
SUMMARY of the doctorate thesis

EARLY NEOLITHIC AND ENEOLITHIC ARCHITECTURE IN THE VINČA CULTURE, BANAT CULTURE AND THE FOENI CULTURAL GROUP. ARCHITECTURAL RECASTS FOR THE UIVAR, PARȚA AND FOENI SITES

In the field of: Architecture

Doctorate Coordinator: Professor Teodor GHEORGHIU, D Arch

1. INTRODUCTION

1.1. Argumentation

The Neolithic Era is crucial in the history of humanity, as this is the stage that makes the transition from a nomad lifestyle, whose purpose is to secure food by hunting and gathering, to sources of food that come from agriculture and animal husbandry. This sedentism generates profound mutations in the history of humanity and, implicitly, in the history of architecture.

The aim of this paper is to study Neolithic architecture in the area of the Romanian Banat during the late Vinča period, the Banat Culture and the Foeni cultural group, for a perimeter that is well-established in space and time, namely the triangle of modern-day Uivar, Foeni and Parța settlements. There is detailed research on the archeological sites in this area that require recasts of local architecture, performed systematically, based on local and areal typologies.

1.2. Hypothesis

Our hypothesis is based on historical data, as well as on the evolutionary process of the human species as aided by tools, continuous adaptation to the environment and migration towards territories with harsh geo-climatic conditions.

1.3. Aim

The aim of the research was to draw up a systematic approach of the architectural phenomenon based on dominant typologies. Starting from actual examples, we set out to choose three constructions from three areas in spatial and temporal proximity, and recast them. At the same time, a major goal of the study was to establish local typologies and an area typology. The thesis sets out to follow, synthetically, the conditions - environmental, economic, social, cultural - that have influenced or determined changes in architecture and to identify viable habitation models within the researched perimeter.

1.4. Context - the current state of research in archaeological literature

By approaching this study, we found that the current standard in recasting Neolithic constructions is representation by axonometries or decomposed perspectives, easy to understand spatially, but lacking the rigor of an accurate geometric representation. The phenomenon is non-coherent, all the more so as, in the representation of small-size archeological artifacts such as tools, pots, jewelry, idols etc., the standard requires at least two angles and a characteristic section at a scale close to the actual object.

1.5. Structure

The thesis is divided in eight chapters, each of them focusing on one of the main topics derived from the above-mentioned hypothesis and objectives. The angles employed to approach the subject follow, on one hand, the establishment of the historic context in which the fundamental change of the living paradigm occurred, the transition from free shape constructions to rectangular forms, the pursuit of this evolutionary phenomenon until the establishment of new housing models and, on the other hand, the identification of an architectural recasting system that is able to define typologically a certain era of humanity, thus opening up uncharted areas in the history of architecture.

Chapter 1 is an introduction to the pursuit and objectives of the thesis, as well as to the applied structure and methodology. The same chapter includes definitions and clarifications of certain terms, to ensure the proper understanding of the thesis.

Chapter 2 focuses on the historical context, from the decisive perspective of the role of tools in the evolution of humanity and in the field of constructions. Defining characteristics of the Neolithic Era are addressed, together with a chronology thereof. The emergence of the first constructions is approached, from a causality standpoint. The transition from free-shape constructions to rectangular ones is discussed, looking over the first rectangular houses in different cultures, as showcased by the most relevant discoveries, and thus reaching the introduction of the concept of Neolithic architecture and the contextualization of the Vinča culture in the Stone Age.

Chapter 3 talks about the field of study in general, with a focus on evolved and complex construction complexes, rectangular in shape, characteristic to stable, culturally well-defined communities. We stress the matter of the coexistence of these systems with nomadic and semi-nomadic forms of habitation.

Chapter 4 talks about aspects defining the Neolithic Era in the area of the Carpathians and the Danube as well as adjacent local cultures, in correlation with civilizations from the Balkans, Anatolia and the area of the Aegean Sea, and the division of this Era in periods. This chapter introduces the Vinča Culture, to which the constructive systems researched in the thesis belong, as well as its manifestations in the perimeter subjected to research and included in the Uivar-Foeni-Parța triangle.

Chapter 5 discusses the need for developing an architectural method of reconstructing archeological constructions that is applicable to any era in the history

of mankind. We present the process for establishing this method and the instruments devised in order to put it into practice: the synthetic data sheets and the parts required for the graphic representation of the object subjected to recasting. We determine the stages within the application of the method and the elements used in the recasting process.

Chapter 6 presents a first test of the D1¹ method, for purposes of calibration and completion¹. The test was performed on a storied dwelling pertaining to the Vinča culture, Uivar village. A structural analysis was carried out together with the specialized engineer involved in the project, and the data sheets were filled in together with the archaeologist. The graphic representation of the reconstruction illustrates a stable structural system and provides accurate and complex volumetric information. This chapter does not test only the verification of the method, but also stipulates the aspects that must be considered during the actual research.

Chapter 7, the most dense one from the architectural standpoint of our research, proposes nine actual recasts of Neolithic constructions from the Vinča and other local cultures. Each recast is illustrated by 9-10 architecture blueprints, containing a full geometric description of the architectural volume. Graphic representations are accompanied by punctual data sheets and a textual description of the recast. For each group of culturally and spatially delimited constructions, a synthetic material is formulated, that defines the local typology in the era subjected to the study.

Chapter 8 contains the relevant conclusions of the research and synthesizes the local architectural typology in the late stages of the Vinča Culture. In line with the principle of expressing the results of the research in double language - textual and graphic - local architectural typologies are presented in 9 blueprints showcasing typological syntheses (corresponding to each construction recast in the research). It includes conclusions on the application of the method and its general applicability, as well as the most relevant discoveries generated by the research.

The annexes include additional elements that are relevant for understanding the method described and applied in the thesis, as well as the comparative exemplification of notions, situations, recasts presented in the research.

1.6. Methodology

The methodology applied to the study branches out in a few directions in order to support the interdisciplinary approach of the topic and provide various, nuanced perspectives to the research.

The first part of the study focuses on creating an analytical exposure of the historical evolution, from the birth of humanity all the way to the late Neolithic, with a stress on the phenomena that generated major effects or changed the housing paradigm. The first part is based on a synthetic presentation of concepts, theories and information in the field of prehistory, sourced from relevant publications.

¹ This testing stage was suggested by Professor Theodor Octavian Gheorghiu, D Arch, during the development of the thesis. It clarified aspects of significance to the latter directions of our research.

For this study we created a new method of architectural recasting, structured in two stages:

I. By systematically presenting the factors that determine the architectural form, we drew up six data sheets that synthesize the relevant archeological data:

- geographical data
- meteorological data
- technical data
- economic data
- social data
- cultural data

II. The accurate geometric representation of the architectural volume by means of blueprints on a 1:50 scale, namely:

- Excavation plan - foundations plan
- Planes
- Roof plan
- Characteristic section
- 4 facades: N, S E, W
- Axonometric projection on a scale of 1:100

Static architect - structural engineer analysis, establishing a viable structural system, and architect - archaeologist analysis, for the finalization of constructive details.

Textual description of the recast.

The last part of the thesis is dedicated to syntheses afferent to the research.

A methodological specificity of the study is the complementary, graphic and textual expression of the research results.

2. The Neolithic Era in the history of humanity

2.1. The genesis of humanity

The standard theory in anthropology is the genesis of hominids from anthropoid apes, a process occurring in Central Africa approximately 2-3 million years ago. We will present a brief coherent succession of the evolutionary phenomenon in order to understand the specific difference from the animal kingdom, supported by **the role of tools in the evolution of the human species.**

2.2. First constructions

The new geo-climatic environments trigger a need of building shelter from the elements: sun, rain, wind, heat, cold; also, large predators or other humans. The first constructions used the land as well as local materials and represented temporary shelters, as being a hunter-gatherer required a nomadic lifestyle and a commute between territories that could provide a source of subsistence. Because of this situation, constructions could not be elaborate; they had to be rebuilt constantly with whatever materials were on hand, in efforts to adjust it to the local environment.

2.3. "The Neolithic Revolution"

"Starting with the Epipaleolithic, in certain areas of the Old World human society underwent an acceleration of its historical development, which reverberated

in the appearance of new and complex elements of their economic, social and spiritual structures in the Neolithic Era, marking the transition to proto-history, and thus being one of the most significant cultural shifts ever recorded in human history. Later in this historical period we have another stage of remarkable progress, the Eneolithic (Chalcolithic)" - V. Chirică, D. Boghian.

It brought about the development of the capacity to process and invent new tools for new uses, and so the chips of fragmented rocks started being polished, pierced - maximizing the efficiency of use. The transition from broken "old stone" to polished "new stone" became important in the history of humanity. And thus, in this new period, named The Neolithic (from the Greek νέος, meaning "new"), after the last ice age, approximately 10,000 years ago, the most important change was recorded. In addition to the domestication of animals, securing a continuous source of food - but still requiring a nomadic lifestyle, the first attempts at cultivating plants, vegetables, cereal, and root vegetables brought about a tendency for sedentism. The first forms of agriculture were exhausting the fertile capacity of the soil, and required a commute between territories, in wait of their regeneration. The development of architecture, the discovery of the rotation of crops, irrigations, the evolution of seeds all lead to harvests that can be obtained on the same territory, humans reaching complete sedentism. This process of sedentism as an effect of the development of agriculture, an aspect that inevitably marked the housing paradigm, was long and complex, with many unelucidated aspects; yet the evolution of tools is undoubtedly an essential factor thereof.

2.4. Neolithic architecture. Transition from free-form constructions to rectangular ones

The shelters of Paleolithic nomads were constructions improvised from local materials, roughly processed by using simple tools, free in shape, conical, semi-circular or expansions thereof, that could be erected fast; later, these were replaced by light, transportable structures. The Neolithic sedentism, brought about by the discovery of agriculture, which took place 10,000 years ago in the Asia Minor region in the fertile perimeter around Tigris-Euphrates and then the Nile, prompted the fastest evolution for architecture as well, which is a less known, less studied aspect in the history of architecture. The paper entitled "Arhitectura neoliticului și epocii cuprului din România" (Neolithic and Copper Age Architecture in Romania) talks about the emergence of these constructions in Jericho, made of stone that had been rudimentarily processed. In his paper "Așezări umane" (Human Settlements), Teodor Gheorghiu talks about the emergence of rectangular constructions in the Neolithic village on the territory of present-day Jerf El-Ahmar, Syria, dating from the end of the 10th millennium - middle of the 9th millennium BCE: in level 6, rectangular dwellings with rounded corners, and in level 7, dwellings with woven walls and rectangular footprint.

3. Field of study

The research conducted on archeological sites shows the juxtaposition of several housing systems and different structures. Round, semi-buried huts, with or without central pillars and conical timbers, in parallel with large rectangular structures, with several rooms. Since huts are a predecessor to the other forms of housing, their approximately simultaneous presence in time can be explained by the fact that they represented an intermediary form of shelter, during the process of erecting the stable, final construction. We directed our studies towards these evolved and complex constructions - coherent human settlements, specific to that society. This process of settling new grounds, building a provisional shelter and then erecting an ample construction that gives the opportunity of adding living or storage quarters in time, as resources, workforce or weather conditions allow it, was also seen in more recent population dislocation processes.

4. The Neolithic Era in the Danube-Carpathian Region

In the Danube-Carpathian region, the Neo-Eneolithic is correlated with the civilizations settled in the Balkans, Anatolia and the Aegean.

For Banat and Transylvania, the Neolithic cannot be separated from the Eneolithic due to a strong local background. There are two major opinions that archaeologists follow on the genesis of the Early Neolithic in the area. One advocates a local, sometimes linear development of certain Neo-Eneolithic civilizations, while the other holds that the genesis and continuations are determined by migratory processes and diffusion, there being two ways of accessing Transylvania - via Wallachia and via Banat.

4.1. The Vinča Culture. Late Vinča

The northern area of the Vinča Culture--thus named after a town in Serbia where important research has been conducted and discoveries have been made--overlaps the historical Banat, on the plain situated at the confluence between Timiș and Danube, as Neolithic migration often followed the course of a river.

Uivar

The current town is located in the region of the Timiș-Bega rivers, the Neolithic settlements being situated on alluvial sediments or other higher areas around the water. An area of over 11 ha has been researched by aerial photography, geomagnetic exploration, over 8 surveys and 3 areas, totaling 1300 square meters (Schier, Drașovean apud. "Arhitectura neoliticului și epocii cuprului din România. Neoliticul", C.M. Lazarovici, G.Lazarovici, p.480). In the central area, archeologically significant deposits are over 4 meters thick.

The lodgings seem located in rows, 4-6 meters between them. Three well-researched houses will be rebuilt, in parallel to already completed recast lodgings, in order to figure out the local typology.

Pața

The area witnessed an overlapping of various civilizations, with carriers of the Vinča C phase, but also evolutions that contribute to the formation of the Banat culture. There are different evolutions in the architecture of the area. We have encountered housings with oval or rectangular pillar holes, large and deep, sometimes in steps. This type of housing is not present only in Pața, but also in other places, including Foeni.

The Foeni Group

Is important to late Vinča because it marks the second migration from the Vinča C "shock." The Foeni migration triggered several processes, among which:

- The conclusion of the evolution of the Banat Culture
- The birth of the Petrești-Transylvania Culture etc.

For some time, the Foeni Group is contemporary with the Vinča C Culture. Architecturally, Foeni-type complexes are related to those in Parța (Vinča C 1) – large housings, with cavities in steps.

The correlation between Foeni developed and Vinča D1 may place the evolution of the Foeni Group in the Vinča C2 period, meaning between years 4950 – 4500 BCE, carried out by Schier, Drașovean in 2004 (apud. "Arhitectura neoliticului și epocii cuprului din România. Neoliticul", C.M. Lazarovici, G.Lazarovici, p.496).

5. Recasting method, D-1, based on archaeological data

Currently there is no standard method of recasting the constructions based on the data obtained from the archaeological research. The method proposed by the author has two stages:

1. Obtaining information
2. Determining the restructure, geometrically

The architecture is determined by three inter-relational environments [21]:

- geography and climate
- technology and economy
- society and culture

In the first stage, six data sheets are needed: data related to geography, climate, technology, economy, society, culture and annexes with the existing information, structured.² Based on these sheets, a qualified architect can restructure a geometrically determined construction by drawing up boards on a scale of 1:100, 1:50 - in accordance to the size of the building, as following: foundation plan, first floor plan, second floor plan, roof plan, characteristic sections - minimum 2, facades - minimum 4 and, optionally, to-scale axonometric projection.

6. Testing the D1 architectural recasting method on a Neolithic dwelling pertaining to the Vinča culture, Uivar village

It is proposed to test the D1 architectural recasting method on a Neolithic dwelling pertaining to the Vinča culture, in the Uivar village. The test led to the development of a stable structural system that will be applied to several researched constructions, finally leading to a determination of the characteristics required in order to establish architectural typologies that are representative to the researched culture.

² The model sheets are included in the Annexes

Subsequent to the tests carried out by means of several analyses, involving a team comprised of an architect, an archaeologist and a structural engineer, the architectural recasting method is developed and ready for application on a coherent set of archaeological research subsequently allowing the determination of local and regional construction typologies and, finally, coherent histories of the architectures of different historical eras, and the establishment of evolutions or involutions within habitation continuities.

7. Architectural recasts of Neolithic housing structures pertaining to the Vinča culture, in the area of the present-day Uivar – Foeni – Parța settlements in the Romanian Banat region

The basic research is focused on the closest recasting of nine constructions pertaining to three areas of geographical and temporal proximity, establishing local and general typologies. For this purpose, a new method of rigorous architectural reclaiming was proposed and it was tested on an actual, physical example. Completed, the method is ready to be applied on nine constructions researched on the archaeological sites of the studied area. Grundrisse outlines were taken, and they can be assimilated as foundation plans, as they contain information on the exact location of the prop pillars - their approximate diameters, the foundation ditch, the foundation depth, interior walls, orientation towards the cardinal points, other specific information (hearths, flooring etc.).

7.1. Architectural recasts for three constructions on the present-day territory of the Uivar commune

Three archaeological sites were chosen on the criterion of the accuracy of their description, allowing for a faithful recast. The descriptions were carried out by Professor Florin Drașovean, PhD.

7.6. Local typological conclusions - Uivar

By reconstructing three structures using the proposed method, we have found a series of common features:

- Wooden frames, embedded pillars approximately 1.5m into the ground - giving stability to the structure, although there are no crossbars creating stable triangles, and beams simply reclining on the natural ramifications of the pillars, tied with rope or rods.

- Ridges in two escarpments of approximately 45 degree angles, longitudinal, made up of rafters approximately 1m apart, reclining on the beams of the long sides (ribs), and the central beam of the roof (hip jack rafter). Longitudinal cleats tied to rafters 50 cm apart, supporting the plant-based cover--probably reed, placed in successive layers, tied or balanced with sand.

- Closures with non-structural walls, built out of vertical pillars, interwoven rods and clay.

- Short sides were closed by lifting walls, and obtaining dead walls.

In the case of ground-level houses with multiple rooms, there could be no ceiling, but directly the attic; thus, the vertical volume allowed for good ventilation during summer.

In the cases in which the existence of a platform with clay was documented, and thus a separate use of the attic, there is a structural advantage to the stability of the construction, the two triangles of the framing contributing to the rigidity of the structure, especially of heavy loads are stored on said platform.

The platforms were raised a few dozens of centimeters above ground.

The clay walls were probably painted in earthy colors, with geometric motifs on the inside and possibly on the outside, as suggested by recasts carried out according to fragments of burnt clay that resulted after fires destroyed the houses; this is presented in further detail in the Annexes, fig. 16.

The holes for access, light and ventilation were minimal and ergonomic, and could be covered with planks of wood, animal skins, canvas or other animal membranes--all these solutions being present in current or isolated Neolithic communities.

This gives us an image of massive parallelepiped-shaped constructions, with small holes, several internal rooms, roofs in two longitudinal escarpments of approximately 45 degrees and dead walls on short sides, the roof--covered in vegetal fiber--protruding approximately 40 cm in the console, protecting the clay walls and holes thereof.

The typology overall was surprisingly unitary, with varying sizes as well as the possibility of inhabiting the attic, which is due to the use of the same local materials, same tools and techniques that led to the creation of a structural system that was stable and easy to recreate one generation after another.

We would like to state that this system requires permanent maintenance and seasonal repairs during spring and during seasons of heavy rainfall, failure to do so leading to fast degradation.

The archeological site research shows the position of structural beams due to different colors of the soil and sometimes traces of burnt clay from the walls, floors or platforms, resulting subsequent to accidental, sanitary or conflictual fires.

7.11. Local typological conclusions - Foeni

After recasting the three housing facilities, a series of stylistic specificities became evident:

- Wooden frames, embedded pillars approximately 1.5m apart, giving stability to the structure even in the absence of cross-bars.
- Beams reclined on natural ramifications of pillars, secured with rope.
- Ridges in two escarpments of variable inclinations in accordance to the width of the constructions, made up of rafters approximately 1m apart, reclining on the beams of the long sides (ribs), and the central beam of the roof (hip jack rafter). Longitudinal cleats tied to rafters 50 cm apart, supporting the plant-based cover--probably reed, placed in 2-3 layers.
- The closures of non-structural walls were made of pillars situated at close distances from each other, woven with reeds, covered with clay.
- On the short sides, the walls were erected as per the shape of the roof, obtaining dead walls with porticos.

In the case of ground-level houses with multiple rooms, there could be no ceiling, but directly the attic; thus, the vertical volume allowed for good ventilation during summer. The setting is presumed; we do not exclude the possibility of a platform closing the first floor, offering a better thermal insulation and allowing for the use of the bridge solely for storage.

In certain cases, the platforms were raised a few dozens of centimeters above ground.

The access, light and ventilation orifices were minimal-ergonomic. In the 3 examples documented and recast in Foieni, approximately 500 years later than the housing facilities in Uivar, we can see the apparition of porticos on the shorter sides, protecting the main access to the housing, and providing a special and distinct typology to these constructions.

As internal division, the researched examples only show the existence of 2 large rooms inside, with successive access from one to the other.

The overall shape is a massive parallelepipedic mono-volume, with 2 interior compartments and a general or partial portico on the short side, with small access and lighting orifices; the roof takes the shape of 2 longitudinal escarpments.

The typology for the Foieni area is unitary; we can still find the massive mono-volume from the Uivar area, but to that, porticos are added in order to protect the main access and provide a covered passage from the inside to the outside, that could be used in various situations. The situation can be explained by the use of the same local materials and resources, as well as the same construction tools and techniques.

This system requires seasonal repair works in the spring and whenever there is heavy rainfall, because these materials are not weatherproof.

The apparition of porticos seems to indicate an evolution of the basic typology, which will be continued in the following cultures, similar stylistic elements being detectable in the traditional cultures of the recent era in the temperate area.

7.16. Local typological conclusions - Parța

The three settlements recast in this research are part of a so-called "block" of living quarters, represented by constructions P40, P41, P41b, P42 and P43. For our recast, we chose two successive stages of P41 and P41b as well as P1/43, as they were the most fully documented from an archaeological standpoint. Due to the high density of constructions, we can see influences in the roof structure and location of windows and doors.

The analytic perspective provided by the three recasts presents a series of common features, as well as several differences.

In terms of the constructive system, we can see the following features:

- Wooden frames, embedded pillars approximately 1.5m into the ground - giving stability to the structure, although there are no crossbars, and beams simply reclining on the natural ramifications of the pillars, tied with rope.

- Ridges in two escarpments of approximately 45 degree angles, longitudinal, made up of rafters approximately 1m apart, reclining on the beams of the long sides (ribs), and the central beam of the roof (hip jack rafter). Longitudinal cleats tied to rafters 50 cm apart, supporting the plant-based cover--probably reed, placed in successive layers, tied or balanced with sand.

- Closures with non-structural walls, built out of vertical pillars, interwoven rods and clay.

- Short sides were closed by lifting walls, and obtaining dead walls.

In the cases in which the existence of a platform with clay was documented, and thus a separate use of the attic, there is a structural advantage to the stability of the construction, the two triangles of the framing contributing to the rigidity of the structure, especially of heavy loads are stored on said platform.

The platforms were raised a few dozens of centimeters above ground.

The holes for access, light and ventilation were minimal and ergonomic, and could be covered with planks of wood, animal skins, canvas or other animal membranes.

We thus get the image of massive parallelepipedal constructions with small windows, generally divided in two rooms, with roofs in two longitudinal escarpments with an inclination of approximately 45 degrees.

In Parța, in the case of the two recasts on the same location - P41 and P41b - we could see the presence of two porticos on the short side; upon reconstruction, the portico was relocated from the eastern side to the western one, probably due to the emergence of a neighboring construction, P42, on the eastern side. This was also the reason behind the move of the main access.

Yet, the typology overall remains surprisingly unitary, only varying in size, which is due to the use of the same local materials, same tools and techniques that led to the creation of a structural system that was stable and easy to recreate one generation after another.

8.1. Areal typology

By studying local typologies, conclusions can be drawn for coherent areas belonging to the same population and time period. We can thus see, in terms of stable constructions, the coherence of a model in which, with the same building techniques and foundation systems, wooden frame resistance structures, with embedded beams, casing in two escarpments, closing systems, and interior division systems, similar architectural forms would be obtained. There were practically small variations in terms of the sizes of the internal divisions, which made it that strictly geometrically speaking, each house was different, although the typology was the same. Thus, the study intercepts **the emergence of a new architectural element - the portico** - a protective area for the entrance, but also a transition from indoors to outdoors and vice versa, that will become characteristic for the temperate area.

8.4. General conclusions

By analyzing and showcasing key points in the existence of humanity in parallel, we can gain a fundamental understanding of the history of architecture, which naturally follows these changes. From operational segregations in specialized areas to new functions of social life, processes originate in this historical period.

We set out to integrate this case study regarding the recasting of coherent Neolithic constructions into the historical context, in order to provide a fair understanding of the moment in history and architecture.

The method that we created by means of this research allows the recasting of constructions pertaining to various historical eras, the quality thereof depending on the amount and accuracy of the recorded data. Also, the recasts can be redone when new data supplementing or contradicting the initial batch emerge.

By applying this type of recasts systematically for various cultures and historical eras we can obtain general architectural typologies, later integrated in the general histories of architecture. We can thus establish characteristics that state their role in the history of humanity, evolution or involution, accumulations and influences that contributed to the technological and cultural level of the construction. The creative development of the field made it so that architecture is an art, and not just the repetition - regardless of how accurate - of standardized models; we thus witness the birth of architecture's dual nature.