strong tradition of geographically oriented historiography in Germany and of village and field layout detection in Scandinavia.<sup>2</sup> These and other agricultural harvest systems once covered large swathes of European territory. To achieve a sophisticated understanding of those systems, the application of a comparative approach based on results obtained in different countries is necessary. Successful investigations that have frequently been cited in literature clearly testify to the fact that unique medieval or early modern European material from peripheral areas can become a source of knowledge for understanding the operation of traditional agricultural systems.<sup>3</sup> This is exactly one of the purposes of this article, which should contribute to a deeper knowledge of medieval and early modern landscapes comprising findings from different parts of European territory.

The article contributes to the overall picture of traditional European field systems by providing insight into the basic principles and arrangements of land division in

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<sup>1</sup> The study is an outcome of the project “Ethnographical Atlas of Bohemia, Moravia and Silesia: Vernacular Architecture, Settlements and Dwellings” (P410/11/1287), supported by the Czech Science Foundation (Grantová Agentura České Republiky, GA ČR). Long-term conceptual development was made possible with support from the research institution RVO: 68378076 and a substantial amount of the study is based on the author’s research undertaken in 2004-2005 and funded by the Fulbright Commission Scholarship.

<sup>2</sup> *Hall*, David: *The Open Fields of England*. Oxford 2014. – *Rippon*, Stephen: *Historic Landscape Analysis. Deciphering the Countryside*. York 2004. – *Oosthuizen*, Susan: *Tradition and Transformation in Anglo-Saxon England: Archaeology, Common Rights and Landscape*. New York 2013. – *White*, Graeme J.: *The Medieval English Landscape 1000-1540*. London, New York 2012. – *Oosthuizen*, Susan: *Landscapes Decoded: The Origins and Development of Cambridgeshire’s Medieval Fields*. Hatfield 2006. – *Orwin*, Charles S.: *The Open Fields*. Oxford 1967. – For Germany and Scandinavia, see *Smith*, Clifford T.: *An Historical Geography of Western Europe Before 1800*. London 1967. – *Van Bath*, Bernard H. S.: *The Agrarian History of Western Europe A. D. 500-1850*. London 1963. – *Born*, Martin: *Siedlungsgenese und Kulturlandschaftsentwicklung in Mitteleuropa. Gesammelte Beiträge*. Wiesbaden 1980. – *Küster*, Hansjörg: *Geschichte der Landschaft in Mitteleuropa. Von der Eiszeit bis zur Gegenwart*. München 1995.

<sup>3</sup> *Jutikkala*, Eino: *How the Open Fields Came to Be Divided into Numerous Selions*. In: *Proceedings of the Finnish Academy of Science and Letters* 1950. Helsinki 1951, 117-142.

Central Europe at the beginning of the Thirty Years War. Two particularly impactful modifications were the late medieval construction of fish ponds, which turned meadows and adjacent fields into new water reservoirs, and the intensification of grain production at manors with the associated extension of demesne lands. At the same time, the article deals with the remarkable influence of the devastation of the Thirty Years War on the structure of contemporary cultural landscapes.

The very need for interregional comparison is supported by the fact that every European region is unique due to the preservation of specific sources. In Bohemia, for instance, documentary evidence contains substantial information on regular forms of agricultural harvesting introduced in the high medieval period (in terms of emphyteutic law description).<sup>4</sup> Similar data is not available for some parts of Europe. For instance, in the British Isles, where regular fieldscape forms are supposed to have been introduced indirectly as part of the post-Norman restoration from 1069 to 1070 and where we have at our disposal extensive remnants of medieval fields, there is unfortunately no detailed documentary evidence concerning its implementation.<sup>5</sup>

Undoubtedly, it would be better if the article was based not only on comparison with West European countries but also with neighbouring regions, especially with Germany, from which most technological and cultural innovations originated and during the medieval and early modern periods were transferred to Bohemia. A study of the chessboard-like systems was produced in Germany in the 1960s, which included the most recent innovative articles and studies on the topic at the time, thereby making the study somewhat obsolete.<sup>6</sup> The stage of preservation of a histor-

<sup>4</sup> *Graus, František: Dějiny venkovského lidu v době předhusitské II. Dějiny venkovského lidu od poloviny 13. století do roku 1419 [The History of the Peasantry in the Pre-Hussite Wars (II). The History of the Peasantry from the mid-13<sup>th</sup> Century until 1419]. Praha 1953.*

<sup>5</sup> *Sheppard, June A.: Medieval Village Planning in Northern England: Some Evidence from Yorkshire. In: Journal of Historical Geography 2 (1976) 3-20. – Sheppard, June A.: Metrological Analysis of Regular Village Plans in Yorkshire. In: Agricultural History Review 22 (1974) 118-135.*

<sup>6</sup> *Hard, Gerhard: Plangewannfluren aus der Zeit um 1700: Zur Flurformengenese in Westpfalz und Saargegend. In: Rheinische Vierteljahrsblätter 29 (1964) 293-314. – Jänichen, Hans: Über den mittelalterlichen und neuzeitlichen Ackerbau im westlichen Schwaben. Beiträge zur Geschichte der Gewinnflur. In: Jahrbücher für Statistik und Landeskunde von Baden-Württemberg 7 (1962) 40-71. – Krenzlin, Anneliese: Blockflur, Langstreifenflur und Gewinnflur als Funktion agrarischer Nutzungssysteme in Deutschland. In: Berichte zur deutschen Landeskunde 20 (1958) 250-266. – Krenzlin, Anneliese/Reusch, Ludwig: Die Entstehung der Gewinnflur nach Untersuchungen im nördlichen Unterfranken. Frankfurt am Main 1961. – Mortensen, Hans: Zur Entstehung der Gewinnflur. In: Zeitschrift für Agrargeschichte und Agrarsoziologie 3 (1955) 30-48. – Schäfer, I.: Über Anwände und Gewinnstöße. In: Mitteilungen der Geographischen Gesellschaft in München 1948 (1950) 117-145. – Scharlau, Kurt: Gewinnflurforschung in Hessen. In: Die Anfänge der Landgemeinde und ihr Wesen I. Sigmaringen 1964 (Konstanzer Arbeitskreis für mittelalterliche Geschichte Vorträge und Forschungen 7). 29-51. – Schröder, Karl H.: Die Gewinnflur in Süddeutschland. In: Die Anfänge der Landgemeinde und ihr Wesen I., 11-28. – For current state of research see Haffke, Jürgen/Kleefeld, Klaus/Schenk, Winfried (eds.): Historische Geographie. Konzepte und Fragestellungen gestern – heute – morgen. Festschrift für Klaus Fehn zum 75. Geburtstag. Bergisch Gladbach 2011.*

ical landscape is also limited in Germany;<sup>7</sup> the article is thus based on confronting testimony of the written sources analysed in this text with physical historical landscapes that are well preserved in England. Therefore, the article compares the obtained results from more distant West European regions so that the analyses of documentary evidence may yield more valuable results by comparing real remnants of physical landscapes from different parts of Europe.

The study shows how a largely unique body of early modern documentary evidence from Bohemia contributes to our knowledge of the layout and cultivation of medieval cultural landscapes. It further investigates the relationships shared with later modifications of medieval systems. The study relies on primary documentary evidence and cartographical reconstruction and focuses on the villages of Borovany and Bojenice in southern Bohemia (district Písek).

*Historical Context of Settlement Forms of High Medieval Origin  
in the Czech Republic*

The analysis of the documentary evidence must be introduced in the context of medieval settlement in Czech lands. During the medieval period, Bohemia was dominated economically and culturally by neighbouring, more progressive Germany, where regular forms of settlement characterized by the application of regulated villages and field layouts had been introduced in the 13<sup>th</sup> century. These new forms replaced the early medieval tradition of irregular and in many cases dispersed settlements in the so-called early settlement areas.<sup>8</sup> The new, more regular settlements generally formed in newly colonized and sparsely settled regions. This is especially the case of less hospitable parts of the country, i.e. in terms of the geography and climate. These settlements were mainly prevalent in the mountainous and hilly border landscapes.<sup>9</sup> In many cases, the older high medieval fieldscape was preserved up to the present day in these newly colonized regions. The reason for this is that the specific geomorphologic character of the land prevented the imposition of Stalinist collectivization in the 1950s. The creation of large blocks of uniformly cultivated fields would have caused immediate massive water erosion of soil and such fields would have turned unarable.<sup>10</sup> Strip lynchets have been particularly well preserved

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<sup>7</sup> Some examples of ridge and furrow systems are available in these works: *Meibeyer*, Wolfgang: Über den Profilaufbau des Pflughorizontes in Wölbäckern. In: *Zeitschrift für Agrargeschichte und Agrarsoziologie* 17 (1969) 161-170. – *Meibeyer*, Wolfgang: Wölbäcker und Flurform im östlichen Niedersachsen. Ein Beitrag zur Entstehung der kreuzlaufenden Gewinnflur. In: *Beuermann, Arnold/Richter, Gerold* (eds.): *Siedlungs- und Agrargeographische Forschungen in Europa und Afrika*. Wiesbaden 1971 (Braunschweiger Geographische Studien 3) 335-366.

<sup>8</sup> Very little is known about the early medieval landscape in Bohemia since almost none of the sources have been preserved. *Smetánka*, Zdeněk: Únětice and Levý Hradec in the 12<sup>th</sup> Century. The Results of Recent Field Work. In: *Archeologické rozhledy* 44 (1992) 231-242.

<sup>9</sup> *Klápště*, Jan: *The Czech Lands in Medieval Transformation*. Leiden, Boston 2012.

<sup>10</sup> *Molnářová*, Kristina: Hedgerow-defined Medieval Field Patterns in the Czech Republic and their Conservation – a Literature Review. In: *Journal of Landscape Studies* 1 (2008) 27-47.

in these areas.<sup>11</sup> Some of them supposedly are the best examples of strip lynchet fieldscapes in all of Europe. Such landscape elements can be compared with the British Isles, where the structure of landscape arrangement – with regards to open-field farming – may be detected above all on the basis of ridge and furrow, and to a lesser degree on the basis of strip lynchets.

It is largely accepted that the late settlement areas are of high medieval origin, and that neither the mechanism nor the period of introduction of the regular forms to the early settlement territory is known.<sup>12</sup> It is possible that they were introduced in the late 15<sup>th</sup> or in the 16<sup>th</sup> century.<sup>13</sup> Even less is known about the later modifications of these newly introduced systems.

The most elaborate old settlement form, a chessboard-like system (*Gewannflur*), is almost exclusively situated in the early settlement area because of the constraints in its implementation, which is owing to the fact that it is best suited to slightly hilly regions with a high risk of soil erosion. Hints as to the origin and later modification of the chessboard system are therefore unlikely to be found in the newly settled areas where, as noted above, the possibilities for this chessboard form are much better. The only exception to this rule is in the region of Dražanská vrchovina,<sup>14</sup> where the high medieval origin and late medieval desertion of the chessboard system is shown in detail on the field survey. Even here, however, the field system can be studied only in its static form, i. e. at the moment of its desertion. The possibility of learning about potential modifications during the long-term usage is very limited.

Another approach is the use of indirect evidence, especially large aggregated data on processes of desertion and development of the density of settlement. Such data proves that the scope of late medieval desertion and population decline was on such a scale that in the majority of cases there were substantial modifications to the village settlement structure and its agricultural hinterland – especially the fieldscape. Those processes completely modified the overall structure of village and field systems of high medieval origins. In those areas affected by late medieval population decline, the original form of high medieval village settlements and field arrangements

<sup>11</sup> *Kuča*, Karel: Oblasti dochovaných strukturálně výrazných plužin v České republice [Areas of Preserved and Structurally Outstanding Fieldscapes in the Czech Republic]. In: *Zprávy památkové péče* 74 (2014) 34–49.

<sup>12</sup> Its later introduction in the early settled areas was mainly due to the existence of older legal relations and complicated land tenure (many villages had more than one owner), which together with already established land use slowed down the process. See *Žemlička*, Josef: *Království v pohybu. Kolonizace, města a stříbro v závěru přemyslovské epochy* [The Kingdom in Motion. Colonisation, Towns and Silver at the End of the Přemyslid Epoch]. Praha 2014.

<sup>13</sup> *Měřínský*, Zdeněk: Studium dějin osídlení na Moravě a ve Slezsku (Současný stav a další perspektivy se zvláštním zřetelem k výzkumu zaniklých středověkých vesnic) [The Study of Settlement History in Moravia and Silesia (Current State and Further Perspectives with Special Regard to Research on Deserted Medieval Villages)]. In: *Archaeologia Historica* 7 (1982) 113–156.

<sup>14</sup> *Černý*, Ervín: *Výsledky výzkumu zaniklých středověkých osed a jejich plužin: historicko-geografická studie v regionu Dražanské vrchoviny* [Results of Research in Deserted Medieval Villages and Filed Patterns: A Historical-geographic Study in the Region of the Dražany Highlands]. Praha 1992.

cannot be studied on the basis of early cadastral maps from the first half of the 19<sup>th</sup> century (fig. 2).<sup>15</sup> Notwithstanding, this fundamental statement does not exclude the possibility that the medieval settlements and field arrangements are detectable from later cadastral maps. This might be the case considering that the number of local farmers remained relatively stable during the high medieval and subsequent eras.

This article investigates whether late cadastral maps (fig. 1-2) are truly irrelevant sources of information for medieval settlement and landscape studies. To do so, the article uses extraordinarily rich evidence, which by coincidence is situated in areas most affected by the Thirty Years War (the impact of late medieval crisis on local settlement cannot be estimated as relevant documentary evidence is lacking). The fact that the results obtained are negative with respect to the relevance of late cadastral maps for the study of medieval settlement and landscape is not a surprise. Nevertheless, this article is an important test to the assumption regarding the lacking relevance of late cadastral maps that has not been evaluated thus far. Since the study only investigated two particular villages, the potential for generalizing the result for the entire country is limited. Furthermore, later modifications of the medieval field-scapes may have taken various forms.

The problem with the current research is that the natural conditions of the Czech Republic, together with methods of premodern and modern farming, have not enabled the preservation of a historical landscape. Notwithstanding, there are some exceptions to the rule, for example the region of Dražanská vrchovina. In those cases, however, those preserved landscapes are remnants of deserted settlement. This means that we are able to learn about the medieval landscape only on the basis of regions with less favourable conditions for settlement of abnormal, untypical regions. In case of “normal” regions, the study of the medieval landscape must be based on indirect sources. The most important one is research on deserted medieval villages: the presumption of high medieval origin of regular field arrangement is derived from the fact that once the regular type of settlement is established, the conditions for finding out the origin of regular field arrangements become available. Again, the weaker aspect of such an approach is reliance on the study of somewhat improper types of settlements that did not prove to be suitable for long-term occupation.<sup>16</sup>

The other source of information is documentary evidence. This is the case for the Czech Republic, where we have a large amount of data on how regular settlement types and field systems were established from the 13<sup>th</sup> century onwards.<sup>17</sup> This is a crucial point for some segments of European studies – especially for the British one

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<sup>15</sup> *Maur*, Eduard: Pustnutí vsí na Plzeňsku za pozdně středověké agrární deprese [Desertion Processes in Plzeň During Late Medieval Agrarian Depression]. In: *Mušková*, Eva (ed.): *Tenkrát na západě (Čech): Kapitoly z dějin kultury a každodennosti Plzně a Plzeňského kraje* [Once Upon a Time in the West (of Bohemia): Chapters in the History of Culture and Everyday Life of Plzeň and the Plzeň Region]. Plzeň 2013, 49-66, here 59.

<sup>16</sup> For a very good summary of current research, see *Nekuda*, Vladimír: *Das hoch- und mittelalterliche Dorf in Ostmitteleuropa im Licht der archäologischen Forschung*. In: *Archaeologia historica* 30 (2005) 263-328.

<sup>17</sup> See especially *Klápště*: *The Czech Lands* (cf. fn. 9).

– since archival sources concerning the context of introducing regular settlement types and field systems are extremely scarce in some parts of Europe.<sup>18</sup> This is caused by the fact that most of the country had already been settled by the time new regular forms of settlement and of cultivation had been introduced – i.e. open-field farming – and is thus less documented in archival sources. In the Czech Republic, areas less suitable for farming were first colonized on a massive scale in the high middle ages, with major participation by German colonists<sup>19</sup> and with the implementation of the so-called German law, which codified how new land should be measured and allotted to farmers.<sup>20</sup> For that reason, many cases of the foundations of new villages as well as the reorganization of older medieval settlements in the so-called old settled areas – regions advantageous for farming – have been preserved. Thus, Czech research may yield very interesting comparative material for the study of open-field systems in the British Isles.<sup>21</sup>

One aspect is the very origin and introduction of those regular types of settlement, which is still far from being completely solved in Western Europe as well.<sup>22</sup> The other aspect in question is the series of subsequent alterations of those systems in the following centuries. So far this theme has also been only moderately studied in the Czech Republic as it requires undertaking studies at the level of townships and is very demanding in terms of time and methodology.<sup>23</sup> Such detailed micro-studies are

<sup>18</sup> *Thirsk*, Joan: The Common Fields. In: *Past and Present* 29 (1964) 3-25.

<sup>19</sup> *Žemlička*, Josef: Století posledních Přemyslovců [The Century of the Last Přemyslids]. Praha 1986, 81-109. – *Měřínský*, Zdeněk: Otázky kolonizace a interetnických vztahů na středověké Moravě [The Question of Colonization and Inter-Ethnic Relations in Medieval Moravia]. In: *Archaeologia Historica* 18 (1993) 99-118.

<sup>20</sup> *Žemlička*, Josef: Die Deutschen und die deutschrechtliche Kolonisation Böhmens. In: *Piskorski*, Jan M. (ed.): *Historiographical Approaches to Medieval Colonization of East Central Europe. A Comparative Analysis Against the Background of Other European Inter-ethnic Colonization Processes in the Middle Ages*. New York 2002, 107-143. – *Žemlička*, Josef: K ujímání a formám německého práva v českých zemích [On the Introduction and on Forms of German Law in the Czech Lands]. In: *Marginalia historica* 6 (2002) 7-38.

<sup>21</sup> For analysis of documentary evidence, see an older study still valid today: *Graus*: *Dějiny venkovského lidu* (cf. fn. 4).

<sup>22</sup> See, for example, a discussion at *Foard*, Glenn: *An Archaeological Resource Assessment of Anglo-Saxon Northamptonshire (400-1066)*. URL: [https://www.le.ac.uk/ulas/publications/documents/29nhas\\_000.pdf](https://www.le.ac.uk/ulas/publications/documents/29nhas_000.pdf) (last accessed 05.06.2015).

<sup>23</sup> *Vorel*, Petr: Z dějin Valu nad Labem a blízkého okolí [From the History of the Village of Valy nad Labem and its Surroundings]. Část III, svazek 1, 2. Valy 1987. – *Vorel*, Petr: Česká léna olomouckého biskupství ve 12.-16. století [Czech Fiefs of the Bishopric of Olomouc from the 12<sup>th</sup> to the 16<sup>th</sup> Century]. In: *Východočeský sborník historický* 1 (1991) 49-106. – *Vorel*, Petr: Vliv vrchnostenského dvorového hospodaření v raném novověku na vývoj obce Dubany na Pardubicku [The Impact of Manorial Farming in the Early Modern Era on the Development of the Village of Dubany in the Region of Pardubice]. In: *Východočeský sborník historický* 10 (2001) 35-68. – *Vorel*, Petr (ed.): *Grunty, rody a domy na Veselí 1401-2001* [Farms, Ancestries and Houses in the Village of Veselí 1401-2001]. Veselí 2001. – *Melmuková-Šašecí*, Eva: Rekonstrukce urbanistického vývoje obcí na Telečsku [The Reconstruction of the Urban Design of Villages in the Region of Telč]. In: *Český lid* 62 (1975) 151-157. – *Dostál*, František: Křenovice u Kojetína, grunty, domky a jejich držitelé [The Village of Křenovice u Kojetína: Farms, Houses and their Tenants]. Křenovice 1940. – *Štřesková*, Jaroslava: *Hospodářský a sociální vývoj obce Chýně* (Historická monografie)

not even common in West European research,<sup>24</sup> despite the fact that they bring valuable insight to what transpired and what happened to townships in the following centuries. It also sheds light on the question of why research that is based on the first Czech cadastral maps from the first half of 19<sup>th</sup> century have produced limited results detecting the make-up of medieval townships (fig. 2).

Analysed descriptions of early modern field systems in documentary evidence yield very valuable testimony on traces of a former metric system of field arrangement being implemented at the moment of origin for a specific field system. Under these circumstances, the discovery of a set of documentary evidence from the estate of Bernartice – although it is from a much later period, namely the 1670s and 1680s, called *vizitace* – is extremely fortunate and valuable.<sup>25</sup> The *vizitace* represent written records of physical revision of rustic properties in the landscape executed by a commission composed of deputies of the local estate government. The revision of property rights was supported by testimony of representatives of local village communities. The documents thus contain detailed descriptions of the agricultural landscape, including specifications of the land tenure of certain plots and their

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[The Economic and Social Development of the Village of Chýně (a Historical Monograph)]. In: Vědecké práce Zemědělského muzea 3 (1963) 15-106. – Valošek, Isidor: Žermanice za feudalismu. K dějinám obce [The Village of Žermanice During the Feudal Period. A Contribution to the History of the Village]. Ostrava 1958. – Petráň, Josef: Zemědělská výroba v Čechách v druhé polovině 16. a počátkem 17. století [The Agricultural Production in Bohemia in the Second Half of the 16<sup>th</sup> Century and the Beginning of the 17<sup>th</sup> Century]. Praha 1964, 79-83. – Ulčák, Ladislav: K vývoji plužiny do konce 16. století [On the Development of the Fieldscape until the End of the 16<sup>th</sup> Century]. In: Československá etnografie 8 (1960) 139-166. – Marková, Zdenka: Formování sídelních typu na Novoměstsku [Forming the Settlement Types in the Region of Novoměstsko]. In: Český lid 57 (1970) 235-241. – Janoušek, Emanuel: Z dějin podřípské vesnice na sklonku feudalismu [From the History of the Village in the Region of the Říp at the End of the Feudal Epoch]. In: Sborník Severočeského muzea. Historia 4 (1964) 17-63. – Petráň, Josef: Příběh Ouběnic. Mikrohistorie české vesnice [The Story of Ouběnice. A Microhistory of the Czech Village]. Praha 2001, 74-95. – Kupková, Renáta / Tetřev, Jan / Šebek, František / Vorel, Petr: Sopřeč. Dějiny obce [Sopřeč – the History of the Village]. Pardubice 1999. – Hanzlík, Jan / Sellnerová, Alena / Veselá, Hana: Vývoj plužiny v Merbolticích od 17. století [The Development of the Fieldscape in Merboltice from the 17<sup>th</sup> Century Onwards]. In: Průzkumy památek 21 (2014) 2, 181-194. – Uhlířová, Lenka: Spatial-temporal Analyses of Landscape Pattern Changes in Horní Stakory Cadastre (Kosmonosy district). In: Historická geografie 33 (2005) 21-37.

<sup>24</sup> Some examples can be found in Hall, David: The Open Fields of Northamptonshire. Northampton 1995. – See also Chibnall, Albert Ch.: Sherington. Fiefs and Fields of a Buckinghamshire Village. Cambridge 1965.

<sup>25</sup> This article presents the most important findings of my research on the field system. In detail, the results have been published in Czech: Dobnal, Martin: Historická kulturní krajina v novověku. Vývoj vsi a plužiny v Borovanech u Bechyně [A Historic Cultural Landscape in the Early Modern Period. Settlement and Field System Evolution at Borovany and Bechyně]. Praha 2003. – Dobnal, Martin: Vesnická sídla a kulturní krajina na Táborsku v 15.-19. století [Villages and Landscapes in the Region of Tábor from the 15<sup>th</sup> to the 19<sup>th</sup> Century]. Praha 2006. – The documents are preserved and stored in the Státní oblastní archiv v Třeboni [State Regional Archives in Třeboň, SOA Třeboň], pracoviště [branch] Jindřichův Hradec, fond [collection] Velkostatek Opařany (designated as Vs Opařany only).

widths. Material such as these have never before been published in the Czech Republic.<sup>26</sup> The documentary evidence comes from the contemporary – i.e. at that point of time – owners of the estate: the Jesuits. Even in the complexity of all archival sources produced by the Jesuit order in Bohemia, this particular finding is exceptional.

The materials found are related to the need for evidence concerning the tenure and cultivation of agricultural land disturbed by the catastrophic Thirty Years War. The devastation caused by the war was so far reaching that substantial parts of the landscape had already been covered by full-grown trees by the time the documents were compiled.<sup>27</sup> Over the course of the war, a restoration of settlements took place, accelerating in the 1670s and 1680s.<sup>28</sup> The way in which individual townships were being restored proves that numerous changes had occurred, including substantial modifications to the agricultural system. These alterations show differences that cast doubt on our ability to understand the medieval landscape on the basis of later cadastral maps. Even though there is a resemblance of these later maps to the landscape arrangement depicted on first cadastral maps from the 1770s (fig. 1), such scepticism might remain.<sup>29</sup> Nevertheless, the sites analysed in this article date to at least the end of the early medieval period, the beginning of the 13<sup>th</sup> century. Preliminary assessments of archaeological findings at the village of Borovany suggest that the 13<sup>th</sup>-century settlement structure was completely different from that depicted on cadastral maps from the 1770s. We therefore cannot exclude the possibility of a scattered form of settlement persisting up to the 13<sup>th</sup> century that was then replaced by the new concentrated form.

In which period precisely the chessboard systems depicted on maps from the 1770s (fig. 1) originated is unclear. The high medieval period (late 13<sup>th</sup> and early 14<sup>th</sup> century) is one possibility; nevertheless, the first half of the 16<sup>th</sup> century cannot be excluded. Key findings of the analysis are discussed further below in terms of the two villages for which abundant documentary evidence is available: Borovany and Bojenice.

#### Methods

The maps of individual field systems were based on an arrangement of furlongs according to cadastral maps from the 1770s (fig. 1). The testimony of the analysed document – the *visitace* – does not suggest that any substantial changes occurred between the origin of the *visitace* and the creation of the cadastral maps. The identification of plots described in the *visitace* has been made possible through:

<sup>26</sup> Apart from iconographical material coming from land and duty registers, or vedute, these documents do not contain information on land tenure, the widths of specific plots expressed in the documents analysed in this article in ridge and furrow, etc.

<sup>27</sup> See *visitace polí a porostlin* (hereinafter *visitace*) from 1675, 1678, and 1680 for the village of Borovany. All documents entitled *visitace* are preserved and stored in the SOA Třeboň, fond Vs Opařany, inv. č. 52-53.

<sup>28</sup> See the *visitace* from 1675, 1677, and 1679 for the village of Skřýchov. For comparison, see also the texts of the *visitace* from 1678 and 1686 for Bojenice.

<sup>29</sup> The maps are preserved and stored in the SOA Třeboň, fond Vs Opařany, inv. č. 688 (Bojenice), č. 689 (Borovany), č. 692 (Skřýchov, 15.3.1779) and č. 693 (Zálší).



- the description of every furlong's position in the *vizitace*;
- the description of the field systems in more than one *vizitace* document (allowing information from different sources to be checked internally);
- the identification of places described on the basis of field names and contemporary objects mentioned in documents other than the *vizitace*;
- and the comparison of the obtained results with physical remnants of the early modern agricultural landscape.

The obtained results are no doubt somewhat affected by the fact that the documents have been projected onto a map reconstruction using later cadastral maps (fig. 1-2), at least as far as the basic division of the field system into furlongs is concerned. As a result, this basic division may have played an inadvertent role in creating the reconstructions. It can be assumed that there are differences between the real state of the land in the 17<sup>th</sup> century and the reconstructions in terms of the width and placement of particular plots (the rate of error is estimated to be 10-20 per cent). Nevertheless, the ability to project the *vizitace* from various years onto a similar map reconstruction is to some extent a confirmation that the correct methods were applied throughout the entire process.

### *Results*

#### *The Reconstruction of Field Systems at the Beginning of the Thirty Years War*

The reconstructions of the 17<sup>th</sup>-century field systems already depict changes that took place in the previous period. Some of the most important are the introduction of fish ponds in the late medieval period and the enlargement of arable land shortly before the outbreak of the Thirty Years War. Because the analysed documents originated some 50 to 60 years after the beginning of the war, the land tenure may not have been reconstructed in its entire complexity with regard to the extensive modifications that took place after the introduction of the field system. Even so, in terms of Central Europe the *vizitace* provided unprecedented insight into the basic principles of the field systems and tenure arrangements that were in place at the beginning of the Thirty Years War.

A comparison of the field systems in place at the beginning of the Thirty Years War (fig. 4-5) with those from maps from the early 19<sup>th</sup> century (fig. 1) shows that the basic scheme of the field systems appears to be the same. The differences that exist are largely due to land tenure rearrangements from the first half of the 18<sup>th</sup> century. At that time, allotments in certain furlongs were completely modified; notwithstanding, the orientation of plot strips was not modified and in most cases did not undergo any extensive changes. Structural modifications resulting from changes in the cultivation of demesne lands played a substantial role here as well. Of equal importance was the fact that the cultivation of arable land was not restored to its pre-war extent over the course of post-war reconstruction. Those changes are described in detail in the following paragraphs.

*Modifications Before the Beginning of the Thirty Years War*

## Modification of Landscapes due to the Introduction of Fish Ponds

Some townships were modified through the introduction of extensive fish pond systems (fig. 4). There is evidence that the majority of these reservoirs existed in the region as early as the 1550s, with their origins, according to research, dating to the end of the 15<sup>th</sup> century or the first half of the 16<sup>th</sup> century. In the literature, the creation of a fish pond system is associated with the abundance of uncultivated land during the late medieval depression. Due to a new, improved system of fish farming, with ponds of different sizes for the different stages of spawning and maturation, the fish pond economy started to become more profitable than the cultivation of fields.<sup>30</sup> The construction of new lakes introduced revolutionary changes to the landscape. New reservoirs were built, specifically on former agricultural land, often on meadows and fields as illustrated by the example of Borovany.<sup>31</sup>

## Traces of Potential Modifications to Furlong Layouts before the Thirty Years War

The reconstruction of the township of Bojenice in 1686<sup>32</sup> suggests alternative scenarios of previous, potentially late medieval development as evidenced by field strips located in two neighbouring furlongs, each of them otherwise completely different in terms of their internal division (fig. 4:2). One possible explanation is that a single furlong was later subdivided into two new parts as the rearrangement of townships in the 18<sup>th</sup> century was based on a simpler division of the land. This resulted in an arrangement that was quite different from its predecessor. It could also be conceivable that the 1686 reconstruction corresponds to the township's original form from the late medieval period, or even from as late as the Thirty Years War, when some furlongs may have been subsequently divided. Similar examples of furlongs that were later divided into additional units with different internal divisions – suggested, for instance, by the land tenure correspondence of plots occurring in both newly originated furlongs – can be found in Germany as well as in Great Britain.<sup>33</sup> In some

<sup>30</sup> *Pánek*, Jaroslav: Die historisch-ökologischen Aspekte der Wasserwirtschaft in den Böhmisches Ländern im 16. Jahrhundert. In: *Historická ekologie* 1 (1998) 77-124. – *Míka*, Alois: Slavná minulost českého rybníkářství [Famous History of Czech Fishpond Cultivation]. Praha 1955, 13-14. – *Míka*, Alois: Feudální velkostatek v jižních Čechách (XIV.-XVII. stol.) [The Feudal Manor in Southern Bohemia (14<sup>th</sup>-17<sup>th</sup> Centuries)]. In: *Sborník historický* 1 (1953) 122-213, here 131-132. – *Míka*, Alois: Nástin vývoje zemědělské výroby v českých zemích v epoše feudalism [An Outline of Agricultural Production Development in Czech Lands During the Feudal Period]. Praha 1960, 186-193. – *Válka*, Josef: Hospodářská politika feudálního panství na předbělohorské Moravě [Economic Policy of the Feudal Manor in Moravia before the Battle of White Mountain]. Brno 1962. – *Macek*, Josef: Jagellonský věk v českých zemích (1471-1526) 1. Hospodářská základna a královská moc [Jagellonian Era in the Czech Lands (1471-1526) 1. Economic Foundations and Royal Power]. Praha 1992, 80-83.

<sup>31</sup> Following documents prove late medieval or early modern origin of the local fishpond system: the division of property from 1553, SOA Třeboň, fond Vs Opařany, inv. č. 3, and the land duties register from 1623-1626, also SOA Třeboň, fond Vs Opařany, inv. č. 37.

<sup>32</sup> Based on the *vizitace* from 1686. SOA Třeboň, fond Vs Opařany, inv. č. 53.

<sup>33</sup> *Dyer*, Christopher: Making a Living in the Middle Ages: The People of Britain 850-1520.

cases, the modification may have resulted in furlongs being reoriented to lie perpendicular to their original positions.<sup>34</sup>

Dating the process may require different approaches depending on the region. In England, the desertion of older, more dispersed early medieval settlements for regularly arranged fieldscapes may be viewed as a *terminus post quem* for the discussion of modifications to the field system.<sup>35</sup> Despite that, newly introduced systems probably took root approximately in the 1200s,<sup>36</sup> whereas in other cases they likely occurred from the 13<sup>th</sup> to the 16<sup>th</sup> century.<sup>37</sup>

According to research, one possible reason for the reallocation of the fields, although regional differences and traits must be kept in mind, is the introduction of the three-field system.<sup>38</sup> In the United Kingdom, the goal was to minimize the distance the plough team had to cover before turning back, thus allowing the beasts to rest more frequently in tandem with a general reorientation from oxen plough teams to horse teams.<sup>39</sup> For the Czech lands, as there are no sources, we can only surmise similar conclusions about the practical or socio-economic reasons for the reallocation. Other reasons for implementing those changes might be modifications of agricultural techniques or impacts of changes in land tenure or of some economic crisis.

#### Extending the Demesne Lands

Before the Thirty Years War, occasionally the structure of the townships was substantially modified through the extensive unification of scattered peasants' holdings

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New Haven 2002, 24. – For a good summary, see also *Beresford*, Maurice W.: Mapping the Medieval Landscape: Forty Years in the Field. In: *Woodell*, Stanley R. J. (ed.): The English Landscape: Past, Present, and Future. Oxford 1983, 106-128, here 126. – *Harvey*, Mary: Regular Open-field Systems on the Yorkshire Wolds. In: *Landscape History* 4 (1982) 29-39, here 32.

<sup>34</sup> *Hall*, David: Field Systems and Township Structure. In: *Aston*, Michael/*Austin*, David/*Dyer*, Christopher (eds.): The Rural Settlement of Medieval England: Studies Dedicated to Maurice Beresford and John Hurst. Oxford 1989, 191-205, here 194. – *Hall*, David: Medieval Fields. Aylesbury 1982, 48-50. – *Hall*, David: Late Saxon Topography and Early Medieval Estates. In: *Hooke*, Della (ed.): Medieval Villages. A Review of Current Work. Oxford 1985, 61-69, here 64.

<sup>35</sup> *Hall*: The Open Fields of Northamptonshire 137 (cf. fn. 24). – *Oosthuizen*, Susan: New Light on the Origins of Open-Field Farming? In: *Medieval Archaeology* 49 (2005) 165-193.

<sup>36</sup> *Wade Martins*, Susanna: Farms and Fields. London 1995, 32-34. – *Matzat*, Wilhelm: Long Strip Field Layouts and their Later Subdivisions: A Comparison of English and German Cases. In: *Geografiska Annaler* 70, series B, Human Geography (1988) 1, 133-147, here 141-142.

<sup>37</sup> *Sheppard*, June A.: Field Systems of Yorkshire. In: *Baker*, Alan R. H./*Butlin*, Robin A. (eds.): Studies of Field Systems in the British Isles. Cambridge 1973, 145-178, here 168. – For other examples see *Sutton*, John E. G.: Ridge and Furrow in Berkshire and Oxfordshire. In: *Oxoniensia* 29-30 (1964-1965) 99-115, here 109.

<sup>38</sup> See, for instance, *Egli*, Hans-Rudolf: Some Thoughts on the Origin of the Open Field System in Switzerland and Its Development in the Middle Ages. In: *Geografiska Annaler*, series B, Human geography 70 (1988) 1, 95-104, here 99, 102-103. In this case, the entire process is dated to the late medieval period from the end of the 15<sup>th</sup> century to the beginning of the 16<sup>th</sup> century.

<sup>39</sup> *Sheppard*: Field Systems of Yorkshire 168 (cf. fn. 37).

into large uniform blocks of demesne lands (fig. 4:1; 5:1).<sup>40</sup> These areas were in some cases reclaimed from dominical forests.<sup>41</sup> Those alterations are probable consequences of late medieval agrarian crisis. In the case of Borovany, the process is recognisable in the structure of the manor and its lands before 1477. The extent of local rustic land decreased substantially between 1553 and 1615.<sup>42</sup> The majority of the demesne lands documented in the 1670s and 1680s were converted to dominical land during the second half of the 16<sup>th</sup> century or at the beginning of the 17<sup>th</sup> century.<sup>43</sup>

Demesne lands were distributed in two ways. The first was a compact distribution where the land was concentrated in a few large blocks adjacent to the manor, as documented in Borovany. The second one was a dispersed distribution with regularly distributed demesne land in the township parallel to scattered peasant holdings, as documented in Bojenice. In Bojenice, the demesne lands probably originated in relation to the structure of the manor between 1576 and 1624.<sup>44</sup> The development of local demesne lands appears to have taken on a dynamic form through the 17<sup>th</sup> century. It probably began with a concentration of dispersed plots (see above) and ended with the abolition of the manor and the transformation of the demesne lands into the holdings of two new peasant farmsteads. The probable cause for this final abolition of the manor was its lower profitability.<sup>45</sup>

The arrangement of the township of Bojenice was more intensively affected by the cultivation of a group of plots transformed into demesne lands in the 1670s and 1680s in the southeast area adjacent to the manor of Bernartice, the centre of the entire estate.<sup>46</sup> After the abolition of the manor of Bojenice, approximately around 1700, this part of the township was attached to Bernartice and became a part of its cadastre when the cadastral townships were created at the end of the 18<sup>th</sup> century.<sup>47</sup> Due to this alteration, land use ratio in the modified township of Bojenice changed remarkably. This change illustrates how different the arrangement of individual

<sup>40</sup> Proved for the village of Bojenice by a land and duties register from 1624-1626. SOA Třeboň, fond Vs Opařany, inv. č. 37.

<sup>41</sup> This is suggested by a description of demesne from 1677 mentioning a field name “Kopanina”, which shows relatively late reclamation of land from the surrounding forests (1677). SOA Třeboň, fond Vs Opařany, inv. č. 53.

<sup>42</sup> See the division of the estate of Bernartice from 1553 and the land and duties register of the same estate from 1615. SOA Třeboň, fond Vs Opařany, inv. č. 3 and č. 54.

<sup>43</sup> The *visitace* from 1675 and the description of the demesne from 1677 provides detailed information on spatial distribution of the demesne in the cadaster. SOA Třeboň, fond Vs Opařany, inv. č. 52.

<sup>44</sup> This is proved by comparing descriptions of acquisition of the Bojenice estate from 1576 (SOA Třeboň, fond Vs Orlík, signatura [signature, sig.] I a N 29) and 1624 (SOA Třeboň, fond Vs Opařany, inv. č. 34).

<sup>45</sup> See report on improving economy of the estate in 1678-1680, an integral part of the memory book of the estates of Opařany and Bernartice from 1606-1738. SOA Třeboň, fond Vs Opařany, inv. č. 35.

<sup>46</sup> The process is documented by texts of the *visitace* from 1672 and 1686. SOA Třeboň, fond Vs Opařany, inv. č. 53.

<sup>47</sup> This was detected by comparing the *visitace* from the 1670s and 1680s (SOA Třeboň, fond Vs Opařany, inv. č. 53) to the Stabile cadastre maps from 1828 (for the villages of Bojenice and Bernartice – available online, URL: [archivnimapy.cuzk.cz](http://archivnimapy.cuzk.cz), last accessed 01.05.2016).

townships in the early modern or older period may be compared to situations documented in the earliest cadastral maps.<sup>48</sup>

Table 1. Changes in land use in the township of Bojenice after attaching part of its demesne lands to Bernartice

Fields	-14 %
Meadows	-6 %
Forests	0 %
Pastures	0 %
Others	0 %

Source: The *vizitace* from the 1670s and 1680s (SOA Třeboň, fond Vs Opařany, inv. č. 53) and the Stabile cadastre maps from 1828 (for the villages of Bojenice and Bernartice – available online at: [archivnimapy.cuzk.cz](http://archivnimapy.cuzk.cz); [last accessed 01.06.2016]).

Reconstructing detailed spatial distributions of Czech demesne lands is an ambitious undertaking. Although there is an abundance of local scholarly work on the changes in the ratio of rustic land to the demesne, the identification of changes in the layout of individual plots in the landscape has rarely been executed. The reason for this is simply the dearth of information on the spatial layout of land tenure in the majority of contemporary documentary evidence. Results obtained from the analysis of the *vizitace* is even more significant because it proves that the basic models for altering the distribution of the demesne lands – both compact and dispersed – are applicable to larger parts of European territory than originally estimated. Examples from England as well as Western Europe and Bohemia are in fact surprisingly similar. Accordingly, the analysis of the *vizitace* in Bohemia actually proves that appropriate methods, which achieved results, were used in research in England.<sup>49</sup>

#### Extending the Arable Land

Written sources indicate that arable land was being extended through the reclamation of forests located at the edges of the analysed townships (4:3; 5:2),<sup>50</sup> a process that accelerated in the period of economic prosperity from the second half of the 16<sup>th</sup> century to the beginning of the 17<sup>th</sup> century. In most cases, the exact boundaries of newly reclaimed plots could not be reconstructed because of their unstable character

<sup>48</sup> The source of data is a very exact Stabile cadastre from 1828 (Národní archiv Praha [National Archives Prague, NA], Fond stabilní katastr [Stabile cadastre collection], sig. Táb 55) and its comparison with the spatial distribution of the land use reconstructed for the 1670s and 1680s on the basis of the *vizitace* (SOA Třeboň, fond Vs Opařany, inv. č. 53).

<sup>49</sup> *Hall: The Open Fields of Northamptonshire* 66-72 (cf. fn. 24). – *Hall, David: Fieldwork and Field Books: Studies in Early Layout*. In: *Roberts, Brian K. / Glasscock, Robert E. (eds.): Villages, Fields and Frontiers: Studies in European Rural Settlement in the Medieval and Early Modern Periods*. Oxford 1983, 115-131, here 117-118. – *Hall, David: Fieldwork and Documentary Evidence for the Layout and Organization of Early Medieval Estates in the English Midlands*. In: *Biddick, Kathleen (ed.): Archaeological Approaches to Medieval Europe*. Kalamazoo/Mi 1984 (Studies in Medieval Culture 1851) 43-69. – See also *Hall: The Open Fields of England* 95-103 (cf. fn 2).

<sup>50</sup> Such a process is evidenced especially by the field name of “Kopanina”, mentioned in description of demesne for the village of Borovany from 1677. SOA Třeboň, fond Vs Opařany, inv. č. 53.

and the rather indifferent description in documentary evidence. This is also the reason why the increase of arable land cannot be understood in terms of changes in the land use ratio. Their irregular shape is related to a specific form of tillage that differs from that practised in older, regularly arranged furlongs.<sup>51</sup>

Just as the less advantageous parts of townships were reclaimed from the woods or other land use forms (e.g. pastures) in times of economic prosperity, these parts were abandoned when crises such as the Thirty Years War emerged and were not reclaimed afterwards. From the perspective of environmental history, this represents a crucial fact: it is clear that the rate of deforestation was much higher at that time than it is today.

#### *Modifications of Field Systems after the Beginning of the Thirty Years War*

##### Changes in Land Tenure

The region under discussion began to be seriously affected by the frequent presence of military troops at the beginning of the Thirty Years War, a conflict that resulted in extensive processes of depopulation and the related decrease of arable land. In the case of Borovany, even the peasants attempting to defend their homes were killed.<sup>52</sup> This led to the temporary but total desertion of cultivated land. In Borovany, the abandoned land was used to extend the demesne lands (see above). The intensive transformation of rustic land into demesne land is unique to Bohemia as it is a direct result of the peasants' obligation to work for the manor and cultivate the demesne lands. At that time, in none of the neighbouring countries can similar processes be found. The considerable extent of the uncultivated land predisposed the estate government to freely manage and allocate the rustic land to particular farmsteads according to current needs. The long-term discontinuity resulting from the catastrophe of 1620 led to the loss of tenure knowledge concerning rustic land in Borovany, a process that was also represented in contemporary documents.<sup>53</sup> Uncultivated land with an unknown holder or belonging to deserted granges was allotted to farmsteads that were being restored. The process by which the size of individual farmsteads was increased, often quite substantially, continued throughout the 17<sup>th</sup> century.<sup>54</sup>

In Bojenice, the extensive modifications of rustic land tenure were also marked by the occurrence of irregularities, which are characterized by the atypically large width of some plots. Some of these plots had been once part of the demesne lands (fig. 4:1). Thus their origins are relatively clear; this may also be true for other cases. It is more probable, however, that the abandoned land was consolidated and reallocated to farmsteads in the course of post-war reconstruction.

<sup>51</sup> *Petráň: Zemědělská výroba v Čechách* 82 (cf. fn. 23).

<sup>52</sup> All farmsteads were recorded in 1623 as farms without a farmer. See SOA Třeboň, fond Vs Opařany, urbář [land register], inv. č. 3.

<sup>53</sup> This was reflected explicitly in the text of the *vizitace*. SOA Třeboň, fond Vs Opařany, inv. č. 52 and č. 53.

<sup>54</sup> Most of those changes in ownership are recorded in a land and duties register from 1667. SOA Třeboň, fond Vs Opařany, inv. č. 39 and in urbář, inv. č. 3 (deposited in the same collection).

Extensive land tenure modifications resulted from the chaotic situation of rustic ownership during post-war reconstruction. These modifications seemed to have continued into the first half of the 18<sup>th</sup> century and resulted in the complete rearrangement of the furlong divisions across the entire township. The testimony of contemporary documentary evidence from the given area is special to Bohemia. Nevertheless, foreign research, primarily from England, may be used to illustrate how modifications in land tenure may have been undertaken in cases of war or agrarian or population crises.<sup>55</sup>

Both the phenomena described here – the transformation of rustic land into demesne as well as the extensively and partially unregulated manner of changing peasants' holdings – were rooted directly in the social and economic consequences of depopulation during the Thirty Years War. Landless peasants, newly settled on vacant land, no longer had to rely on wage labour, which worsened the current shortage of manpower and at the same time raised wage levels for such labour. Oppositely, demand for agricultural products fell rapidly due to extensive depopulation. Estate managers found a solution in cutting prices by implementing a serfdom system, thereby forcing peasants to work for free on demesne land. The extension of labour service thus enabled lords to sell their products cheaply. As a consequence, the labour duties raised remarkably from the mid-17<sup>th</sup> century onwards, making it very advantageous to use vacant rustic land while exploring it as a new part of demesne.<sup>56</sup>

#### Permanent Desertion of Parts of Arable Land

The comparison of cadastral maps from the 1770s (fig. 1) with map reconstructions of both townships under discussion based on 17<sup>th</sup>-century documentation proves that there are considerable differences between today's forestation and that of the pre-Thirty Years War landscape (fig.: 4-5). The economic plans of the estate government were determined by the need for a peasant workforce and peasant equipment such as plough teams in order to cultivate the demesne lands. In promoting a sufficient labour force, the manor needed to provide rustic land for peasants, which

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<sup>55</sup> Again, most information is in the text of the *vizitace*. SOA Třeboň, fond Vs Opařany, inv. č. 52 and č. 53. – Most of those changes in ownership are recorded in a land and duties register from 1667. SOA Třeboň, fond Vs Opařany, inv. č. 39.

<sup>56</sup> For relevant literature, see *Cerman, Markus/Maur, Eduard: Proměny vesnických sociálních struktur v Čechách 1650-1750* [Changes in Rural Social Structures in Bohemia 1650-1750]. In: *Český časopis historický (ČČH)* 98 (2000) 737-774. – *Cerman, Markus: Villagers and Lords in Eastern Europe 1300-1800*. Houndmills, Basingstoke 2012. – *Cerman, Markus/Steffelbauer, Ilja/Torst, Sven* (eds.): *Agrarrevolutionen. Verhältnisse in der Landwirtschaft vom Neolithikum zur Globalisierung*. Innsbruck, Wien, Bozen 2008. – *Bůšek, Václav* (ed.): *Společnost českých zemí v raném novověku* [The Society of Czech Lands in the Early Modern Time]. Praha 2010. – For older reference, see, for instance, *Klíma, Arnošt: Agrarian Class Structure and Economic Development in Pre-Industrial Bohemia*. In: *Past and Present* 85 (1979) 49-67. – *Maur, Eduard: Zemědělská výroba na pobělohorském komorním velkostatku v Čechách* [Agricultural Production at Post-White Mountain Chamber Manor in Bohemia]. Praha 1990. – *Maur, Eduard: Český komorní velkostatek v 17. století* [Czech Chamber Manor in the 17<sup>th</sup> Century]. Praha 1976.

meant that enough arable land from deserted fields had to be reclaimed after 1618. In these terms, the status of some farmsteads was altered from cottager<sup>57</sup> to peasant with land allotted to those farmsteads accordingly. At the same time, in Borovany the documents show a decrease in the number of farmsteads (four farmsteads were deserted completely), which corresponds to the shrinkage of its arable land (fig. 5:3).<sup>58</sup>

Similarly, there is a clear difference in the village of Bojenice in the amount of arable land when comparing the 17<sup>th</sup>-century map projections (fig. 4) with cadastral plans from 1828 (fig. 6). Fields from before the Thirty Years War in the northern part of the township were covered almost completely with forests some two hundred years later. Pre-1618 fields or commons were transformed into pasture by the 1770s (fig. 4:3; 6). Differences in the land use ratio (comparing reconstructions for the 1670s and 1680s with Stabile cadastre from 1828) are shown below; however, there is an error rate of 10 to 20 per cent due to the limitations of the 17<sup>th</sup>-century text descriptions of the townships.

Table 2: Changes in land use ratio in both villages in the 1670s and 1680s versus the 1828 Stabile cadastre map

	Borovany		Bojenice	
	1670s-1680s	1828	1670s-1680s	1828
Fields	52 %	41 %	78 %	67 %
Meadows	6 %	6 %	9 %	9 %
Forests	32 %	43 %	6 %	11 %
Pastures	1 %	1 %	4 %	9 %
Others	8 %	9 %	4 %	4 %

Source: *Vizitace* from the 1670s and 1680s (SOA Třeboň, fond Vs Opařany, inv. č. 53) and the Stabile cadastre maps from 1828 (for the villages of Bojenice and Bernartice – available online at: [archivnimapy.cuzk.cz](http://archivnimapy.cuzk.cz), [last accessed 01.06.2016]).

These observations are even more important because they are indeed random discoveries documented only by this set of extremely well-preserved archival documents. The occurrence of common woods<sup>59</sup> is also documented for other villages in the northern part of this region near the city of Bechyně. Based on archaeological evidence, a similar situation prevailed in parts of Drahanská vrchovina in southern Moravia. Marginal parts of some local townships are covered with woods today, which show physical remnants of ridge and furrow deserted after the onset of the Thirty Years War.<sup>60</sup> Even so, very little research on this area has been conducted in

<sup>57</sup> The term cottager means, according to terminology of Berní rula cadaster, a smaller peasant's holding. *Cerman/Maur: Proměny vesnických sociálních struktur v Čechách 1650-1750, 746-747* (cf. fn. 56). – Nevertheless, in some cases a smaller amount of land may be allocated in villages to a peasant's farm in comparison to cottagers' holdings. The main difference represents equipment of both categories of farms, whose integral part needs to be in the case of peasants a functional ploughing team.

<sup>58</sup> See SOA Třeboň, fond Vs Opařany, urbář, inv. č. 3.

<sup>59</sup> Former rustic arable land was transformed in case of desertion mainly into forests.

<sup>60</sup> Čermý, Ervín: Zaniklé části plužin soudobých osad na Drahanské vrchovině [Deserted Parts of Fieldscapes of Contemporary Villages in the Drahany Highlands]. In: *Archaeologia Historica* 4 (1979) 235-247.



the Czech Republic. Generally, historians have paid little attention to the problem and there are very few extant archival sources that document the origin of common woods from land under cultivation prior to the Thirty Years War. This does not mean, however, that the process did not occur or that it occurred on a limited scale.

The obtained results are also important in another respect: they document different demands in terms of the extent of arable land necessary for subsistence. The extent of arable land under cultivation never reached pre-war levels in the Czech Republic again. This implies that more intensive forms of agricultural cultivation eventually took root as the population came to exceed its pre-war level. In the future, similar mapping of land use changes for other parts of the Czech Republic could give an important impetus to the research of environmental history.

#### Cultural Landscape Design (Fieldscape)

The analysed *vizitace* can also help in understanding the cultural landscape of that time. The most comprehensive is information on the ridge and furrow<sup>61</sup> used to describe the width of certain plots; it represents a very interesting complement to scholarly discussions taking place in West European countries, especially in England.<sup>62</sup> The results from reconstructing the field system arrangement at two sites cannot be applied to other parts of Europe considering their different physical (geomorphologic, soil, climate, etc.) and socioeconomic conditions. Even so, the information obtained still has potential in providing possible directions for explaining the arrangement of the cultural landscape in Western Europe, especially England.

Unlike the available iconography, the *vizitace* show that ridge and furrow is prevalent in the townships and also indicate the reasons behind their absence in the majority of forests located on deserted arable land. They prove that even in the 1670s and 1680s, a certain amount of ridge and furrow was already largely invisible due to the desertion of arable land after 1620. Although this would suggest that the pro-

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<sup>61</sup> Unlike as in the *vizitace*, ridge and furrow is usually depicted on iconographic material; however, these representations are somewhat simplified and contain no information regarding ownership.

<sup>62</sup> *Mead, W. R./Kain, R. J. P.*: Ridge-and-furrow in Kent. In: *Archaeologia Cantiana* 92 (1976) 165-171. – *Hall, David*: Modern Surveys of Medieval Field System. In: *Bedfordshire Archaeological journal* 7 (1972) 53-66. – *Parry, Martin L.*: A Typology of Cultivation Ridges in Southern Scotland. In: *Tools and Tillage* 3 (1976) 3-19. – *Taylor, Christopher C.*: Fields in the English Landscape. London 2000. – *Orwin*: The Open Fields (cf. fn 2). – *Rowley, Trevor*: Medieval Field Systems. In: *Cantor, Leonard* (ed.): *The English Medieval Landscape*. London 1982, 25-55. – *Muir, Richard*: The New Reading the Landscape: Fieldwork in Landscape History. Exeter 2000. – *Mead, W. R.*: Ridge and Furrow in Buckinghamshire. In: *Geographical Journal* 120 (1954) 34-42. – *Sutton*: Ridge and Furrow in Berkshire and Oxfordshire (cf. fn. 37). – *Kain, R./Mead, W. R.*: Ridge-and-furrow in Cambridgeshire. In: *Proceedings of the Cambridge Antiquarian Society* 67 (1977) 131-137. – *Silvester, Robert J.*: Ridge and Furrow in Norfolk. In: *Norfolk Archaeology* 40 (1988) 286-296. – *Harrison, M. J./Mead, W. R./Pannett, D. J.*: A Midland Ridge-and-furrow Map. In: *Geographical journal* 81 (1965) 366-369. – *Jackson, James C.*: The Ridge-and-furrow Controversy. In: *Amateur Historian* 5 (1961) 1, 41-53. – *Baker, Alan R. H./Butlin, Robin A.*: Introduction: Materials and Methods. In: *Baker/Butlin*: *Studies of Field Systems* 1-41 (cf. fn. 37).

bability of ridge and furrow being preserved in the contemporary cultural landscape is quite low, even today one can still find remnants of ridge and furrow from the 17<sup>th</sup> century in former common woods, particularly regarding similar widths and orientation.<sup>63</sup>

The analysis of the *vizitace* also reveals signs of the so-called transverse ridge and furrow (located at a right angle to the longer side of the plot) and of a very large ridge that is apparent in areas where its size exceeds that of nearby ridges. Large ridges may have been caused by different tillage methods, as we know from West European case studies.<sup>64</sup> Examples from other parts of the Czech Republic also suggest a possible relationship between the width of ridge and furrow and local hydrological conditions. In the Czech Republic, the intentional creation of ridge and furrow was determined by traditional tillage methods because the ridge lowered the level of the water table. For more humid soil, narrow ridge and furrow was typical, while drier land was formed into quite wide ridge and furrow. However, multiple causes led to the creation of ridge and furrow and the role of traditions should not be underestimated.<sup>65</sup> As most of these issues have been discussed at length in West European research, we are quite familiar with Western patterns. The Central European case presented in this study can act as an inspiring contribution to the debate on general trends and local characteristics.

#### 18<sup>th</sup>-Century Field System Reforms

Differences in the field system layout become clear when comparing reconstructed field systems from the 1670s and 1680s to those prevalent in the 1770s (fig. 4-6). There are fundamental differences based on the distribution of land tenure among individual farmsteads, the regularity of land division, and the overall layout of the field system. These variations cannot be entirely explained by the methodological constraints of map projections based on the *vizitace* descriptions of the contemporary landscape. The substantial rearrangement of field systems – here meaning the preservation of the basic layout in certain furlongs while completely modifying their internal divisions – took place between the 1670s and the 1770s. As tillage methods were not altered, all of the following aspects of field systems remained the same: the basic furlong layout, the communication network, the orientation of the divisions of particular furlongs, and the location of meadows but not their division into individual pieces of land owned by farmers.<sup>66</sup> The modifications that occurred concerned

<sup>63</sup> However, medieval field systems preserved in the region of Drahanská vrchovina (southern Moravia) prove that at least in this area ridge and furrow covered only a part of a given plot. Černý, Ervín: *Zaniklé středověké osady a jejich plužiny: Metodika historickogeografického výzkumu v oblasti Drahanské vrchoviny* [Deserted Medieval Villages and Their Field-scapes: The Methodology of Historical-Geographical Research in the Drahany Highlands]. Praha 1979, 79.

<sup>64</sup> Taylor, Christopher C.: *Fieldwork in Medieval Archaeology*. London 1974, 124. – On the implementation of various traditions of cultivating the land, see Wilson, D. R.: *Alterations to Ridge and Furrow: Some Examples Illustrated*. In: *Aston/Austin/Dyer: The Rural Settlement of Medieval England 183-190*, here 189 (cf. fn. 34).

<sup>65</sup> Adkins, Lesley/Adkins, Roy: *The Handbook of British Archaeology*. London 1982, 250.

<sup>66</sup> There is no direct information on the reform in documentary evidence, which has been lost

the splitting of fields and meadows into individual plots as well as the modification of the number and sizes of strips in specific furlongs. Completely new bundles of strips were created; however, in almost all cases, the previous orientation was retained. New meadow divisions corresponded to the new allotment of field strips to farmsteads. The execution of reforms was probably also associated with the omission of former hedgerows and the creation of new ones.

The rearrangement of the fields system clearly and spatially defined the land tenure of both peasant and cottager (*chalupner*) farms. After the reform, peasants held wider strips, whereas cottagers were allocated narrower pieces of land arranged in bundles. The reform thus unified the type and rents of two basic categories of farmsteads (peasants and cottagers) in both Borovany and Bojenice in terms of simplifying and organizing land tenure in the landscape, which thus became perfectly organized by space as well as easy to define. Two categories of farmsteads already existed at the time of the reform; the reform itself simplified and unified the land tenure of every farmstead into a highly regular system. This reorganization thus represents a reaction to the uncoordinated restoration of settlements in the catastrophic aftermath of the Thirty Years War.

The rearrangement of the field system layout must have been a relatively large undertaking. As a result, geometrical methods and landscape mapping together with the creation of written documentation must have occurred. However, the documents appear to have been lost due to the complicated history of the Bernartice estate. Indirect evidence from contemporary land registers shows that reforms took place in the 1730s, at least in the case of the village of Bojenice.

The discussed reforms represent a phenomenon that was not restricted to the area around the city of Bechyně but, as documentary evidence suggests, was implemented on many estates in Bohemia, as well as on other estates held by the Jesuit order. The reasons for its broader implementation have been stated above. Other reasons may include the tendency of estate governments to increase the number of peasants obligated to assist with their plough teams for the purpose of demesne cultivation; cottagers, however, were not obligated. The analysed *vizitace* are unique as they provide detailed evidence of how a previously chaotic land tenure system was reorganized. This is an area to which historians have paid minimal attention and in which the primary methodology has not enabled scholars to trace the spatial aspect of land tenure alterations. Instead, they have concentrated almost exclusively on detecting the impact of the reforms in terms of economic history.<sup>67</sup> Their actual effects on the contemporary landscape – which could be quite easily conceptualized through a simple analysis of the *Stabile cadastre*, the first geometrically exact plan – has not been assessed, except for a very few examples. The analysis of the *vizitace* has enabled us to not only fill in some of these gaps in the study of 17<sup>th</sup>- and 18<sup>th</sup>-

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and is not available today. However, land registers contain several statements referring to the implementation of the reform, which testify that the farmland was leased to a new holder of the farmstead to an extent equal to other holders. This information is dated to the 1730s and 1740, see SOA Třeboň, fond Vs Opařany, urbář, inv. č. 3.

<sup>67</sup> For examples from neighbouring Germany, see: *Hard: Plangewannfluren aus der Zeit um 1700* (cf. fn. 6).

century land reforms, it has also helped us to understand their real impact on the layout of the cultural landscape.

#### *Summary*

The presented analyses provide a new insight into the basic principles and arrangements of land division in Central Europe at the beginning of the Thirty Years War. It helps us to understand the impact of late medieval and early modern alterations of field systems, which considerably modified later arrangements. Two particularly impactful modifications were the late medieval construction of fish ponds, which turned meadows and adjacent fields into new water reservoirs, and the intensification of grain production on manors with the associated extension of demesne lands.

From our point of view, signs of secondary alterations of the field system before the Thirty Years War, for example changes in the overall layout of the field system and the spatial distribution of specific furlongs, are also important. The significance of these changes is all the more evident in the context of West Europe sites, allowing us to conceive of a much greater spatial distribution than previously imagined.

Another crucial point in the development of the analysed field system is the devastating effect of the Thirty Years War as manifested in the desertion of both peasants' and cottagers' farmsteads. Land tenure was altered over the course of the conflict through the desertion of tillage of many plots and their subsequent reallocation to other farms. Analysed archival sources have allowed us to document the desertion of many plots of arable land and to prove that local deforestation reached an extent that has never been matched since the war.

Typical signs of the given field systems may be generalized, at least in relation to the so-called early settlement area, which was to a small degree settled from the early middle ages onward. In the so-called late settlement areas, colonization intensified for the first time in the beginning of the 13<sup>th</sup> century. The consequences of the Thirty Years War were lessened because of the hilly and mountainous nature of the terrain, which made it less appealing for armies, and due to the stability of the settlements. The field system structure is imagined to have also been more stable here.

The detailed testimony of the *visitace* concerning the arrangement of the cultural landscape enabled an in-depth comparison of Central European with West European conditions (especially in England), which had not been achievable before. The results of the presented analysis show the need for a study of the traditional European historical landscape that is based on the comparison of examples from different countries, such as Germany.

To some extent, the chaotic restoration of farms, primarily during the 17<sup>th</sup> century, resulted in land reforms that unified and organized the land tenure of particular categories of farmsteads, namely peasants and cottagers. In some cases, the reform modified the distribution of the given field system into particular furlongs. Furthermore, from a methodological perspective, the inadequacy of 18<sup>th</sup>- and 19<sup>th</sup>-century cadastral maps for studying European medieval field systems has been confirmed by the present analysis. This analysis thus provides new and relevant information for the debate while encouraging a broader discussion on modifications of Central European cultural landscapes during the early modern period.

*Figures*

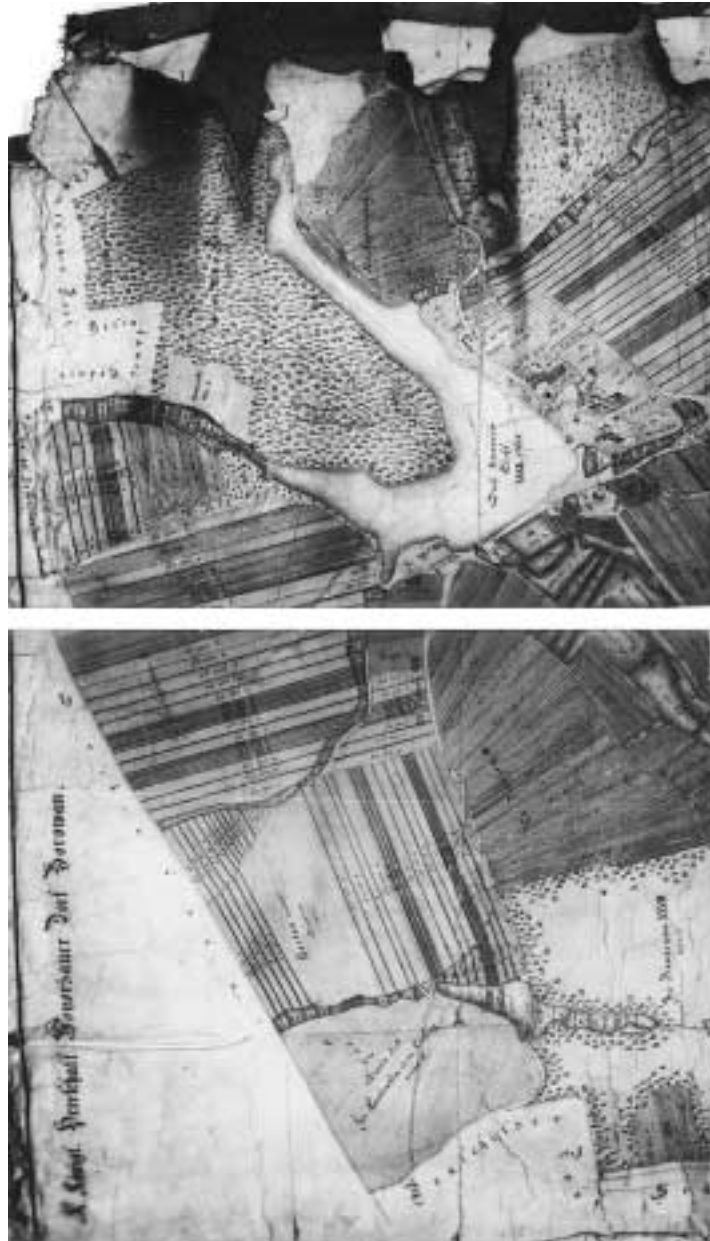


Fig. 1: An example of cadastral maps from the 1770es: the village of Borovany. SOA Třeboň, fond Vs Opařany, inv. č. 689.



Fig. 2: An example of the Stabile cadastre map: the village of Borovany, 1828. Map based on archival documents from Český úřad zeměměřický a katastrální [State Administration of Land Surveying and Cadastre, ČÚCK]. URL:[www.cuzk.cz](http://www.cuzk.cz) (last access 01.06.2016).



Fig. 3: An example of preserved fieldscape of probable high or late medieval origin: the village of Petrovice ve Slezsku. Photo from 2000, map based on orthophoto, ČÚCK, [www.cuzk.cz](http://www.cuzk.cz) (last access 01.06.2016).



Fig. 4: Reconstruction of the field systems in the village of Bojenice in 1686. Light grey: pasture. Medium grey: meadows. Dark grey: woods. 1: demesne fields. 2: plots signaling later division of furlongs, strips that stretch over two neighboring furlongs. 3: areas newly reclaimed in the second half of the 16<sup>th</sup> century and beginning of the 17<sup>th</sup> century and becoming later on former arable land deserted and converted to other land use types after the beginning of the Thirty Years War. Drawing by the author.



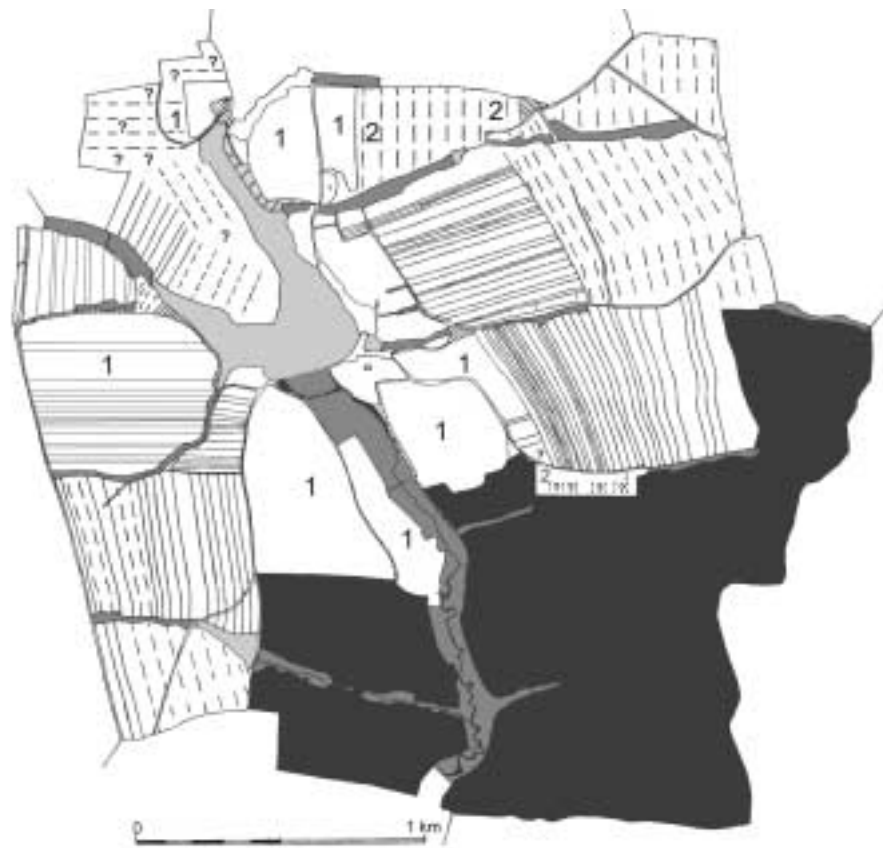


Fig. 5: Reconstruction of the field systems in the village of Borovany according to the *visitace* from both 1675 and 1680. Light grey and hatched (diagonally): pasture. Medium grey: meadows. Dark grey: woods. Light grey: fish ponds. 1: demesne fields. 2: areas newly reclaimed in the second half of the 16<sup>th</sup> century and the beginning of the 17<sup>th</sup> century. Drawing by the author.



Fig. 6: Township of Bojenice on the Stabile cadastre map (1828). Light grey: pasture. Medium grey: meadows. Dark grey: woods. Hatched (horizontally): fish ponds. 1 – former arable land deserted and converted to other land use types after the beginning of the Thirty Years War. Drawing by the author.



Fig. 7: Township of Borovany on the Stable cadastre map (1828). Light grey: pasture. Medium grey: meadows. Dark grey: woods. Hatched (horizontally): fish ponds. 1 – former arable land deserted and converted to other land use types after the beginning of the Thirty Years War. Drawing by the author.