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ECOLOGY OF EVERYDAY LIFE

Clay, stone, and bog iron ore architecture, and the reuse of wooden elements in Mazovia and the Dobrzyń Land



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Introduction

Contemporary debates on sustainable development, climate protection, and responsible resource management direct our attention to the ways in which humans have adapted to environmental conditions throughout history. In the industrial and post-industrial eras, this relationship underwent a radical transformation: natural building materials were largely replaced by industrial products, and practices of resource reuse were marginalized in favor of a consumption-driven model of production. Meanwhile, careful observation of the heritage of traditional rural architecture reveals a rich reservoir of practices that today may be described as **ecologies of everyday life.**

This concept refers to largely unreflected practices of the past that supported frugal economies, material recycling, and a close integration of building activity with the local natural environmenvol. The “ecologies of everyday life” were neither an ideological program nor a social project – they arose from necessity and from the pragmatics of rural life. Limited access to raw materials, the high cost of imported products, and challenging environmental conditions shaped building practices that, from today’s perspective, can be understood as ecological. In this view, traditional architecture becomes not only an object of historical or ethnographic study, but also a point of reference for contemporary searches for sustainable forms of building.

Aims and scope of the publication

The aim of this monograph is to analyze the role of natural and reused materials in the traditional architecture of the Lower Vistula region – using the examples of Mazovia (the Płock area) and the Dobrzyń Land – and to present them through the lens of the ecologies of everyday life. The publication seeks to address the following questions:

- How did architectural traditions based on stone, clay, and bog iron ore function, and what role did they play in local building practices?
- In what ways did practices of secondary material circulation operate (e.g., shipbuilding timber, dismantled structural elements, millstones)?
- Which geographical, economic, and cultural factors determined the choice of specific building materials?
- What significance do these traditions hold for contemporary pursuits of ecological architecture and sustainable development?

In this way, the traditional rural architecture of the Lower Vistula region is presented as a field in which everyday practice intersects with ecological concepts, and where material heritage becomes a source of inspiration for the presenvol.

The Vistula Valley as a Cultural Space

For centuries, the Lower Vistula Valley has served as an important communication and cultural corridor. The river connected regions, enabled the transport of people and goods, and at the same time functioned as an axis for the exchange of building traditions and architectural patterns. An analysis of the architecture of this area cannot be limited to a single county or administrative region, as administrative boundaries often do not coincide with cultural onep. For this reason, the present monograph focuses primarily on Mazovia (the Płock region) and the Dobrzyń Land, while also taking into account comparative contexts from Kuyavia and the Chełmno Land.

The region is characterized by considerable environmental diversity, ranging from the low-lying floodplains of the Vistula River to undulating morainic landscapep. This diversity had a direct impact on the choice of building materials. In areas lacking extensive forest complexes, clay and stone predominated, whereas in more heavily forested regions wood served as the primary construction material. These differences are clearly visible in the architectural documentation collected during field research.

Research Methods

The conclusions presented in this study are based on three methodological pillars:

1. **Archival and literature research** – including both classic ethnographic studies (works by Adam Fischer, Gerard Ciołek, Maria Fryczowa, and Karol Iwanicki) and descriptive sources (estate surveys, notes by Ignacy Krasicki). The analysis of these materials makes it possible to identify long-term processes in building practices. Archival research was conducted at the Archive of the Museum of the Mazovian Countryside in Sierpc and at the

Provincial Office for the Protection of Monuments in Warsaw, Płock Branch. We would like to express our gratitude to the staff of these institutions for their commitment and support.

2. **Field research** – carried out in 2025 and covering 100 localities in left-bank and right-bank Mazovia as well as in the Dobrzyń Land. During the research, interviews were conducted with local residents and photographic documentation was produced of structures built of stone, clay, bog iron ore, and shipbuilding materials.

It should be emphasized that many buildings could not be documented photographically due to the lack of consent from owners, which highlights the need to consider social factors in research on traditional architecture. Nevertheless, the collected material allows for a comprehensive reconstruction of the range of forms and types of stone and clay buildings in the region.

State of Research

Although traditional wooden architecture in Poland has been the subject of extensive scholarly literature, clay and stone architecture has long been treated as a marginal phenomenon. It was often regarded as a substitute form of construction, characteristic of poorer households and therefore considered less worthy of attention. Only more recent studies (including those by Tomasz Czerwiński) have demonstrated that the scale of this phenomenon was far greater than previously assumed. For example, in Kuyavia in the nineteenth century, the proportion of clay buildings reached as much as 86%. Similar patterns were recorded in the Łódź, Warsaw, and Pomeranian regions.

In the case of Mazovia (the Płock region) and the Dobrzyń Land, existing studies have been limited to isolated mentions of clay and stone buildings, while architecture made of bog iron ore has been almost entirely overlooked. The field research conducted for this study can therefore be seen as an important addition to existing data and an attempt to fill a significant research gap.

Outline of the Issues

Preliminary analyses allow for several observations to be made:

- Clay and stone were widely available materials, obtained directly from fields and uncultivated land.
- Bog iron ore occurred only locally, as its formation was dependent on specific environmental conditions.
- Residential and farm buildings constructed from these materials were still commonly found in the second half of the nineteenth century, and in the case of farm buildings, even into the 1970s.
- In many localities, such as Głuchowo, Czachorowo, and Dzięgielewo, residents recalled that nearly all buildings had been constructed of clay.
- Alongside natural materials, reused materials were widely employed, including shipbuilding timber, elements from dismantled windmills, bricks and roof tiles from demolitions, and even millstones.

These practices point to the existence of a historical circular economy, in which every material possessed value and could be reused.

From Pragmatism to Ecology

The analysis of architecture in the Lower Vistula region reveals a significant paradox. From the perspective of rural inhabitants, the choice of building materials was driven by pragmatism, poverty, and the availability of local resources. From today's standpoint, however, these practices align closely with ideas of recycling, waste minimization, and sustainable development. Traditional building thus becomes a key to understanding unconscious forms of ecological practice that anticipated contemporary debates on the importance of the natural environment.

In this sense, the “ecologies of everyday life” may be understood as a bridge between past and present: the building traditions of the rural past can serve as inspiration for contemporary architects and designers seeking low-emission and environmentally friendly solutions.

Structure of the Work

The monograph consists of six chapters and a conclusion:

1. The first chapter presents the Vistula Valley and the specificity of the ethnographic regions of Mazovia (the Płock area) and the Dobrzyń Land, together with their cultural landscape.
2. The second chapter addresses the use of clay, stone, and bog iron ore in vernacular architecture in Poland, with particular emphasis on Mazovia and the Dobrzyń Land.
3. The fifth chapter is devoted to the redistribution of building materials and to traditional forms of recycling.

The conclusion offers an attempt at synthesis: the Lower Vistula region is presented as an area of unique building practices in which the past meets the present, and tradition becomes part of contemporary ecological reflection.

As a result of the research conducted, photographic and archival materials were collected from Mazovia and the Dobrzyń Land relating to clay, stone, and bog iron ore architecture, as well as structures incorporating shipbuilding elements. The gathered sources make it possible to analyze the characteristics of the “ecological” architecture of the regions under study.

1

Mazovia and the Dobrzyń Land within the Cultural Landscape of the Lower Vistula Valley

The Dobrzyń Land and the Płock Mazovia, two neighboring regions with a rich historical and ethnographic past, are distinguished by centuries-old traditions and histories that have shaped their development[1]. Frequently interconnected, and at times even administratively integrated, they nevertheless retained a clear sense of distinctiveness and local autonomy. Such a situation is characteristic of borderland areas, where cultural and geographical proximity does not preclude the existence of subtle yet enduring differences in identity and tradition.

The boundary between the Dobrzyń Land and the Płock Mazovia is marked by the Skrwa River, which not only separates but also connects them – serving as a space of interaction, exchange, and mutual influence[2]. At the same time, both regions lie along the axis of the Vistula River, a waterway of fundamental importance to their history and cultural landscape. The Vistula functioned not only as a route of communication and economic exchange, but also as a symbolic artery around which local conceptions of space, borders, and community were formed. Along its course, settlement, commercial, and religious centers developed, and its valley became a natural corridor for the circulation of ideas, beliefs, and cultural pattern.

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1 The description of the region is based on an excerpt from the book: R. Piotrowski, *„Jednemu się zmiele, drugiemu się skrupi". Młynarze i młyny w pamięci zbiorowej mieszkańców pogranicza mazowiecko-dobrzyńskiego*, Toruń 2021.

2 "The name is recorded already at the very beginning of the 13th century. The following forms are attested: Strzqua 1202, Strqua 1248, Strca, Straca, Strączna, Strkam 1300, Strwa 1379, Strqua 1383, Strzqua 1456, Sztrzkwa 1461, Sstrqua 1472, Strqua 1475, Strawa 1543, Strqua 1581, Skrwa 1889." In: *Z dziedzictwa kulturowego, językowego w Ziemi Dobrzyńskiej. O nazwach miejscowych i wodnych gminy Skrwilno*, edp. R. Bartoszewski, M. Krajewski, A. Wróbel, "Z dziejów Ziemi Dobrzyńskiej", vol. 22, Dobrzyń nad Wisłą 2018, p. 133.

In this sense, both the Skrwa and the Vistula rivers fulfill a dual role – they divide and unite – thus shaping the borderland yet dialogical character of this part of Mazovia and the Dobrzyń Land. On the one hand, the Skrwa and the Vistula act as natural limes, encompassing various natural and topographical barriers that enable a clear and legible division of both settlement and cultural influences between two or more regions[3]. As early as the sixteenth century, Sebastian Klonowic, in his work *Flis, to jest spuszczanie statków Wisłą i inszymi rzekami do niej przypadającymi*, wrote:

> **Bishop's Islet will itself come into sight,**
> **Where the swift Skrwa in rushing course pours into the Vistula,**
> **Which from ancient times has set apart Mazovia**
> **From the Dobrzyń land[4].**

On the other hand, rivers also connect – they facilitate communication not only in a geographical sense, but also in social and cultural terms. They constitute natural corridors for the exchange of goods, ideas, and symbols, fostering contacts between settlements, regions, and communities located on both of their bankp. In this way, the river, while being a physical boundary, simultaneously becomes a space of encounter and dialogue[5].

Through bridges, causeways, and fords, the Skrwa binds together two zones inhabited by the people of the Dobrzyń Land and of Mazovia, creating a system of mutual interdependence rather than a permanent division. Contrary to common opinion, it therefore does not constitute an impassable border, but rather a space of mediation – a zone of contact, exchange, and coexistence. Both crossings and riverside settlements became natural points of meeting and trade, as well as places where traditions and symbols intermingled. In the case of the Skrwa, it is difficult to speak of a barrier in a hydrological sense – its riverbed, relatively narrow

3 Cf. J. Grodecki, Dzieje Polski do r. 1194, in: R. Grodecki, P. Czachorowski, J. Dąbrowski, *Dzieje Polski średniowiecznej*, vol. I, ed. J. Wyrozumski, Kraków 2011, p. 56.

4 P. F. Klonowic, *Flis, to jest spuszczanie statków Wisłą i inszymi rzekami do niej przypadającymi napisał*, Warszawa 1984, p. 71, lines 1301–1304..

5 Cf. Ł. M. Stanaszek, *Nadwiślańskie Urzecze. Podwarszawski mikroregion osadniczy*, Warszawa-Czersk 2014, p. 150.

and easy to cross, never constituted an insurmountable obstacle. Instead, it may be regarded as a natural boundary, clearly legible in the landscape, which for centuries has structured space while simultaneously shaping the distinctiveness and modes of valorization of the two historical regions separated by its course.

The Dobrzyń Land is a historical and ethnographic region marked by a strongly articulated distinctiveness in relation to Mazovia, Kuyavia, and the Chełmno Land. As Jan Święch observed in his monograph devoted to the peasant architecture of the Dobrzyń Land: "The Dobrzyń Land lies on the borderland of three former major tribal groups: the Greater Poles, the Pomeranians, and the Mazovians. Its extent is defined by the rivers Vistula, Drwęca, Pissa, Krynica, and Skrwa (...). To the west and south it borders Kuyavia, to the north the Chełmno Land, and to the east Mazovia"[6]. Such a course of the boundary corresponds with the findings of Alexander Petrov, the author of one of the most important monographs devoted to this region, entitled *The People of the Dobrzyń Land: Their Character, Speech, Customs, Rites, Songs, Proverbs, Riddles, etc.*

> The locality within whose boundaries I collected the material here presented in crudo, formerly known as the Dobrzyń Land, comprises the present-day counties of Rypin and Lipno, situated within the Płock Governorate. The Dobrzyń Land, that is, the aforementioned two counties, borders to the north the former Chełmno Voivodeship, today the Kwidzyn Regency, separated from it by the Drwęca River, together with the rivers flowing into it – the Rypienica, also known as the Odleka, and the Pissa; to the east it borders the Płock Voivodeship, today the Płock County, separated by the Skrwa River; to the south it is bounded by the Vistula River, separating it from the Brześć (Kuyavian) Voivodeship, today part of the Warsaw Governorate; and to the west it borders the Inowrocław Voivodeship, today the Bydgoszcz Regency[7].

6 J. Święch, *Architektura chłopska ziemi dobrzyńskiej od połowy XVIII wieku do lat czterdziestych XX wieku*, Toruń 2002, p. 9.

7 A. Petrow, *Lud ziemi Dobrzyńskiej, jego charakter, mowa, zwyczaje, obrzędy, pieśni, przysłowia, zagadki, itp.*, „Zbiór Wiadomości do Antropologii Krajowej" (1878), vol. II, „Dział etnologiczny", p. 3. In all quotations, the original spelling has been preserved.

This region was treated by some scholars either as a transitional area between major ethnographic regions or was incorporated into the space of one of them. Such an approach was adopted, for example, by Oskar Kolberg, who classified the Dobrzyń Land as part of Old Mazovia[8]. From a historical perspective, however, Mazovia clearly differentiated itself from the Dobrzyń Land between the thirteenth century and 1815:

> "(...) the mouth of the Skrwa (right-bank) (...) marks, on the right bank of the Vistula, the former Dobrzyń Land as distinct from Mazovia, and on the left bank – Kuyavia; thus, territories which for many centuries (from the mid-thirteenth century) remained interconnected through socio-economic ties (including settlement and ownership structures) as well as administrative and political relations. At the same time, from that period until 1815, Mazovia clearly separated itself from the Dobrzyń Land and Kuyavia"[9].

Płock Mazovia is also referred to as Old Mazovia. It encompassed "(...) the right-bank part of the northern Mazovian lands (...)"[10]. To the west it borders the Dobrzyń Land and ends at the Skrwa River; it is separated from Zawkrze and the Ciechanów Land by the Wkra River, while to the south the boundary is formed by the Vistula River[11]. As Aleksander Maciesza observed: "Płock Mazovia was a frontier district, inhabited by petty nobility, whereas Warsaw Mazovia was a non-frontier district dominated by larger landed estates"[12].

At the close of the Middle Ages, this area belonged to the most densely populated regions of the Crown. This was most likely the result of earlier

8 Cf. O. Kolberg, *Dzieła wszystkie*, vol. 41, Mazowsze, cz. VI, Wrocław-Poznań 1969, p. 10.

9 J. Powierski, Wstęp, in: *Osadnictwo nad Dolną Wisłą w Średniowieczu*, ed. P. Gierszewski, Warszawa 1989, p. 7.

10 Vol. Baraniuk, *Rys etnograficzno-kulturowy Mazowsza*, in: *Mazowsze*, Płock 1999, p. 22. Na temat koncepcji dotyczących terminu Mazowsze Płockie pisał między innymi Damian Kasprzyk. Cf. D. Kasprzyk, *Regionalizm płocki w II Rzeczypospolitej*, Płock 2008, pp. 20–32.

11 Zob. Vol. Czerwiński, *Osadnictwo i budownictwo ludowe na Mazowszu północno-zachodnim w XIX i na początku XX wieku*, Sanok 1995, p. 4.

12 A. Maciesza, *Mazowsze Płockie jako odrębny region geograficzny*, „Przegląd Geograficzny" 1927, vol. 7, p. 76.

population movements toward borderland areas. The "colonizers" migrating to the frontier zones came primarily from the ranks of petty knights and free peasants. This did not remain without influence on the subsequent fate of Mazovia, including Płock Mazovia. After the slowing down and eventual cessation of migration processes – certainly influenced, among other factors, by the development of the manorial economy – a period of gradual fragmentation of estates began. This process led to a slow social declassification. As early as 1633 and 1677, constitutional provisions referred to the loss of noble status by individuals engaged in crafts, trade, or other urban occupations, which, given the significant fragmentation of estates, was unavoidable.

The process of declassification proceeded gradually; as might be expected, it first affected the poorest representatives of this social class. In the nineteenth century, the process of blurring cultural boundaries between peasants and the impoverished Mazovian nobility continued. A certain degree of unification occurred, both in the spiritual and material spheres. The wealthier segment of the Mazovian nobility, however, placed emphasis on highlighting its distinctiveness and social difference, which was manifested in dress, behavior, language, and family traditions alike.

The peasant stratum – more precisely, its internal structures – was shaped in a manner similar to that found in other parts of the country, including the Dobrzyń Land. Among the most privileged groups in the first half of the nineteenth century were peasants from royal and ecclesiastical villages. These villages were the earliest to be regulated and converted to rent-based tenure[13]. Such decisions had a significant impact on the standard of living, culture, and sense of identity of the inhabitants of these settlements. Well-managed farms, a high degree of personal freedom, and numerous privileges meant that residents of such localities were excellent holders, often very prosperous. It is worth quoting here a passage from Oskar Kolberg's work on Mazovia: "(...) what a difference there is between rent-paying peasants, for example in state-owned estates, and serf peasants! In rent-based estates peasants fare better, receive greater care, and themselves strive to establish schools for their children"[14].

[13] E. Popiołek, *Rolnictwo województwa płockiego w latach 1815–1830*, „Rocznik Muzeum Mazowieckiego w Płocku" 1978, vol. 10.

[14] O. Kolberg, *Mazowsze obraz etnograficzny*, vol. 4, *Mazowsze Stare*, Kraków 1888, p. 42.

Importantly, these differences were still noted in the 1930s by Marcin Kacprzak, who wrote with reference to Płock County: "In Płock County there were many ecclesiastical and royal estates, as well as small hereditary holdings averaging 20–30 włókas. (...) Royal and ecclesiastical villages, whose peasants paid rent, stand out even today in terms of prosperity among villages as a whole"[15].

The most numerous group in Płock Mazovia, however, consisted of serf peasants. Settled on small plots of land, they barely managed to make ends meet. They became owners only after enfranchisement in 1864:

> "Peasants were enfranchised only by the tsarist decree of 19 February (2 March) 1864. This decree granted full ownership of land and abolished feudal obligations. The right of ownership of land was granted to all peasants who possessed holdings. In other words, by virtue of this decree the peasant became the owner of the land previously cultivated, and in civil-law matters connected with it (e.g., inheritance, division of property) came under regulations governed by the Napoleonic Code of 1804"[16]

A detail of considerable importance for the following discussion is the lack of a sense of distinctiveness among the inhabitants of the Dobrzyń Land in relation to Mazovia. Teresa Karwicka wrote in *Folk Culture of the Dobrzyń Land*:

> "Such an important element as the awareness of distinctiveness, mentioned in the introduction and still alive at the end of the nineteenth century, has now completely disappeaed. We do not find it even in the memory of informants. If they know anything about the distinctiveness of the Dobrzyń Land, it is secondary knowledge acquired at school or from books. There is a complete lack of a sense of difference between the people of the Dobrzyń

15 M. Kacprzak, *Wieś płocka. Warunki bytowania*, Warszawa 1937, p. 32.

16 M. Drozd-Piasecka, *Ziemia w społeczności wiejskiej. Studium wsi południowo-wschodniego Mazowsza (koniec XIX i XX wieku)*, Warszawa 1991, p. 90.

> Land and the inhabitants of neighboring Mazovia. What does exist, however, is an awareness of certain distinctiveness along the Kuyavian–Dobrzyń borderland (...)"[17]

At this point it is worth citing the words of Ryszard Kukier, which in a sense complement the observations made by the author quoted above:

> "The author of these words – in identifying the cultural identity of the inhabitants of this land and their sense of spatial and ethnic self-classification – expressed a view demonstrating the distinctiveness of the Dobrzyń people, yet also a view pointing to their stronger ties with the Płock Mazovians – or 'Mazurians,' as the inhabitants of the Skrwa river basin were referred to"[18].

As may be assumed, long-standing political and ecclesiastical relations, whose origins can be traced back to the early Middle Ages, were not without influence on this state of affairs[19].

The period of the partitions, when the Dobrzyń Land and Mazovia became part of the Kingdom of Poland – the so-called Congress Kingdom – also had a significant impact on the development of these regions. Likewise, the period of the partitions, during which the Dobrzyń Land and Mazovia were incorporated into the Kingdom of Poland, did not remain without influence on the identity and everyday life of their inhabitants. On the one hand, it entailed administrative subordination to Russian authorities, which brought with it a new bureaucratic structure, legal system, and organization of social life.

On the other hand, it introduced elements of modernization: agrarian reforms, the development of transport and communication networks,

17 Vol. Karwicka, *Kultura ludowa ziemi dobrzyńskiej*, Warszawa-Poznań-Toruń 1979, pp. 210–211.

18 R. Kukier, *Pogranicze etnograficzne dobrzyńsko-mazowiecko-płockie*, „Notatki Płockie" 1981, vol. 26, no. 2, pp. 14–15.

19 Cf. Vol. Żebrowski, *Kościół (X–XIII w.)*, in: *Dzieje Mazowsza do 1526 roku*, ed. A. Gieysztor, H. Samsonowicz, Warszawa 1994, p. 133.

and the emergence of new commercial centers and public institutions. Particularly significant were changes in the structure of land ownership, which initiated social processes that ultimately led to the enfranchisement of peasants in 1864. In cultural terms, this period deepened the process of blurring the boundaries between the petty nobility and the peasantry. Former differences in wealth and social status were gradually reduced, leading to the formation of a new, shared popular identity.

In the collective memory of the inhabitants, the experiences of repression following the uprisings left a particularly strong imprint – confiscations of property, deportations to Siberia, but also local forms of resistance, ranging from the preservation of patriotic songs and symbols to everyday religious practices treated as a means of sustaining Polish identity. In this sense, the partitions and inclusion within the Kingdom of Poland not only left an administrative mark, but also became a culture-forming factor: they accelerated social processes, transformed relations between social strata, and at the same time strengthened a communal sense of belonging to "one nation," despite local ethnographic differences.

2

Ecologies of Everyday Life: Clay, Stone, and Bog Iron Ore in Vernacular Architecture

The relationship between humans and the environment is dynamic and reciprocal – on the one hand, humans shape their surroundings and draw upon its resources; on the other, the environment sets the framework for everyday functioning and forms of cultural expression[20]. It is sufficient to recall the influence of landscape on a sense of identity, or of geomorphological conditions on types of agricultural economy. These are interactions with shifting vectors and varying intensity of influence on the plane of environment–human/human–environment.

For centuries, the primary building material used in Poland for the construction of houses and farm buildings was wood[21]. As Adam Fischer noted: "On the basis of the population census of 1921, we can see that throughout Poland the wooden house predominates (from 70 to 90%)"[22]. Understood in this way, wooden construction in its basic form remained for centuries the dominant model of rural architecture, fully adapted to Poland's environmental, climatic, and social conditions. As Maria Gładyszowa observed: "(...) at the turn of the nineteenth and twentieth centuries, and even in subsequent years, solid wooden walls were most

20 G. Ciołek, *Wpływ środowiska geograficznego na formy osadnictwa i budownictwa wiejskiego w Polsce*, „Lud" 1952, vol. 39, pp. 239–243.

21 "European building traditions include several zones, of which the most extensive covers the Scandinavian Peninsula, the north-eastern part of Poland, and the northern and central parts of Russia, distinguished by the overwhelming influence of timber as a building material." In: G. Ciołek, *Regionalizm w budownictwie wiejskim w Polsce*, vol. I, Kraków 1984, p. 110.

22 A. Fischer, *Etnografia słowiańska. Polacy*, Lwów-Warszawa 1934, pp. 166–167. In the territory of the Dobrzyń Land in the second half of the 19th century, wood was the primary building material and structures erected with it constituted 95% of all buildings, while clay buildings accounted for only 3%. Cf. J. Święch, op. cit., p. 148. In the 1920s, wooden buildings in the Dobrzyń Land constituted between 50% and 75% of all structures. Cf. T. Karwicka, *Kultura ludowa ziemi dobrzyńskiej*, Warszawa–Poznań–Toruń 1979, p. 102.

commonly erected. Alongside them, traditional rammed earth construction or timber-frame (half-timbered) structures filled with clay, wattle-and-daub, or brick continued to be used"[23].

Also in Płock Mazovia and the Dobrzyń Land, wood was the primary building material. In Gerard Ciołek's study The Influence of the Geographical Environment on Forms of Settlement and Rural Architecture in Poland, we read: "The Warsaw Voivodeship had the lowest percentage of forest cover (15.9%), although it lay within the Polish building zone which in 1928 was distinguished by a figure of 70–100% wooden buildings in rural areas"[24]. This situation was most likely the result of conservative tendencies prevailing among rural inhabitants, accustomed to traditional wooden construction, as well as "(...) an innate rural distrust toward all kinds of innovations in the field of building"[25]. An interesting example confirming Gerard Ciołek's thesis is cited by Zygmunt Gloger:

> A different kind of rural building evolution was observed in the village of Jeżewo-Nowe near Tykocin. There, when Jan Gloger abolished serfdom in 1859 and converted the peasants to rent-paying tenure, he built for them an entirely new village of masonry houses for fire safety reasons. The peasants, however, could not grow accustomed to masono.y dwellings nor reconcile themselves with the nickname "tenement-dwellers" (*kamienicznicy*) given to them by their neighbors. Thus, when in 1864 they were enfranchised while living in masono.y houses, within a few years they demolished almost all of them and built wooden houses for themselves – "Polish" ones, notched at the corners – no longer the single-room dwellings they had possessed in the days of serfdom, but twice as large, two-room houses[26].

23 M. Gładyszowa, *Terytorialne zróżnicowanie budownictwa* in: *Etnografia Polski. Przemiany kultury ludowej*, vol. 1, Wrocław 1976, p. 298.

24 G. Ciołek, *Wpływ środowiska...*, op. civol., pp. 245–246.

25 G. Ciołek, *Regionalizm w budownictwie wiejskim w Polsce*, vol. 1, Kraków 1984, p. 119.

26 Z. Gloger, *Budownictwo drzewne i wyroby z drzewa w dawnej Polsce*, Warszawa 1907, p. 146.

The effect of this tendency was the recognition of wooden architecture as canonical within the context of rural culture – both peasant and noble:

> "Not so long ago, traditional wooden architecture in our country was a synonym of Polishness, and even of Slavicness. Such a perception resulted not only from the ubiquity of the romantic ('wooden') myth of the manor and the cottage, but also from political indoctrination that deliberately sustained the nineteenth-century cult of the past in order to explain to society the backwardness of the Polish countryside. Thus, 'backwardness' was reclassified as a canon, while progress was recast as a shameful apocryphon identified with otherness (foreignness)"[27].

This approach was consolidated and reinforced through the activities of open-air museums and the theoretical work of open-air museologists[28].

In some regions, however, the "dominant" role of wood as a building material was broken[29]. Limited forest resources – for example in the Łowicz, Kutno, or Płock counties – meant that rural inhabitants had to adapt to local conditions and choose building materials that were available locally. Information about difficulties in obtaining firewood, let alone construction timber, can be found, among other sources, in Korespondent Płocki: "The price of timber, both construction and firewood, has increased enormously in the vicinity of Płock over the past ten years. (...) As for construction timber, there is no question of it at all; "...it was impossible to obtain it locally (...)"[30]. Faced with growing difficulties in acquiring timber, rural inhabitants began to turn to other raw materials available in their immediate

27 A. Pelczyk, *Budownictwo murowane – czyli problem z autentycznością*, technologią i stereotypami w polskich muzeach na wolnym powietrzu. „Studia Lednickie" 2008, no. 9, p. 134.

28 See: *Memoriał w sprawie ochrony budownictwa drewnianego w Polsce. Program organizacji parków etnograficznych*, Warszawa 1966; *Open-Air Museums in Poland*, ed. J. Czajkowski, Sanok 1981. J. Szałygin, *Dziedzictwo drewnianej architektury w Polsce*, „Ochrona Zabytków" 2013, no. 1–4, pp. 281–298. J. Szałygin, *Architektura drewniana jako unikalna cecha polskiego krajobrazu kulturowego* in: *Raport o stanie architektury drewnianej w Polsce*, Warszawa 2023, pp. 19–24.

29 G. Ciołek, *Regionalizm*..., op. cit, p. 111.

30 *Korespondent Płocki* 1879, 9(21), p. 2.

surroundings, which naturally became part of the local building landscape. As a result, clay, stone, and bog iron ore came to serve as substitutes for wood – replacement materials that were literally "at hand." This choice was determined by two fundamental factors: economic considerations and the availability of substitute resources. The environmental and economic context meant that householders, when adopting new building solutions, unknowingly practiced and propagated ecological tendencies within traditional vernacular architecture, based on the exploitation of environmental resources within their natural limits.[31]

The following part of this chapter discusses three basic groups of building materials that replaced wood – clay, stone, and bog iron ore – which illustrate the interactions between the environment and humans and their building practices in the regions of Mazovia and the Dobrzyń Land.

[31] R. Piotrowski, *Crisis Materials and Local Resilience: Environmental Determinants of Building Practices in Nineteenth- and Twentieth-century Rural Poland*, „Environment and History" 2025, vol. 31(4).

Clay

Clay construction in Poland encompasses a wide spectrum of techniques – from wattle-and-daub and rammed earth structures to walls made of sun-dried bricks. In the forms known from the nineteenth and twentieth centuries, it likely developed in the sixteenth and seventeenth centuries[32]. Construction solutions applied in clay buildings migrated from Greater Poland, Kuyavia, and Pomerania southwards and, at a later stage, spread to the central regions of the Polish–Lithuanian Commonwealth, including Płock Mazovia[33]. Jarosław Szewczyk observed that clay structures attracted the greatest interest among architects in Poland (both in the period of independence and under partition) from the mid-eighteenth century to the late 1830s[34]. Specialist literature focused on clay constructions and their value for rural building, particularly their importance for manorial and estate architecture. Authors of practical manuals valued clay for its durability, resistance, availability, and – most importantly – its low cost:

> Where timber for construction is expensive, or its procurement difficult and distant, while clay is found at a small distance and heather is plentiful in the vicinity, it would be a waste of forest and labor to erect buildings of wood – especially barns, sheepfolds, pigsties, stables, cart sheds, distilleries, granaries, etc. – for although heather buildings are erected more quickly and the material has no intrinsic value, they are nevertheless safer from fire, have tighter walls, and thus are warmer in winter for all livestock, and more durable (...)[35].

32 Cf. M. Pokropek, *Budownictwo ludowe w Polsce*, Warszawa 1976, p. 97.

33 Ibidem.

34 J. Szewczyk, *Budownictwo z gliny w dawnej polskiej literaturze technicznej*, „Architecturae et Artibus" 2009, no. 1, p. 85.

35 K. Kossowski, *Sposób stawiania budowli gospodarskich z wrzosu i gliny, i pokrycia onych dachem niepalnym*. Wilno 1839, pp. 21–22.

Specific "schools" of clay construction emerged, whose directions of development depended on particular regions. Technical and specialist books published at the time were addressed directly to owners of estates and landed properties, who were encouraged to introduce changes in manorial architecture[36]. Recommendations concerning material selection in the context of manor houses referred primarily to practical considerations – durability and the low cost of available building materials.

Despite this, clay as a material did not enjoy particularly high esteem: "(...) wattle-and-daub constructions were in fact known everywhere, not only throughout Poland but across much of Europe. Woven and daubed construction was disparaged as a temporary product of poverty – ugly and impermanent, though at the time very widespread"[37]. Thus, despite good technical properties and low construction costs, clay buildings were generally perceived as evidence of poverty. An example of this attitude can be found in one of Ignacy Krasicki's notes, in which he mentioned miserable rural huts built of clay: "(...) barely resembling shelter, daubed huts, with rooms in which panes made of crushed glass were set into clay (...)"[38]. The bishop's description is undoubtedly accurate and aptly reflects the living and building conditions prevailing in certain regions of eighteenth-century Poland. Such circumstances resulted from political destabilization and the exhaustion of society by incessant armed conflicts that, from the mid-seventeenth century onward, became a permanent feature within the borders of the Commonwealth. The general condition translated directly into the standard of living of rural inhabitants, and the aforementioned clay hut (lepianka) stands as its clearest testimony[39].

Such constructions – provisional, impermanent, and often single-room – were characteristic of smallholding populations living on the edge of poverty. For example, in Warmia and Masuria, clay residential buildings

36 See, inter alia: P. Świtkowski, *Budowanie wieyskie dziedzicom dobr y possessorom toż wszystkim iakążkolwiek zwierzchność po wsiach i miasteczkach maiącym do uwagi y praktyki podane. Z figurami*, Warszawa–Lwów 1782; F. Rausch von Traubenberg, *Elementa architecturae ad structuras oeconomicas applicatae; Budownictwo wiejskie do gospodarskich potrzeb stosowne. Zawiera 7 tablic miedziorytowych*, Warszawa 1788.

37 J. Strzelczyk, op. civol.

38 I. Krasicki, *O dobrem mieszkaniu*, Warszawa 1803, p. 214.

39 Cf. I. Tłoczek, *Dom mieszkalny na polskiej wsi*, Warszawa 1985, p. 32.

were typically erected by the poorest householders[40]. Albert Zweck likewise noted that "The dwelling inhabited by the poorer class, the so-called 'chałupa,' is indeed not, as Cotta wrote (...), a dugout, but most often an extremely poor building of clay or wood with a thatched roof"[41].

An example of the use of clay construction on a larger scale is provided by the region of Kuyavia, particularly its central and western parts: "There was no other ethnographic region in Poland in which clay was used so universally in peasant residential construction, regardless of the owners' economic status, as in Kuyavia"[42]. Maria Fryczowa, author of the monograph Traditional Folk Architecture of Kuyavia, noted that in the nineteenth and the first half of the twentieth century the proportion of clay huts in individual villages reached as much as 86.3%, with approximately 6% wooden buildings[43]. She emphasized that they were often erected "(...) on the sites of former wooden ones – timber is becoming increasingly expensive, while good clay can usually be dug on one's own field (...)"[44] The popularity of clay as a building material in rural Kuyavia, however, had an economic basis: "In Kuyavia, rammed-earth buildings, the so-called 'swallow's nest' type, are commonly erected, since wooden buildings are more costly here due to the lack of construction timber, which must be transported from several miles away"[45].

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40 See: M. Pokropek, *Osadnictwo i budownictwo*, in: *Kultura ludowa Mazurów i Warmiaków*, ed. J. Burszta, Wrocław-Warszawa-Kraków-Gdańsk 1976, p. 167.

41 A. Zweck, *Mazury w ujęciu krajoznawczym i etnograficznym*, tłum. L. Lewandowska. Dąbrówno 2024, p. 193.

42 J. Święch, *Chłopskie budownictwo zagrodowe Kujaw w XIX wieku i pierwszej połowie XX wieku*. Kraków 2012, p. 120.

43 Cf. M. Fryczowa, *Tradycyjne budownictwo ludowe Kujaw*, Toruń 1961, p. 34.

44 M. Fryczowa, op. civol. Zob. też M. Gładyszowa, *Budownictwo*, in: *Etnografia Polski. Przemiany kultury ludowej*, vol. 1, Wrocław-Warszawa-Kraków-Gdańsk 1976, p. 298. „Jedyną formę najdawniejszego budownictwa reprezentują budynki lepione z gliny, znane ze źródeł archiwalnych jako >lepianki<. Gliniane ściany mają we wsiach folwarcznych dawne czworaki, a we wsiach gospodarskich lub dawno parcelowanych – budynki należące do ludności małorolnej, dawnych chałupników itp.; tego typu budowle przetrwały więc w budownictwie warstw uboższych.". Zob. B. Matuszewska, *Z badań nad kulturą materialną ludności wiejskiej okolic Inowrocławia*, in: Z badań nad budownictwem ludowym w Wielkopolsce (1954–1957), ed. A. Kutrzeba-Pojnarowa, Warszawa 1959, p. 61.

45 M. Borucki, Ziemia kujawska pod względem historycznym, jeograficznym, archeologicznym, ekonomicznym i statystycznym, Włocławek 1882, p. 213.

Such building solutions therefore had both an economic and an ecological dimension. On the one hand, they allowed households to avoid the costs associated with purchasing timber. On the other, they reduced the need to transport building materials from more distant locations. This aligned with a local logic of resource management based on materials available in the immediate vicinity of the homestead, which also facilitated and accelerated the construction process.

An important factor – environmental and economic in nature – that influenced the choice of material was deforestation or limited access to timber resources:

> **Clay finds application only in those areas where the lack of forest does not allow for the development of wooden construction. Typical clay daub buildings predominate mainly in the Tarnopol Voivodeship and in adjacent parts of the Lwów and Stanisławów Voivodeships (...)[46].**

It is worth at this point referring to the observations of the scholar of Kashubian culture, Izydor Gulgowski, who wrote that the wooden house was common in Kashubia because privately owned forests – and almost every *gbur* (peasant landholder) owned a piece of private woodland – provided inexpensive building material. However, "In the northern part of Kartuzy County, and in the Wejherowo and Puck counties, wooden buildings were abandoned much earlier, because after the separation of landholdings, around the middle of the previous century, private forest ownership decreased significantly. Timber-frame structures began to be built, with the spaces between them filled with clay"[47].

Maria Żywirska, on the basis of inspections of episcopal estates in the White Forest (Puszcza Biała), observed that in the area she studied there was greater material diversity in buildings in the seventeenth and eighteenth centuries. In addition to wood, clay and stone were used, and the number

[46] A. Fischer, *Etnografia słowiańska. Polacy*, Lwów-Warszawa 1934, pp. 166–167.

[47] I. Gulgowski, *O nieznanym ludzie w Niemczech. Przyczynek do ludoznawstwa i krajoznawstwa Kaszub*, Gdańsk 2012, p. 39.

of clay huts (lepianki) during that period was higher than in the first half of the twentieth century[48]. Clay was also not uncommon in the Chełmno Land. It was used both as infill in timber-frame structures; in later periods, clay was replaced by brick. According to Klemens Krajewski, clay huts and rammed-earth structures also occurred in the Chełmno Land:

> "The third group, comprising lepianka constructions, included all huts and buildings erected from brushwood and clay. (...) The building material (...) consisted of corner posts driven vertically into the ground and brushwood used to weave the walls. The brushwood base of the walls was daubed with clay on both the exterior and interior sides of the structure. A distinct folk technique is represented by rammed-earth constructions, built from clay mixed with straw, chaff, or (c)husks. This system was used in the nineteenth century and even into the early twentieth century. The dialect term welewant – that is, a wall with an uneven texture (from the German Welle – wave, Wand – wall) – has survived to this day"[49].

Father Władysław Łęga, in turn, noted that in the Chełmno Land the highest proportion of clay huts

> "(...) occurs mainly to the northwest of Toruń and to the east of Chełmno. These are areas rich in fertile soil and poor in forests. White spots on the map indicate either the absence of settlements, as in the bend of the Vistula north of Czarnowo, or the exclusive use of brick as a building material. This applies particularly to the numerous estates found here, but also to villages in which wooden and clay construction is regarded as backward"[50].

48 M. Żywirska, P*uszcza Biała jej dzieje i kultura*, Warszawa 1973, p. 292.

49 K. Krajewski, *Tradycyjne budownictwo chałup ziemi chełmińskiej. Studium etnograficzne*. Toruń 2022, p. 86

50 W. Łęga, *Ziemia Chełmińska*, Wrocław 1961, p. 57–58.

It should be noted that clay gained importance as an inexpensive building material in the difficult postwar realities – both after the First and the Second World Wars[51]. In the period after 1945, clay construction was promoted as a cheaper alternative[52]. In the foreword to Racięcki's book published in 1946, one can read:

> "Being long aware that the Polish peasant faces one of the most difficult problems – namely, replacing in construction the basic materials, i.e. wood, whose catastrophic shortage is obvious; brick, the production of which is many times insufficient; and cement, the delivery of which in adequate quantities our disorganized and costly transport system is unable to ensure – with local materials, that is, materials which do not require transport, which are available at every building site, as one says 'at hand.' Among these materials, besides local stone, lime near lime kilns, and finally reeds and straw, clay is counted foremost – a material in which a large part of our country abounds in sufficient quantity and appropriate quality"[53]

This building material was used, among other things, in the construction of facilities belonging to State Agricultural Farms (Państwowe Gospodarstwa Rolne). Examples include State Agricultural Farms in the localities of Grabnik and Kolniszki. Importantly, the description of the works carried out includes information on obtaining building material directly from the construction site: "The clay used for construction comes partly from the foundation excavations and partly is transported from a distance of several dozen meters by narrow-gauge railway"[54].

51 "(...) in loess areas, cottages with walls built of clay mixed with straw are encountered. [...] The tradition of such cottages also occurs in the following counties: Opatów, Sandomierz, Kozienice [...]. Houses made of clay were reportedly built, among others, by poorer German settlers." in: R. Reinfuss, *Z badań nad budownictwem ludowym w województwie kieleckim*, „Polska Sztuka Ludowa" 1971, no. 2, p. 69.

52 J. Geniusz, *Oszczędność materiałowa w budownictwie wiejskim*, „Budownictwo Wiejskie" 1953, no. 1, pp. 6–7.

53 Z. Racięcki, *Jak samemu zbudować z gliny tani, zdrowy i trwały budynek mieszkalny lub gospodarczy*. Łódź 1946, p. 9.

54 I. Wieczorek, *PGR Grabnik i Kolniszki budują z gliny*, „Budownictwo Wiejskie" 1954, no. 4, p. 8.

Against the background of nationwide practices, Mazovia occupies a significant place. From fifteenth-century documents we learn that alongside buildings erected from logs there also functioned "(...) daubed structures, presumably clay-coated wattle constructions (...)"[55]. Such lepianki most likely had walls of a fenced construction – composed of thicker vertical posts driven into the ground, between which wattle made of brushwood was stretched. The walls were then coated with clay mortar both on the exterior and interior, producing a solid and well-insulating surface. In the Middle Ages, constructions of this type were widespread in western and southern Slavic territories, which allows us to discern their shared technological roots.

In the Dobrzyń Land, "clay was used sporadically for the construction of cottage walls, and only by smallholding farmers"[56]. As late as the second half of the nineteenth century, wood remained the primary building material, and wooden buildings accounted for 95% of all structures. Clay buildings, by contrast, made up only 3%[57]. Even in the 1920s, wooden buildings in this region constituted between 50% and 75% of all structures[58]. In Mazovia, however, as in other regions of central Poland, the tradition of clay construction persisted exceptionally long. Clay buildings that can still be found today in some Mazovian villages are no longer lepianki, but glinobitki – more technologically advanced structures, attesting to the evolution of local building craftsmanship and the skillful adaptation of older techniques to changing economic conditions.

In areas where clay-plastered walls exist, a certain proportion of buildings were erected from rammed earth, without the use of wooden load-bearing elements. This type of construction is dated as early as the late seventeenth century, and on a broader scale from the first half of the nineteenth century, when during the period of the Congress Kingdom efforts were undertaken to rebuild destroyed rural settlements[59].

55 Vol. Lalik, *Zagroda na Mazowszu w XV wieku*, „Kwartalnik Historii Kultury Materialnej" 1957, no. 3/4, p. 495.

56 J. Święch, op. civol., p. 158.

57 J. Święch, *Architektura chłopska ziemi dobrzyńskiej*..., p. 148.

58 Vol. Karwicka, *Kultura ludowa ziemi dobrzyńskiej*, Warszawa-Poznań-Toruń 1979, p. 102.

59 G. Ciołek, *Regionalizm*..., op. cit., p. 119.

Evidence of the long history of clay use may be found in examples of buildings dating from the mid-nineteenth century – namely, a residential building in the village of Studzieniec, a large clay barn whose original fragments are located in the village of Lisice Folwark, as well as a clay house from the second half of the nineteenth century in Wernerowo. These oldest preserved examples of clay construction may be treated as remnants of building forms that were most likely quite common for decades in the area of Płock Mazovia. During interviews conducted with residents of individual villages, it emerged that most – if not all – residential as well as farm buildings in these localities had been erected from clay. It suffices to mention Głuchowo, Czachorowo, or Dzięgielewo. This practice was followed due to the low cost and easy availability of this type of building material.

Particularly interesting examples of former rural architecture are clay barns that have survived in some localities, such as Rzeszotary Gortaty, Stare Bożewo, Nowe Malanowo, and finally the already mentioned barn from Lisice Folwark. In the *Commentaries to the Polish Ethnographic Atlas*, we read that: "The greatest number of clay barns and cowsheds was recorded in Kuyavia, the adjacent part of Mazovia, and northern and eastern Greater Poland"[60]. These buildings belong to the largest in terms of volume. They provide excellent testimony to the acquisition and use of local resources on a large scale. Such structures were characterized by high resistance to external factors, and the material used in them acquired considerable durability after decades. The owner of the barn in Lisice Folwark recalled enormous difficulties encountered during the demolition of one fragment of a clay wall. The demolished elements resisted weathering for many years, despite the lack of protection from rainfall.

Marcin Kacprzak, in his book *The Płock Village: Living Conditions*, noted that even in the period after the First World War wooden buildings predominated in the Płock countryside (59.5%), yet second place was already occupied by clay houses (18.7%)[61]. These data refer to residential buildings. Farm buildings made of clay appeared even earlier. Houses constructed

[60] B. Dołżycka, *Budownictwo ryglowe i glinobite*, in: *Komentarze do Polskiego Atlasu Etnograficznego*, Wrocław 1995, p. 143.

[61] M. Kacprzak, *Wieś płocka. Warunki bytowania*, Warszawa: Instytut Spraw Społecznych 1937, pp. 58–59.

from this material were regarded as typical dwellings of the rural poor not only in the area under study[62]. Such buildings were mentioned in the context of recollections by people who settled on parceled landed estates in Płock Mazovia in the 1920s and 1930s. Clay architecture was also characteristic of German settlers, who in that period constituted 5.5% of the population of Płock Mazovia[63]. Good examples are now-vanished buildings in Lipniki and Wernerowo near Sierpc. Erected in the first decade of the twentieth century, entirely in rammed-earth construction, they belonged to German settlers. In Lipniki, according to interviews conducted with residents, the part of the village inhabited by German settlers was built precisely from this material, whereas in the Polish part houses were wooden. Perhaps in this tendency one may find analogies to the use of clay in so-called Olęder construction in central Mazovia, mentioned by Jerzy Szałygin:

> "An extremely interesting and noteworthy phenomenon was the use of clay as a building material, which was also employed in the construction of heating systems (the best example of an archaic system can be found in the house at Sady 18, Nowy Dwór Mazowiecki municipality), as well as in daubing residential and farm parts of houses, barns, and stables, and in insulating ceilings. Clay buildings had their disadvantages, but also their advantages; they were built using an interesting technology, with straw, wood, and small branches. Although they were less durable than wooden ones, they provide an example of the prudence and skill of builders who were able to make use of the local specificity of the settled area in the absence of sufficient quality and quantity

62 B. Matuszewska, *Z badań nad kulturą materialną ludności wiejskiej okolic Inowrocławia*, in: *Z badań nad budownictwem ludowym w Wielkopolsce (1954–1957)*, ed. A. Kutrzeba-Pojnarowa, Warszawa 1959, p. 61; M. Fryczowa, Tradycyjne budownictwo ludowe Kujaw, Toruń 1961, p. 34. M. Pokropek, Osadnictwo i budownictwo, in: *Kultura ludowa Mazurów i Warmiaków*, ed. J. Burszta, Wrocław-Warszawa-Kraków-Gdańsk 1976, p. 167; J. Święch, *Architektura chłopska ziemi dobrzyńskiej od połowy XVIII wieku do lat czterdziestych XX wieku*, Toruń 2002, p. 158.

63 M. Milewska, *Koloniści niemieccy na Mazowszu u progu niepodległości II Rzeczypospolitej,* „Rocznik SNPL", 2018, no.. 18, pp. 67–86

of timber (or its high price)"[64].

It is also worth noting that Father Władysław Łęga likewise associated clay architecture in the Chełmno Land with German settlement. Evidence for this was to be the already mentioned German-derived term welewant, used to refer to a clay wall (among others in Biskupice and Papowo)[65].

It is worth noting that the majority of clay houses in the study area were built shortly after the First World War (after 1918) or after the end of the Second World War (after 1945). This tendency was therefore directly connected with the crises characteristic of postwar periods. The very difficult economic and material conditions that prevailed after the wars, including in Mazovia, forced inhabitants to use building materials that were readily available, inexpensive, and easy to work with – qualities that clearly apply to clay. As a result of extracting clay for construction purposes, micro-transformations of the abiotic environment occurred within household plots or in nearby fields.

During the field research, sites from which clay had been extracted for building purposes were identified. One such depression later served as a household rubbish pit, traces of which are still visible today. Another pit filled with groundwater and was transformed or adapted by its owner into a fish pond. One of the interviewees recalled a pit formed after clay extraction near a newly erected house; every year during the thawing period it filled with water and became a place for children's play.

The data presented here illustrate well the regional diversity in the use of clay. Its occurrence as a primary building material was not the norm, but rather a response to local environmental and economic conditions. In regions where timber was scarce or its price exceeded the means of peasant households, clay became the basic construction material. Its widespread use in Kuyavia or western Mazovia thus had an adaptive character – peasants made use of what was readily available and did not

64 J. Szałygin, *Wykorzystanie gliny w budownictwie olęderskim na środkowym Mazowszu jako przyczynek do rozpoznania technologii glinobitki*, in: *Glina w obiektach zabytkowych – ochrona, konserwacja*, ed. J. Marcinek, Warszawa 2019 p. 46.

65 W. Łęga, *Ziemia Chełmińska*, Wrocław 1961, p. 57.

entail purchase costs. This phenomenon points to the dynamic nature of construction solutions in traditional architecture. Depending on historical context, resource availability, and economic circumstances, shifts in the choice of building material frequently occurred.

Within individual villages, as well as on a broader scale – across entire ethnographic regions – situations could arise in which clay technology almost completely dominated over wooden construction. Owing to its availability, clay may be regarded as a "democratic" material: it required no financial outlay beyond one's own labor. The example of the White Forest (Puszcza Biała) reveals yet another pattern – local communities were able to respond flexibly to environmental factors by combining different technological solutions. In areas where soils were sandy and less fertile, and where forest resources were gradually depleted, the use of clay and stone became an economic necessity. In other periods, for example during times of prosperity or greater access to timber, wooden constructions could once again come to the fore.

Such data demonstrate that the architectural landscape of the Polish countryside was not homogeneous, but rather sensitive to changing natural and economic conditions. Clay buildings in Kuyavia or the White Forest were therefore not merely the result of a "lack of timber," but constituted evidence of local technical knowledge and adaptive building practices, which fit squarely within the framework of the so-called ecologies of everyday life.

Building Techniques

In Płock Mazovia, as in the Dobrzyń Land, traditional rammed-earth constructions (*glinobitki*) predominated, constituting a characteristic example of local adaptation to environmental conditions and available resources. This technique – based on erecting walls from compacted clay mixed with straw or chaff – reflects not only a former economy of materials, but also a building culture deeply rooted in the region. Owing to their thermal insulation properties and ease of repair, rammed-earth structures proved well suited to the local climate, while at the same time forming an integral element of the cultural landscape of Mazovian and Dobrzyń villages. In many places, remnants of these constructions can still be found today – often abandoned, yet continuing to testify to former technologies and the aesthetics of folk architecture.

The process of acquiring and preparing the building material was relatively simple and fully adapted to local conditions and technical capabilities. After extracting clay from nearby pits or clay excavations, it was mixed with chaff, sand, chopped straw, and sometimes also with heather. The latter ingredient was readily used as a natural reinforcement improving the cohesion and durability of the clay mixture. Proportions depended on the type of clay. So-called "fat" clay required larger amounts of organic additives (straw/chaff/husks), while leaner clay required fewer additional components. Jan Świtkowski wrote:

> Almost all of our villages, and a greater part of poor small towns, have all their buildings made of clay, about which it should be known that it is usually yellowish in color, but sometimes also dark, gray, or black. Good clay is either very or moderately fat, or else entirely lean. Very fat clay, although better for bricks than lean clay, shrinks somewhat during forming and firing; therefore, moderately fat clay is best for bricks, while lean clay is the worst, for it produces very weak bricks (...). Conversely, very lean clay is good for plastering stoves and for coating walls, since it does not require mixing with so much earth, sand, straw, or other substances to

temper it[66].

uch mixtures also increased the thermal insulation properties of clay buil- ng material: “The more pores it contains, the lighter it is and the better s insulating properties; the greater its moisture content, the poorer its insulation. Porous additives include, for example, straw, reed, or artificially expanded mineral particles such as pumice, lava, expanded clay, porous glass, or fired shale”[67].

Animals such as horses or cattle were used to mix and knead the mass, trampling it with their hooves to achieve a uniform consistency. At times, children and women also took part in the treading process. The entire procedure took place directly at the planned construction site, eliminating the need to transport heavy material. Field data collected during research in Mazovia and the Dobrzyń Land are corroborated by materials gathered in 1960–1963 by Klemens Krajewski in the Chełmno Land:

> In a suitable depression in the terrain, clay was placed, then chaff and husks were added, and everything was doused with water. In order to achieve complete and thorough mixing of this mass, cows or horses were led – or even driven repeatedly – through the prepared clay. The animals pressed the mass with their hooves, kneading and working it so that all material components combined into a uniform building material ready for rammed--earth walls. Sometimes the transported clay was only poured over with water, after which the wet clay was usually kneaded barefoot by girls[68].

he same technique of preparing the clay mass was also used in Kuyavia[69]. więch notes that “the building material had to be prepared in such a way

66 P. Świtkowski, *Budowanie wieyskie dziedzicom dobry possessorom...*, pp. 21–22.

67 M. Kamieniarz, *Budownictwo z gliny w aspekcie energooszczędności i ochrony środowiska*. „Materiały Budowlane” 2014, no. 11(507), p. 52.

68 K. Krajewski, op. cit. p. 69.

69 J. Święch, *Chłopskie budownictwo zagrodowe...*, op. cit., p. 121.

that, when taken in the hands, it did not stick to them, and at the same time a piece thrown onto the ground did not crumble”[70].

Clay buildings were erected on a stone foundation course, which limited direct contact between the prepared building material and the ground, thereby reducing moisture penetration into the walls. Walls were formed using shovels or so-called gachle (also referred to as gafle). Construction was carried out in stages. First, the aforementioned stone foundation was prepared. Depending on the technique, formwork was either used or omitted. In the latter case, a wider layer of clay was laid at the base of the building, followed by successive – progressively narrower – layers until the full height of the walls was achieved; wall thickness thus tapered slightly toward the top. During field research, no local name for this type of construction was recorded; in the scholarly literature it is referred to as the “swallow’s nest” (*na jaskółkę*) technique.

More commonly, however, clay buildings were erected using formwork. These were wooden molds that helped maintain the vertical alignment of the walls and prevented the material from slumping. Each layer of clay mass “enclosed” within the wooden formwork was carefully tamped to ensure sufficient density and cohesion between layers. Interviews indicate that women were most often engaged in this work, tamping the clay with bare feet. The laid layers were then left to dry naturally, a process that took from several days to several weeks, depending on weather conditions. After the walls were completed, their surfaces were leveled with spades, giving them a compact, uniform texture; axes were also sometimes used to smooth façades.

Field interviews suggest that the construction of a typical rammed-earth house required only two people – one supplying the clay mass, the other placing and compacting successive layers within the prepared formwork. Wall thickness at ground level ranged from 60 cm to as much as 80 cm, ensuring durability, stability, and thermal insulation[71].

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70 Ibidem.

71 *Budownictwo wiejskie. Według wykładów Pr. Czesława Domaniewskiego na Kursach Przemysłowo-Rolniczych w Warszawie*, ed. M. Patzer, Warszawa 1913, p. 57.

To reinforce building corners and wall structures, juniper branches or heather shoots were placed between successive layers of clay. This procedure not only increased the durability of the structure but also enhanced cohesion, allowing walls to better withstand shrinkage and expansion and minimizing cracking during drying. Among those who emphasized the necessity of using heather in clay construction was Kajetan Krassowski, who wrote:

> In my opinion, the best material for this purpose is vigorous winter wheat straw after the ears have been cut off, which may then serve as fodder for sheep. Although this method may be good, priority should always be given to heather – firstly because straw has another, very important use in farming; secondly because heather binds the clay mass far more strongly and firmly and does not rot as quickly. Only where there is no heather or brushwood should one resort to this method. In the absence of heather, any low, branching shrub may be used, such as marsh rosemary (*Ledum palustre*), bog bilberry (*Vaccinium uliginosum*), low species of willow – such as rosemary willow (*Salix rosmarinifolia*) or willow rokita (*Salix incubacea*) – as well as shrubby birch (*Betula fruticosa*), or even small branches of common birch, Lombardy poplar, pine, fir, juniper, etc.[72]

To this day, fragments of plants, chaff, and organic fibers used in the clay mortar can be found in the ruins of former rammed-earth buildings – almost like material traces of past building techniques embedded in the fabric of the walls.

On the external – and sometimes also internal – wall surfaces, regular grooves were incised, intersecting to form geometric patterns, most often diamonds. In Kuyavia, simple agricultural tools such as two-tined pitchforks were used to make these incisions. At the points of intersection, small stones, crushed bricks, or sometimes lumps of bog iron ore – material with excellent absorptive properties – were pressed in. This practice had

[72] K. Krassowski, *Sposób stawiania budowli gospodarskich z wrzosu i gliny, i pokrycia onych dachem niepalnym*. Wilno 1839, p. 18.

both practical and aesthetic dimensions. On the one hand, stone or brick aggregate reinforced wall surfaces and further increased the already high adhesion of subsequent layers of clay render.[73] One eighteenth-century building manual states:

> Finally, these walls may be covered with plaster, but immediately – while they are still wet – they must be studded with somewhat longer pieces of roof tile, brick, glass, flint, etc. These pieces should be well embedded in the wall. Then good lime should be prepared, containing less sand than usual. Into this lime one then adds well-teased hair or animal bristles, and with this mixture a thin coat of plaster is applied. Any other method of plastering clay with lime is, as they say, throwing money into the mud[74].

Thus, grooves and embedded stones served a function analogous to so-called szprosy – split branches, and later wooden laths, fixed to walls both inside and outside buildings to prevent clay render from slipping off vertical surfaces. Such solutions were used both in small-town architecture (e.g., Czerwińsk nad Wisłą) and in rural buildings, examples of which can still be found today. At the same time, these treatments also reveal an aesthetic dimension. Many of the buildings identified in the study area, as well as those documented in archival sources, were never plastered. It may therefore be assumed that the lines and reinforcing stone or brick fragments introduced order and visual interest to the façades of clay buildings. As a result, even simple structures acquired an individual character, bearing witness not only to practical knowledge but also to the aesthetic sensitivity of their builders.

Unfortunately, practical considerations often overshadowed aesthetic

73 „Nadto, glina posiada wielką siłę przyciągającą tak do własnych cząsteczek jak i do innych ciał.", in: *Encyklopedia rolnicza i rolniczo-przemysłowa*, ed. A. Strzelecki, H. Kotłubaj, vol. I, Warszawa 1888, p. 495.

74 P. Switkowski, *Budowanie wieyskie dziedzicom dobr possessorom toz wszystkim iakążkolwiek zwierzchność po wsiach i miasteczkach maiącym do uwagi y praktyki podane*, Warszawa-Lwów 1782, p. 465.

needs and the desire to surround oneself with objects or buildings that bring pleasure to their owners. In this case, however, it is easy to see that material conditions do not solely shape consciousness; rather, people consciously strive – even in situations of extreme poverty, deprivation, and material scarcity – to create things that are not only functional but also, at least to a minimal degree, aesthetic.

In many buildings in the vicinity of Sierpc and Płock, door and window surrounds were made of fired brick. Some clay buildings also had corners constructed of fired brick, often using reclaimed bricks from demolitions. The simplest finish for door openings, however, consisted of wooden frames. These frames were braced with transverse beams – two per side – equal in length to the wall thickness. The vertical beams rested on boards forming the threshold or, where no threshold beam was present, were set directly on the ground. The lintel extended beyond the threshold, forming so-called "whiskers" projecting beyond the door opening. Hinges were fixed to the wooden frame, upon which the entrance door was hung.

Only in one case within Mazovia and the Dobrzyń Land was it possible to identify a wattle-and-daub (*lepianka*) construction. The upper part of the gable wall of a residential building was executed using this technique:

> The wattle infill – referred to locally as a kosz ("basket") – served as reinforcement for the wall and, being entirely embedded in a thick clay daub, protected it against cracking. For this reason, it was not possible to erect a wattle-and-daub wall with the weave coated with clay on only one side, a solution that was employed in timber-frame (half-timbered) walls. In lepianka walls, it was not the frame but precisely the woven infill combined with a thick layer of clay that constituted the primary composite building material[75].

The structure is located in the village of Mochowo. In the center of Mochowo, within a brick building, a knee wall and the gable of the roof

[75] J. Szewczyk, *Łączenie drewna z kamieniem, zaprawą glinianą lub betonem jako technologia, jako zamysł architektoniczny i jako wytwór kultury materialnej*, vol. 1, *Dawne rozwiązania systemowe na tle rozwiązań wernakularnych*, Białystok 2020, p. 61.





were constructed of clay.

Beneath the clay render, a structure made of wooden rods and a thick straw weave was visible, which had been coated with clay on both the exterior and interior sides.

Catalogue/examples

Bożewo Stare



A clay barn built at the beginning of the 20th century. According to local accounts, the clay was mixed with chaff and stones. The clay mortar was trampled by horses.





Chabowo Stare





A clay barn erected on a stone foundation. Probably early 20th century. The clay was mixed with chaff.

Studzieniec

A clay residential building, originally most likely a czworak (four-family dwelling) erected in the mid-19th century. It is the oldest surviving clay residential building in Sierpc County. The building's form refers to the house type popular in wooden construction and characteristic of Mazovian architecture, featuring a hipped roof (*dach naczółkowy*).





Szumanie Pustoły

A stone-and-clay structure, most likely erected at the turn of the 19th and 20th centuries. The lower parts of the walls were built of fieldstone, while the upper portion of the building was made of clay. The clay was mixed with straw and reinforced with juniper branches. Flat stones served as lintels for the ventilation openings. The frames of the window and door openings were made of fired brick.







Warzyn Kmiecy

In the center of the village there is a building that formerly served as a shop. It was constructed in the mid-20th century and constitutes another example of the continuity of local building traditions – in this case, clay construction.



Wernerowo

The house was originally built of clay; only later did a subsequent owner convert the clay-built farm section into stone construction. The first owners and builders of the house were probably German settlers. The building material – clay – was extracted close to the farmstead. Pits left after clay extraction still exist today and now serve as fish ponds.





Zgagowo

A clay-and-stone structure. This is a cowshed dating from the early 20th century. The wooden elements of the door joinery are connected with wooden dowels. Clay walls rise on a high stone foundation, with fragments of ceramic ridge tiles (*gąsiory*) embedded into the façade. The building was originally thatched with straw.





Żabowo

A single-tract wooden-and-clay building. The wooden section served a residential function, while the clay-built part housed an oil mill. In the farm section, clay was most likely used instead of wood for safety reasons. Oil mills contained open hearths on which, among other things, flaxseed was heated. According to information obtained in Żabowo, the building was constructed in the 1950s.



The house was built by a married couple in 1956. The foundations were made of stone, sand, and clay. Horizontal insulation was used in the building – a layer of roofing felt separating the foundations from the walls. The clay was mixed with straw and heather. The clay mortar was trampled by animals. The material was prepared on site, at the location where the building was to be erected. To reinforce the corners of the clay structure, juniper branches were inserted between layers of clay. The house was built layer by layer, with each layer being trampled by the wife. No formwork was used – the structure was erected using the "swallow's nest" (*na jaskółkę*) technique. After the walls were completed, they were shaped and leveled with a spade, both inside and outside the building. Broken brick fragments were then pressed into the outer faces of the prepared walls, after which the walls were "thrown" (splashed) with a thin clay slurry.





Stone

Stone architecture in Poland has a centuries-old tradition, although it has never been the dominant form in the country's cultural landscape:

> The widespread use and durability of wooden construction in Poland – undoubtedly based on the ease of obtaining the raw material – had enormous significance not only for shaping the rural landscape and the silhouette of Polish towns, but also influenced the development of masonry construction. Masonry construction was never the dominant form of building in Poland until modern times; its range was limited to certain centers (cities) and to certain types (above all sacral and defensive architecture, and only to a small extent residential buildings)[76].

Stone, as a durable material resistant to fire and variable climatic conditions, played a particular role in construction of strategic, sacral, and representative significance. Already in the Neolithic and Bronze Ages it served as a fundamental constructional and symbolic material – used in the building of barrow graves, megalithic structures, and the earliest settlement foundations[77]. In the Middle Ages, this material acquired special prestige. It became a marker of status and authority: castles, churches, monasteries, city walls, and defensive towers were built of stone. The choice of stone did not result solely from its availability, but was also an ideological decision – an expression of the aspiration toward permanence

[76] A. Wyrobisz, *Budownictwo murowane w Małopolsce w XIV i XV wieku*, Wrocław – Warszawa – Kraków 1963, p. 28.

[77] See e.g. A. Matuszewska, *Odkryć to, co pozornie znane. Megality Pomorza Zachodniego*. Szczecin 2024.

and immutability, and at the same time an attempt to overcome the transience of human matter. Stone buildings were meant to endure "for centuries," in contrast to wooden structures, which were subject to decay and impermanence.

Across the territories of Poland, different types of stone were used depending on geological conditions and local traditions. In the southern regions of the country – on the Kraków–Częstochowa Upland, in Lesser Poland, and in Silesia – limestones and sandstones predominated, being easy to work and widely available. In the north and central parts of Poland, by contrast, where deposits of sedimentary rock were lacking, glacial erratics left behind by the retreating ice sheet became the primary building material. These elements of the landscape were not only a raw material but also carried a strong symbolic potential – stones of unusual shapes or sizes were often surrounded by local legends and belief practices[78].

Stone in Polish architecture therefore fulfilled a dual function: practical and symbolic. It was a foundation – both literally and metaphorically – upon which wooden, brick, and clay structures rested, while at the same time serving as a sign of permanence. In folk tradition, stone often played the role of a liminal object, frequently connecting the human world with the afterlife. It is enough to recall foundation offerings placed beneath the cornerstone, the rituals accompanying its laying, or beliefs associated with the threshold stone, which fulfilled protective and boundary-marking functions.

In the well-documented nineteenth-century rural architecture, stone was used primarily for the construction of foundation courses, cellar structures, fences, floors, and paving surrounding farmsteads. Over time, with the development of masonry techniques and socio-economic changes in the countryside, stone ceased to be the exclusive domain of monumental architecture. It also found its place in vernacular architecture – as an accessible, natural, and exceptionally durable material. The use of locally available building resources contributed to the creation of a coherent rural landscape, in which inhabitants relied on materials that were literally at

[78] V. Wróblewska, Kamień, [entry in:] Słownik polskiej bajki ludowej, Toruń 2018, p. [not specified].

hand. This phenomenon is clearly visible in Mazovia, the Dobrzyń Land, as well as in other regions of Poland. Various types of stone constituted a natural source of building material for simple yet solid rural structures..

However, depending on geomorphological context, vernacular architecture employed the stone material available in a given region: "In deforested areas, but with soft, calcareous 'opoka' in the subsoil, farm buildings (cowsheds, stables), and sometimes even residential buildings, are constructed of stone (...). This material found broader application during the reconstruction of villages destroyed after the First and Second World Wars"[79].

This situation is analogous to the use of clay, which gained popularity as a building material primarily in postwar and, more broadly, crisis periods. Even in the 1915 publication Rebuilding the Polish Village, issued by the Civic Committee for the Reconstruction of Villages and Towns in Kraków, one finds a paragraph addressing the unsatisfactory properties of stone materials as building materials for residential structures:

> "Walls made of stone – limestone and sandstone – cannot be as widely applied to residential houses as brick walls, as they are significantly colder and readily absorb moisture; they therefore require much greater heating of interiors and the application of an interior lining of half a brick. To avoid this, the standard thickness of stone walls should be assumed as follows: for sandstone 1.00 m, for limestone 1.50 m. Only at such thickness will the thermal conductivity coefficient equal that of a brick wall 0.55 m thick. Stone walls should also be lime-rendered on the exterior for the same reasons as brick walls. In general, walls of sandstone, limestone, as well as fieldstone, are best used only for foundations or for the walls of farm buildings"[80].

79 R. Reinfuss, *Z badań nad budownictwem ludowym w województwie kieleckim*, „Polska Sztuka Ludowa" 1971, no. 2, p. 69.

80 Odbudowa polskiej wsi. Projekty chat i zagród włościańskich opracowane przez grono architektów polskich wydane pod redakcyą Władysława Ekielskiego. Warszawa 1915, p. 4.

Nevertheless, the availability and "plasticity" of certain stone materials influenced their broader use in monumental (churches, palaces), urban, and rural architecture alike. An excellent example is provided by buildings made of calcareous opoka stone in the Lublin region:

> "Opoka has been used as a building material for centuries. Its use is of local significance. Owing to the relatively good physical parameters of the raw material, its high availability, and the aesthetic qualities of the stone, it began to be used on a mass scale for construction purposes. In addition, the ease of extracting this raw material, particularly in the Lublin region, caused its use to expand significantly in later periods"[81].

As a porous rock, opoka is characterized by good insulating properties. Importantly, it is easy to work – a result both of its lightness and its block-like structure[82]. As in the case of clay, the choice of material depended on local resources. Katarzyna Giereło-Klimaszewska, writing about the folk architecture of the Jelenia Góra Basin, noted a certain regularity:

> "Regardless of location, the most readily available building materials occurring almost everywhere were used – spruce and larch wood, granite, or slate. House construction was an undertaking involving the entire village. Neighbors assisted one another in transporting felled timber and in its processing. The wood was selected with great care: it could not be twisted or come from a previously uprooted tree. For stone parts, stones from the immediate vicinity were used. This was a resource occurring in abundance"[83].

81 M. Trochanowicz, K. Drobek, *Budownictwo z opoki wapnistej na terenie Lubelszczyzny,* „TEKA Komisji Architektury, Urbanistyki i Studiów Krajobrazowych Oddział Polskiej Akademii Nauk w Lublinie" 2021, no. 4, p. 66.

82 Ibidem, pp. 66–67.

83 K. Giereło-Klimaszewska, *Architektura ludowa Kotliny Jeleniogórskiej i okolic. Przeszłość i współczesność*, in: *Księga dwudziestolecia Karkonoskiej Państwowej Szkoły Wyższej w Jeleniej Górze*, ed. H. Gradkowski, A. Woźny, Jelenia Góra 2018, p. 103.

In Kashubia, and more broadly in Gdańsk Pomerania, material shortages as well as new legal regulations governing the use of timber in construction – introduced by edicts of Frederick William I and Frederick II – were intended to "force" inhabitants to use local materials other than wood. These included, among others, stone and clay[84]. Despite resistance to new construction methods, stone was quite often used in farm buildings:

> "The recommended saving of timber in construction influenced the spread of large livestock buildings, in which partition walls separated spaces for individual species of farm animals. The walls of this new type of livestock building were increasingly built of stone, using the technique of granite ashlar blocks"[85].

Although stone construction appears less frequently than clay construction in residential architecture in Płock Mazovia and the Dobrzyń Land, from the second half of the nineteenth century onward stone architecture constituted an important component of the regional heritage in the context of farm buildings. Stone architecture in the study area represents a particularly interesting adaptation of a material with physical and aesthetic properties distinct from those of clay. Stone, unlike clay, was more difficult to work and far more demanding to transport; nevertheless, its durability and resistance to weathering made it a highly valued material. In the regional landscape, stone buildings usually signified wealth, prestige, or a special function, and thus appeared primarily in sacral, manorial, farm, and infrastructural structures (mills, cellars, bridges).

In the area under discussion, stone was obtained primarily from cultivated fields, where for centuries farmers encountered glacial erratics deposited during the last glaciation. These are among the most significant elements of the so-called young-glacial landscape extending across the Dobrzyń

84 K. Zimmermann, *Fryderyk Wielki i jego kolonizacya rolna na ziemiach polskich*, vol. 2. Poznań 1915, p. 205–206.

85 Vol. Sadkowski, *Kamień i glina w tradycyjnym budownictwie wiejskim na Kaszubach*. „Biuletyn Stowarzyszenia Muzeów na Wolnym Powietrzu w Polsce" 2009, no. 11, p. 108.

Land and northern Mazovia[86]. Stones were often collected along field boundaries, and over time began to be used for the construction of simple structures, fences, and walls. In some cases, material was also sourced from small, local quarries or pits, especially in areas where deposits of limestone, sandstone, or marl were exposed.

Owing to its rough texture and weight, stone imposed a different rhythm of work and a different approach to shaping space than clay. It required greater precision, planning, and cooperation among several people. Despite this, in the hands of rural craftsmen it acquired an almost "organic" character – bonding with the earth from which it originated and integrating into the rhythm of the local landscape.

Stone, like clay, was used primarily because of its availability and its essentially cost-free nature. It was enough to collect building material during spring agricultural work to later use it in the construction of cowsheds, pigsties, barns, and even houses. Preliminary research indicates that in Płock Mazovia there were also villages with a dominant prevalence of stone buildings. Such villages include, among others, Wilkowo and Wola Grąbiecka. In the latter locality, characterized by a very specific building pattern, farm buildings and cellars were constructed of stone. Wola Grąbiecka also features an interesting example of a wooden-and-stone barn – one bay built of wood, the other of fieldstones.

Erratic boulders transported from Scandinavia during the last glaciation were commonly referred to as "fieldstones." In the rural architecture of Płock Mazovia, they began to be used on a broader scale in the second half of the nineteenth century. Initially, in vernacular architecture, stones were used mainly for fences and foundations. Over time, with growing demand for building materials and a simultaneous shortage of timber, stone farm buildings began to be erected – most often cowsheds, pigsties, and cellars, though examples of stone barns are also known in the study area.

Stone was collected annually during spring agricultural work. According to local narrative traditions, "the Earth gave birth to stones." The phenomenon

86 L. Marks, et al., *Northern Central Europe: glacial landforms during deglaciation* (18.9–14.9 ka]) in: D. Palacios, P. D. Hughes, José M. García-Ruiz and Nuria Andrés (ed.) European Glacial Landscapes, Chennai 2023, pp. 95–104

of cryoturbation – that is, the upward movement of stones toward the soil surface – is the result of cyclical freezing and thawing of the ground.

Boulders hindered the cultivation of fields; therefore, farmers removed them and gathered them into piles. Large stones intended for construction were used either in their raw state or subjected to stonemasonry processing. In the latter case, they were broken into smaller pieces and shaped to fit wall constructions; sometimes they were given a form approximating a cuboid. The stones were bonded/jointed with lime or clay mortar. It should be noted that the joints between stones were filled with small fragments of bog iron ore, which absorbed moisture and helped dry the binding mortar. An interesting example of such use of bog iron ore is an 18th-century manor granary from the village of Rościszewo.

Stone residential buildings are rare in the study area[87]. Only isolated examples of this type of architecture have been identified. One building was erected by a family of German settlers; it is a small residential-farm structure dating to the 1930s. Another example is a residential-farm building constructed in the 1930s after a fire destroyed a wooden homestead. The material for its construction was brought by all the villagers. In this crisis situation, with no possibility of acquiring timber, fieldstone was used instead. One interviewee recalled that villagers, wishing to help those affected by the fire, collected stones from fields and “by the river,” and then carried them to the construction site.

[87] M. Kacprzak, *Wieś płocka. Warunki bytowania*, Warsaw 1937, p. 59.

Building techniques

Stone architecture in Mazovia and the Dobrzyń Land was based on rock material transported by the ice sheet during the last glaciation. Glacial erratics (erratics), commonly referred to as "fieldstones," occurred widely in this area:

> They are of particular importance because in the areas where they occur there is a lack of other stone materials. Consequently, in many counties of the Polish Lowland they are intensively collected and used for crushed stone, aggregates, and even paving blocks. Sometimes, especially in villages, they are also used as building material. Glacial erratics occur in a wide range of sizes – from small fragments to giants with volumes of several hundred cubic meters. A disadvantage from the standpoint of usability is their great petrographic diversity, which affects the overall physical and mechanical properties of crushed stone or aggregate. Among glacial erratics, granites of varying grain size, color, and state of preservation predominate. Alongside them occur gneisses, amphibolites, porphyries, sandstones, and quartzites. Diabases, diorites, pyroxenites, pegmatites, etc., occur rather in small quantities[88].

Stones were collected from fields during spring agricultural work. They constituted an obstacle to crop cultivation; therefore – just as today – after winter thaws stones were cleared from fields and gathered in one place. A clear example of this practice is the piles of fieldstones collected by farmers during agricultural work.

[88] M. Kamieński, *Skały budowlane w Polsce*, Warszawa 1949, pp. 100–101.



Glacial erratic boulders of various sizes, once collected in sufficient quantity, constituted a good building material. They were used primarily for foundation courses, both for residential and farm buildings. Often they were left unworked and laid in their natural form, bonded with clay–sand mortar or – at a later period – with lime mortar. In some cases, loosely arranged stones served as foundation courses.





Stone foundation course made of unworked boulders. Rzeszotary Gortaty.



The foundation course of a no-longer-existing post mill (paltrak) in Kobyla Łąka.

Stone buildings could be erected either by the farmers themselves or by specialist masons–stonemasons. The latter solution was adopted because of the difficulty of working stone. For this reason, compared with clay, stone appears to be a more “demanding” material. Boulders, depending on the skill of the mason–stonemason, were either cut or left uncut. A certain regularity can be observed: structures dating from the late 19th and early 20th centuries were built of better-fitted and more carefully prepared material.

By contrast, buildings erected in the mid-20th century were most often constructed of poorly dressed stone or of unworked boulders. This may testify both to haste and to a shortage of specialists capable of working such a demanding material.

As mentioned above, stone buildings were erected from either cut stones or rounded boulders. In both cases, efforts were made to fit them together as closely as possible. Both clay and lime mortars were used to bond the stones. Frequently, in order to reinforce the structure, the “gaps” between larger boulders were wedged with smaller, flat stones. Such solutions are particularly clearly visible in ruined structures..



Fragment of a building wall in Pianki.



Stones in the wall structure wedged with smaller fragments (photo: R. Piotrowski).



Fragment of a stone-and-clay wall built from unworked glacial erratic boulders.

In buildings dating from the mid-20th century, another technique of constructing stone walls was encountered. First, wooden formwork was prepared, into which stones of various sizes were poured and then flooded with cement mortar. In this way, the walls were raised layer by layer. A characteristic feature of this type of wall are the visible "joints" created by the pouring of cement. They may give the impression of poor workmanship, but in fact are merely the result of this particular construction technique. Cowsheds built in this manner can be found, among other places, in Topiąca.

The walls of stone buildings are typically "double-layered." The first, outer layer consists of large dressed or undressed boulders; the second, inner layer is made up of smaller stones, most often bonded with clay, which fill, thicken, and stabilize the wall. In this way, an appropriate wall thickness of approximately ±80 cm was achieved, ensuring thermal insulation. Unfortunately, today – given the small numbers of livestock (cattle, pigs, etc.) kept in stone cowsheds and pigsties – during prolonged frosts the interiors of these buildings can turn into a kind of cold storage.



Convex joints in a farm building in the village of Topiąca (photo: R. Piotrowski).

The joints between boulders were very often pointed with lime mortar or, in later periods, with cement mortar. In Budownictwo wiejskie by Karol Iwanicki one reads: "In walls not intended for plastering, the joints should be filled with mortar so that rain and snow do not linger on them"[89].

[89] K. Iwanicki, *Budownictwo wiejskie*, Kiev–Warsaw 1917, p. 28.

Naturally, the form of filling the so-called joints depended on the skill of the individual mason. Some took on a convex shape, others were flat or concave.



Malanówko – a farm building with brick surrounds framing the window openings (photo: R. Piotrowski).

Window and door openings were often framed with fired brick. Corners were also frequently constructed of fired brick.

In the mid-20th century, cement brick became widespread. The construction of stone buildings was undertaken both by specialist stonemasons–masons and by the farmers themselves. In order to obtain suitable material, it was often necessary to break or cut the stones.

Large boulders were split using a hammer and a chisel; an experienced stonemason did not need to apply much force – precision was sufficient to divide the stone. Another method involved breaking boulders with gunpowder. For this purpose, a hole was drilled into the stone, an explosive charge was placed inside, and upon detonation the stone split into two parts. Traces of such practices are visible on many boulders, whether incorporated into buildings or serving as threshold stones.

In the village of Białasy in Sierpc County there is a building that exemplifies stone-and-clay residential–farm architecture, whose form refers to Dutch (Hollander) building traditions. This small, single-tract house consists of a residential section and a farm section separated by a central hallway. The building was erected in the 1930s, and the first owner of both the house and the farmstead was a German settler.

Fences

In addition to various types of woven, picket, or slab fences, stone fences were also constructed. Stone – owing to its abundance and ease of acquisition – was most often simply collected from fields and piled, for example, near farmsteads, making it an excellent and inexpensive building material. Stone fences can be found in individual villages across virtually the entire north-western Mazovia region. They occur in the surroundings of Mława and Ciechanów, as well as near Płock and Gąbin.

Fieldstones were used to build such fences. They were laid without any binding mortar. Two types of stone fences can be distinguished:

1. Those built from so-called rounded stones (*okrąglaki*), with the largest stones placed at the base. The lower part of such a wall was wider and tapered toward the top.
2. A second type of stone fence was built primarily from large stones fitted together during construction. They were arranged so that the front face of the wall formed an almost smooth surface, while smaller stones served only to fill and tighten gaps between the larger stones.

It is worth noting that stone fences, despite their cultural context, remained natural elements that over time became overgrown with moss and other vegetation. In this way, a specific ecological micro-system developed, of considerable importance to local fauna and flora, as well as to insects.

In many localities during the Second World War, German authorities dismantled stone fences, using the material thus obtained for other purposes, such as road construction. This occurred, for example, in the village of Dąbrówki near Sierpc, where a cobbled street was built during the German occupation.

In the village of Głuchowo, also near Sierpc, a stone wall constructed before 1939 has survived to the present day, having escaped dismantling by the Germans.

The most recent example of this type of fence is located in the village of Białyszewo and was constructed at the turn of the 20th and 21st centuries.





Fence in Głuchowo. According to local accounts, it was built before 1939..

Cellars

Cellars in Mazovia took various forms. They could be simple so-called parski – earth cellars with masonry fronts – as well as cellars built of cement, brick, and stone. The façades of such cellars were very often constructed of stone, while bricks were used for forming arches and corners. The interiors featured barrel vaults built of brick and stone, and the rear wall was constructed of boulders. Owing to this type of construction – taking into account ventilation openings, the layer of earth insulating the vault, and shading provided by trees – a consistently low temperature was maintained inside such structures throughout the year.

In some wide-fronted cellars, the front, rear, and side walls were made of stone. Frequently, the foundation course from which the brick or cement vault was sprung was also constructed of stone.



Cellar in Białyszewo.

Such structures are known throughout Mazovia as well as in the Dobrzyń Land. When properly constructed, they maintained suitable temperatures in summer, protecting stored products from heat, and in winter they insulated the interior from the direct effects of atmospheric conditions. Larger cellars were built within manor farm complexes, and multi-chamber cellars are also known – for example, from the village of Krajewice.



Cellar in Krajewice.



Cellar in Kuskowo. Built in 1953.

Catalogue/examples

Czachorowo

A fragment of a farm building made of large glacial erratic boulders, cut/dressed on the façade side of the building. A partition wall made of unworked stones is also visible.





Mieszczk

Stone farm buildings in a former miller's farmstead. They were erected at the beginning of the 20th century.





Rościszewo

Stone building of a manor granary. Probably erected in the late 18th century.







Rzeszotary Chwały

Fragment of a cowshed built by Adam and Helena Rzeszotarscy. According to family accounts, the cowshed was erected in the late 19th century.





Stone forge – still in operation as late as 2010 – relocated from the site where a shop was built in Rzeszotary Chwały. The forge is currently situated closer to the forest, by the road leading to Rumunki Chwały.

Stradzewo

Stone barn. Lime mortar joints. Stones dressed to achieve proper fitting.





Topiąca

One of the few examples of stone residential–farm architecture. Individual fragments of bog iron ore were also identified within the wall.





Wilkowo

Barn – one of many stone structures in this locality.





Bog iron ore

Bog iron ore is an iron ore occurring at shallow depth. Its composition is such that "(...) iron oxyhydroxides with a poorly ordered internal structure dominate (...), alongside which, in varying amounts, occurs clastic material– primarily quartz, feldspars, and rock fragments. Occasionally, siderite (...) and vivianite (...) as well as clay minerals are encountered. In some varieties of ore, an important component is organic matter"[90]. This material is readily available in river valleys and wetland areas[91]. Over the long term, deposits of bog iron ore are renewable[92]. For centuries, layers of this raw material were exploited for iron production[93]. However, it also played an intriguing role in architecture–initially, as evidenced, in monumental construction,

90 Kraczkowska, Vol. Ratajczak, G. Rzepa, *Kawałkowe odmiany rud darniowych jako materiały budowlane i przykłady ich zastosowań z terenu Polski*, „Ceramics" 2001, no. 6, pp. 454–455.

91 Vol. Ratajczak, G. Rzepa, *Polskie rudy darniowe*, Kraków 2011, p. 108–109; M. Santon, R. D. Yager, B. Fey, D. L. Wright, G. Winfield, *Formation and Geochemical Significance of Iron Bog Deposits*, in: E. Church, Paul von Guerard, and Susan E. Finger, (ed.), *Integrated Investigations of Environmental Effects of Historical Mining in the Animas River Watershed, San Juan County, Colorado*, Colorado 2007, p. 693–720; O. P. Bricker, W. L. Newell & N. P. Simon, *Bog iron formation in the Nassawango Creek watershed*, Maryland, USA', in:: J. F. Martin-Duque, C. A. Brebbia, A. E. Godfrey & J. R. Diaz de Teran (ed.) *Geo-Enviroment: Monitoring, Simulation and Remediation of the Geological Environment*, Southampton 2004, pp. 13–23.

92 E. Kowalczyk-Heyman, *Ruda-Skroda. Przyczynek do dziejów rudnictwa żelaza na Wysoczyźnie Kolneńskiej w średniowieczu i na początku doby nowożytnej*, „Studia Geohistorica" 2, (2014): 85.

93 M. Thelemann, W. Bebermeier, P. Hoelzmann, E. Lenhardt, *Bog iron ore as a rescource for prehistoric iron production In Central Europe – A case study of the Widawa catchment area in eastern Silesia, Poland*, "Catena" 2016, no. 149(1), p. 474–490; M. Leh, *Raseneisenerz-Vorkommen und das historische Hüttenwesen In der Görlitzer Heine/Puszcza Zgorzelecka*, "Berichte der Naturforschenden Gesellschaft der Oberlausitz" 2019, no. 27, pp. 135–142.

primarily sacral, and eventually, in some regions, becoming part of the heritage of vernacular architecture. As noted by Tadeusz Pawlik:

> According to present-day standards, lump bog iron ore used as a building stone exhibits weak physico-mechanical parameters in laboratory tests (high porosity and water absorption, low frost resistance, and low compressive strength). The properties of bog iron ore depend primarily on such factors as petrographic variability and long-term exposure to disintegrating atmospheric agents. Nevertheless, lump bog iron ore was successfully used for centuries in the construction of building walls. The particular value of architectural structures preserved in Poland that were built using bog iron ore derives, among other things, from the fact that they date from across the entire last millennium and represent both sacral and secular architecture[94].

In Poland, the oldest monuments constructed of bog iron ore date to the period of the early Piast state and include, among others, fragments of foundations and walls of sacral buildings. Among the earliest are the uncovered foundations on Ostrów Lednicki, currently dated to the 10th century[95]. Many churches in western Poland were built of bog iron ore (as the primary building material) or with its use; it suffices to mention the churches in Niwiska, Studzieniec, and Mirocin Dolny[96]. An example of the use of bog iron ore in defensive architecture is the castle in Uraz on the Oder River, built in the 13th century[97]. Most probably, the largest number of buildings constructed of bog iron ore is found in the Lubusz

94 Vol. Pawlik, *Ruda darniowa w Polsce – wystêpowanie i zastosowanie w architekturze*, „Przegląd Geologiczny" 2023, no. 71(11), p. 566.

95 J. Skoczylas, *Wykorzystanie w przeszłości darniowych rud żelaza jako materiału budowlanego*, „Ochrona Zabytków" 2000, no. 53/2(209), p. 207.

96 Ibidem, p. 208.

97 I. Kraczkowska, Vol. Ratajczak, G. Rzepa, *Kawałkowe odmiany rud darniowych jako materiały budowlane i przykłady ich zastosowań z terenu Polski*, „Ceramics" 2001, no. 66, p. 456.

Land and in Greater Poland, and decidedly fewer in Mazovia[98]. Naturally, structures built of bog iron ore occur not only in Poland[99]. In certain historical periods, it was even recommended by architects and officials as a valuable raw material, above all non-combustible. As emphasized by Elżbieta Wijas-Grocholska with reference to Opole Silesia: "In the mid-19th century, along with growing difficulties in obtaining timber and bans on erecting wooden buildings, construction using other, non-combustible materials spread. One of these was fired bog iron ore, recommended by contemporary architects as a material with significant technical and resistance advantages"[100].

It is worth noting that bog iron ore was a local raw material–obtained on site, often from the immediate vicinity of villages. Its use fits well within the traditional framework of the "ecology of everyday life." Inhabitants not only made use of what was available, but also endowed new buildings with greater durability and fire resistance compared to wood. Examples include farm buildings erected in the 1960s: "(...) northeast of Grabów, in the localities of Czempisz, Dzięcioły, Rożenno, and Pogonowice–there are also relatively 'young' farm buildings, as they were built in the 1960s. Numerous examples of local use of this building material can be found in other localities situated in the fork between the Prosna and Warta rivers, including Bibianna Mała, Nowe Prażuchy, and Gadowskie Holendry"[101]. This represented an adaptation to environmental conditions and, at the same time, a manifestation of thrift. Importantly, construction using bog iron ore is an excellent reflection of the environmental and social identity of the inhabitants of particular localities.

A special case is the Pyzdry Forest (Puszcza Pyzdrska), where Dutch settlers erected buildings from bog iron ore: "Extremely interesting is the

98 Vol. Ratajczak, G. Rzepa, *Rudy darniowe w świeckim i sakralnym budownictwie jako atrakcja geoturystyczna*, „Zeszyty Naukowe Politechniki Śląskiej" 2006, no. 273, p. 358–359.

99 H. Sitschick, F. Ludwig, E. Wetzel, J. Luckert, Vol. Holding, *Raseneisenerz – auch in Brandenburg ein mineralischer Rohstoff mit bedutender wirtschaftlicher Vergangenheit,* "Brandenburgische Geowissenschaftliche Beiträge" 2005, no. 1(2), p.122–124.

100 E. Wijas-Grocholska, *Wiejska architektura – dziedzictwem kulturowym Stobrawskiego Parku Krajobrazowego*, Opole 2015, p. 16.

101 Vol. Ratajczak, G. Rzepa, *Rudy darniowe w świeckim i...*, p. 360.

material–namely bog iron ore–from which many farm and residential buildings were made. Construction using bog iron ore is encountered in other regions of the country, but nowhere does it occur in such quantity, nor have so many structures built from it been preserved"[102]. Settlers experienced in managing wetland environments naturally turned to bog iron ore as a readily available material well suited to local conditions. As a result, this region has preserved an exceptional architectural heritage–examples of cottages and farm buildings erected entirely of this material, sometimes combined with clay, fieldstone, or brick[103].

Marian Pokropek, conducting research in the Green Forest (Puszcza Zielona), recorded the use of bog iron ore "(...) in the construction of kitchens, stoves, and chimneys"[104]. Examples of the use of bog iron ore preserved in open-air museums can be found, among others, in the Greater Poland Ethnographic Park, which includes a cellar built of this material, as well as in the Adam Chętnik Kurpie Open-Air Museum in Nowogród, where the chimney of one of the cottages was also made from this raw material. Contemporary structures built of bog iron ore are also known, such as a bus stop in Górne Grądy[105].

A particularly interesting example of the use of bog iron ore is the palace complex in Łowicz. It consists of a defensive tower, a caretaker's house, a chapel, and a small palace. All these structures were built of bog iron ore bonded with lime mortar. It is worth noting that the bricks used in the construction of these buildings came from the former Łowicz castle. Thus, we are dealing here not only with the use of local material, but also with the reuse (recycling) of building material. The structures date to the first half of the 19th century:

102 W. Przewoźny, *Krajobraz w turystyce kulturowej – przykład osadnictwa olęderskiego w Wielkopolsce*, „Warsztaty z Geografii Turystycznej" 2021, no. 11, p. 239.

103 P. Szwelc, *Katalog architektury regionalnej dla obszaru „Puszczy Pyzdrskiej". Opracowanie badań terenowych przeprowadzonych jesienią 2009 roku*, Pyzdry-Poznań 2009.

104 M. Pokropek, *Materiały do historii budownictwa ludowego z terenu kurpiowskiej Puszczy Zielonej*, Warszawa 1962, p. 79.

105 H. Zaniewska, M. Zaniewska, *Wartości krajobrazu okolic ujścia Prosny i problemy jego ochrony*. „Architektura Krajobrazu" 2013, no. 3, p. 64.

"It should be recalled that General Klicki, as a soldier of the Vistula Legion, stayed in Italy in the years 1797–1806, and later also in France and Spain, which had a clear influence on the subsequent realization of his architectural vision. A particular originality was imparted to the building by carefully dressed bog iron ore, which was used extensively in its construction, becoming the primary material employed for the façades of the walls and the turret– except for the southern wall, where red brick predominated"[106].



106 W. Warchałowski, *Ogród generała Stanisława Klickiego w Łowiczu*, „Ochrona Zabytków" 1998, no. 51/4 (203), p. 357.









The palace complex in Łowicz is not the only example of the use of bog iron ore in south-western Mazovia. Within the Bolimów Landscape Park there is the Kaczew Forest Lodge, whose foundations were built of locally occurring bog iron ore: "Materials derived from local resources were used in the construction of the hunting manor. Bog iron ore, with a centuries--long tradition of use in Łowicz County, appears in the foundations"[107]. Deposits of bog iron ore in this area are located, among other places, in the Bolimów Forest. It was precisely from there that material was obtained for the realization of the Arkadia concept near Nieborów. The beginnings of Arkadia date back to the 18th century, when the castellan's wife Helena née Przezdziecka, following the example of other titled ladies, wished to build an idealistic and idyllic pastoral village. It was described as follows:

> It is a place which was once a miserable village scattered across a flat plain, without trees, water, or views. Helena Radziwiłłowa née Przezdziecka resolved decisively to transform this corner, abandoned by nature, into a fragment of that Greek land so praised by poets for the beauty of its setting, the fertility of its pastures, and the happiness of its inhabitants. It cannot be said that this bold undertaking was fully successful, although there was no lack of wit, taste, or money; for these means were still insufficient to overcome nature or to bring it into balance[108].

The Arkadia project was prepared by Szymon Bogumił Zug. Bog iron ore was used, among other things, for door arches, elements of wall construction, and fragments of masonry. At the end of the 1980s, during renovation and modernization works, a footbridge made of bog iron ore was built in the park: "A new entrance to the park was also created from the western side, with a bridge built of bog iron ore and a section of a new avenue led

107 A. Cichy, Z. Tucholski, *Leśniczówka Kaczew (Szwedówka) – dawny dwór myśliwski Radziwiłłów oraz rys historyczny leśnictwa Dóbr Nieborowskich*, „Kwartalnik Historii Nauki i Techniki" 2024, no. 69(1), p. 42.

108 K. Tańska Hofmanowa, *Wybór pism*, vol. 6. Wrocław 1833, p. 231–232.

through an enclave of old alders to the western bank of the pond"[109]. Today, the museum-park open to visitors impresses not only with its picturesque character but also with the building materials used, which reflect the geomorphological specificity of this region.

In Mazovia and the Dobrzyń Land one can find numerous examples of the use of bog iron ore in vernacular architecture. From our perspective, this material may be regarded as one of the most interesting building substitutes in the study area, which–similarly to clay and stone–served as a replacement material used in periods of crisis and shortage of timber resources[110].

The occurrence of bog iron ore depends on the biological environment–high moisture levels have a positive effect on the formation of bog iron ore deposits. For this reason, the river valleys of the Vistula and the Skrwa constitute excellent locations for the precipitation of insoluble iron oxides, hydroxides, and carbonates. At least since the 19th century, farmers have treated such deposits as an impediment, and even an obstacle, to agricultural work. Ore-bearing areas have therefore been regarded as wasteland. Today, many farmers remove bog iron ore deposits in order to reclaim meadows. Collected in piles, similarly to glacial erratic boulders, they become part of the agricultural landscape.

The oldest example of the use of bog iron ore in the study area was identified in the walls of the riverside castle at Bobrowniki in the Dobrzyń Land. Fragments of bog iron ore were used in a manner similar to glacial erratic boulders. Unfortunately, these are only isolated lumps, so it is difficult to speak of any deliberate engineering or constructional concept, or of the use of this material for aesthetic reasons.

Thanks to archival research, individual buildings dating from the turn of the 19th and 20th centuries were also identified in Kamion Podgórny on the left-bank side of Mazovia.

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109 W. Piwkowski, *Arcadia Restituta*, „Ochrona Zabytków" 1995, no. 48/3–4, p. 262.

110 R. Piotrowski, *Between Necessity and Pragmatism: Stone, Clay and Bog Ore in Rural Architecture in the Borderland of the Mazovian Region and the Dobrzyń Region*, "Journal of Heritage Conservation" 2020, no. 63, pp. 145–146.





House in Kamion Podgórny. Archive of the Voivodeship Office for the Protection of Monuments (WUOZ) in Płock.

Other examples of buildings erected from bog iron ore, or incorporating its use, date to the 20th century. This material was employed in the construction of wall structures of both residential and farm buildings. During field research, local inhabitants most often pointed to villages situated in the

upper course of the Skrwa River, in the vicinity of Skrwilno. Deposits of bog iron ore in this area are located close to farmsteads–on fields and meadows–from which it was extracted during agricultural work. As already mentioned, bog iron ore is an iron ore occurring at shallow depth, which facilitated its extraction[111]. As a building material, it is characterized by strength properties comparable to brick2[112]. In the study area it was used in rural construction primarily in the period after the Second World War, when it served as a substitute building material.

A flagship example of the use of bog iron ore on the Mazovian–Dobrzyń borderland is the village of Pietrzyk. According to local accounts, in the 1920s and 1930s buildings in the village were erected of wood. After the Second World War, however, both residential and farm buildings were constructed from bog iron ore. It was obtained from fields adjacent to the village. In that period, most buildings were erected from this material, and many of them have survived to the present day. Unfortunately, some have fallen into ruin, while others have been insulated and have thus lost their original character.

Certainly, buildings made of bog iron ore in Mazovia and the Dobrzyń Land are not as spectacular as those found in the Lubusz Land, Lower Silesia, or the Pyzdry Forest. Nevertheless, they constitute an important–and today increasingly rare–example of vernacular architecture executed with non-canonical materials that were readily available and easy to work. Such structures formed part of a cultural landscape that emerged directly from the geomorphological resources of a given region.

111 E. Kowalczyk-Heyman, *Ruda-Skroda*..., p. 85 (pp. 85–98).

112 J. Jasieńko, A. Di Tommaso, Ł. Bednarz, S. Casacci, K. Raszczuk, *Analiza porównawcza – wieże zagrożone zawaleniem w Polsce i we Włoszech: różne przyczyny, podobne problemy*, "Wiadomości Konserwatorskie" 2015, no. 43, p. 41.

Bog iron ore – construction techniques

Bog iron ore was a material obtained from nearby or adjacent fields, most often from uncultivated wet meadows. It occurred at shallow depth, which made its extraction by farmers relatively easy. In the study area, this material gained popularity after 1945, particularly in localities situated near areas with high soil moisture. After extraction, bog iron ore was in principle immediately suitable for use in construction and was also easy to work. Pawlik notes this explicitly: "Certainly, one should also add issues of good workability and ease of forming blocks, which directly results from the relatively low hardness of lump bog iron ore in comparison with gneiss and granitoid blocks of Scandinavian erratics, commonly used in traditional construction"[113]. The porosity of the ore "blocks" facilitated bonding between successive layers. Walls made of bog iron ore were erected on stone plinths and bonded with lime mortar. Corners were often built of fired brick, sometimes given an aesthetic form–for example, herringbone-pattern corners. Door and window surrounds were likewise built of fired brick. The roof structure was identical to that used in buildings erected from glacial erratic boulders or fieldstones.

[113] Vol. Pawlik, op. cit., p. 556.

Catalogue/examples

Pietrzyk

A no-longer-existing house constructed of bog iron ore. The corners, window surrounds, and door jambs were built of fired brick. The material was obtained from nearby fields. Approximate date of construction: the 1950s.





A ruined farm building in Pietrzyk and a fragment of bog iron ore from the wall of the structure. In addition to the bog iron ore, reclaimed brick fragments were used in the construction. The joints were made with clay mortar.





Szczypiorno

House constructed of bog iron. Renovation works aimed at insulating the building are currently underway, which has obscured its original construction. Fragments of bog iron are still visible in the outermost layer of the building's mass.



Dąbrówki

Lumps of bog iron were pressed into the joints of stone buildings (barns and cowsheds). According to information obtained from the owner, this practice was well known and was intended to help dry the mortar joints.







Close-ups show pieces of bog iron pressed into the lime joints. The good absorbent properties of the bog iron were used to dry the jointing mortar.

3

Secondary (Reuse) of Materials in Vernacular Architecture



A very common phenomenon in the traditional Polish countryside was the reuse of materials–wooden, stone, and clay–when erecting new buildings. From the study area, there are known cases where salvaged timber from windmills was used to build houses; good examples are residential buildings in Rzeszotary Pszczele and Dramin. In the former, windmill timber was concealed behind boarding, while in the latter, wood recovered from a windmill was used to rebuild part of a house after a fire. There are also known examples of windmill timber being reused for door and window joinery in localities across Mazovia and the Dobrzyń Land. Most often, the "most noble" elements of a windmill–the mill beams and the main post (sztember)–were reused; once processed in a sawmill, they provided excellent construction timber.

Interestingly, these were not the only elements reused in other structures. Millstones–both those from mills and semi-finished pieces (unfinished or damaged during production)–can also be found in new functional contexts. Many are built into church walls, for instance in the churches of Wyszogród, Bodzanów, and Pułtusk. It is difficult to determine unequivocally whether they served strictly utilitarian or perhaps symbolic functions; nevertheless, local communities clearly reused them as structural elements in sacred buildings. An excellent example of a pragmatic approach to originally non-building materials is a wayside shrine in Chrosno (outside the study area, in the Kuyavia region), where millstones from a destroyed post windmill (paltrak) were used to construct the pedestal of a roadside figure. Local residents stated plainly that it would have been a waste not to reuse such stones. Their actions were thus driven by pragmatism and an aversion to wasting available resources. Notably, steel components from the same windmill were also reused in the walls of farm buildings.

Near Sierpc, on the farmstead of a former owner of a watermill, one can admire a pavement made of worn millstones. Here again, one might seek symbolic meanings–emphasizing social status or professional identity–but a naturalistic interpretation that attributes such practices to pragmatism, thrift, and ingenuity in repurposing "waste" materials seems fully justified.

A particularly interesting cultural phenomenon in the Vistula Valley and in settlements near the river was the secondary use of shipbuilding materials from vessels operating on the Vistula. Timber was reused mainly from berlinkas, but also from so-called floating mills, known in Mazovia as bździele[114].

Thanks to materials held in the archives of the Museum of the Mazovian Countryside in Sierpc and the Branch of the Provincial Office for the Protection of Monuments in Płock, several such buildings were identified that once existed in Rębowo and Maszewo. Field research further confirmed the presence of residential and farm buildings made from shipbuilding materials in Ciućkowo near Wyszogród, and especially in Czerwińsk nad Wisłą.



Fisherman's house in Jastarnia (photo: P.M. Pogodziński)

[114] D. Brykała, M.P. Pogodziński, R. Piotrowski, *Traces of disappearing heritage: upcycling of wooden vessels preserved in the vernacular architecture of a large river valley in Central Europe*, „Rural History" 2022, no. 34(2), p. 243–261



Toruń, house on Rybaki Street (photo: P.M. Pogodziński)

Based on archaeological sources, ethnographic data, and preserved structures, it can be concluded that the practice of using timber from dismantled vessels as building material was known from the early Middle Ages to the present day. Such buildings have been identified in coastal localities–Hel, Jastarnia, Dźwirzyno, Gdańsk–as well as in Vistula riverside settlements from Nowy Dwór Mazowiecki to the vicinity of Bydgoszcz[115].

The data collected so far on this issue make it possible to distinguish two zones in Poland where buildings constructed using shipbuilding timber as a building material occur.

115 M. Kuklik, *Tryptyk helski, część 1 do roku 1920*, Gdańsk, 2010, p. 58; F. Sulimierski, B. Chlebowski, W. Walewski, 1880–1902, *Słownik geografi czny Królestwa Polskiego i innych krajów słowiańskich*, Warszawa, vol. II, p. 50; Borkowski J, Kuczkowski A., *Relikty późnośredniowiecznych oraz nowożytnych urządzeń nadbrzeżnych w Dźwirzynie, gm. Kołobrzeg*, „Materiały Zachodniopomorskie, Nowa Seria", 2009/2010, vol. VI/VII, z. 1: Archeologia, p. 403–416; Z. Misiuk, *Wstępne wyniki badań archeologicznych prowadzonych na obszarze protomiasta gdańskiego pomiędzy dzisiejszymi ulicami Tartaczną i Panieńską w Gdańsku w latach 2008–2010*, in: XVII Sesja Pomorzoznawcza, vol. 2, ed. H. Paner i M. Fudziński, Gdańsk, 2013, p. 343; A.W. Reszka, *Wiślane statki i techniki nawigacyjne od XVI do XX wieku*, Gdańsk, 2012, p. 130.



Barn from Rębowo and an example of a plank with holes from shipbuilding dowels (photo: R. Piotrowski)

The first zone comprises the Baltic Sea coast together with adjacent port areas. This zone is characterized by a large number of examples recorded during archaeological research conducted mainly in the areas of Gdańsk and Wolin. In light of archaeological data, shipbuilding timber was frequently used in the construction of floors, quays, and pedestrian routes. Based on ethnographic data and preserved buildings, it has been established that a distinguishing feature of this zone was the acquisition of shipbuilding timber from wrecks broken up along the seashore.

The second region, characterized by the acquisition of raw material from worn-out Vistula River vessels, is the zone extending along the Vistula from Nowy Dwór Mazowiecki to the vicinity of Bydgoszcz. In this region, surviving architectural examples have been identified, with the largest concentration occurring in the Płock Mazovia region[116].

116 P. M. Pogodziński, *Reuse of boat structural elements in the wooden buildings along the Vistula River*, "Wiadomości Konserwatorskie – Journal of Heritage Conservation" 2019, no. 59, p. 106–114.

One of the more interesting examples of this type is located in the Museum of the Mazovian Countryside in Sierpc. It is a barn from the village of Rębowo, situated near Czerwińsk and Wyszogród. In the wooden material (planks) used in its construction, visible holes remain from wooden dowels that once joined the structure of a Vistula river vessel. Initially identified as a berlinka, it was most probably a floating mill originating from the vicinity of Wyszogród.



Recycling as Exemplified by the Architecture of Czerwińsk

For centuries, Czerwińsk has been associated in social awareness primarily with its monuments: the Romanesque church, the monastic buildings, and the miraculous image of Our Lady of Consolation. In an account by Oskar Flatt from 1854, there is a vivid description of the town:

"You may scarcely have heard this name; with astonishment you look at a handful of wretched houses huddled like abandoned orphans around a lofty church and ask what significance this little town might possibly hold?"[117].

In the shadow of these exceptional treasures of Polish culture lies a small town of rare urban composition, only slightly transformed from the Middle Ages to the early twentieth century[118]. A distinctive feature of this layout is the preserved small-town wooden architecture dating from the late nineteenth and mid-twentieth centuries[119].

These buildings possess another value that enhances both their conservation and scholarly significance. Some of them were constructed using reused elements derived from decommissioned Vistula river vessels–berlinkas. The number of surviving structures allows one to conclude that Czerwińsk is a unique site on the map of Poland where this exceptional type of architecture has endured, bearing witness to the town's distinctive Vistula-river heritage.

Czerwińsk is situated on the right bank of the Vistula River, primarily on the high terraces of the river escarpment. The terrain morphology, shaped by two hills and numerous side valleys, influenced the town's spatial

117 O. Flatt, *Brzegi Wisły od Warszawy do Ciechocinka: z dopełniającym poglądem na przestrzeń od Torunia do Gdańska: (przewodnik żeglugi parowej)*, Warszawa 1854, p. 24.

118 Uzasadnienie decyzji Mazowieckiego Konserwatora Zabytków o wpisie układu urbanistycznego w miejscowości gminnej Czerwińsk nad Wisłą, powiat płoński do Rejestru Zabytków. Decision no. 47/2009 of 16 January 2009. Available at: https://www.mwkz.pl/ (accessed: 28 January 2019).

119 Ibidem. M. Szulińska, *Rejestr zabytków – problematyka wpisów obszarowych na przykładzie Czerwińska nad Wisłą*, „Kurier Konserwatorski" 2010, no. 9, p. 29–34.

development. On the western, higher hill stands the church together with the monastery of the Canons Regular. This complex constitutes the most important element of the local cultural landscape and forms its principal dominant feature[120]. On the neighboring eastern hill lies the cemetery. On the slopes descending gently toward the Vistula River, the settlement spreads out.

The most prominent feature of Czerwińsk is the Church of the Annunciation of the Blessed Virgin Mary, one of the oldest masonry structures in Polish lands[121]. Kings prayed there–Władysław Jagiełło sought success before the battle against the Teutonic Knights and later gave thanks for victory at Grunwald, offering votive gifts and his knightly helmet[122]. The basilica houses the image of Our Lady of Consolation of Czerwińsk, painted in 1612 and renowned for numerous miracles and graces, as evidenced by many votive offerings[123]. From the seventeenth century onward, the abbey became an important religious and pilgrimage center. The church and monastic buildings form a unique architectural ensemble. As aptly described by Margarita Szulińska:

"The characteristic monumental mass of the church with its twin-tower façade, together with the adjoining three-winged claustral buildings on the southern side, constitutes one of the oldest and most valuable examples of sacred architecture in Poland, created through the accumulation of various styles and periods, essentially from the twelfth to the eighteenth century."[124]

An important factor in spatial development was the functioning, from as early as the twelfth century, of two settlement forms with separate sub-urban centers[125]. The first was the abbey together with an adjoining monastic settlement, probably located near today's Kościuszki Street126.

120 J. Nowiński, *Czerwińsk*, Warszawa 2012, p. 29.

121 Ibidem, p. 9.

122 Ibidem, p. 57.

123 Ibidem, p.31oraz strona Gminy Czerwińsk nad Wisłą http://www.czerwinsk.pl/index.php?cmd=zawartosc&opt= pokaz&id=5 (data dostępu: 29.01.2019).

124 Inne założenie przedstawił Michał Witwicki, który uznaje, iż osada ta znajdowała się na północ od klasztoru (M. Szulińska, op. civol. – tam dalsza literatura).

125 M. Szulińska, op. civol., p. 31.

126 Ibidem.

This settlement was granted town rights in 1582, though this did not affect the spatial layout.

The second spatially formative complex was the episcopal center with the Church of St. Adalbert, which existed until 1778. Closer to the Vistula lay a market settlement that received town rights in 1373; this, however, did not lead to changes in the market square or earlier building plots[127]. This spatial and administrative structure survived until the nineteenth century, when the episcopal and monastic centers were unified and expanded by suburbs stretching along the Vistula[128]. At the beginning of the nineteenth century minor changes occurred–the market square was paved and equipped with wells. The first and only town hall was built in 1810 and demolished after 31 years[129]. In 1827 Czerwińsk had 49 houses and 522 inhabitants[130]. The town's development was influenced by permission for Jewish settlement.[131] Around 1880, the population reached 1,010 with 79 houses, six of them masonry[132]. In the interwar period the town had 1,600 inhabitants. In 1869/1870 it lost its town rights and today functions as a village serving as the seat of a municipality.

The First and Second World Wars and the postwar period did not significantly alter Czerwińsk's spatial layout or building fabric. Already in the 1960s and 1970s, conservation documentation of valuable houses from the late nineteenth and early twentieth centuries was prepared, demonstrating relatively early recognition of this architecture's potential. However, the lack of conservation[133]and social engagement led, after several decades, to the situation described by M. Szulińska: "Many of these buildings are

127 Ibidem.

128 *Słownik geograficzny Królestwa Polskiego i innych krajów słowiańskich*, vol. 1, Warszawa 1880–1914, p. 836.

129 M. Szulińska, op. civol., p. 32.

130 *Słownik geograficzny Królestwa Polskiego...*, op. civol., p. 836.

131 Decyzja o wpisaniu układu urbanistycznego obejmującego miasteczko została podjęta w 2009 roku. Spotkało się to z dużym sprzeciwem samych mieszkańców oraz lokalnych władz (M. Szulińska, op. civol.) oraz wywiady własne autora z mieszkańcami.

132 M. Szulińska, op. civol., p. 32

133 P. M. Pogodziński, *Drewno szkutnicze jako materiał budowlany*, „Nautologia", r. LII, p. 77–80.

in a state of significant or complete destruction; due to contemporary renovations, many have already lost their original values."[134]

A distinguishing feature of this architecture is a particular form of upcycling–many of these houses were built using demolition material from Vistula river vessels. Across Poland, the use of timber from watercraft as building material had been practiced since the Middle Ages, as evidenced by finds from port centers such as Gdańsk and Wolin, where shipbuilding timber was used in houses and quays[135]. The oldest recorded example of secondary use of shipbuilding elements in Mazovia was discovered during archaeological excavations in the Old Town of Płock: a well lined with oak planks from a riverboat hull dated to the sixteenth century[136].

Czerwińsk is exceptional because, due to various factors, it has preserved the largest number of examples of this type of architecture, importantly retained in situ as part of the cultural landscape.

The reuse of shipwreck fragments as building material formed an essential element of Vistula-river tradition, and such buildings occurred from Nowy Dwór Mazowiecki to the vicinity of Bydgoszcz.[137] Preliminary reconnaissance research[138]allows identification of two areas with higher concentrations of such structures. The first, smaller one includes Toruń and its immediate surroundings. The second, much larger area–with existing examples[139] –is the Mazovia Płock region, with a notable cluster in Czerwińsk.

134 M. Szulińska, op. cit., p. 32.

135 A. Reszka, *Wiślane statki i techniki nawigacyjne od XVI do XX wieku*, Gdańsk 2012, p. 112. M. Trzeciecki, *Kultura materialna średniowiecznego Płocka*, in: *Historia Płocka w ziemi zapisana. Podsumowanie dotychczasowych badań archeologicznych*, ed. A. Gołembnik, Płock 200, p. 115.

136 A. Reszka, op. civol., p.112–113.

137 Badania w okresie 2015–2017 były prowadzone ze środków prywatnych Pawła Pogodzińskiego w czasie wolnym. W 2018 roku uczestniczyłem w projekcie „Nadwiślańskie dziedzictwo Czerwińska nad Wisłą" zorganizowanym przez Stowarzyszenie „Nasz Czerwińsk nad Wisłą". Bardzo serdecznie dziękuję w tym miejscu członkom Stowarzyszenia za możliwość udziału w tym wartościowym przedsięwzięciu.

138 Na przykład stodoła z Rębowa znajdująca się na terenie Muzeum Wsi Mazowieckiej w Sierpcu (A. Piasecki, R. Piotrowski, P.M. Pogodziński, *Stodoła z Rębowa, gm. Wyszogród z II połowy XIX wieku jako przykład budownictwa z wtórnie wykorzystanych elementów szkutniczych*, „Rocznik Wsi Mazowieckiej w Sierpcu" 2017, vol. 8, p. 85–95.

139 A. Reszka, op. civol., p. 75 -93.

In the late nineteenth and early twentieth centuries, Czerwińsk played an important role in Vistula river transport. It had a landing stage for excursion vessels running between Warsaw and Włocławek, a small port, and a shipyard where a characteristic local freight boat–the bat–was built[140].Many inhabitants' professional lives were tied to the river, and some specialized in dismantling decommissioned river vessels. Recovered ship timber was sold as building material. This dismantling tradition was still recorded in 1954 and 1955[141], when skipper Eugeniusz Broniarek dismantled several berlinka-kafówka vessels brought from Bydgoszcz. Structural elements were sold to local farmers. A witness, Adam Reszka[142], emphasized that the wood was "mostly entirely sound, especially the oak hull planks"[143]. After the skipper's death, the tradition ceased. Today, only a few buildings made from recovered materials remain[144].

The largest and oldest such building stands on Kościuszki Street and is dated in the provincial heritage register to 1860[145]. It is currently abandoned and deteriorating. Nearby, at Kościuszki 1, stands a former mangle building with walls partially made of ship elements. On Klasztorna Street there is a house whose walls are built from ship components, plastered so that only in damaged areas are characteristic hull planks visible. In one house at Batory Square, the floor consists of berlinka planks, while rafters in a brick house on Świętokrzyska Street were made from longitudinally split hull planks. According to the owner, the wood came from one of the last dismantled berlinkas in the 1950s.

140 A. Reszka, op. civol., p. 112.

141 A. Reszka (1929–2011), Komandor żeglugi śródlądowej. Jedna z najwybitniejszych postaci w kręgach żeglugi śródlądowej w Polsce.

142 A. Reszka, op. civol., p. 112.

143 Obiekty zostały rozpoznane na podstawie możliwej dostępności do badań. Część obiektów dostępna bez większych ograniczeń badawczych z ulicy czy chodnika. Do części obiektów zostałem wpuszczony dzięki uprzejmości właścicieli, za co bardzo serdecznie dziękuję.

144 https://bip-filep.idcom-web.pl/sites/47097/wiadomosci/294611/files/zabytki_nieruchome_wpisane_do_ rz_i_wlaczone_do_wez.pdf

145 W rozmowach z mieszkańcami przewijają się informacje, że próbują oni zakryć konstrukcje drewniane, ponieważ uważają drewno za gorszy materiał, w porównaniu do cegły czy betonu. Uważają też, że zamieszkiwanie w domach drewnianych może być przez niektórych odbierane jako wyznaczniki niezamożności właściciela.

Interviews revealed that many existing houses also contain walls built from berlinka fragments, later concealed for various reasons[146] by façade cladding such as siding. Residents reported that some buildings were demolished, leaving empty plots or replaced by brick houses. Respondents also noted vulnerability to fire–e.g., a large shed built from berlinka near the cemetery burned down[147].

Field research consistently indicates that the material came from a single type of vessel: the *berlinka*. In inland navigation terminology, these vessels are precisely termed *berlinka-kafówka* (also known as *odrzak* or *finówka*)[148]. Developed in the second half of the nineteenth century, it derived from the older *szpicberlinka*[149]. It featured distinctive bow structures (kafy) made of profiled oak. Standard dimensions were 40.2 m in length, 4.6 m in width, side height 1.6–1.9 m, and cargo capacity 100–150 tons. Vessels were typically built from oak and high-quality pine. Earlier forms and detailed dimensions are illuminated by the wreck from Stare Dęby[150], held in the collection of the Museum of the Mazovian Countryside in Sierpc. Dendrochronological analysis indicates construction after 1778[151]. Fire traces on frames suggest sinking due to fire, possibly during the Napoleonic Wars or the November Uprising[152]. The bottom consisted of oak hull planks preserved up to 7 m long, 0.44–0.66 m wide[153] and 0.075[154]–0.08 m thick[155].

146 Informacja uzyskana od mieszkańców, ale także A. Reszka, op. civol., p. 113.

147 A. Reszka, op. civol., p. 103 – 113.

148 A. Reszka, op. civol., p. 103.

149 A. Reszka, *Statek z Dębego odnaleziony w korycie rzeki Narwi*, „Nautologia" 1992, no. 3–4 , p. 46–47; A. Piasecki, *Znalezisko wraka płaskodennego statku z Dębego gm. Nowy Dwór Mazowiecki*, „Rocznik Muzeum Wsi Mazowieckiej w Sierpcu" 2011, vol. 1, p. 23–33; W. Ossowski, *Przemiany w szkutnictwie rzecznym w Polsce. Studium archeologiczne*, Gdańsk 2010, p. 140–141.

150 W. Ossowski, *Statek z Dębego...*, op. civol., p. 141.

151 A. Reszka, op. civol., p. 47.

152 Ponowne badania pomiarowe wskazują na postępujący skurcz drewna. W 2007 roku klepki miały szerokość od 24 cm do 51 cm (Cf. A. Piasecki, op. civol., p. 26).

153 A. Piasecki, op. civol., p. 26

154 W. Ossowski, op. civol., p. 140–141.

155 http://www.czerwinsk.pl/index.php?cmd=zawartosc&opt=pokaz&id=5





Czerwińsk.

The reasons residents employed such upcycling are noteworthy. One was the scarcity of timber due to deforestation since the nineteenth century, as forests were converted to farmland[156]. Another was economic–building materials were often scarce and unaffordable for poorer inhabitants[157], who built houses of clay or unfired brick[158]. Berlinka timber was much cheaper than sawmill lumber and consisted of selected, knot-free wood. Emotional factors also played a role: interviews suggest that building with ship elements affirmed professional identity and the community's Vistula-river heritage. For surrounding farmers, practical considerations predominated.

Today, construction seeks "new materials" from waste, termed recycling or upcycling[159]. It appears that Polish rural communities practiced upcycling "before it was fashionable." Evidence includes houses built from ceramic and sawmill waste in Podlasie[160] and structures using ship elements[161]. Such buildings are undervalued examples of ingenuity and resourcefulness, offering valuable insights into architecture and contemporary discussions on reuse.

These structures highlight the uniqueness of the place and reframe Flatt's "handful of wretched houses." They underscore Czerwińsk's distinctive Vistula character and justify further listings in the provincial heritage register[162].

156 Z powodu wysokich cen drewna w okresie przedwojennym szkutnicy z Czerwińska pozyskiwali materiał z okolic górnej Narwi lub okolic Augustowa (A. Reszka, *Wiślane statki*..., op. civol., p. 79).

157 Z. Cieśla-Reinfuss, *Materiały do sztuki ludowej Mazowsza Płockiego*, „Polska Sztuka Ludowa – Konteksty", 1953, vol. 7, z.1, p. 38–55.

158 U. Koźmińska, *Nowe materiały w architekturze mieszkaniowej. Reutylizacja, recykling, upcykling, cradle-to- cradle – przyszłość czy utopia?*, „Środowisko Mieszkaniowe" 2013, no. 11, p. 256 -263.

159 I. Horba, J. Szewczyk, *Ceramika zastosowana w budownictwie ludowym jako cenne dziedzictwo kultury materialnej w podlaskiej gminie Czarna Białostocka*, „Architecturae et Artibus" 2012, no. 13, p.18- 25.

160 P. M. Pogodziński, *Drewno szkutnicze jako materiał budowlany*, „Nautologia" 2017, no. 154, p. 77–80.

161 Obiekty zabytkowe planowane do włączenia w ewidencji wojewódzkiej. Spis dostępny na stronie http:// czerwinsk.bipgmina.pl (data dostępu: 28.01.2019).

162 Należy podkreślić, iż Stowarzyszenie „Nasz Czerwińsk nad Wisłą" prowadzi różne działania, które przyczyniają się do ochrony i dokumentacji wielu wartościowych obiektów w przestrzeni Czerwińska.

This architecture merits further study of river shipbuilding and wooden rural and small-town architecture. Comprehensive documentation is essential to preserve memory of this integral element of the Vistula landscape for future generations[163].

While the inscription of Czerwińsk's urban layout in the heritage register prevented drastic alterations, urgent efforts are needed for full documentation and interdisciplinary research due to two factors: ongoing degradation[164] and the passing of the last builders and users [165]. Research goals should include identifying ship elements used as building material, their variety and complexity of application. Dendrochronological studies could determine vessel age and construction dates. The resulting data would clarify traditions of ship element reuse.

Czerwińsk is a unique place in Poland and Mazovia. Long overshadowed by larger centers like Wyszogród and Zakroczym, its slow development fostered stagnation. Today, thanks partly to residents' resistance to change, Czerwińsk has the potential to become a distinctive tourist attraction. Its rich heritage, natural and landscape values support this potential[166]. As Oskar Flatt wrote in 1854: "For Czerwińsk, the present is the past, and the past the present, for the past is the expression of its being."[167].

More than 150 years ago this was a reproach; today, however, this characterization appears to contain a potential that has already been recognized by filmmakers, as the town has served as a filming location for numerous films and television series1[168]. Czerwińsk is also the setting of an adventure novel addressed to a younger readership[169].

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163 Dla wielu mieszkańców nawet niewielkie remonty są poza ich możliwościami finansowymi.

164 Wielu młodszych mieszkańców nie pamięta historii powstania obiektów.

165 M. Szulińska, op. civol., p. 33.

166 O. Flatt, op. civol., p. 24.

167 https://pl.wikipedia.org/wiki/Czerwi%C5%84sk_nad_Wis%C5%82%C4%85 (data dostępu: 28.01.2019).

168 (accessed 28 January 2019).https://pl.wikipedia.org/wiki/Czerwi%C5%84sk_nad_Wis%C5%82%C4%85

169 Z. Orlińska, *Detektywi z klasztornego wzgórza*, Łódź 2015.

Conclusion

The Unconscious Ecology of Everyday Life – past – present – future –

From a cultural and ecological perspective, architecture built of clay, stone, and bog iron ore constitutes evidence of a harmonious coexistence between humans and the environment. The secondary use of shipbuilding materials, as well as other construction materials, testifies to architectural traditions while simultaneously expressing pro-ecological thinking long before it entered scholarly and public discourse[170].

The choice of such materials was not solely the result of poverty or necessity; it also reflected a practical approach to resources and an ability to use them effectively. It exemplifies how traditional local communities were able to find a balance between subsistence needs and the opportunities offered by nature. The selection of building materials was influenced by three fundamental factors:

1. Geographical – Limited access to timber compelled communities to reach for alternative raw materials. In central Polish counties such as Kutno or Płock, where forest cover fell below 10%, wood was a scarce commodity. The lack of local resources and the high cost of imported timber encouraged householders to use clay or stone. In regions with restricted forest resources, timber became a deficit material and its price increased, particularly when it had to be transported from distant areas. In such circumstances, builders turned to local materials that were readily available and required no complex processing–above all clay, fieldstone, and bog iron ore.

[170] Zob. m.in. M. Kamieniarz, *Nowatorskie i ekologiczne budownictwo z gliny*, „Czasopismo Inżynierii Lądowej, Środowiska i Architektury 2016, vol. 33, p. 151–158; M. Hyła, D. Kupiec-Hyła, Domy z lekkiej gliny. Poradnik budowy szkieletowych domów z wypełnieniem z lekkiej gliny, Kraków 1994; A. Kapłańska, Powrót budownictwa naturalnego, „Krakowski Rynek Nieruchomości" 2017, no. 14, p. 14–15; M. D. Nowak, *Tradycja domów proekologicznych. Przykłady polskie*, „Mazowsze. Studia regionalne 2017, no. 20, p. 25–38.

The choice of a specific building material was also influenced by climate[171]. Regions with harsher conditions required tighter and warmer constructions, which favored the use of clay as an insulating material, both in walls and in earthen floor layers.

2. Economic – Clay and stone construction occurred more frequently among poorer social strata. In the Dobrzyń Land, clay walls were erected primarily by smallholding farmers, while in Warmia and Masuria they were built by the poorest peasants. Maria Fryczowa noted that clay houses were often erected "on the site of former wooden ones–wood is becoming increasingly expensive, while good clay can usually be dug on one's own field." In this context–the economic factor–one of the key elements was wealth. Poorer householders opted for cheaper and more readily available materials that were literally at hand and could be obtained within the boundaries of their own farms, such as clay or so-called fieldstone.
3. Cultural – Architectural patterns circulated between regions, leading to the adaptation of building techniques. Clay and stone, although associated mainly with deforested areas, also appeared where a tradition of their use already existed. In this case, we are dealing with the diffusion of cultural patterns rooted in different architectural regions[172]. Population movements, the exchange of experience, and the observation of neighbors meant that traditions of using alternative building materials also emerged in regions where natural conditions did not compel their use. Gerard Ciołek attributed greater importance to the first of these factors–the geographical one–considering resource availability and climate to be decisive in shaping the built landscape. Economic and cultural factors he regarded as less significant.

From the perspective of ethnology and research on the ecology of traditional cultures, all of these elements formed an inseparable nexus. The

171 G. Ciołek, *Wpływ środowiska geograficznego na formy osadnictwa i budownictwa wiejskiego w Polsce*, „Lud", 1952, vol. 39, p. 239–243.

172 „Za region architektoniczny uważano zatem obszar, na którym dominują formy budowlane i plastyczne o cechach identycznych, bądź podobnych, właściwych dla wydzielonego obszaru." in: M. Gładyszowa, op. civol., p. 279.

decision to build a house of clay, stone, or bog iron ore was not merely a reaction to a lack of timber, but also evidence of cultural flexibility and resource management in the spirit of sustainability–long before the concept itself was formulated.

Materials such as stone and clay, and finally bog iron ore, were most often used to erect farm buildings–stables, cowsheds, pigsties, as well as barns. By contrast, the oldest residential buildings preserved in the field that were made using clay can be dated to the mid-nineteenth century. It suffices here to mention the barn in Lisice Folwark or the residential building (most likely a czworak) in Studzieniec.

As Tomasz Czerwiński observed: "In connection with the nineteenth-century transformation of the countryside, the shortage of construction timber and its high cost, masonry construction based on local, easily accessible materials such as fieldstone and clay began to spread."[173]. As a result of the research conducted, one cannot fully agree with the statement by Zofia Cieśla-Reinfussowa, according to whom:

> **In rather exceptional cases other building materials are used in Mazowsze Płockie, and clearly as substitute materials employed by poorer populations or in the erection of farm buildings. Rammed-earth residential houses were recorded in Czermno, Gostynin County; farm buildings–in Krzywie, Gostynin County.[174]**

In the Mazowsze Płockie region, clay and stone were indeed substitute materials, and for a long time wood remained the primary building material. Nevertheless, in the field one can find a large number of preserved farm buildings–stone, clay, or stone-and-clay–as well as clay residential buildings; it is enough to mention localities such as Głuchowo, Kolczyn, or Żółtowo.

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173 Vol. Czerwiński, *Osadnictwo i budownictwo ludowe na Mazowszu północno-zachodnim w XIX i na początku XX wieku*, Sanok 1995, p. 33.

174 Z. Cieśla-Reinfussowa, *Materiały do sztuki ludowej Mazowsza Płockiego*, „Polska Sztuka Ludowa" 1953, z. 1.

The material for erecting clay, stone, and bog-iron-ore buildings was "at hand." [175]

Field research and ethnographic interviews indicate that local communities relied primarily on resources available in the immediate surroundings of their farms. Interviews conducted during fieldwork revealed that clay was extracted from adjacent fields–information encountered, among others, in Wernerowo. Sometimes clay was obtained directly at the site of the planned construction, as documented by accounts from Głuchowo.

The process of clay extraction left a lasting mark–micro-changes in the local landscape. As a result of raw-material extraction, depressions and pits were created, many of which have survived to this day. Frequently, these hollows transformed–through natural processes–into water bodies. In Wernerowo one can find a typical example of such adaptation: in a depression formed after clay extraction that filled with water, a farmer created a fish pond. Such practices demonstrate that rural communities not only exploited local resources but also assigned them new functions–transforming extraction sites into elements of a functional landscape. Importantly, materials such as clay, after a period of exploitation, underwent spontaneous renaturalization in the literal sense of the word. Leaving the cultural circuit, the building material returned to the natural cycle as a renaturalized sedimentary deposit. Despite anthropogenic impact, there was no permanent destruction of the landscape.

Stone is likewise a natural material with high ecological potential. In the case of Mazowsze and the Dobrzyń Land these are erratics–glacial boulders. Fieldstones were primarily gathered during agricultural work, when fields were cleared of boulders and erratics. In many cases they were collected locally and stored near buildings, to be used for foundations, fences, or roadside shrines. More rarely–when the local supply of stone was insufficient or when rapid construction was required–stone was brought from other villages or obtained from neighboring farms. Such solutions required social coordination and testify to the practical flexibility of local communities in managing limited resources.

[175] J. Szałygin, *Katalog zabytków osadnictwa holenderskiego na Mazowszu*, Warszawa 2004, p. 37.

Local extraction of clay and stone also had an ecological dimension. Using materials available in the immediate vicinity minimized the need for transport–thus saving energy, reducing costs, and limiting interference with landscapes beyond one's own farmstead[176]. At the same time, human-made forms resulting from these activities–such as clay pits or stone piles–were adapted to other uses–ponds, fences, foundations–indicating an understanding of the cyclical nature of materials and space.

Thus, from an ethnographic, cultural, and ecological perspective, the use of clay, stone, or bog iron ore should not be viewed solely as a manifestation of poverty or a lack of access to "modern" building materials. On the contrary, these traditional solutions reveal skillful and conscious adaptation to local natural conditions and rational management of available natural resources. The use of local raw materials–often combined with their reuse in subsequent constructions (so-called vernacular recycling)–was part of a strategy of thrift and self-sufficiency characteristic of rural communities. In this sense, clay, stone, and bog-iron-ore construction exemplifies a former "ecology of everyday life"–a practice of sustainable resource use arising both from necessity and from profound environmental knowledge and awareness of its limits.

Analysis of source materials and field evidence allows one to conclude that in Mazowsze Płockie and the Dobrzyń Land buildings of clay, stone, and bog iron ore were erected for both residential and farm purposes. The preserved remnants are dominated by utilitarian structures–cowsheds, pigsties, stables, and barns–which, despite their simplicity, display a high degree of functionality and durability. Observation of these buildings also reveals connections between construction techniques and practices of rural space use: solid stone or clay foundations, reinforcement of corners with juniper or heather branches, and the addition of plant fibers to clay mortars–all testify to a thoughtful building strategy adapted to local climatic, geomorphological, and social conditions.

Particularly noteworthy are observations concerning architecture associated with German settlement. Preserved buildings of former farmsteads,

176 M. Kamieniarz, *Nowatorskie i ekologiczne budownictwo z gliny*, „Czasopismo Inżynierii Lądowej, Środowiska i Architektury" 33(63): 2016 p. 151–152.

erected of clay or stone, confirm the broad application of these materials across different cultural traditions and indicate their durability and universality.

Equally important are findings on techniques of preparing clay mortars, which show a high degree of variation and local innovation. In addition to classic additives such as straw and sand, heather was used to increase cohesion, and juniper branches to reinforce building corners. Thanks to such practices, structures were more resistant to cracking and walls retained stability over many years.

It is also significant that the use of fieldstone in rural construction in Mazowsze Płockie and the Dobrzyń Land persisted into the second half of the twentieth century. This testifies to the long tradition of employing natural building materials among local inhabitants and to the continuity of local construction solutions.

Bog iron ore was used on a larger scale in south-western Mazovia, while in Mazowsze Płockie and the Dobrzyń Land it appears mainly in the context of post-war crisis–especially after the Second World War–when shortages of industrial materials, scarcity of timber, and economic hardship prompted reliance on natural resources that had never been widely employed in regional rural construction.

Finally, there are materials of "multiple use." Resourcefulness, creativity, and pragmatism led inhabitants of the former countryside to manage building materials economically. There are known examples of repeated reuse of bricks, stones, and wooden elements in the construction of successive buildings. In the case of shipbuilding materials in particular, however, they also functioned as markers of identity rooted in the relationship between people and the river. Buildings erected from ship timbers in Czerwińsk, discussed above, were not merely practical solutions but also expressions of pride in professions and labor connected with the Vistula.

Inlight of the analyses conducted, it can be stated that clay, stone, and bog iron ore were not secondary materials, but elements of a complex adaptive strategy combining thrift, sustainable resource use, and local creativity. These studies underscore the role of traditional building as a source of knowledge about human–environment relations and as a key

component of the cultural heritage of Mazowsze and the Dobrzyń Land. Therefore, from a cultural-studies and ecological perspective, the non-canonical and reused-material constructions described in this book not only satisfied functional needs but also shaped the cultural landscape and the identity of place–and at times social identity. The loss of these structures and the process of forgetting unfortunately erase an important part of this heritage.

In conclusion, it is worth considering the potential of traditional construction using non-canonical and reclaimed materials. In the context of contemporary trends and ongoing research into clay and straw architecture, as well as the use of other materials now considered unconventional, knowledge of past architectural traditions of specific regions and subregions can be regarded as a source of inspiration and models worthy of emulation.

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