

HISTORICAL MEASUREMENTS AND PROPORTION ON THE MANOR HOUSE IN TREBOSTOVO PART.1

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Abstract

Knowledge of historical measurements and proportions is an essential part of architectural-historical research. These insights enable the enhancement of methods for restoring historical architecture. The research focuses on analyzing historical dimensions of constructions and architectural elements in mansions and manor houses within a selected region of Slovakia. Through geometric analyses of selected buildings across different stylistic periods, we aim to reveal continuity and connections in design.

Keywords:

Measurements;
Proportion;
Manor houses;
Mansions;
Turiec.

1 Introduction

The primary focus of the research into the documentation of the historical measurements and proportion systems of the manor house in Trebostovo is part of a broader study within a dissertation. This focused research examines the use of historical measurements and proportions in rural noble residences from the early Renaissance (approximate dates) to the Classicism period (approximate dates), with specific focus on the Turiec region. The region spreads in the north-western part of Slovakia in the Turčianska kotlina basin surrounded by the mountain ranges Malá and Veľká Fatra, Kremnické vrchy and Žiar. The region includes the two towns districts of Martin and Turčianske Teplice, which together form part of the historical administrative unit of *Turčianska stolica*. This region is characterized by a unique collection of noble residences, that have remained mostly in their original condition, where we are able to document the development of historical measurements and proportional systems through several select constructed works. Additionally, the documentation of the formal elements that are based on historical facts, architectural-historical research, surveys, and artifacts can be performed in situ. Understanding the historical measurements and proportions of constructions, formal elements, and spatial relationships can serve as an auxiliary science in processing architectural - historical research and in the design of heritage restoration within these studies. The objects under investigation are manor houses and estates that are registered in the Central List of Cultural Heritage as national cultural monuments. This study focuses on objects constructed or remodeled from the early Renaissance up to the Classical period (until 1876, when a mandatory metric system was introduced in the region). For the analysis of historical measurements and their proportions, it is crucial that the objects remain in their original state, without extensive alterations, especially from the 20th and 21st centuries. An important criterion for selecting the objects was the ease of accessibility for inspection and measurement. The manor house in Trebostovo is a suitable object for research, as it has not yet undergone comprehensive heritage restoration. Only parts of the manor have been restored [1], and the selected architectural elements examined remain in their original condition. Since its inception, the manor house has undergone three significant construction phases, which have been documented in archival sources. During the 19th and 20th centuries, this manor house was only partially modified, and the construction work was primarily utilitarian in nature.



Fig. 1: Trebostovo from a bird's eye view. Author: Kráľová.

2 History of Trebostovo and the manor house

The village of Trebostovo is located to the southwest of the city of Martin, and lies at the foot of the Malá Fatra mountain range in the Trebostovo stream valley. The most dominant feature of the village is the manor house on the hill that overlooks the path leading up to the village. Today, the manor house

is part of the greater village urban area, but it once stood isolated from the typical stream-side type settlement and its community. Its eastern facade faces the road leading to Trnovo.

Archaeological finds of pottery from the manor, dated to 1977 [2], suggests that the settlement dates back to the 13th to 15th centuries. The first mention of the village appears in a document from 1262, in which it is referred to as *terra Treboztou* [3], in the vicinity of the settlement of Trnovo. Since 1309, it has been noted as a royal village [4]. According to J. Šikura, Trebstovo was divided into two settlements - "Malé a Velké Trebstovo" (Small and Big Trebstovo) - by the mid-14th century, and which may also have referred to two separate manor houses.

Both settlements became the property of Blatnica Castle in 1488. The Révai family acquired the castle and its associated lands in 1538 [5], after Emperor Ferdinand I. granted František I. Révai the hereditary title of Turiec County Judge. In 1545, František I. gifted a portion of the dominion, which included Trebstovo, Jahodníky, and parts of Bystrička, Necpaly, and Žabokreky, to his brother Štefan I. Since then, the Révai estate has been divided into the Sklabiňa-Blatnica line and the newly formed Trebstovo line of the family.

2.1 Oldest structure in the area

Under the southeastern part of the current manor, archaeological research uncovered the foundations of the oldest structure in the area. A circular tower with a diameter of about 6 meters is dated to approximately the 14th to 15th centuries based on pottery findings. On the eastern side of the tower, parts of two parallel walls were discovered, which may have served as access to the staircase of the tower. This oldest structure could have been part of the original manor house mentioned in the portal inventory from 1534 [6]. The manor house with the tower and the nearby outbuildings likely resembled a typical medieval courtyard typology [7].

2.2 History of the manor house after the Establishment of the Trebstovo line of the Révai family

2.2.1 First construction phase of the manor house

Representatives of the Trebstovo branch of the family belonged to the *nižšia šľachta* (lesser nobility) and were divided into two manors. We do not have archival records regarding the origin of the older structure of the manor, but it can be assumed that in the last quarter of the 16th century, around 1578, Ladislav II, the son of Štefan Révai, remodeled the original manor (*curia nobilitaris*) into an Early Renaissance block-shaped manor house with some exterior dimensions of 12 x 25 meters. The date of its creation is estimated by analysis of a preserved inscription in the interior of the current manor, which would originally have been located on the facade of the stair tower [8].

The position of the oldest circular tower at the southeastern corner of the Early Renaissance manor house suggests that the tower was a part of it. Corner circular towers were typical for block-shaped manors of this type during the early Renaissance. Although in several cases there were two or four towers. Similar fortified towers were also present at the manor house in Turčianska Štiavnička, built around 1580 by the Sklabiňa-Blatnica line of the Révai family, but different from the fortified houses in Moravia-Silesian Region [10]. Due to an inappropriate restoration scheme, only one tower remains today [9]. The existence of a second tower at the northeastern corner of the Trebstovo manor house has not yet been confirmed by archaeological research, which has not conducted exploratory archeological excavations in that area; however, it is presumed that a second tower was part of the structure [6].

Archaeological research at the Trebstovo manor house [1] confirmed the presence of a stair tower with a square floor plan, located on the western side of the former courtyard facade (imprints of arches can be observed on the western wall of the current courtyard facade). The staircase in the tower provided access to the second floor of the block structure and served as the main entrance to the three-part layout of the ground floor. The entrance opening lacked stone framing and had only a deep, segmentally arched reveal. Entering led into the central section - a hall - from which access was available to additional rooms. These rooms were vaulted with barrel vaults and lunettes. The internal partitions on the ground floor are original. The exact layout of the upper floor with wooden beam ceilings can no longer be precisely determined.

The arrangement of windows on the eastern facade from the first construction phase is preserved in six window axes. On the western facade, there are 2+1 on the ground floor and 1+1 on the upper floor. The northern facade had 3+3 window axes. The southern facade of the building has not survived, due to subsequent expansions. The arrangement of openings on the stair tower is unknown. The windows were modified in a later construction phase, but the interior decoration of the window frames has been partially preserved on all windows. The decoration consisted of floral ornaments bordered with

a red trim. The windows on the outside had stone frames, painted alternately in red and pink. Above the windows, fragments of simple figurative painting were discovered. Stylized plant motifs painted in red on a lime wash were located diagonally around the windows. Restoration research from 1986 [11] revealed this artistic treatment of the facade around the window in its entirety, as the addition of the corner tower brought the window into the interior of the manor. This also uncovered the masonry of the stair tower, where a Latin inscription was preserved reading “NE FESTINE DETEGERE NE CITO PAVPER FIAS,” attributed to the Greek poet and dramatist Menander [7]. Translated, it means “Do not uncover hastily, lest you quickly become poor.”

The facades were covered in white lime plaster and horizontally divided by painted cordon and under-roof bands. Another decorative element was the moulded rustication with a sprayed surface. Large rustications measuring 67 cm alternated with smaller ones measuring 40 cm. Both had a height of 40-41 cm and were painted with a diagonally applied grid in red [1]. In the facade decoration, two principles meet: ornamental painting in the late medieval style and Renaissance techniques of plastic rustication.

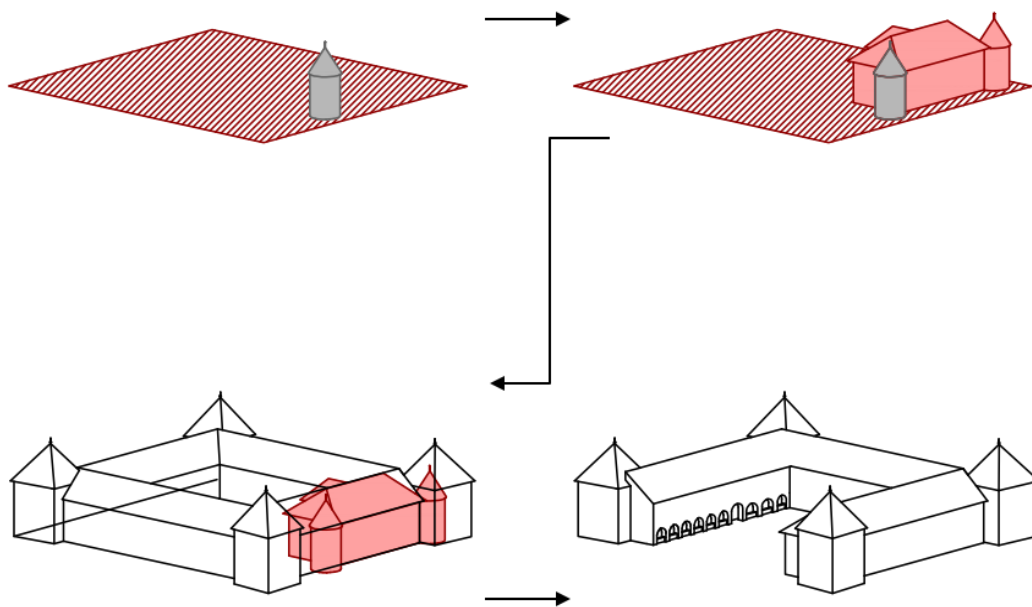


Fig. 2: Scheme of the development of a medieval courtyard with a residential tower into a four-winged Renaissance manor house. Author: Kráľová.

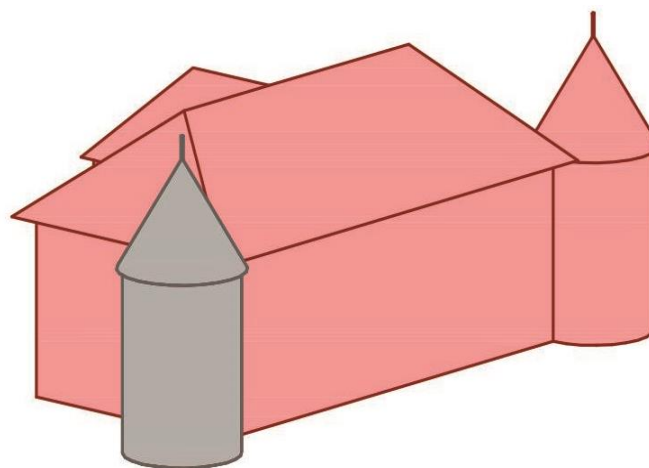


Fig. 3: Scheme of the oldest structure in the area - a residential tower, which became part of the first construction phase of the manor house in the last quarter of the 16th century. Author: Kráľová.

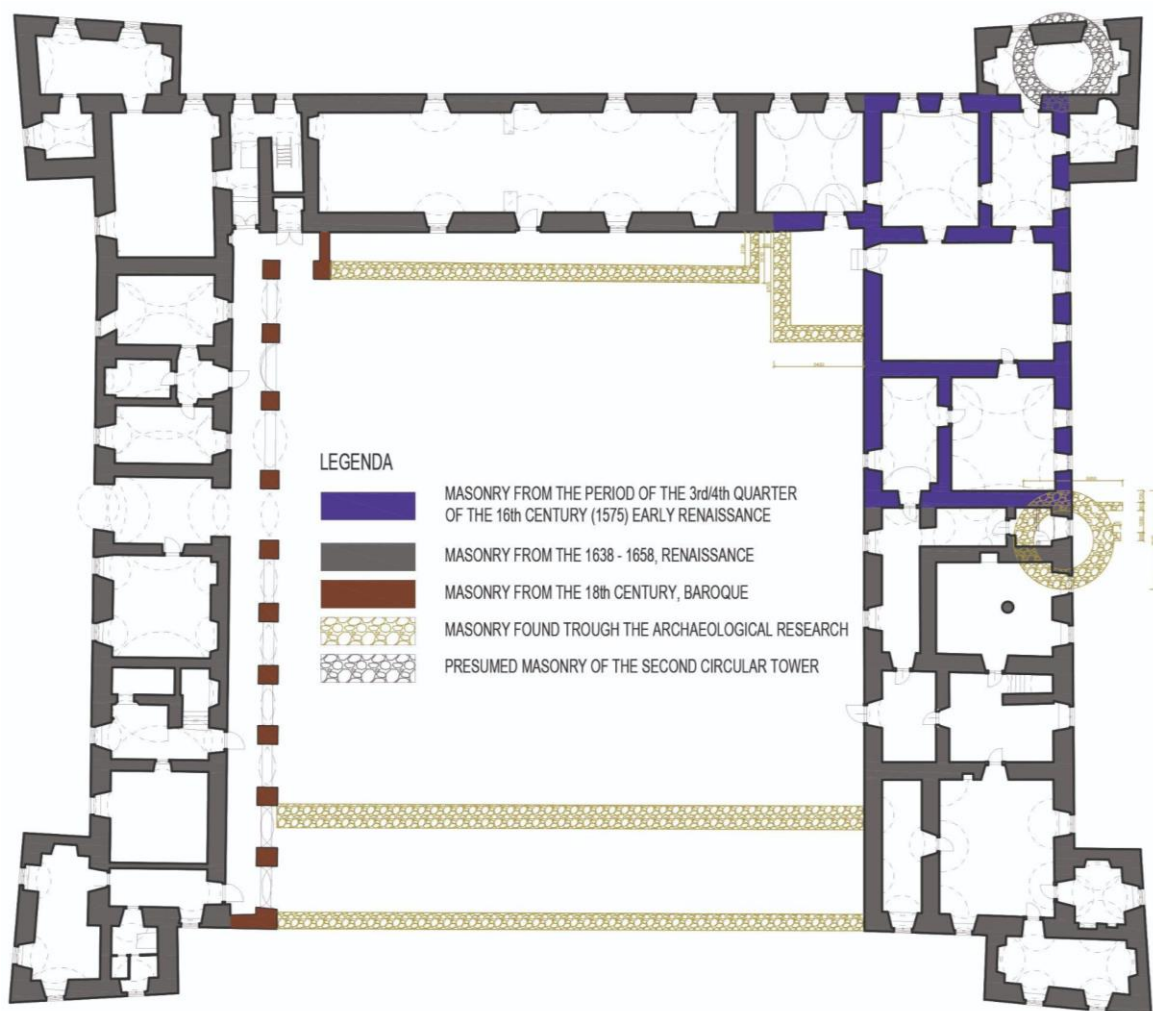


Fig. 4: Floor plan of the first ground floor of the manor house with object analysis and masonry found by archaeological research [2]. Laser scanning of the object was made by ORNTH spol. s r.o. in 2018. Author of graphic design: Kráľová

3 Methods of researching historical measurements

During the field research conducted at the manor house, observational and measurement methods were applied to examine the existing state of architectural elements. These elements were selected based on their architectural and historical values, as well as information obtained from previous archival research. After photographing and documenting the elements, a photogrammetric model was then created using Agisoft Metashape software. The software calculated a 3D model from the selected photographs, which was then further processed into orthophotos at actual scale using CAD software. Geometric methods were used on the orthophotos to determine the mutual proportions and historical measurements. Procedures and results were validated through collaboration within the grant VEGA 1/0681/23 and the prepared database of historical measurements helped identify the dimensions found on individual architectural elements.

3.1 Selection of architectural element for the analysis of measurements and proportions from the first construction phase

The window from the first construction phase has only been preserved in the part of the manor house that later became part of the interior. The window opening had a rectangular shape and was framed with stone, which was divided into eight fields alternately colored in red and pink [8]. Linear drawings of stylized tulip flowers adorned the corners. The window featured a stone lintel and a stone sill. Currently, clear impressions of the sill are visible at the bottom of the window opening, although the sill itself has not survived. In the center above the lintel, a figurative drawing is preserved-depicting a man in profile dressed in stylized period attire.

The basis for the measurement analysis is an orthophoto exported from a photogrammetric model. In this case, the measurement was sought by projecting the dimensions of the stone frame surrounding the window. Based on a physical inspection and subsequent photo documentation, the condition of the window was analyzed, revealing the absence of the stone window sill (imprints of the sill are visible in the photographs).



Fig. 5: Early Renaissance window from the first construction phase of Trebostovo manor house.
Author: Krušínský.

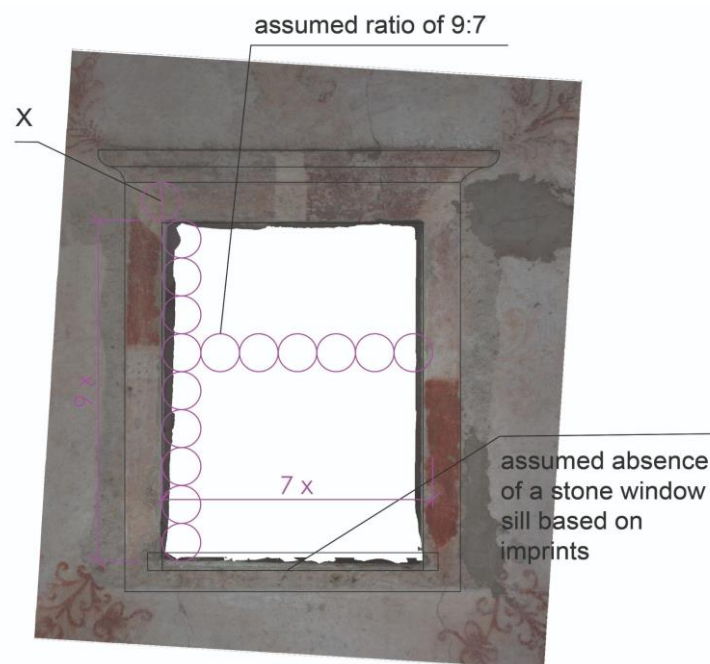


Fig. 6: Process of finding the measurements on an early Renaissance window. The aspect ratio of the internal dimension of the opening was found in the first step. The aspect ratio is 9:7. Author: Kráľová.

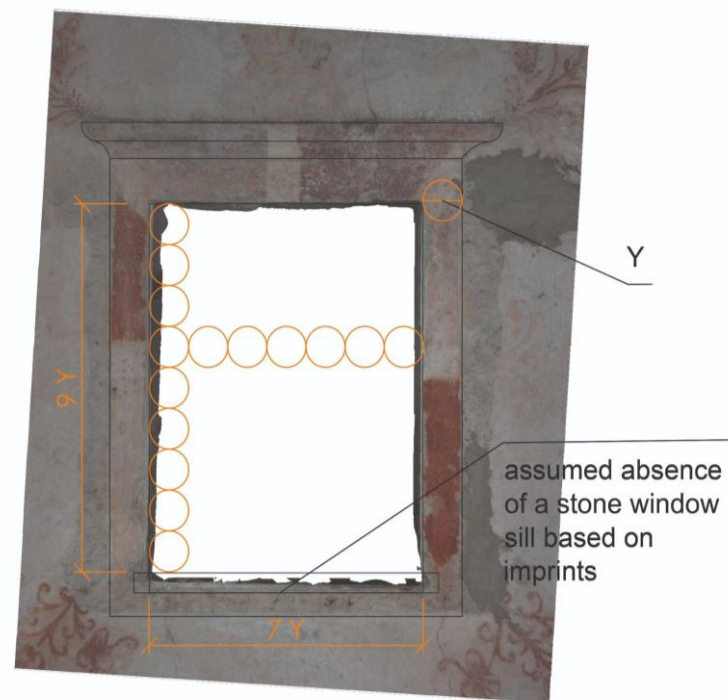


Fig. 7: Verification of the measurement from the second point and refinement of the measurement using geometric division followed. Aspect ratio is 9:7. Author: Kráľová.

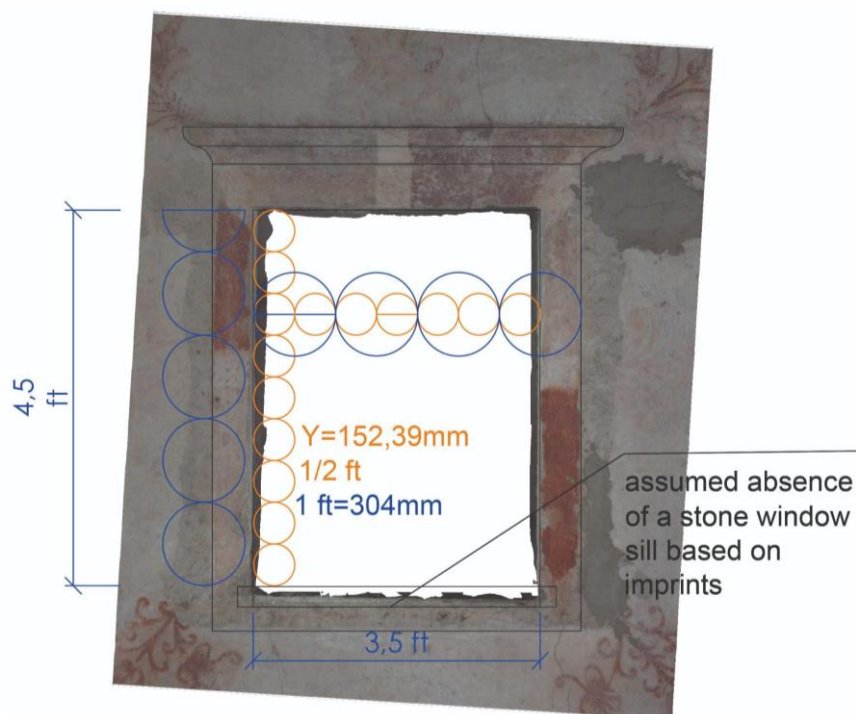


Fig. 8: The value of the feet found through geometric analysis is 304 mm. Author: Kráľová, Krušínský.

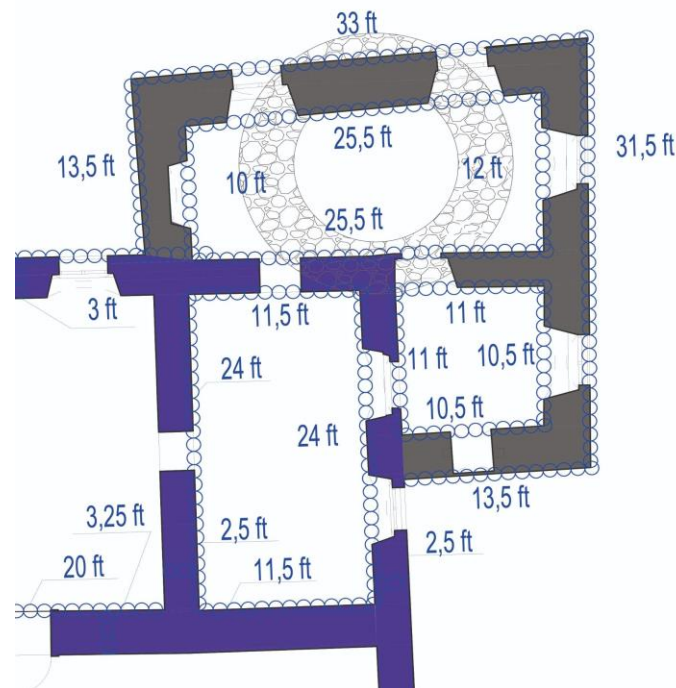


Fig. 9: Verification of the found measure (feet) on the floor plan of the second floor in the rooms near the Renaissance window. Author: Králová, Krušínský.

3.2 The proportions of the examined window

The identified proportions of the examined window, in the context of the studied part of the building, point to the use of a more complex method for generating proportional sequences based on so-called magic squares. The 9:7 proportion does not correspond to musical ratios or other proportional sequences derived from mathematical series and patterns commonly used in earlier architectural periods. In the Renaissance, the method of generating sequences using magic squares was not exceptional, as it was to some extent a novel concept. From the 14th and especially the 15th century, they began to be used in musical composition, visual arts (e.g., Albrecht Dürer's *Melencolia I*), and also in architecture for creating diagrams.

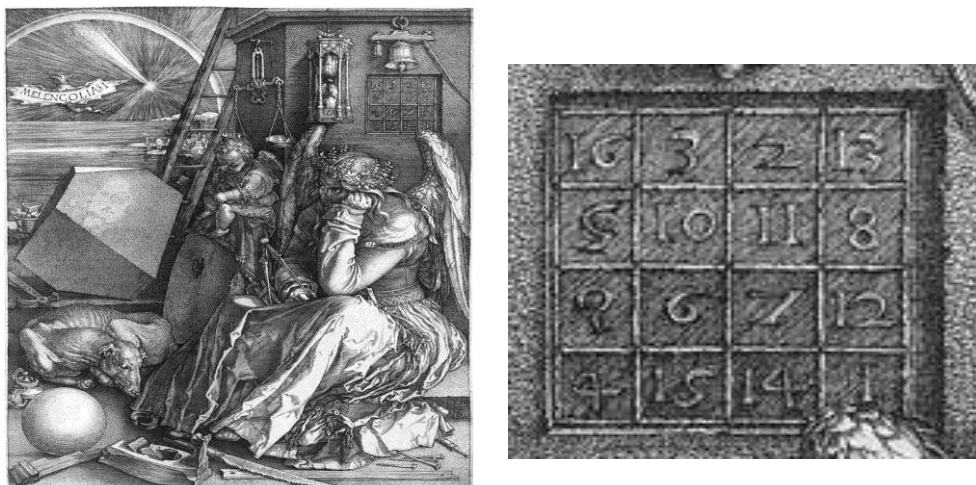


Fig. 10: Albrecht Dürer's *Melencolia I* (1514) and magic square.
https://www.britishmuseum.org/collection/object/P_1910-0212-303 [online]

4 Conclusion: evaluation of the measure

The value of the footprint found through geometric analysis on the window from the first construction phase is 304 mm. This measure, according to Colberg [12], was used in the past in the city of Augsburg in present-day Germany. The assumption of bringing this measure from the territory of

present-day Germany may be linked to the Révai family and their involvement in supporting evangelical faith in the region (particularly through František I. Révai, brother of Štefan I., who corresponded directly with Martin Luther [13]). The measure was verified on the floor plans of adjacent rooms and door and other openings. The measure was also verified on the tower added during the second construction phase in 1638, making it likely that this length unit was used throughout the completion of the four-winged manor house. Similar results using a single length unit were found in the case of the Rural House in Vápenná Village, similarly in the case of the Church of All Saints in Vlcovice. [14,15]

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