The life and death of windmills in central Poland: Between lost heritage and the heritage of memory[1]

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The life and death of windmills in central Poland: Between lost heritage and the heritage of memory
Windmills are one of the most complex human inventions of the pre-industrial era. Making use of wind energy to serve human needs was not only a miracle of architecture and technology: it produced silent witnesses of history – an important part of a rural landscape, local identity and folklore. Thanks to their multiple roles, windmills are useful research objects for scientists in various fields. In Poland the first written records of windmills date from the thirteenth century. Shortly after World War II there were still about 3300 such constructions (many of them still fully operational) despite losses in the war. Today there are around 250 windmills under legal protection (around 70 of which were moved to open-air museums). This figure illustrates the vulnerability and progressive disappearance of Poland's windmills. Despite the efforts made to protect this heritage, often the only remnants of such objects are the memories people living nearby. These memories join the present with the past, recall people and their work, and preserve the memory of an item. Windmills that have ceased to exist are still present in people's collective remembering as a sum of their subjective experiences and impressions. In this paper,

[1] The article is a result of the three projects entitled: "Memory of the stones. The origin, use and sacralisation of millstones set into the walls of Gothic churches in the South Baltic Lowlands" (grant no. 2019/35/B/HS3/03933), funded by the National Science Centre. Project leader: Dr Dariusz Brykała IGSO PAS; "The memory of stones. Origin, use and sacralization of millstones embedded in walls of Gothic churches within the Southern Baltic Lowlands" (grant no. 2019/35/B/HS3/03933), funded by the National Science Centre, Poland. Project leader: Dr Dariusz Brykała & "The Heritage of Frost Giants. From the Geomythologies to the Cultural Geomorphology of Erratic Boulders in the Young Glacial Area of Poland" (grant no. 2023/49/N/HS3/02181), funded by the National Science Centre, Poland. Project leader: Dr Robert Piotrowski

we decided to combine different approaches to the matter of heritage – both tangible and intangible. We argue for the importance of collecting recollections of ordinary people and interviews with eyewitnesses, as well as examples of institutional or private efforts made to protect windmills, to explain the equal value of both of these methods for preserving memories about the work and skills of millers – that is, the memory of a profession that was once a vital part of cultural identity.

Keywords: windmills, industrial herotage, heritage of memory, Poland

"It was such a decoration for
our village. I liked going there.
I don't know when it was
demolished [...] There was a road
with mulberries leading there.
A beautiful windmill". (F.a.85)

Introduction: Why is saving the memory of windmills so important?

The choice of windmills as a research angle was based on their special status and importance to local cultural heritage – both tangible and intangible – and in connection with their ongoing disintegration.[2] Windmills have been present in Poland since the thirteenth century. Like a number of other economic facilities, they have suffered the consequences of many tragic events resulting from the country's complicated history, to which they bore silent witness. A huge number of windmills were destroyed during the two world wars. The rapid loss of windmills in the twentieth century was also influenced by certain political changes that took place after the end of World War II, which had a negative impact on development of milling using windmills, as well as family enterprises engaged in grain milling. Therefore, the second half of the twentieth century was a period that saw the death not only of those who carried out this profession, but also of the objects themselves. Windmills are constructions with a relatively fragile structure, subject to atmospheric conditions and vulnerable to biological degradation of the building materials, simple vandalism, or wilful destruction by landowners. Only a small fraction of Poland's formerly vast milling heritage is under legal protection.[3] One form this protection takes is moving the object to an open-air museum[4]. In early 2020 there were 71 windmills under the protection of museums.[5] However, it often happens that even organised actions, when undertaken without understanding the uniqueness of this type of architecture, irreversibly destroy the original structure and turn it into a memory prosthesis – an architectural shell of no great value which primarily serves the function of entertainment or education. This frequently occurs in the case of private initiatives aimed at protecting windmills, but can also occur with poorly planned museum interventions.

Taking all these aspects into consideration, we decided that the narratives of eyewitnesses and people experiencing these places are an important form of preserving the memory of

[2] MOSAKOWSKI, Zachariasz, et al. Watermills and windmills as monuments in Poland – Protection of cultural heritage in situ and in open-air museums. In: *Muzeológia a kultúrne dedičstvo*, vol. 8, 2020, Is. 3, pp. 41–62; VECCO Marilena A definition of cultural heritage: From the tangible to the intangible. In: *Journal of Cultural Heritage*, vol. 11, 2010, No. 3, p. 323.

[3] Research conducted in 2019–2020 found 576 entries in the register for milling and milling-related facilities, 254 of which were related to windmills. In 1954 there were almost 3,300 such objects inventoried in Poland, illustrating the scale of disappearance of windmill heritage. MOSAKOWSKI et al., pp. 44, 52.

[4] ŚWIĘCH, Jan. Ochrona młynarstwa wiejskiego w polskich muzeach na wolnym powietrzu. Założenia i realizacja. In: A. Przybyła-Dumin, B. Grabny, P. Roszak-Kwiatek (eds). *Młynarstwo tradycyjne – wczoraj, dziś, jutro… Problemy zachowania ginącego dziedzictwa*. Chorzów: Muzeum "Górnośląski Park Etnograficzny w Chorzowie", 2017, p. 141.

[5] MOSAKOWSKI et al., Watermills and windmills… p. 54.

windmills and frequently the only source of knowledge about them. In this sense, intangible heritage can be considered a carrier of knowledge about tangible heritage. It is a repository of human memories which protects and transmits the memory of the past. Knowing that the posthumous existence of windmills that have been destroyed is closely intertwined with the lives of people who remember them, memories about them take on special value and significance. When those people die, it will mark the very end of the objects. Single extracted material memory carriers, such as millstones, which often appear in new functional contexts, are also of great value.[6]

This article is an attempt to capture multi-vector processes: the death of objects that are a part of Poland's cultural heritage; their functioning in residents' memory, and capturing the value of an object in order to maintain the memory of and read the past. Thus, the "voices" of both people and objects will be heard in this article.

Method

The first step was to conduct archival research.[7] This identified catalogue cards from the late-nineteenth/ early twentieth century pertaining to 150 windmills in the northwest Mazovia region. They were used to conduct a typological analysis of conservation and determine the specific types of windmills found in this area. Tactical maps of the Military Geographical

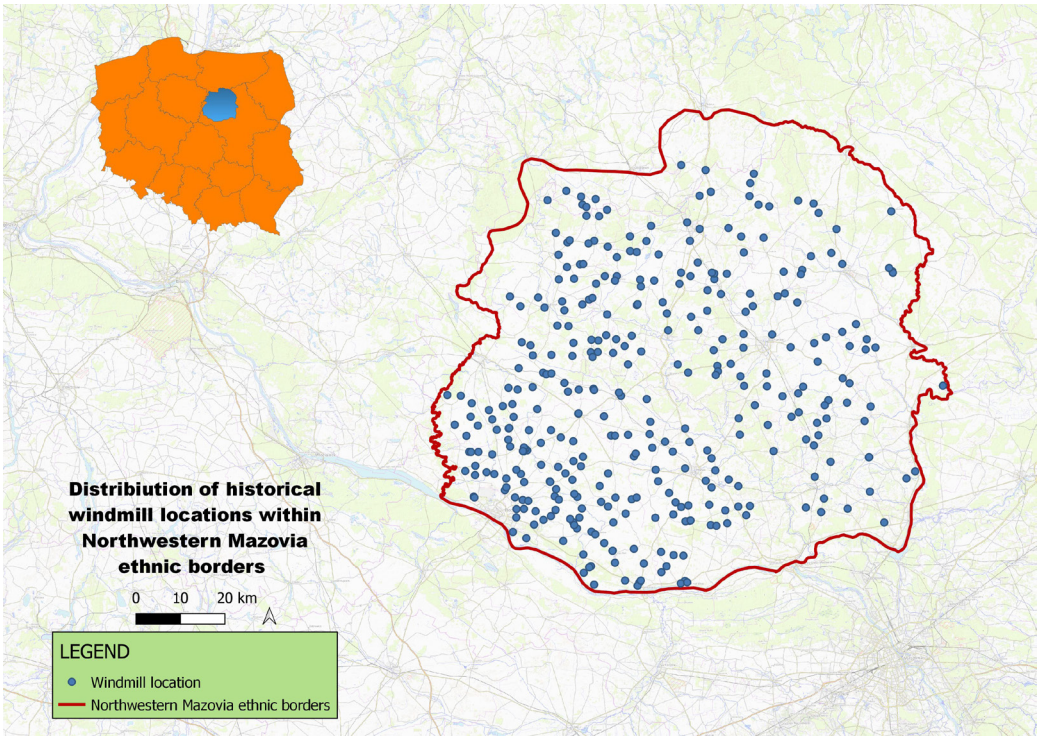

Fig. 1: *Map of windmills northwest Mazovian Region.*

[6] BRUMANN, Christoph. Cultural Heritage. In: J. D. Wright (ed.). *International Encyclopedia of the Social & Behavioral Sciences*, Second Edition. Vol. 5. Oxford: Elsevier Ltd., 2015, pp. 414–419.

[7] Urząd Ochrony Zabytków w Płocku, Urząd Ochrony Zabytków w Ciechanowie, Muzeum Wsi Mazowieckiej w Sierpcu.

Institute in Warsaw (WIG) were also examined;[8] they revealed 351 windmills that still existed in the 1920s and 1930s and enabled us to reconstruct their distribution in relation to rural and small-town settlements (see Fig. 1).

Ethnographic field research was conducted in 2018 and 2022. They resulted in 52 ethnographic interviews and a two-hour film recorded with the participation of a 95-year-old miller.[9] The research topics oscillated between people's memories about millers, an evaluation of their work, and the windmills themselves. Interviews were conducted both with relatives of millers and with people not directly related to miller families. Qualitative interviews were conducted in the form of a free conversation typical of an unstructured interview.[10] Thanks to this approach, the interlocutors did not feel embarrassed and could pay attention to issues that were important from their point of view and value the objects or the events related to them according to their own value system. In this way, the element of research exclusivism was minimised or even excluded.

This article uses the terms "phantom object", "reused object" and "memory prosthesis", the meanings of which require clarification. A *phantom object* refers to an object that does not exist or exists in a state of complete destruction, the memory of which has been preserved in local records – whether in social or individual memory or physical source materials. It generates narratives that can be inspired by empty places, remains of objects, photographs and maps. A *reused object* refers to the phenomenon of upcycling or cultural recycling and is associated with the conscious use of construction elements or parts of historical objects in a new typological and symbolic context. A *memory prosthesis* is somewhat analogous to a memory object;[11] it refers to objects that have replaced an original ones both at the level of part-to-whole, and in terms of the substitution that occurs at the level of the original–model relationship. This phenomenon may imply positive values – substitutive, memorative and mnemonic – as well as negative ones related to misleading the observer. An example of this are copies of objects in state and private open-air museums which have little value beyond simulacra

This article also forwards the metaphorical concept of "windmill death", reflecting the fact that in Polish milling culture the destruction of a windmill was described in this way – a great example of anthropomorphising of objects.

Birth and development of milling in Mazovia

Polish researchers' opinions are divided as to the number of windmills at the turn of the sixteenth and seventeenth centuries in Masovia.[12] The source materials clearly show that the

[8] http://igrek.amzp.pl/; BRYKAŁA, Dariusz, et al. Wykorzystanie energii wiatru i wody w okresie ostatnich 200 lat na obszarze województwa kujawsko-pomorskiego. In: *Prace Komisji Krajobrazu Kulturowego* 29, 2015, p. 12.

[9] PIOTROWSKI, Robert. *"Jednemu się zmiele, drugiemu się skrupi". Młynarze i młyny w pamięci zbiorowej mieszkańców pogranicza mazowiecko-dobrzyńskiego*. Toruń: Wydawnictwo Naukowe UMK, 2021.

[10] ESTERBERG, Kristin G. *Qualitative Methods in Social Research*. Boston: McGraw-Hill, 2002, pp. 89, 103–104; SKINNER, Jonathan. A Four-part Introduction to the Interview: Introducing the Interview; Society, Sociology and the Interview; Anthropology and the Interview; Anthropology and the Interview – Edited. In: *The Interview: An Ethnographic Approach*. J. Skinner (eds). London & New York: Routledge, 2020, pp. 10–11.

[11] KIRSCHENBLAT-GIMBLETT, Barbara. *Objects of Memory: Material Culture as Life Review*. In: E. Oring (ed.). *Folk Groups and Folklore Genres: A Reader*. Utah: State University Press, 1989, pp. 330–331.

[12] PIETRZAK, Janusz. *Nowożytne budownictwo przemysłowe w dobrach biskupich na Mazowszu*. Łódź: Katedra Archeologii Historycznej Instytutu Archeologii Uniwersytetu Łódzkiego, 2013, p. 185; PAWIŃSKI, Adolf. *Polska XVI wieku pod względem statystyczno-geograficznym*. Vol. 5. *Mazowsze*. Warszawa: Skład główny Gebethnera i Wolffa, 1895, p. 133.

nineteenth century was the heyday of milling with windmills.[13] According to statistical data from 1830, 663 millers were registered in the region then known as the Płock Voivodeship.[14] This number includes millers employing both wind and water, as well as those were working on boat mills.[15] Throughout the entire period of the Kingdom of Poland, i.e. between 1870 and 1914, windmills and watermills were the most popular type of mills. In 1876, out of a total of 5,991 milling plants, only 76 were steam mills,[16] the remaining group being wind, water and boat mills. Given northwest Mazovia was part of the Kingdom of Poland, these proportions can be applied to this region. In 1899 there were 167 watermills, 637 windmills and only one steam mill in the Płock Governorate.[17] Statistics from later years show changes in the percentage ratio between modern steam/electric mills and wind/watermills.[18]

The analysis of detailed maps of the Military Geographical Institute in Warsaw from the 1930s identified the locations of 351 windmills in the studied area. According to the data from 1939, there were over 70 windmills in the Płock district alone.[19] Taking into account the number of watermills (20) and motorised mills (17) operating in the Płock district at that time, the total number of mills was approximately 107.[20] Therefore, it can be estimated that there were approximately 100 watermills and windmills operating in the Płock district. The district included 821 towns, so there was one windmill for approximately every eight towns.

The oldest and most common type of windmill was the post mill. A post mill is built around a central vertical post around which the entire building rotates.[21] Post mills occur across

[13] BRYKAŁA, Dariusz; et al. Wykorzystanie energii wiatru i wody w okresie ostatnich 200 lat na obszarze województwa kujawsko-pomorskiego. In: *Prace Komisji Krajobrazu Kulturowego* 29, 2015, p. 10.

[14] RODECKI, Franciszek. *Obraz jeograficzno-statystyczny Królestwa Polskiego*. Warszawa: Drukarnia Gałęzowskiego i Kompanii, 1830, p. 5.

[15] *LUSTRACJA województwa mazowieckiego 1565, cz. I*. I. Gieysztor, A. Żaboklicka, (eds). Warszawa: PWN, 1967, p. 142; CHLEBOWSKI, Bronisław. *Słownik geograficzny Królestwa Polskiego i innych krajów słowiańskich*. Vol. 15, no. 1. Warszawa: Nakładem Władysława Walewskiego, 1900, p. 374; ŻEBROWSKI, Tadeusz. Stolica książąt mazowieckich i płockich (1138–1495). In: M. Kallas (ed.). *Dzieje Płocka*. Vol. 1. *Historia miasta do 1793 roku*. Płock: Towarzystwo Naukowe Płockie, 2000, p. 78; GAWARECKI, Wincenty, H. *Opis topograficzno-historyczny ziemi wyszogrodzkiey na teraz w obwodzie i województwie płockiém położonéy*. Warszawa: W Drukarni Zawadzkiego i Węckiego, 1823, p. 22; BRYKAŁA, Dariusz, et al. Traces of disappearing heritage: Upcycling of wooden vessels preserved in the vernacular architecture of a large river valley in Central Europe. In: *Rural History,* vol. 34, 2023, No. 2, pp. 243–261.

[16] PUŚ, Wiesław. *Przemysł Królestwa Polskiego w latach 1870 – 1914 Problemy struktury i koncentracji*. Łódź: Uniwersytet Łódzki, 1984, p. 220.

[17] *GUBERNIA PŁOCKA POD WZGLĘDEM GEOGRAFICZNO-STATYSTYCZNYM I ADMINISTRACYJNYM*. Kalendarz Informator Płocki na rok 1899. Płock: Drukiem K. Miecznikowskiego, 1899, p. 41.

[18] DZIK Antoni. *Młynarstwo w Polsce*. Warszawa: Nakładem Związku Młynarzy Polskich, 1928, p. 20; TURCZYNOWICZ Stanisław. Wyzyskanie sił natury w Polsce dla celów energetycznych. In: *Roczniki nauk rolniczych i leśnych* 33, 1934, p. 464; TURCZYNOWICZ Stanisław. Wiatraki w Polsce. In: *Sprawozdania i Prace Polskiego Komitetu Energetycznego* 8, 1934, p. 648.

[19] KURSKI, Ignacy, J. Opisanie powiatu płockiego, jego granice administracyjne, ukształtowanie, wody, klimat, rolnictwo i przemysł. In: I. J. Kurski (e.d). *Kalendarz informator Mazowsza Płockiego i ziem sąsiednich*. Płock: Wydawnictwo B-ci Detrychów w Płocku, 1939, p. 31.

[20] KURSKI, Ignacy, J. (1939), p. 31.

[21] STOKHUYZEN, Frederik. *Dutch Windmills*. Bussum: MW Books Ltd., 1962; LANGDON, John. *The "Engineers" of Mills in the Later Middle Ages*. London: Society for the Protection of Ancient Buildings, Wind & Watermill Section, 2007; LUCAS, Adam. *Wind, water, work: Ancient and Medieval Milling Technology*. Leiden-Boston: Brill Academic Publishers, 2011, p. 111; MOOG, Berthold. *Introduction to Molinology: History, Technique and Culture of Traditional Mills*. Binningen: The International Molinological Society, 2018, p. 74; PRARAT, Maciej. *Młyny wodne, wiatraki i kieraty w XIX i 1 połowie XX w. na terenie Pomorza (w granicach dawnych Prus Zachodnich). Technika i architektura*. Toruń: Wydawnictwo Naukowe UMK, 2023, p. 267.

Europe, though they differ according to region. The main structural elements of Polish post mills are similar to those used most commonly in Germany; however, certain technical elements represent independent solutions.[22]

The next most common type of windmill was the paltrock mill (sometimes spelled paltrok). A paltrock mill has a rotating construction which rests mainly on rollers, sometimes only supported by a small post.[23] This type of mill was invented in the Netherlands in the sixteenth century as a sawmill.[24] It should be noted that the grinding machines in Poland refer in their design, function and construction directly to those used in Germany in the nineteenth century.

The least common design in Mazovia was the smock mill, in which the head and roof are rotatable and mounted on a wooden block.[25] This type of mill was also invented in the Netherlands in the sixteenth century. In Poland, it was most popular in the northern regions. As with paltrock mills, the Polish construction style was more similar to German designs. During the research, no tower windmills (with brick bases) were found in this area.

Based on information obtained from catalogue cards from the 1950s and 1960s, out of 150 windmills described, 100 were post mills, 14 were paltrock mills and two were smock mills. The remaining 34 windmills remain unidentified. However, on the basis of analysed photos it can be confidently stated that they were not smock mills. Therefore, all three basic types of windmills were present in the studied area.

Windmills were most often located a short distance from settlements or on their edge. Occasionally, they were located between villages. The smallest group were mills located in rural areas. In small towns they were usually built on the outskirts – in the border zone.[26] In summary, it can be concluded that in Mazovia region the most characteristic type of windmill was the simplest post mills.

The calculations above illustrate – in quantitative and qualitative terms – how important windmills were for the cultural landscape in the studied area between late nineteenth and first half of the twentieth century. The number of mills and their construction features – as well as the status of people associated with them – distinguished them from other rural facilities. They played an important utilitarian but also symbolic function in the village space.[27]

Death of windmills

A few windmills have survived to this day in northwest Masovia. These are single examples, and include those in Ługi, Drobin, Bodzanów, Zeńbok, Kosemin, Brzechów, Gradzanów Zbąski and Bielsko (Photo 1). However, in most cases, what remains of former windmills are only memories connecting the objects with the places:

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[22] TIJMAN, E. *Paltrock windmills in middle and eastern Europe*. In: F. Stüdtje, (ed.), *Transactions of the Seventh Symposium of Molinology*. Schleswig-Holstein, Hamburg: The International Molinological Society, 1994, pp. 373–391; ŚWIĘCH, Jan. *Tajemniczy świat wiatraków*. Łódź: Polskie Towarzystwo Ludoznawcze, 2005, p. 50.

[23] BICKER CAARTEN, Anton. *The early history of windmills in the Netherlands*. In: *Transactions of the 1 International Symposium of Molinology*, Portugal-Biblitheca Molinologica, 1965, p. 156.

[24] COUWENHOVEN, Ron. *1100 Zaanse Molens*. Zaandam: Stichting Uitgeverij Noord-Holland in samenwerking met Vereniging De Zaansche Molen, 2015.

[25] NOTEBAART, Jannis C. *Windmühlen. Der Stand der Forschung über das Vorkommen und den Ursprung*. Den Haag, Paris Mouton Verlag Den Haag, 1972, pp. 25–26.

[26] ZAYATS, Inna. The Historical Aspect of Windmills Architectural Forms Transformation. In *Procedia Engineering* 117, 2015, p. 689.

[27] YILMAZ, Meltem. Architectural identity and local community. In: *Ekistics* 73, 436/441, 2006, p. 140; ADAMCZEWSKI, Jerzy. *Młynarstwo magiczne*. Wrocław: Polskie Towarzystwo Ludoznawcze, 2005, p. 52.

Photo 1.

> When I was young, I used to sit on the stones that were left of the windmill. And you looked and you looked […] These stones were lying where the windmill used to be. (M.a.60)

> In Dębsko? There was no windmill in Dębsko. Unless it's for corn or something [...]
> For meal? Maybe for meal. But nothing like this one. One like this one was in Garków Stary. On the left side of Nadratowo as you drive. There you can see these logs, this pile, because it fell down two or three years ago. When you drive along, you can see a pile like this. (M.a.45)

This state of affairs was influenced by both World War II and the new political system in Poland after 1945. The post-war authorities did not support the development of private business activity. The effects of this policy also influenced the milling industry. Under communist rule, restrictions on milling work and excessive taxes led to these facilities no longer being used for their intended purpose, as it was no longer profitable. Analogies can be found in the process of extinguishing/liquidating watermills.[28] This trend had a direct impact, leading to frequent changes in the operational status of windmills and, eventually, their destruction. Useless windmills were frequently converted into warehouses, granaries and even barns. These changes had negative consequences for both structures and construction materials. Windmills designed to rotate around their own axis tilt on one side if not used in this way.[29] This destroys the load-bearing elements and other parts of their structure. Propellers left in one position became warped and damaged:

> As I recall, it was here. The wind was blowing it away – sometimes the boards, sometimes the propellers. There it was. I don't remember when it fell apart because I didn't live here for long. […] It was a symbol of Stobiecin, because there were no others like this one in the area. When I was a little kid, I liked to play there, but they chased us because something could fall on our heads, a beam or a board [...] My son lives there, his father used to have a grinder there, but it's an old story. (F.a.70–75)

Together with their functions, the importance of windmills in the local economy also changed. When not in use, paltrocks could slip off their rollers due to their own weight and one-sided tilting. Discontinuing use of windmills for their original function meant that they were no longer repaired, as this would have involved non-returnable investment. Therefore, farmers allowed the mills on their lands to be slowly destroyed. "It's lying there", one interviewee said, pointing to a pile of the remains of a wooden structure of a windmill (Photo 2).

[28] BRYKAŁA, Dariusz. Uwarunkowania przyrodnicze lokalizacji młynów wodnych w zlewni Skrwy. In: K. German, J. Balon (eds), *Przemiany środowiska przyrodniczego Polski a jego funkcjonowanie.* Kraków: Instytut Geografii i Gospodarki Przestrzennej Uniwersytetu Jagiellońskiego, 2001, p. 166.

[29] PRARAT, O potrzebie badań ciesielskich…, p. 99.

Photo 2.

When I came here, it was only working for a short time. Sixty years ago there was such a storm that the wings were torn off and they rotated and flew like that. They broke off and fell. And that was the end of the windmill.

Interviewer: Have there been any attempts to convert it into an electric mill?
No. Only a windmill. When the propellers broke, my father [father-in-law] didn't grind any more. The windmill stood empty and collapsed three years ago. It stood here for 170 years. (F.a. 83)

A few windmills were converted into electric mills:

It was probably wind- and electricity-powered. There was probably a turbine there and when it was running on wind it was charged, and when there was no wind they switched to electricity. Something like a substitute. (M.a.65)

As long as I remember, there were no propellers. It was converted to an electric one. (M.a.63)

There was also a windmill in Głużki. I know because that's where I come from. […] It was electric-powered and had rollers. They took it apart. The owner was killed by an electrical shock at the mill. She [the miller's wife] was still working afterwards. She had someone to help there, but it was hard. (M.a.ok.70)

Of the 150 objects described, 25 had been subjected to such modernisation.[30] This had consequences in the form of design changes. The most common procedure was to dismantle or shorten the propellers, which no longer fulfilled their original function (Photo 3). As a

Photo 3.

[30] Data based on materials collected at the Monument Protection Offices in Plock, Ciechanów and the Masovian Village Museum in Sierpc.

result, these windmills lost their original appearance. For safety reasons they were placed on a foundation. In several cases, including Drobin, Chrapoń, Warzyń Skóra, windmills were enlarged by adding new rooms, changing their volume, shape and proportions. The original shape of a windmill was covered with the new structures, sometimes made of brick. These actions did not protect the buildings from destruction, they just slowed down the process while significantly interfering with their original structure.

A great number of the windmills were dismantled in the 1980s and 1990s, as well as in the early twenty-first century. Every so often, their fate fulfilled itself, as it happened in the case of one of the windmills in Szreńsk: "There was another windmill, but a youth set it on fire and nothing remained of it" (M.a.70). The windmill in Rochnia, which was converted into an electric mill after a lightning strike in the 1960s, burned down due to a short circuit in 2015.[31]

The windmill stood where the house now stands on a high foundation. It's still Rochnia, but already in Liberadz, behind the sign. It was in use until the end. It burned down six to eight years ago. Probably from the electrics. (F.a.45)

Object of memory

Phantom objects generate memory narratives that can be inspired by empty places, ruins, photographs, maps, and objects. These substitutes stimulate memory to recreate experiences, events and memories that are vague and opaque:

> Where that bunch of lilacs is, behind those farm buildings. There was a wooden house there. And there was a windmill about a hundred steps behind it. A great one. It reached to the ground. It was the mill. (F.a.80)

Sometimes they evoke a sense of loss or nostalgia:[32]

> His family must have photos, because it is something for the younger generation, because there are no such windmills anymore. They certainly have souvenirs somewhere, because it was important. (M.a.63)

These memories are characterised by a subjectivity typical of individual, non-objectivised and metamorphic memory. They are subject to a constant process of forgetting and replaying

[31] "On Thursday, January 15, a historic mill in Rochnia (Szreńsk commune) burned down. The fire brigade carried out the operation for over 5 hours. Three houses near the mill were saved from burning down. The fire broke out around 6.45. Grain was stored in a historic wooden mill. Unfortunately, when the fire brigade arrived at the site, the fire had spread to practically the entire facility. The firefighters' task was to save the buildings located near the mill. Fire brigades from Rochnia, Szreńsk and Mława took part in the action. The owner himself tried to put out the fire first. Unfortunately, when the firefighters arrived, the mill was completely engulfed in fire – says Marek Augustynowicz, a spokesman for the District Headquarters of the State Fire Service in Mława. Losses were estimated at approximately 150,000 zloty. The mill and its equipment burned down. Four tons of grain and a grain silo burned down. The neighbouring buildings also suffered losses, mainly in the form of destroyed windows and gutters. A high-voltage line was also damaged. In addition to firefighters, on site there also appeared police officers and energy company employees. – The cause of the fire was probably an electrical short circuit – says Marek Augustynowicz. We managed to save three neighbouring residential buildings." Spłonął młyn i 4 tony zboża". In Kurier Mławski, 20 January 2015.

[32] TRIGG, Dylan. *The Memory of Place. A Phenomenology of the Uncanny*. Athens: Ohio University Press, 2012, p. 298. HILL, Lisa. Archaeologies and geographies of the post-industrial past: landscape, memory and the spectral. In: *Cultural Geographies* vol. 20, 2013, No. 3, pp. 379–396.

sequences and individual events.[33] Memories inspired by a conversation, a photograph, a point on a map are all sources of subjective information about objects and the people associated with them:

> The Germans dismantled it. People took everything from here and grandpa got angry and waved it off. I don't know, maybe because they thought he was German and reported him? I don't know. He didn't want to do anything here anymore and went to Nadolnik to the mill and worked there for many years. I helped him there many times when I was older. I mixed the grain with a wooden shovel. He was a good miller. (M.a.70)

> This windmill […] when I was lying awake at night, I liked to listen to it working. […] I remember my grandmother bringing flour from the windmill and baking rolls. I remember it well. (F.a.78)

One clear sign of lost windmills' existence is their foundations, typically made of stones and bricks held together with cement mortar. Bases built on a circular plan stand out from the landscape and, unlike the boulders that form the foundations of post mills, they can be unmistakably defined as the work of a man. However, these last physical relics of the region's economic past are being used in a brand new way. In Lutocin, one such space was adapted as a backyard fireplace (Photo 4). In the other case, the interior of the brick circle serves as a flower bed planted with birches. Interestingly, in Kobyla Łąka near Bieżuń, the remains of the construction post of a paltrock mill that strengthened and stabilised the building has been preserved.

Photo 4.

The situation is different with the foundation stones of post mills. These boulders, which were once an integral element of the windmill's structure with a high degree of technical complexity, return after the mill's "death" to their natural environment – to the untamed space of forgetting. As one informant recalled, "When you go there to pick mushrooms, you can see such large stones [remains of foundations] and such a semicircle" (M.a.57). In the case of boulders from the foundation, a so-called "functional inversion" or renaturalisation process occurs. However, the very moment of rejection – leaving foundation stones after the windmill has been dismantled – is a phenomenon that may be classified as "cultural expulsion". Geological objects that have never ceased to be objects, reassigned to the world of nature after serving as foundations, seem to return to their original purpose. This phenomenon applies primarily, or perhaps only, to loosely arranged erratic boulders from post mills. Often, they are the only material evidence of windmills that remains. Because they belong to the order of nature, they are unidentifiable to an outside observer as an object briefly incorporated into the cultural space. After the destruction of the object in the process of cultural expulsion, the erratic boulders that served as foundations (in the process of cultural inclusion) are returned to the space of nature, but remain a reference point for memories. They stimulate the mind to reminiscence

[33] NORA, Pierre. Between Memory and History: Les Lieux de Memoire. In: *Representation*. Special Issue: *Memory and Counter-Memory* 26, 1989, pp. 7–24.

Photo 5.

and, being a part of a local landscape, they can act as a clear code – a space of memory, albeit not for everyone but only for those who know how to read it (Photo 5).

Other material remains in the space include paved squares and access roads to windmills. These material testimonies are illegible without the situational/historical context, which is possible to obtain by referring to cartographic and photographic materials/sources or memories of residents/owners who remember the original purpose of these objects. Paved access roads still constitute problems in the development of these areas. Most often, sites with such remains are used for pastures.

> Here is a meadow, because you can't plough here. Only stones. Because there was an access road here and there were also stones under the windmill so that there would be no mud. (M.a.65)

> When you were digging in the garden, the stones of the windmill got in the way. There were so many of them that it was impossible to dig. This is where it stood. (F.a.55)

There are also examples of reusing materials and parts of the windmills in new functional contexts. To paraphrase Tim Ingold's words, we can say that objects are what they are until they become something else.[34] Material remains from demolition were often used on farms. There are identified cases of using post-demolition material to repair/reconstruct a residential building:

> The windmill no longer operated after the war. The house partially burned down due to lightning [...] The windmill was dismantled and the material was used to build a part of the house. The windmill stood on a post. This post was big. (M.a.96)

Window and floor woodwork was made from wooden elements of the windmill's construction. Everyday items were also made, such as tables and chairs: "They contained resin. So much of it that smoke was coming out. No woodworms. You could peel off such a layer (about 1 cm) and the wood was still healthy. We made a table and chairs from it" (M.a.40). These activities, bordering on recycling or upcycling, can be considered a manifestation of pragmatism resulting from economic constraints as well as awareness of the value of material obtained from demolished windmills.[35] It is worth noting that in Płock Mazovia similar projects were

[34] INGOLD, Tim. Toward an Ecology of Materials. In: *Annual Review of Anthropology* 41, 2012, p. 435.

[35] FRANGIPANE, Anna. From spolia to recycling: The reuse of traditional construction materials in built heritage and its role in sustainability today: A review. In R. Přikryl et al. (eds), *Geological Society London Special Publications* 416, 1. *Sustainable Use of Traditional Geomaterials in Construction Practice*, 2016, pp. 23–34; STRASSER Susan. Complications and Complexities: Reflections on Twentieth-Century European Recycling. In *Contemporary European History Special Issue vol.* 22, 2013, No. 3, pp. 517–518.

undertaken in relation to other wooden objects – both architectural and from shipbuilding.[36]

Alongside the wooden elements, individual devices and non-wooden parts of the structure were repurposed. During field research, we came across a peculiar use of rollers from the rotation mechanism of a paltrock windmill which were now being used as dumbbells by the miller's grandson. Such rollers were high value, so they were often repurposed. For example, some farms continued to use them to mill grain, building special buildings in which the rollers were operated electrically. These places served functions analogous to earlier windmills and served local farmers.

A different fate awaited the millstones. One of the most lasting material remains after the destruction of the windmill, providing evidence of its former existence, millstones basically became useless objects from a utilitarian point of view. However, they did not lose their material properties and symbolic connotations. By interacting with humans, they acquired new meanings and values[37] and appear in a new functional, symbolic and spatial contexts. For example, millstones from the windmill in Kobyla Łąka were used to make a table:

> The millstones are […] at home, in Bieżuń. I took them there myself. He made a table out of them. You can lean on it and it won't fall over. I left one as a souvenir. It is in the yard. (M.a.60)

Photo 6.

In Krysko, millstones were placed in front of one of the entrances to the primary school, serving an aesthetic and memorial function (Photo 6, lower part of the illustration). A similar idea was behind an exhibition of millstones on a former miller's farm in Czerwińsk on the Vistula River. In Kowalewo Skorupki there were plans afoot at the time of research to use them in a garden composition. Sometimes millstones are used to decorate home driveways (Photo 6). They are also used in the construction of roadside shrines. There is an example from Czerwińsk where a millstone and a quern-stone were a part of an artistic installation near a roadside cross. Unfortunately, in 2022 the millstone was stolen and now only the quern stone remains at the cross. A similar use of millstones

[36] POGODZIŃSKI, Pawel M. Reuse of boat structural elements in the wooden buildings along the Vistula River. In: *Journal of Heritage Conservation* 59, 2019, pp. 106–114; PIASECKI Aleksander, et al. Stodoła z Rębowa, gm. Wyszogród z II połowy XIX wieku jako przykład budownictwa z wtórnie wykorzystanych elementów szkutniczych. In: *Rocznik Muzeum wsi Mazowieckiej w Sierpcu* 8, 2017, pp. 85–93.

[37] GOSDEN, Chris and MARSHALL, Yvonne (1999). The Cultural Biography of Objects. In: *World Archaeology, vol.* 31, 1999, No. 2, pp. 169–170.

was recorded, among others, in the town of Chrosno in Kujawy (Photo 7).[38] Displaying millstones in new functional and symbolic contexts, often sacred, has a long tradition dating back to earlier eras.[39] It is worth mentioning the tradition of embedding them in the church walls. Examples of this type occur in Germany, Great Britain and Poland.[40] In Poland, most churches with millstones are located in Pomerania and northwest Mazovia. In the latter region, these include churches in Płońsk, Bodzanów, Krysk and Zakroczym (Photo 8). An interesting example of a semi-finished millstone built into the church wall from the presbytery side can be found in the church in Zagroba, built at the beginning of the twentieth century. In Czerwińsk, in front of the main entrance to the basilica, a small millstone forms part of the pavement. However, considering its location – the central point of the composition in the shape of an isosceles cross – this type of use may have a more profound symbolic meaning.[41] These specific ways of "exhibiting" millstones can be treated as attempts to construct a local, social and, finally, family "diachronic identity".[42] Cultivating memory through objects related to professions of the past constitutes the distinctiveness of a given family on the social and cultural level.[43] It is worth recalling that the mnemonic value of an item has archaic inclinations.[44] Although in many cases the reuse of millstones in new contexts can be explained primarily in terms of aesthetic, practical or nostalgic reasons, there are examples that prove the continuity of the symbolic dimension of these utilitarian objects.

Photo 7.

At this point, one may be tempted to say that the reuse of materials and objects from windmills bears the hallmarks of spolia, because the material and objects are used in the construction of functionally different buildings or their purpose is changed completely.[45] These objects can also be looked at from the perspective of "biographies of things" which have lost their original meaning and functions only to be reintroduced into cultural circulation in a different functional

[38] PIOTROWSKI, Robert. Wiatrak w narracjach wspomnieniowych. In: M. Prarat (ed.) *Wiatrak koźlak w Chrośnie z końca lat 60. XVIII w. Jego dzieje i problematyka konserwatorska*. Toruń: Muzeum Etnograficzne w Toruniu, 2022, pp. 26–27.

[39] WATTS, Susan R. *The life and death of querns. The deposition and use-contexts of querns in south-western England from the Neolithic to the iron age*. Southampton: HP, 2014, pp. 40–42; O'SULLIVAN Aidan. KENNY N. A matter of live and death? In: *Archaeology Ireland,* vol. 22, 2008, No. 4, p. 9.

[40] ŚWIĘCH, Jan. *Tajemniczy świat wiatraków*. Łódź: Polskie Towarzystwo Ludoznawcze, 2005, p. 148.

[41] WATTS, Susan. The Symbolism of Querns and Millstones. In: *AmS-Skrifter* 5, 2014, pp. 53–66; URBAŃCZYK, Przemysław. *Medieval Arctic Norway*. Warszawa: Polish Academy of Sciences, 1992, p. 101; BARANOWSKI, Bohdan. *Polskie młynarstwo*. Wrocław: Ossolineum, 1977, p. 119.

[42] HORN, Christian et al. Introduction. In: C. Horn, G. Wollentz, G. Di Maida, A. Haug (eds), *Places of Memory Spatialised practices of remembrance from prehistory to today*. Oxford: Archaeopress Publishing, 2020, p. 2.

[43] ASSMANN, Jan. Collective Memory and Cultural Identity. In: *New German Critique* 65, 1995, pp. 129–130.

[44] VANSINA, Jan. *Oral Tradition as History*. Wisconsin: The University of Wisconsin Press, 1985, pp. 44–45.

[45] KALAKOSKI, Iida, HUUHKA, Satu (2018). Spolia revisited and extended: The potential for contemporary architecture. In: *Journal of Material Culture,* vol. 23, 2018, No. 2, p. 193.

Photo 8.

context with a new purpose and, therefore, value.[46] At the same time, they still remain part of an economic object of enormous utilitarian and symbolic importance. Moreover, this process often creates a landscape of material representations of ideas about windmills and the status of their owners. In some situations, millstones can be considered a kind of mirror, reflecting people's ideas.[47]

Within two former mill farms there are replicas of the windmills that stood there years ago. One of them was constructed in 1999 by a miller from Czarnia Duża. He started working in his father's windmill in prewar Poland and was taught the trade by his father, who was himself the son of a miller. As an eleven-year-old boy, he helped with the lighter milling activities. Many years of work at the windmill, which he later inherited and which provided the main source of income and support for his family, left him with a great degree of sentiment about this trade. For a considerable period of time, the windmill was a significant place for the family. It literally and figuratively set the rhythm of everyday life. Therefore, after the windmill died, the miller decided to build a copy of it (Photo 9). This souvenir was intended to remind his grandchildren of the old windmill and an activity deeply rooted in family tradition.

> For the children and grandchildren to see what this windmill looks like. And some people came here to do something like that for them, too. They brought in craftsmen to copy it in their garden. And I say "Go and measure. Do. You won't do the same one, anyway. (M.a.95)

A second model – much smaller, but reflecting the proportions and type of a post-mill – was built by the miller's grandson. His grandfather came from a large family in which all the men – his father, grandfather and great-grandfather – ran windmills. When asked why he made this model and placed it in the place of the former windmill, the informant replied: "I don't know ... so that there would be a sort of a souvenir" (M.a.60). These examples of strong emotional relationships between the past and the present allow us to see the sometimes unconscious

[46] KOPYTOFF, Igor. The Culture Biography of Things. In: A. Appadurai (ed.) *The social life of things. Commodities in cultural perspectives*. Cambridge: Cambridge University of Press, 1986, p. 66.

[47] See: SCARPACI Joseph L. Material Culture and the Meaning of Objects. In: *Material Culture,* vol. 48, 2016, No. 1,*Special Issue: Consumer Goods*, p. 1.

Photo 9.

bond between an object and a person, where the object should be seen as the apotheosis of a former life and ethos. Such attempts to maintain memory can be called memory prosthesis with positive inclinations.

Potential of the memory heritage

Due to their volume and structure, windmills stand out from other rural facilities. One interviewee compared windmills to towers: "This windmill was like a tower with such wings" (F.a.85). For others, there were spaces for children's games and fantasies:

> We used to go there and chase each other. We scared each other that there was something ghoulish there. Because it's a building like that, so we told each other stories and got frightened. (F.a.40)

The interlocutors' statements mentioned the value of these objects for the local community and landscape:

> When the windmill was here, I didn't pay any attention to it. It was always there [...] But now it's gone, I feel sorry for it, because it's such an important building. When something disappears, only then you wonder. (M.a.70)

It is hard to disagree with the last statement. All that remains of many windmills are memories, old photos and sometimes traces of their existence in the landscape. These anthropogenic micro-changes in the geological structure – foundations, paved access roads, stone squares around the windmill – are a record of the memory of the landscape.[48] Both residents and researchers can rediscover these places and the memories associated with them.[49] The memory of windmills can be defined as a form of intangible cultural heritage. Years of inability to develop this form of milling as an industry and, ultimately, the lack of awareness of their value alongside insufficient funds to maintain and protect their wooden architecture, have cursed windmills. They have become a burden, something unwanted, even though they could still be an asset to local communities. Importantly, the informants were aware of this:

> It could be used in agritourism. Now it would be such a showcase, but back then people had no awareness. (M.a.80)

[48] BRIERLEY Gary, J. Landscape memory: the imprint of the past on contemporary landscape forms and processes. In: *Area*, vol. 42, 009, No. 1, p. 79.

[49] INGOLD Tim. The Temporality of the Landscape. In: *World Archaeology*, vol. 25, 1993, No. 2, pp. 152–153.

> I don't know who agreed to take it away from here. It was such a monument. I remember how they were dismantling it. (F.a.40)

A good example of positive action and building a local brand based on a historic windmill is the initiative taken by the inhabitants of a small village in Kujawy (Chrosno, Kuyavian-Pomeranian Voivodeship) aimed at protecting their eighteenth-century facility, which has served as an emblem of the village for years and generates interest from tourists. The windmill serves both a memorial function – recalling of the village's past – as well an emblematic function, defining the status of the inhabitants and generating awareness of the value of this type of architecture.[50] This project is an example of the process of changing the valuation of objects based on their social, historical and economic context. The memory of the past is shaped through the prism of the present, and memory and forgetting play a crucial role in this phenomenon.

The value of windmills is also appreciated by private investors. A smock mill from Niegocin was relocated to Prusim in 2012 where it serves as a restaurant.[51] A windmill from Niszczyce was moved to the town of Krzyczki Szumne near Nasielsk: "It was under protection and they took it [...] to Nasielsk or Pułtusk […], I think to Nasielsk, and it stands there" (M.a.50). It was adapted for the needs of a downhill zip line (Tyrolean), one of the main attractions of the resort.[52] In the Masovian Village Museum in Sierpc certain parts of the original structure and equipment of the windmill were made available to visitors after reconstruction.[53]

Windmills that have been adapted to a new functional context and subjected to cultural implementation can constitute a very important part of new heritage in a new place. The new spatial and functional context is the next stage in their history. Taking into account actual conditions, this is probably the only direction that would enable the protection of these objects, but it generates huge costs. One of the young heirs of a nineteenth-century windmill had an opinion on this:

> In the past, [there were windmills] in Garków, Liberadz, Szreńsk. The one in Szreńsk has already been sold. And now only this one remains. It could be a tourist attraction because people like to see such things, but renovation is too expensive. (M.a.30)

In Europe, the primary focus of research is on preserved and operational mills. The majority of publications are dedicated to the analysis of technical and construction solutions. This approach helps to preserve the generations-old tradition of building, repairing and operating these highly specific machines. Craftsmanship skills in this field have been inscribed on the UNESCO World Heritage List. The Netherlands was recognised in 2017 for the "craft of the miller operating windmills and watermills"[54] and in 2021, Iraq was recognised for the "traditional craft skills and arts of Al-Naoor".[55]

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[50] Compare: RYCHNOWA Lucie, et al. Open-air Museums: The Future of the Presentation of Spiritual and Architectural Heritage. In: *Muzeológia a kultúrne dedičstvo*, vol. 10, 2022, Is. 1, p. 9.

[51] https://www.olandia.pl/atrakcje/wiatrak

[52] http://www.nosselia.pl/galeria/

[53] https://my.matterport.com/show/?m=doYcnBP4tdb

[54] https://ich.unesco.org/en/RL/craft-of-the-miller-operating-windmills-and-watermills-01265

[55] https://ich.unesco.org/en/RL/traditional-craft-skills-and-arts-of-al-naoor-01694

In Poland, windmills are for the most part no longer preserved, and there are no longer individuals with the skills to operate them. Hence, the proposed anthropological approach is one attempt to preserve the intangible heritage associated with mills.

That is why the fragments of longer statements – subjectively verified memories – presented in this article are worth treating as a crucial part of the heritage of milling memory. They are testimony to the importance and value of these objects both for the cultural landscape and intangible memory heritage of local communities. In the future, this aspect also may need to be increasingly analysed in countries where there are still many mills and individuals proficient in their operation.

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