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PREFACE

This special issue comprises a selection of papers presented at the conference on Defence Heritage, organised by the University of Alicante and the Wessex Institute in 2016.

Redundant defence sites built throughout history for the defence and control of a given territory, offer a range of opportunities to planners, architects and local communities to redevelop large areas, bringing new life to often neglected parts of towns. The papers included in this issue increase our knowledge about the design and function of sites which are no longer required for defence and which have had a successful transformation to new sustainable futures.

The current military requirement for rapid and flexible response needs different physical resources from classical fixed position installations. As a result, huge tracts of land and buildings became redundant and available for new uses. The redundancy process has accelerated over the last few years and in many regions of the world there is a new urgency to dispose of surplus defence property in response to a changing defence strategy and reduction in some form of military spending. Added to this is the increasing risk of destruction of the world's material cultural heritage, including defensive architecture, either incidentally or deliberately.

Over recent years a large number of interventions to this heritage have been developed, and the research related to their history, restoration and enhancement has increased. Research centres around the world have brought to light a wealth of information that facilitates the preservation of a unique heritage.

Redundancy affects landmark buildings and many sites. Their development is a complex planning challenge, differing from ordinary changes of use because of their unusually wide range of interested stakeholders and their expectations. What is needed is the creation of new long term economic, social and cultural activities able to generate wealth as well as appropriate adaptive reuse or reconfiguration of the structures respecting their historical value.

In recent decades, historical and constructive researches related to fortified enclosures, for instance, have produced a new citizens' perception about its cultural and historical value. The city of Pamplona in Navarre is a classic example in this regard. Extensive research on the bastioned fortifications and magnificent pentagonal citadel raised awareness among urban managers of the need to restore this fortified complex. In addition to recovering missing elements, some interventions resulted in better connected city heritage sites, through elevators and bridges linking disjointed urban parts. The restoration of the fort of St Bartholomew was achieved after two decades and the public response was very positive. The example of action taken on the fortifications of Pamplona demonstrates that it is possible to turn defence walls – originally designed as a barrier – into a link between districts.

The papers included in this issue demonstrate that the conference objectives of reviewing the redesigned functions of defence sites have been achieved. They contribute to a better understanding of the issues and optimisation raised by their redundancy and the implications of different development projects for the sites.

The Editors
2016

DOCUMENTATION, RECOGNITION AND PROTECTION OF MODERN FIELD FORTIFICATIONS IN THE CZECH REPUBLIC (CASE STUDY: THE THIRTY YEARS' WAR)

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ABSTRACT

In addition to large stable fortifications made of stone or bricks that are listed as national heritage sites, the Czech Republic is home to debris of dozens of smaller field fortifications from early modern times. They are mostly relics of battles and military campaigns associated with the Thirty Years' War in 1618–1648, a series of shorter wars during the 18th century and the Napoleonic Wars.

So far, only sites from the Thirty Years' War have been systematically studied and documented, i.e., a total of thirty fortifications found in seven localities. The field fortifications from the 18th to the beginning of the 19th century have only been studied and documented at random, and the total estimated number of sites is 100–150. Locating field fortifications, as well as their description and documentation, is primarily based on research combining cartographic, iconographic and written sources, along with field research (ground research, LIDAR surface screening and scanning). Excavation and experimentally built fortification models (at 1:1 scale) play an important role in our recognition of the construction details. In spite of the long-term research, most of the fortifications are not protected on national heritage lists.

Key words: Czech Republic, field fortifications, modern era.

1 INTRODUCTION

The Czech Republic has a long tradition in the field research of modern field fortifications. One hundred years ago, systematic research of the former battlefield from 1620 took place near Rakovník. Several years later it was followed by an excavation of parts of the Swedish camp fortification near Stará Boleslav from 1639–1640 [1]. In previous decades, however, the extent of interest in these sites has grown intensively. Reasons for this are many. First, the Czech Republic has seen the rapid expansion of archaeological disciplines dealing with the modern era, the age of complex modernization and contemporary times [2]. There has also been a steadily rising interest in fields concerned with the archaeological research of wars and military, i. e., military archaeology, battlefield archaeology or conflict archaeology. Modern field fortifications are also the subject of landscape archaeology and space archaeology. Extra attention is paid to these sites in terms of non-destructive archaeology, especially aerial archaeology and airborne laser scanning [3]. Many fortifications have also been researched using historical cartography methods. Last but not least, relics are sought out by both amateur and professional researchers as important orientation points for metal detector research.

Well-preserved fortifications are principally associated with the Thirty Years' War (1618–1648), the First and Second Silesian War (1740–1742 and 1744–1745), the Seven Years' War



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Figure 1: Confirmed relics of the Thirty Years' War field fortification in the Czech Republic. 1: Redoubt near Přísečnice 1641; 2: Swedish besieging camp near the Kynžvart castle 1647/1648; 3: battlefield near Třebel 1647; 4: battlefield near Rozvadov 1621; 5: battlefield near Rakovník 1620; 6: redoubt near Volary 1618–20; 7: Swedish camp Horní Moštěnice 1643; 8: fortification near Jablunkov in the first half of the 16th to 19th century (Credit: V. Matoušek and R. Tyslová).

(1756–1763), the War of the Bavarian Succession (1778–1779), the Napoleonic Wars (1800–1815) and the Austro-Prussian War (1866). Although the total number is unknown, estimates point to dozens, perhaps even hundreds of sites. Professional interest in these sites is usually limited to locating the site and documenting it, using drawings, photography and measurements. Their historical context is generally dealt with only in terms of specific regional history. The Thirty Years' War fortifications are the only exception in this case. The narrow approach to a regionally interesting landscape element is elevated to the systematic study of a specific military phenomenon of the first half of the 17th century (Fig. 1).

2 HISTORICAL CONTEXT

The first and last shots of the Thirty Years' War were fired in Prague. Severe battles led to the building of field fortifications in the Czech lands mostly at the beginning of the war (the Bohemian War, 1618–1620/1623) and at its end when the Swedish military invaded and occupied various areas in the Czech lands in the 1640s. Military architecture of the time corresponded to the unprecedented development of firearms (artillery), as it became a dominant power on battlefields as early as the first half of the 15th century. The builders of Europe's field fortifications (including those in the Czech lands) followed the tradition of the 'Neo-Italian School', which is characterized by a high number of polygonal bastions connected to each other by short straight curtain walls (Fig. 2). These late medieval principles were enriched by innovations by Spanish, Old Dutch and Old German schools, which widened the fortifications using a system of small outlying fortresses. The relics of extensive fortification lines and small outlying fortresses are apparent in the landscape today as noticeable geometric formations of lines, rectangles, triangles and other polygons, sometimes even circles and semicircles (Fig. 3).

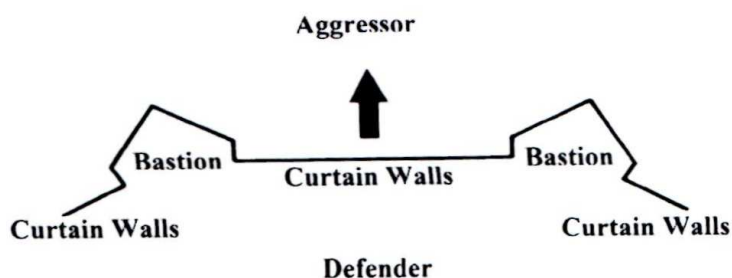


Figure 2: Diagram of a simple bastion fortification (Credit: V. Matoušek and R. Tyslová).

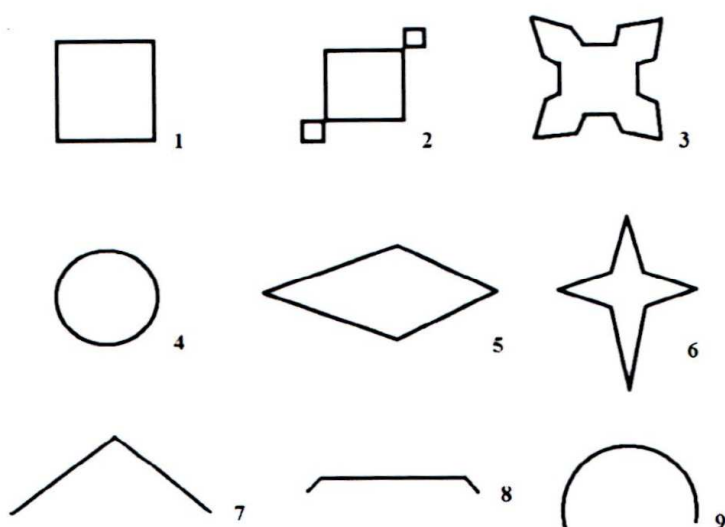


Figure 3: Platform shapes of the basic types of preserved Thirty Years' War fortifications in the Czech Republic. (Credit: V. Matoušek and R. Tyslová).

The tradition of bastion fortresses was held until as late as the 19th century. Thus, in order to identify the period and event associated with the particular relic, it is necessary to combine several methods.

3 RESEARCH METHODS

3.1 Archival sources

From many archival sources I would like to single out the extensive work entitled *Theatrum Europaeum*, which was first published in 1633 by an engraver and publisher, originally from Basel, Matthäus Merian (1593–1650). The first six volumes describe significant European events from the years 1618–1651 [4]. In addition to detailed descriptions including specific information about military campaigns and battles, the *Theatrum* contains a number of large engravings depicting these events. The engravings represent a complex source of information, combining elements of maps, plans, works of art and written sources. The works published in *Theatrum Europaeum* are valuable both artistically and as a source of documentation. Authors of the original engravings were often military engineers who had designed the field fortifications themselves [5]. Thanks to detailed analysis of the engravings in the sixth

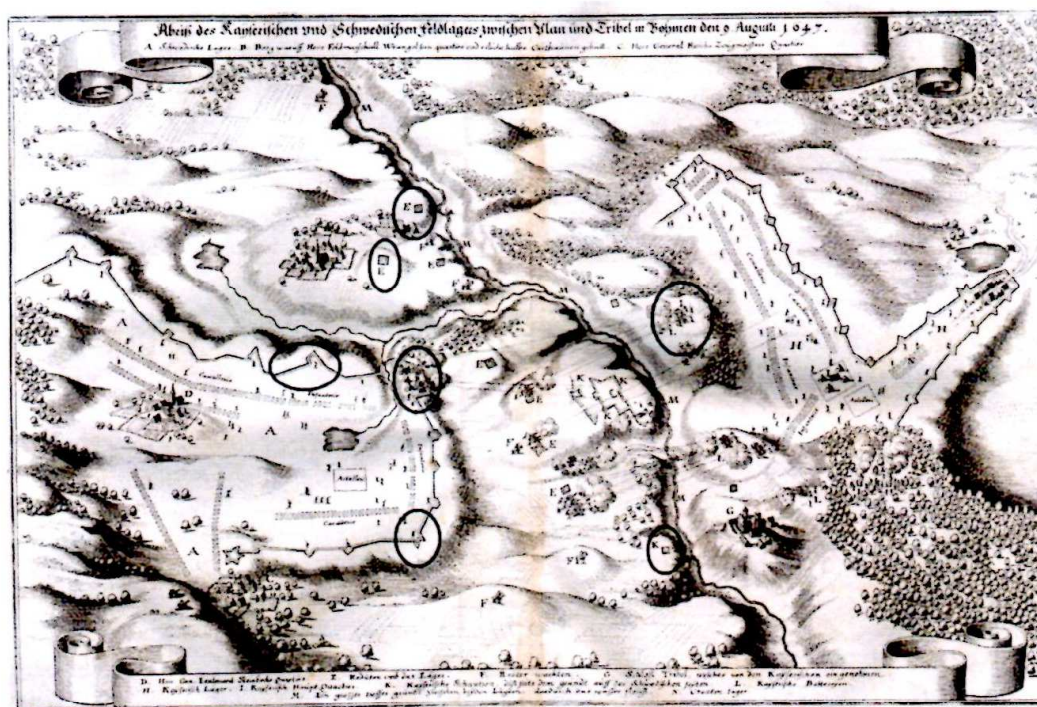


Figure 4: Battlefield near Třebel, 19 August 1647. The circled fortifications are still preserved today. *Theatrum Europaeum* volume VI. Digitalized by V. Matoušek.

volume, a large system of field fortifications relics from 1647 was identified in the terrain near Třebel (Fig. 4). In terms of informational quality, the engravings of battlefields in leaflets published at that time are often substantially less valuable. However, the leaflet concerning the battle between Waidhaus and Rozvadov, where general Mansfeld's army and the army of the Catholic League clashed in the summer 1621 (Fig. 1: 4), is an example of a leaflet engraving that is a highly valuable source for identifying the battlefield and specific fortifications [6].

3.2 Cartographic sources

Many of the historical field fortifications could be identified in the terrain, thanks to the research of cartographic sources. The most crucial source here is the set of military surveys carried out in the 18th and 19th centuries. The first military survey (ratio of 1:28800), named the Military Map of the Kingdom of Bohemia, was carried out in Bohemia in the years 1764–1767 and 1780–1783, in Moravia in 1764–1768, and in Czech Silesia in 1763. The second military survey, named Militär-Aufnahme-sektionen von Böhmen (ratio of 1:28800), was created in Bohemia in 1842–1852 and in Moravia and Czech Silesia in 1836–1840. The third military survey 1:25000 was created in 1874–1880 [7].

3.3 Aerial photography and LIDAR surface screening and scanning

Combining cartographic sources with aerial archaeology and airborne laser scanning has proved to be highly effective [3]. These modern technologies have not yet been used to contribute to the research of the Thirty Years' War fortifications. However, they have been successfully used for identification of extensive fortification systems from the War of the Bavarian Succession (1778–1779) and the Napoleonic Wars (1813) in North Bohemia (Fig. 5).

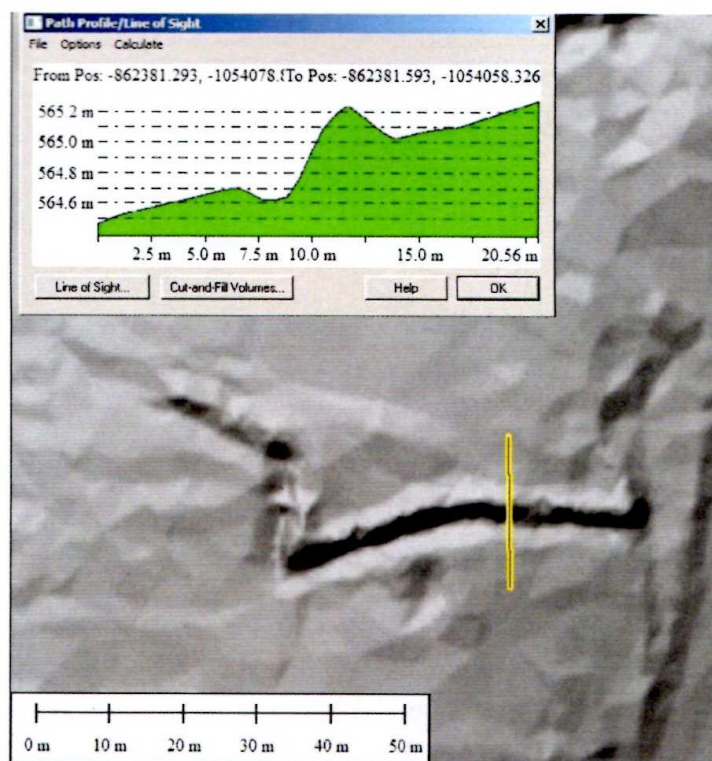


Figure 5: A corner of the Swedish camp on the former battlefield from 1647 near Třebel, found using airborne laser scanning. Digitalized by P. Hrnčířk.

3.4 Military handbooks

Military handbooks are also a valuable source for field fortification research because they include not only information about shapes and proportions of the specific fortification elements, but also instructions on how the elements should be built. For research in the Czech lands, two primary handbooks are used: one from a Polish mathematician, geodesist, architect and cartographer Jozef Naronowicz-Naronski (circa 1610–1678) and the other, the handbook of Prussian officer G. Schwinck [8].

3.5 Archaeological research and metal detector survey

In recent years, three archaeological research projects have made a major impact on the recognition of military architecture. In 1988–1990 and 1999–2003, systematic archaeological research of the battlefield from 1647 was carried out under the Třebel castle in West Bohemia (Fig. 1: 3; 1: 4). A total of seven fortifications was identified and studied [9]. In 2010–2014 the battlefield from 1620 was researched near Rakovník in Central Bohemia (Fig. 1: 5). Six preserved fortifications were found here [10]. Eighteen fortifications in total were identified on the battlefield from 1621 between Rozvadov and Waidhaus on the Czech-Bavarian border (Fig. 1: 4; 1: 6; 1: 7), but only two of them were subject to archaeological research [6].

An experimental archaeological method was used twice for the research of modern field fortifications. This involved building a model of an imperial redoubt examined on the battlefield near Třebel from 1647. The experiment proved that a group of 70 men who used the redoubt as a base (see [8]) was capable of building it in the shape of a square with 17 m sides (measured on the head of the wall) in only two days. That also included the head of the wall being fitted with wicker baskets filled with soil and rocks [11] (Fig. 6).



Figure 6: Archaeological excavation in the redoubt of the Catholic League army on the battlefield from 1621 near Rozvadov (Credit: V. Matoušek).

4 TYPOLOGY OF FIELD FORTIFICATION FROM THE THIRTY YEARS' WAR

Although iconographic sources and military handbooks provide a wide range of fortification shapes, the reality in the terrain is usually more modest (Fig. 3). The most frequent shape still preserved today (found 20 times) is a square redoubt (Fig. 3: 1). However, the word *square* in this context must be used carefully; here it describes all tetragons (rectangles or trapezoids) with a platform similar to a square. The redoubts can be divided into three categories based on size. The smallest redoubts have sides 17 m long (measured on the head of the wall). The middle-sized redoubts have sides 30–32 m long; the largest – the Volary Ramparts (Volarské šance) – is a square with 41 m sides. These categories include both artillery and infantry redoubts. When we convert the size to historical units, we find out that the basic side length of a small redoubt was approximately 60 feet (17.76 m), the middle sized being 100 feet (29.6 m) and the largest 140 feet (41.44 m). The height of the walls as they stand today is between 50 and 150 cm, and their original height cannot be estimated (Fig. 7).

In a smaller number of cases we can also find other shapes in the terrain. Rondels were observed twice, both of which were built by the Swedish army (Fig. 3: 4). Near Rakovník on the imperial side, five redans were found (Fig. 3: 7) ranging between 28×22 m (angle 97°), 9×10 m (angle 100°), 20×22 m (82°) and 16×11 m (73°). The fifth of these redans was located in impenetrable vegetation and could not be closely examined. Four other redans were found on the battlefield near Rozvadov, where four star-shaped redans were preserved with one of the cones significantly protracted. (The terms *rondels*, *redans*, etc., describe the platform shapes; they are specifically shown in Fig. 3. Further defining these terms exceeds the topic of this article.)

The platforms of the preserved fortifications more or less correspond to the handbook shapes (Fig. 8). However, the shapes of their trenches and walls generally differ from

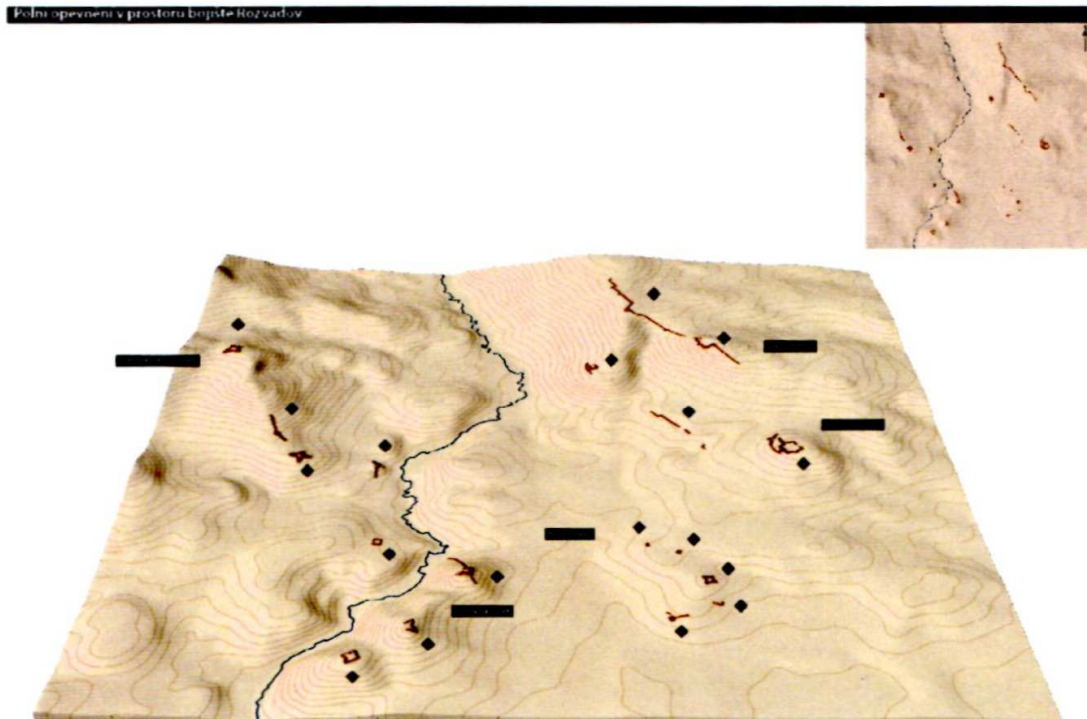


Figure 7: Plan of the battlefield from 1621 near Rozvadov. Digitalized by P. Hrnčířk.

handbook regulations. A trench defined by a trapezoidal cross-section (and flat bottom) was intended to be the base for construction. The material removed during the digging of the trench was then meant to be used in creating a more or less structured wall, also trapezoidal, or a system of trapezoids connected to one another. Nevertheless, the results of research near Rozvadov and Třebel show that the reality was different. Only one redoubt near Třebel fitted the handbook requirements, while the other three were surrounded by round trenches and (compared to the handbook regulations) haphazardly built walls.

5 THE ISSUE OF PRESERVING BATTLEFIELD FORTRESS RELICS

The relics of modern fortifications (i.e., those from the Thirty Years' War and others) can be found both in open agricultural landscape and in forested areas. The number of sites found in forests is slightly higher, as they were originally often created in rough landscape that was not used for agriculture. In Fig. 1, we can see that most of the Thirty Years' War's fortifications were preserved in mountainous and forested border areas. Fortifications built in close proximity to a forest are also often found quite commonly. It is true that this required some of the agricultural land to be used, but the unwillingness to invest the time and energy needed for the fortification's later demolition leads to a simple solution: leaving the fortification to natural processes including the forest surrounding it. Last but not least, another group contains sites preserved in the middle of agricultural areas left to natural processes; today they are overgrown with bushes and trees.

6 CONCLUSIONS

The relics of modern battlefields are an important and relatively widespread element of the Czech landscape. Many have been preserved primarily due to their location; for centuries they have been located in relatively inaccessible forested areas. However, this fact also complicates their identification and recognition. Experiences from systematic research of the

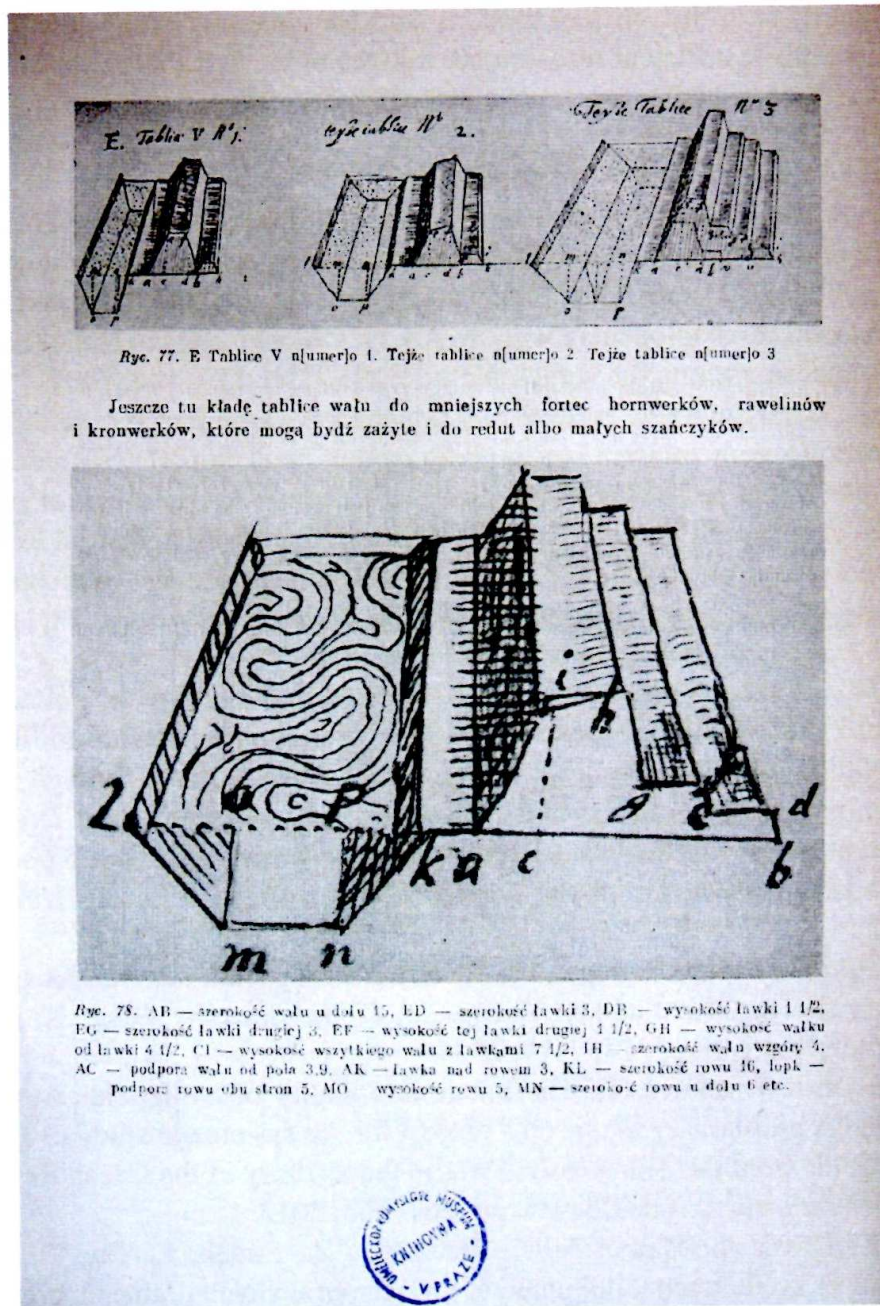


Figure 8: Exemplary shape of a trench and a wall according to J. Naronowicze-Naronski from 1657 (according to Nowak 1957) (Digitalized by V. Matoušek).

Thirty Years' War fortifications prove that significant effort is needed to examine these monuments thoroughly. Research based on a combination of all methods and approaches described above in this article would be the most effective. However, this can prove to be extremely demanding in terms of finances, time and management. Therefore, developments in prospection based on scanning and screening of the surface, including LIDAR, can be seen as the most dynamic option. This method encompasses a very effective branch of research that offers solid and presentable information about the number and density of field fortifications in the landscape in a relatively speedy fashion. Unfortunately, it is not rare that identification of the site in the terrain marks the last phase of research, and findings are not developed into a deeper research project that could specify the nature and time of the site's creation.

This implies that most of the relics of modern field fortifications have yet to be thoroughly researched. Also, this insufficient research contributes to the fact that relics of modern field fortifications are rarely listed as protected national heritage sites.

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