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RAMMED EARTHEN FARM BUILDINGS IN TWORKOWICE, CIECHANOWIEC MUNICIPALITY, N-E POLAND

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GLINOBITE BUDYNKI WIEJSKIE W TWORKOWICACH W GMINIE CIECHANOWIEC

Abstract

In June 2009 and October 2021 field surveys were performed in Ciechanowiec municipality, Wysokie Mazowieckie County, in south-western part of the Podlaskie region, N-E Poland, to look for semi-vernacular buildings made with raw materials or alternative constructions, such as rammed earth, wattle and daub, and cordwood masonry. In particular, a group of rammed earth barns was found and examined in a small village of Tworkowice. All those buildings were built in the 1950s, but their construction had been known in that region before that time. The intention behind this work has been to contribute to recognizing the distribution of hitherto underresearched vernacular or semi-vernacular earthen architecture in N-E Poland, as most researchers of vernacular and semi-vernacular architecture of the Podlaskie region have focused onto timber architecture rather than earthen constructions.

Streszczenie

W czerwcu 2009 i październiku 2021 roku na południowo-zachodnich krańcach województwa podlaskiego, w gminie Ciechanowiec w powiecie wysokomazowieckim przeprowadzono poszukiwania terenowe ukierunkowane na znalezienie dawnych wiejskich budynków wzniesionych z użyciem parobudulców i nietypowych konstrukcji, takich jak glinobitka, szachulec, mur z polan opałowymi i tym podobne. Najliczniejszą grupę budynków glinobitych odnaleziono w niewielkiej wsi Tworkowice. Pochodzą one z połowy XX wieku, lecz reprezentują konstrukcję, która w tamtych okolicach występowała już wcześniej. W niniejszej pracy zaprezentowano pozyskane informacje o tworkowickich budynkach glinobitych, przy czym zamiarem autorów było, by ów ilustrowany opis mógł być przyczynkiem do szerszego rozpoznania występowania i różnicowania budownictwa glinianego (jako podzbioru lokalnej architektury ludowej) w regionie, które to zagadnienie jak dotąd wymykało się naukowemu opisowi, gdyż gros badań podlaskiej architektury ludowej dotyczyło budynków i konstrukcji drewnianych.

Keywords: Polish vernacular architecture; Podlaskie; Ciechanowiec; Tworkowice; rammed earth

Słowa kluczowe: polskie budownictwo ludowe; Podlasie; Ciechanowiec; Tworkowice; glinobitka

INTRODUCTION

In June 2009, a search was conducted in the municipality of Ciechanowiec for old buildings made of untypical materials, particularly those with clay walls.¹

The reason for the search was the information obtained earlier about the locally higher occurrence of buildings made of clay (mainly with clay walls and clay walls re-

¹The 2009 research was conducted by Dr. Jarosław Szewczyk, with the participation of students of Białystok University of Technology, Faculty of Architecture.

inforced with juniper), firewood logs, brushwood, braids and similar materials, which categories of buildings were studied as part of the assessment of the structural and material diversity of folk architecture (vernacular and semi-vernacular²) in the Podlaskie region.

The field search was repeated 12 years later, in October 2021³. This time it was carried out in cooperation with the K. Kluk Museum of Agriculture in Ciechanowiec and was aimed at updating knowledge of the state of preservation of clay buildings or those made of other unusual construction materials, with a view to their possible preservation. Consideration was also given to translocating selected buildings or erecting copies of them on the Museum grounds, in the so-called 'clay sector' that could be created there. In the process, several previously unknown old buildings with walls made of unusual building blocks were found.

This article presents results from the village of Tworkowice, located on the Nurzec River about 5.5 km northeast of the Nurzec River's confluence with the Bug River, and 4.5 km south of Ciechanowiec. During interviews with villagers in 2006, opinions were obtained on the existence of approximately 20 clay-built outbuildings in the village dating back to the early post-war years (1945-1965, but mainly 1950-1955), and physically a few buildings were found at the time during the search (about 12, as searches and interviews could not be conducted on all properties). In 2021, 10 clay buildings were found.

This article summarizes the results of the research and describes the material and structural peculiarities of the Tworkowice clay buildings. The results are set in a historical and geographic context.

1. CONSTRUCTION FROM NON-STANDARD BUILDING MATERIALS IN CIECHANOWIEC MUNICIPALITY

Due to its proximity to Ciechanowiec, at the end of the 19th century and in the first decades of the 20th century, Ciechanowiec's building craftsmen (including Jewish ones) also influenced the construction of the village of Tworkowice, where their wooden buildings benefited from improvements inherent in small-town ar-

chitecture, for example as regards the design of cooker and chimney systems and types of carpentry joints.

The building movement was stimulated, among other things, by quite frequent fires, after which not only did the destroyed buildings have to be rebuilt, but also – at least sometimes – this had to be done quickly despite the scarcity or high prices of building materials. Ciechanowiec was particularly badly affected by war-time fires: almost the entire town burned down in August 1863 during the January Uprising, then in August 1915, and in August 1920 during the Polish-Bolshevik War as well as several times during World War II. In the meantime, larger fires occurred several more times: in 1874, about 170 Ciechanowiec houses burned down; extensive fires were also reported on 26th and 29th August 1900; smaller fires also occurred from time to time in the surrounding villages.

After fires or other emergencies, buildings in Ciechanowiec and the neighbouring villages were rebuilt using wood, less frequently bricks, but sometimes other substitute materials and atypical constructions, including claypit (with clay walls interlaid with juniper brushwood), straw plait with clay (a variant of half-timbered construction), and straw and wood plait (a variant of half-timbered construction),⁴ and, in the first decades of the 20th century, also from firewood logs laid like bricks on lime mortar. Sometimes the reason for choosing clay constructions and other alternatives to wood was not only the high price of full-value traditional building material (carpentry timber and even higher price of bricks), but also the fear of the combustibility of wood and the desire to reduce the cost of insuring the buildings which was lower for clay plastered buildings than for wooden buildings.

The Second World War resulted in the extermination of the Jewish population, which made up about half of the towns' population (in the case of the left-bank part of Ciechanowiec in 1921, 1603 out of 3291 inhabitants were Jewish). Until the Holocaust, the Jewish poor formed a significant part of the building clientele and some of them erected and lived in cheap houses made of parabudgets. The Holocaust wiped out the Jewish population in the towns of the region, but a measure of technological knowledge, including knowled-

² Vernacular architecture, otherwise known as native, folk or, more correctly, customary architecture, includes buildings of purposeful form and construction shaped by the summation of the experience of generations of folk builders. It was opposed to style architecture, which includes buildings designed by architects, and was therefore called 'architecture without an architect.' By contrast, by semi-vernacular architecture we mean buildings shaped as a result of the summation of the experience of generations of folk builders, but at the same time improved to some extent by the thought of an architect or improved by the efforts of talented individuals.

³ The 2021 research was conducted by Dr. Magdalena Sulima and Dr. Jarosław Szewczyk, with the participation of students from the Faculty of Architecture at Białystok University of Technology, including the authors of this article.

⁴ See the analysis of the issue in: [J. Szewczyk, 2009], [M. Czarkowska, U. Kuczyńska, 2016b].

ge of building material and technological alternatives, remained. Later, a top-down, post-war building advisory service introduced new alternative building technologies and supported construction with what were then called local materials, i.e. locally available substitutes for carpentry timber (for example, waste wood, sawdust, firewood) or materials to replace expensive bricks; thus, buildings with poly-lime walls began to be built using the Niewierowicz method.⁵ There were also dry-laid loft walls with lime fill and internal thermal insulation made from charcoal backfill and sawdust, walls made from homemade concrete blocks, cinder-block concrete, etc. Some villages near Ciechanów, such as Kozarze (only 2 km from Tworkowice in a straight line), became a kind of laboratory for various building constructions with the use of parabudgets, because in the above-mentioned Kozarze buildings with all the above-mentioned constructions and materials were erected between 1946 and 1955. The situation was similar in Ciechanowiec itself.

Both before and after the Second World War until the early 1960s, claystone reinforced with juniper brushwood was known and occasionally used in the municipality of Ciechanowiec and neighbouring communities. It was one of the more frequently used substitute building structures here. The most numerous group of juniper-clay farm and residential buildings was erected in Tworkowice during the first post-war decade.

2. TWORKOWICE CLAY BUILDINGS REINFORCED WITH JUNIPER

It is not known whether any clay-built buildings were erected in Tworkowice before the Second World War, but clay-built buildings reinforced with juniper were occasionally used in the surrounding villages; in fact, they could be found in villages in the valley of the Bug and Nurzec rivers along a roughly 60-km strip from Ostrów Mazowiecka to Siemiatycze (with Tworkowice and the entire Ciechanowiec municipality lying exactly in the middle of this strip). Some of the clay-built buildings in this area were old – for example, in the village of Krakówki-Dąbki (in the municipality of Grodzisk), just 15 km south-east of Tworkowice, there used to be a clay-built house dating back to the 19th century.⁶ Several pre-war buildings, constructed with clay (including clay interlayered with juniper), exist or existed

until recently in villages to the east and south-east of Tworkowice, towards Perlejewo (Pelch, Leszczka Mała and others).

After the Second World War, several farmers in Tworkowice decided to rebuild their houses using clay; later farm buildings were also built from this material, with a significant contribution made by a local foreman called Ilczuk, better known by his nickname 'Zuzga'. Buildings with clay walls reinforced with juniper brushwood were still erected until the 1960s, but this construction was later abandoned, among other reasons due to the labour-intensive nature of the work. They were also built in the surrounding villages, but not in such numbers as in Tworkowice. Here, as already mentioned, by the 1960s there were around 20 buildings with clay walls interlaid with juniper, of which 10 to 12 have survived to the present day (Fig. 1).

2.1. Dwelling houses

Several whitewashed clay houses can already be found at the entrance to the village from the Ciechanowiec side, one (on property No. 15) at the opposite exit from the village, and two (Nos. 20 and 9) within the

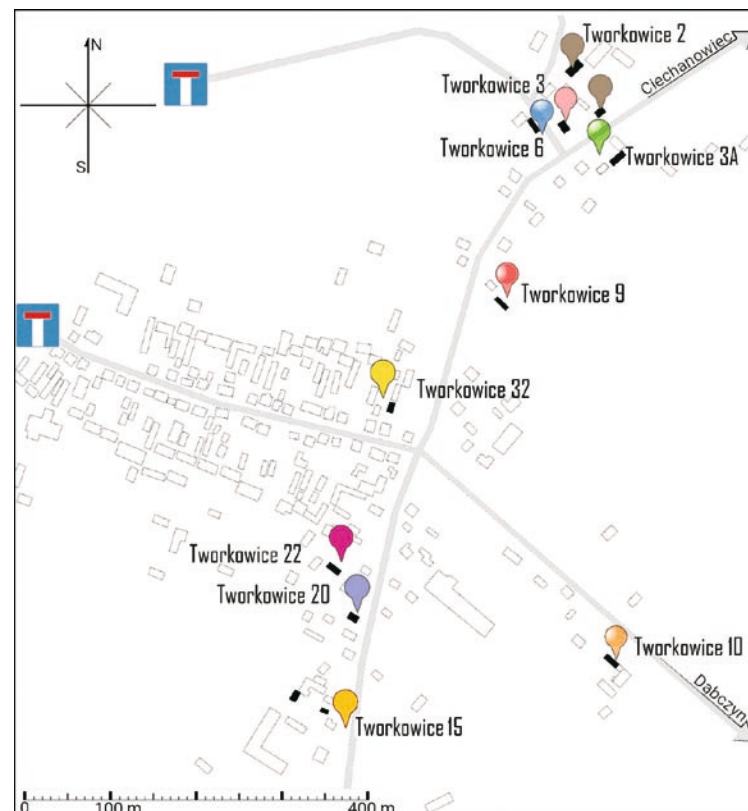


Fig. 1. A map of rammed earthen buildings distribution in Tworkowice, based on 2009 and 2021 field surveys; source: the authors

⁵ See: [M. Niewierowicz, 1930], [J. Szewczyk, 2010].

⁶ Information obtained during field research in 2009 from Stanisław Tryniszewski from the village of Siekierki, Drohiczyń municipality.



Fig. 2/a-d. Rammed earthen farmhouses in Tworkowice; source: the authors, 2009

loosely built-up area in the newer eastern part of the village (Fig. 2). No clay houses were found in the densely built-up old (western) part of the village.

Of these five houses (or more, as some information is uncertain), three are still inhabited. Information about their clay construction comes from the owners, neighbours and others (information was obtained successively between 2008 and 2022, but much of it was piecemeal or contradictory), nevertheless the clay-built construction is generally evident from the uneven texture of the walls, which – with one exception – have not been plastered but only white-washed with lime.

The other two former houses are interesting insofar as they were built as combined with a livestock section. They are no longer in use and, from the outside, only the chimneys, without which they would look like ordinary, small animal buildings, bear witness to their former residential purpose (Figs. 4-5). Inside, they usually have a vestibule and a living room with a brick and kettle cooker (Fig. 3), while the remaining rooms were used as non-residential. These buildings were whitewashed and unplastered. The falling off white-wash exposed the clay structure of the walls.

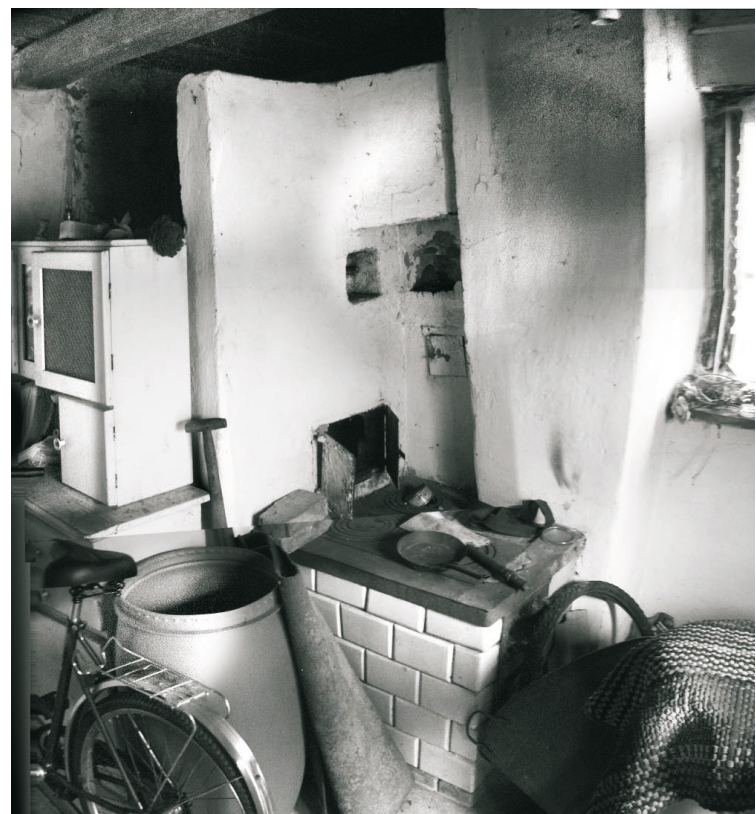


Fig. 3. Inside an earthen house in Tworkowice (No. 9); source: the authors, 2009



Fig. 4/a-d. An old earthen farmhouse in Tworkowice (No. 15); source: the authors, 2009

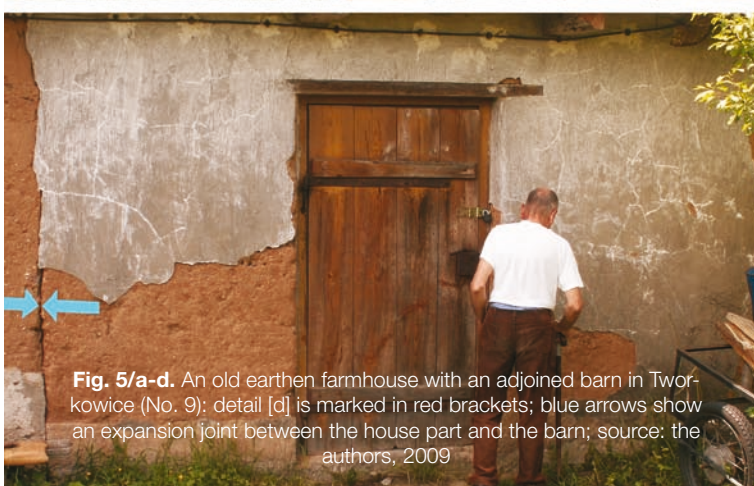


Fig. 5/a-d. An old earthen farmhouse with an adjoining barn in Tworkowice (No. 9); detail [d] is marked in red brackets; blue arrows show an expansion joint between the house part and the barn; source: the authors, 2009

2.2. Livestock buildings

In principle, barn walls were not made of clay, as this type of building material did not help to dry out the grain, straw or hay stored in the barn. Indeed, clay was used in the construction of barns, but only as a material for compacting threshing floors. Only one or two old barns at the entrance to the village have preserved their clay threshing floors to this day. In general, most of the barns preserved in the village are not very old and date from the 1970s and 1980s, involving the use of more modern building materials: hollow blocks, bricks and reinforced concrete pillars.

On the other hand, most of the clay-built buildings in Tworkowice are former small livestock buildings, designed to house a horse, several cows, pigs and chickens, but nowadays are no longer in use or at most serving a storage function. They may have been built on the basis of typical (model) designs, taking into account the clay-block construction. This could be evidenced by the repetition of several similar layouts of livestock buildings in different homesteads (with turrets on the axis of the gable wall; Fig. 6). Some of them have later extensions – wooden (Fig. 8/c,d) or of hollow blocks (Fig. 6/a,b, Fig. 7, Fig. 8/b, Fig. 10/c; Fig. 11/a).

The unplastered or stripped original thin plaster walls of the livestock buildings made it possible to compare their degree of erosion under weathering between June 2009 and October 2021 (Fig. 6/a,b, Fig. 7/a,b). During these more than 12 years, the cavities increased in the corners not exposed to the wind (irrespective of the sides) and at the window frames, while the wall planes did not suffer much damage (Fig. 7b). It is interesting to note that, some 70 years after they were erected, Tworkowice clay buildings generally remain in a good state of repair and some are well cared for and kept in excellent condition despite the lack of plaster to protect the masonry (Fig. 8/c,d; Figs. 9 and 11).

2.3. Structural nuances

A visual inspection of the Tworkowice clay buildings reveals a surprising paradox: the foundations of the pigsties and other livestock buildings are more solid than those of the houses. The dwelling houses were built on brick foundations up to about 35 cm above ground level (Fig. 2; Fig. 4/a,b,d), while the foundations of the seemingly more inferior livestock buildings are not only higher, elevated more than half a metre above ground level, but also more solid, made of large split stones (Fig. 4/c; Fig. 6/c,d; Figs. 7-10). That this is not the case is evidenced by the buildings comprising a re-

sidential and a livestock section. For example, in the building shown in Fig. 5, the residential part is separated from the livestock part and has a lower foundation than the livestock part.

There are two possible explanations for this paradox. The first is that the houses were built earlier, just after the war and under the pressure of necessity, so the building work was carried out in haste and no care was taken to ensure the soundness of the foundations. The farm buildings, on the other hand, were erected somewhat later and under the expert advice of delegated engineers or construction technicians and, as already mentioned, were probably built to typical designs.

The second explanation would take into account the fact that the clay could have eroded more quickly in pigsties than in houses, because in pigsties, where the animals were kept on high bedding and where they would have rubbed against the walls, the clay would have been exposed to dampness and mechanical damage, so this was prevented by building clay walls in advance on solid foundations, sometimes even almost a metre high (Fig. 10/a). Perhaps pigsties were also sometimes erected on the foundations of former houses. This would be evidenced by the case shown in Fig. 10/b, showing a foundation about half a metre high, but made of huge carefully split erratic boulders, where some stones are up to 80 cm in diameter.

Also worthy of comment is the very construction of the clay-bit walls of the Tworkowice buildings. The walls, including the foundation section, are usually just over 40 cm thick and about 250 cm high, of which the clay-beam section itself is about 190 cm high. It was rammed in double-sided sliding formwork with layers of clay 10-15 cm thick, so that the total height of the clay-bound wall consists of 14-20 layers, especially visible in areas of heavy erosion (14 layers can be seen in Fig. 4 and in Fig. 10; about 20 layers can be seen in Fig. 5/d; as many in Figs. 7, 9 and 11). After each three layers had been compacted, the formwork forms were raised by 30-40 cm. The clay was taken directly from the excavations. Each layer was interlayered with cut fresh juniper branches before compaction, and, if available, also with cut juniper and pine roots. Successive layers of brushwood were laid at different angles to the wall axis, so that the whole formed a bond. Once dried in the mass of clay, the juniper brushwood was not subject to further decay and to this day retains its hardness and strength, being a kind of reinforcement for the clay, and the entire such wall can remain stable for many decades.



Fig. 6/a-d. The most popular type of earthen barn in Tworowice (above: the same barn in 2009 and 2021); source: the authors, 2009 and 2021



Fig. 7/a,b. The same barn in Tworowice (No.10) in 2009 and 2021 (erosion visible); source: the authors, 2009 and 2021



Fig. 8/a-d. Rammed earthen barns in Tworkowice; source: the authors, 2009 (a, c, d) and 2021 (b)

3. TWORKOWICE EARTHENWARE CONSTRUCTION IN THE EYES OF THE NATIVES

During field searches in 2009 and 2021, attempts were made to obtain as much information as possible from villagers. The results were meagre: information turned out to be fragmentary and memory unreliable. Most often, respondents reported that construction from juniper and clay was initiated here by foreman Ilczuk, called 'Zuzga', although in neighbouring villages clay and juniper buildings were also constructed before the war, and in some places even before (or during) the First World War.

Tworkowice's clay building with juniper is more extensively recalled and described by Franciszek Wojtkowski from the neighbouring village of Wojtkowice (original flow of speech retained, interview October 2021): 'We got the ground clear, laid the fundaments,

that is, laid stones and poured cement between them. It was hard to access, but a bag or two for the fundaments was usually within reach. In the end, if there was no cement, lime was used. Then a box was set up, pins were put through it, there was a hole in the box, slats to secure the box, and caps were put on the top so it wouldn't come apart and move from side to side. One would pour in the clay, the other would compact it. A layer of clay, on top of that juniper and again. And so one by one we layered and built the wall. There were about three layers of juniper for a single layer of mould, because it wasn't hard to find. And later the roof was made of wood, because there was no other option - the roof had to be made of wood, and later the covering was of well beaten straw. The roof was made in such a way that there wasn't much of a span under the gable, so that the roof wouldn't collapse. In

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the beginning, beams were laid along each wall, later additional beams. When the building was rectangular, these additional beams were the length of the shorter wall and were laid parallel to it, every 2 metres. (...) The sheathing, if it was well made, could last up to 30 years, except that it was flammable, which was a disadvantage. Such sheathing could lie for a long time, but if it was well made. Only good straw was cut early, when the harvest was about to take place, there was still greenish straw, ripe grain, greenish straw, then they cut it with a scythe, threshed it with a flail and the straw was stiff. (...) The roof was made from the bottom up and when at the top, a row of straw was laid along the top, and

on top of that there were some goats made of wood, so the wind wouldn't blow the straw away. – Who built them? – Mainly family, sometimes neighbours, because they lived nearby and helped out, but everyone had their own work to do. In return for your help, later they helped you. The rule was – you help me today, and I'll help you tomorrow. If you finished building a house, you would have a 'wreath party', a celebration of the erection of the building. – How long did it take to erect such a building? – It depended on the building, but one thing was always the same, with every construction, if you made a row of clay, you had to wait for it to dry and then, most often, the next day you would put the



Fig. 9/a-d. A rammed earthen barn in Tworkowice; source: the authors, 2021



Fig. 10/a-c. Elevated foundations of rammed earthen barns; source: the authors, 2021

structure back on and add another row. Sometimes it was the next day, sometimes the same day, depending on how dry the clay was. Sometimes it took two weeks to put up the walls, because you had to wait for the clay to set... because when it was fresh it could all move apart and it was all done by hand, so it didn't go that fast compared to today. – Did anyone from outside participate in the construction? – No, if anyone did help it was someone from the village, someone local. I don't even know if there were plans drawn for the buildings, I think it was just for reference, because I remember my mother drawing a plan of one of the farm buildings herself. – How many furlongs of clay did you have to bring and where did you get it from? – The clay was usually from the field, (...) but not all the clay was suitable for building, because it was either too oily or too dry. The clay subsoil was dug somewhere in the field and from there the whole village usually took it. Later, when a new place was found and they dug there, people would take clay from there again. As a guide, 50 or more horse-drawn carriages were needed! Now, for comparison, an average trailer somewhere could probably hold 20 such carriages.'

4. DISCUSSION

Against the background of the rightful conviction about the former dominance of wooden construction in Podlasie, the role of historical building with the participation of clay seems to be marginal, omitting clay threshing-floors, clay cookers and chimneys and clay floor slabs, and sometimes clay joints of foundation stones. Although clay walls were built only when there was an urgent need, this type of construction was not unusual – in almost every old Podlasie village, among the dozens of wooden cottages, pigsties and barns, one or two buildings (sometimes more) had clay walls. The earliest and relatively most common of these unique buildings was the timber-framed loft structure [J. Szewczyk, 2009], known since at least the 19th century, while the most recent was the so-called 'rock' construction [J. Szewczyk, 2009], which in the vicinity of Ciechanowiec was understood to have walls made of logs laid with lime mortar, known there since the 1920s, but more widely used after World War II. On the other hand, the timeline and origin of the clay-block construction reinforced with juniper brush-



Fig. 11/a-b. Earthen barns; source: the authors, 2021

wood is questionable. It may have become popular in the first decades of the 20th century as an echo of the so-called Niewierowicz construction [see J. Szewczyk, 2010], which began to be promoted around 1911 in the Vilnius and Białystok regions. It could also – which seems more likely – have preceded that of Niewierowicz's, as juniper-reinforced clay walls were probably already known not only here in the Bug River valley, but also further afield in Belarus – along its Belarusian-Lithuanian border as far as the vicinity of the Latvian town of Dyneburg (Daugavpils).

On the other hand, it is very likely that in some villages alternative constructions were used so rarely that, although such buildings existed, the ways of erecting them were forgotten over time, and it was local tinkers, enthusiasts, rationalists or even tinkers from outside who contributed to their discovery and re-popularisation. In Tworkowice this role was fulfilled by the foreman 'Zuzga', nevertheless it is worth remembering that in this village, almost adjacent to Ciechanowiec, there was no shortage of creative, active and imaginative people, and some of them went down in history for good (e.g. Stanisław Karolkiewicz 'Szczęsny', later co-founder and president of the World Association of Home Army Soldiers; [see: J. Woźniak, W. Suleja, 2009]). Its history was also influenced by Ciechanowiec rationalists.

CONCLUSIONS

Field explorations were carried out in June 2009 and October 2021 in the municipality of Ciechanowiec, including in the village of Tworkowice, where there were formerly said to have been about 20 clay-built farm buildings dating from the early post-war years (1945-1965, but mainly from 1950-1955), and 12 were physically confirmed, of which at least 10 buildings survived to 2021, including 2 houses and 2 residential-inventory buildings; the remaining buildings had an inventory function. All of these buildings have walls of rammed clay in moulds, interlayered with thin layers of yawl brushwood. Thus, Tworkowice turns out to be the village with the highest proportion of this type of building, although this manner of construction was known and used in many villages in the Bug River valley, as well as in Belarus.

The Tworkowice clay and claystone buildings can hardly be classified as traditional vernacular buildings; rather, it seems that their creation should be interpreted as a rationalising invention based on immediate needs, resurrecting a technology that, although

already known in the past, was almost completely forgotten in Tworkowice itself until the Second World War, and its restoration was remembered by the locals as the work of one of the local builders.

Nonetheless, it seems that these buildings deserve scientific description and preservation, as they are a testimony to the peculiarities of the early post-war times, when economic and supply difficulties led decision-makers and the population to use so-called 'local materials', and ingenious rationalisers improved the old ways of building using clay, straw, brushwood, stones and similar materials. In the valley of the River Bug, and especially in the Ciechanowiec municipality, 'building with local materials' developed beyond average, as clay-beam, clay-silt, loft, glade and similar constructions were already known there. Today only relics of that construction remain.

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