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Field Research in the Targowisko Region in 2018–2019

Abstract

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The article presents the results of test excavations at three sites in the early Neolithic settlement region of Targowisko, carried out in 2018–2019. The goal of these investigations was the detection of fragments of Neolithic settlement zones where only one building phase has survived. It was decided to perform this task using a magnetometer as part of a slightly wider program of geomagnetic prospection. The second goal was to acquire sets of arti- and ecofacts related to the shortest possible period of time, i.e. equal to the existence of one family living in one house, representing one cultural tradition. The third goal was to explain the generators and mechanisms of early Neolithic cultural transformation from a micro-regional perspective.

Keywords: LBK, early Neolithic, Małopolska, Malice culture, transformation, dwellings, Targowisko region

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Introduction

In the years 2002–2007, on the route of the A-4 motorway through the fields of the village of Targowisko, district Wieliczka (approx. 30 km east of Kraków) and neighboring villages, large-scale rescue excavations were carried out and which brought significant archaeological discoveries. One of the most interesting discoveries was the unveiling of vast fragments of a settlement complex from the early Neolithic age (i.a. Czerniak 2013; Czekaj-Zastawny 2014; Zastawny (ed.) 2014; Kadrow 2018; Kadrow *et al.* 2020; 2021; Forysiak *et al.* 2021).

This settlement complex (Fig. 1) is located between the Vistula and Raba rivers (the so-called “Targowisko” region – cf. Czerniak 2013; Kadrow *et al.* 2021 or “Brzezie” region, cf. Czekaj-Zastawny 2017, fig. 12). In the zone described above, traces of *Linienbandkeramik* (hereafter: LBK) settlement from the

oldest (I) to the youngest (III) phases have been documented (cf. Czerniak *et al.* 2006; Włodarczak 2006; Kadrow and Ochoński 2008; Czerniak 2013; Zastawny and Grabowska 2014; Kadrow *et al.* 2020). Moreover, relics of the early and classical Malice culture (hereafter: MC) phases have been discovered there (Czekaj-Zastawny *et al.* 2002; 2007; Czerniak *et al.* 2007; Grabowska and Zastawny 2014; Kadrow *et al.* 2020).

In 2018–2019, test excavations were carried out on three selected sites from this region, the purpose of which was to achieve several goals. One of them was the detection of such fragments of Neolithic settlement zones where only one building phase has survived. It was decided to perform this task using a magnetometer as part of a slightly wider program of geomagnetic prospection (cf. Golański *et al.* 2019).

The second goal, closely related to the first, was to acquire sets of arti- and ecofacts related to the shortest possible period of time, i.e. equal to the existence

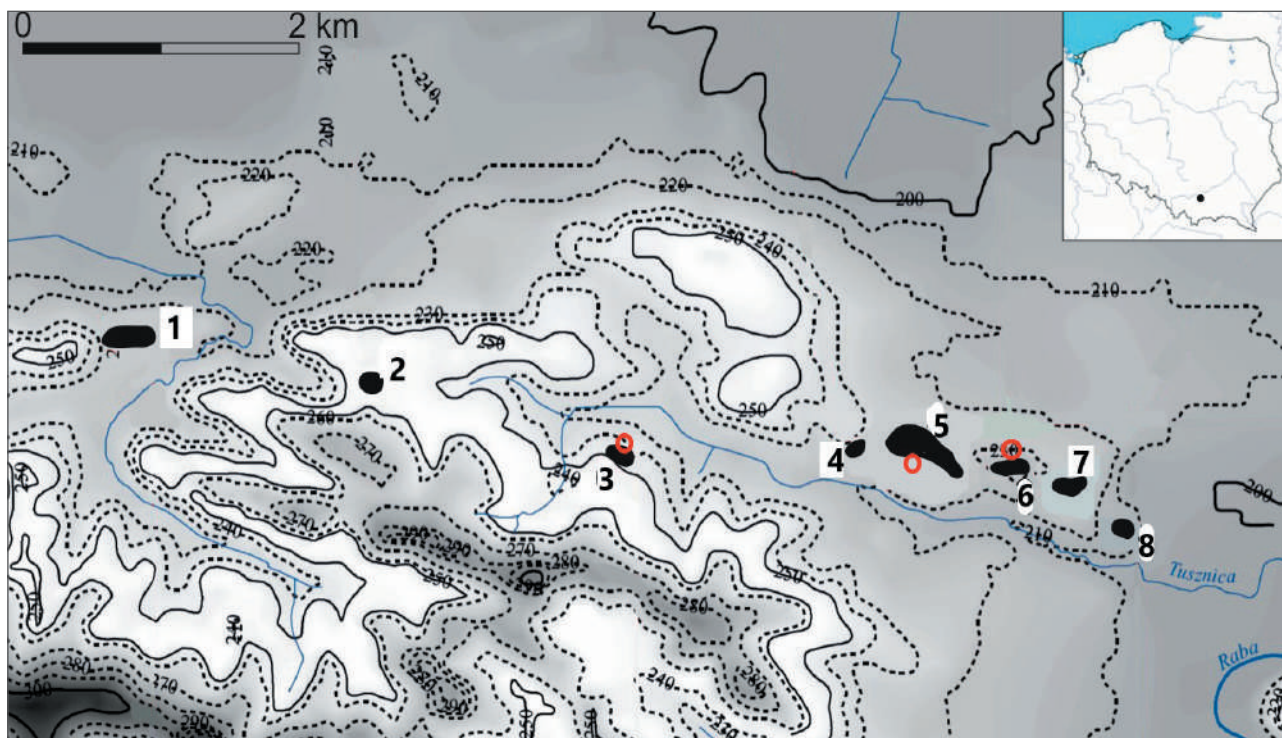


Fig. 1. Targowisko settlement region. Early Neolithic (LBK and MC) sites with relics of houses: 1 – Zagórze 2, 2 – Brzezie 17, 3 – Brzezie 40, 4 – Szarów 9, 5 – Targowisko 16, 6 – Targowisko 14–15, 7 – Targowisko 12–13, 8 – Targowisko 10–11; test excavations made in 2018–2019 on sites marked with red circles.

of one family living in one house, representing one cultural tradition, with no mix of older or younger archaeological material. Due to the multi-phase nature of the Neolithic settlement in the Wieliczka-Bochnia loess zone, this task is neither easy nor obvious. A valuable hint in this regard was the observation of Ryszard Grygiel that the traces of single-phase settlement (house 56 in Brześć Kujawski, site 4) can only be discovered on the edges of settlements inhabited for longer periods (Grygiel 1986, 273, ryc. 3).

These types of single-phase and peripherally situated remains of houses, being reference points for the interpretation of chronologically mixed groups of monuments, allow for a more in-depth reconstruction of the microprocesses of the development of settlement infrastructures on long-term inhabited sites. Ultimately, they are intended to help achieve the third goal, i.e. to explain the generators and mechanisms of early Neolithic cultural transformation from a micro-regional perspective, in line with the main goal of the NCN project 2016/21/B/HS3/03137 (*Great culture transformation in microregional perspective. Trends of changes inside Danubian farmers – interdisciplinary study*).

Field research on selected sites

As a result of a field survey conducted in 2017 by Martin Posselt (company: Posselt & Zickgraf – Archäologisch-geophysikalische Prospektionen GbR from Germany), relics of three houses at three sites were selected for excavation tests: Brzezie 40 (LBK), Targowisko 16 (LBK) i Targowisko 14–15 (MC) (cf. Golański *et al.* 2019, 9–15).

In 2018, the team of the Łódzka Fundacja Badań Naukowych, led by Adam Golański, conducted excavation tests of the LBK dwelling structures (Fig. 2). It was decided to explore the long house from the northern ends of site 40 in Brzezie and the post-hole house from site 16 in Targowisko. These objects met the condition of being located on the edge of the settlements, representing single-phase (in both cases the beginning of the *Želiezovce* phase) of settlement.

In 2019, the remains of the MC house were identified at sites 14–15 in Targowisko (Fig. 2). It met similar expectations as the relics of the LBK houses described above. In each of the three mentioned cases, an area of 10 ares was investigated. The size of the excavation units was sufficient to reveal the available parts of the



Fig. 2. Targowisko settlement region. Map of geomagnetic survey divided into target areas (red) with location of excavated houses (blue circles) (prepared by M. Posselt; cf. Golański *et al.* 2019).

examined houses and their immediate surroundings in order to exclude the presence of traces of settlement from other building phases.

Brzezie site 40

At the northern edge of site 40 in Brzezie, geomagnetic prospecting revealed the relics of one long LBK house, clearly separated from other traces of building structures (Fig. 3; cf. Golański *et al.* 2019, fig. 12–15). In an excavation unit with an area of one are, the remains of long building pits (Fig. 4) with no traces of post-holes have been discovered (Fig. 5, 6). Their absence is not caused by the destructive effect of post-depositional processes. Rather, it is a construction peculiarity of this house (cf. Czerniak 2019, fig. 2).

In pits near the house and in so-called cultural layer, 604 pieces of LBK pottery were discovered. The vast majority of these were very small sherds. Only 15% of them represent characteristic fragments, i.e. ornamented ones or being parts of the upper rims or bottoms. The ceramics are divided into delicate vessels, ornamented by incised lines (Fig. 7: 2, 4–8, 10, 11, 13; 8: 1–6, 10, 12, 14) and kitchen ones, composed of hemispherical bowls and vessels with a neck, decorated with plastic elements and fingernails imprints (Fig. 7: 1, 3, 9, 12; 8: 7–9, 11). The presence of notches crossing the incised lines (Fig. 7: 8, 11; 8: 3) al-

lows to date this set of pottery to the beginning of the Želiezovce (III) phase (Kadrow 1990, 72–73, fig. 28; 2020, fig. 7). A characteristic feature of this set of remains is the relatively high proportion of parallel, closely spaced incised lines in the ornamentation (Fig. 7: 5, 11, 13; 8: 1, 2, 4, 10, 12, 14).

Targowisko site 16

On the western edge of site 16 in Targowisko, thanks to the geomagnetic prospection, traces of three long LBK houses, located at fairly large distances from each other, were recorded (Golański *et al.* 2019, fig. 4–7). It was decided to excavate the northernmost house (Fig. 9).

A house consisting of 5 rows of post-holes was unveiled (Fig. 10, 11). Long pits have been explored on both sides of the house (Fig. 12, 13).

In domestic pits and in the so-called cultural layer, 618 pieces of LBK pottery were discovered, mostly of small size. Only 14% of the pottery sherds represent the category of characteristic ceramics, i.e. they have an ornament or are part of the rim or a bottom.

Among the delicate ceramics, vessels decorated with incised lines (Fig. 14: 6–8, 10, 12–14, 16; 15: 2, 5, 6, 10, 12, 14, 17, 18, 20) which are sometimes cut with notches, predominate (Fig. 14: 2, 4, 5, 9, 18, 20; 15: 1, 11, 13, 16). Kitchen ceramics, including hemispheri-

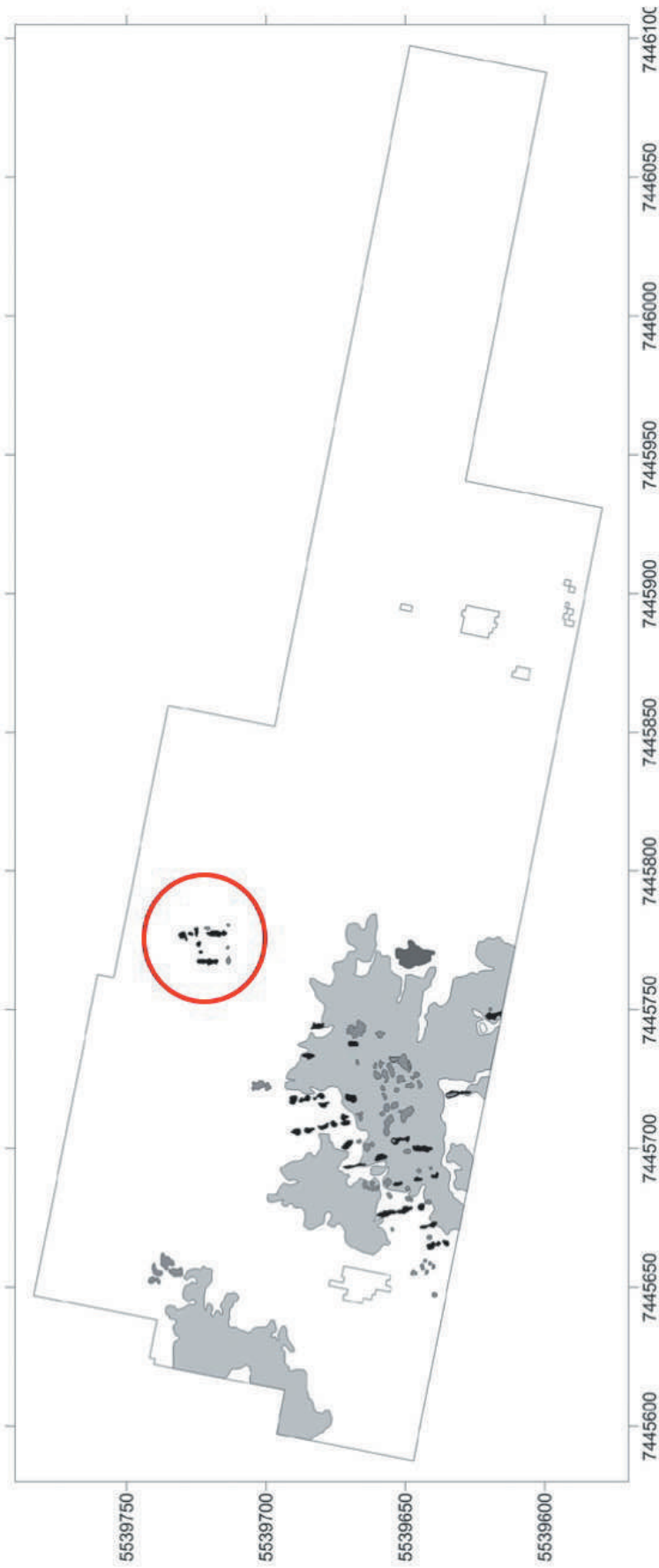


Fig. 3. Brzezie site 40. Location of LBK dwelling structure chosen for test excavations marked with a red circle on the background of the results of geomagnetic prospection (according to Golański *et al.* 2019).

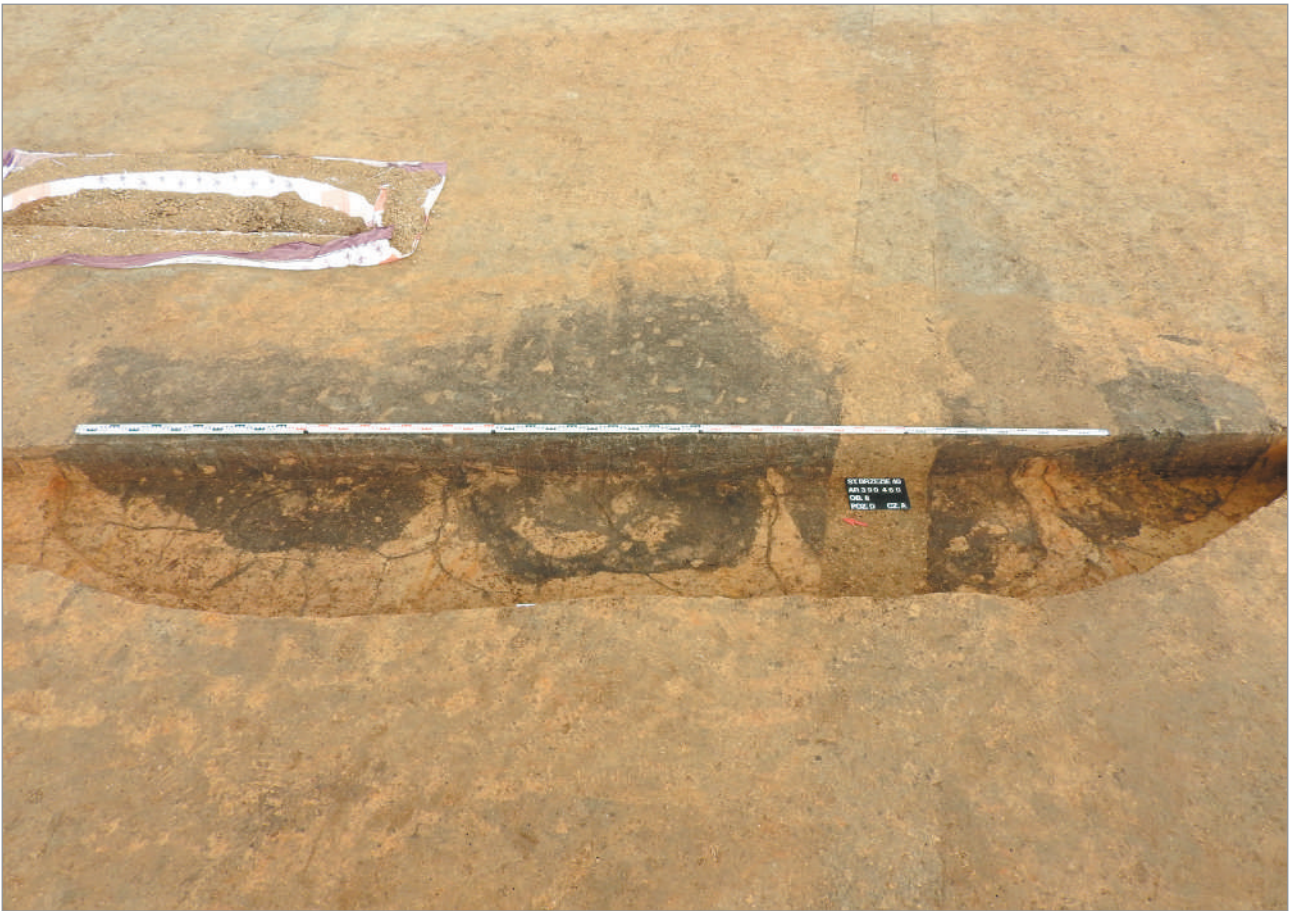


Fig. 4. Brzezie site 40. Profile of the long pit (feature 8) along the E wall of the LBK house (drawn by M. Golańska).



Fig. 5. Brzezie site 40. Relics of the house with features (objects) numbering. Surface cut with diagonally running modern grooves (drawn by M. Golańska).

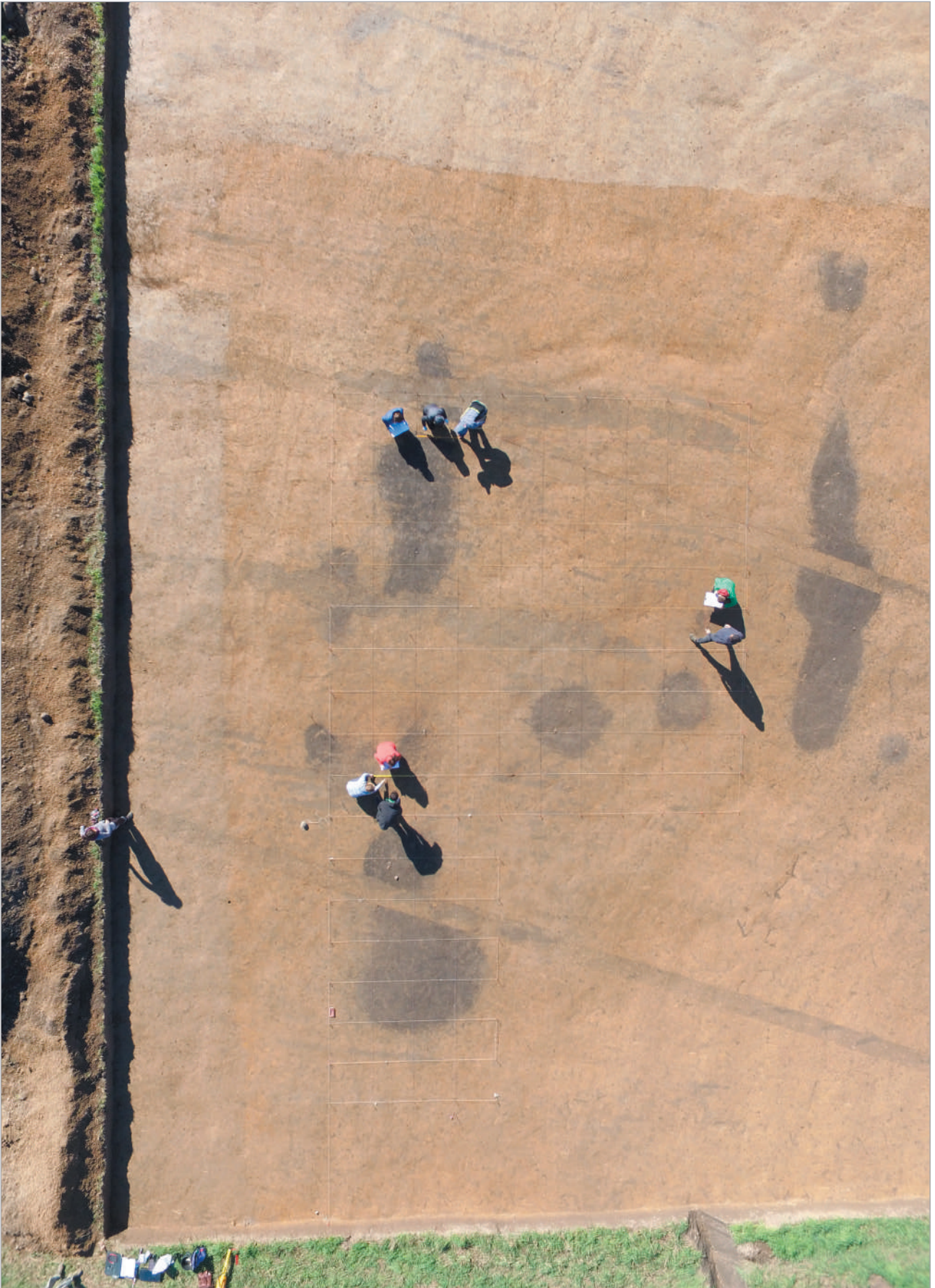


Fig. 6. Brzezie site 40. Spatial arrangement of the objects that are the remains of the LBK house (photo by A. Golański).

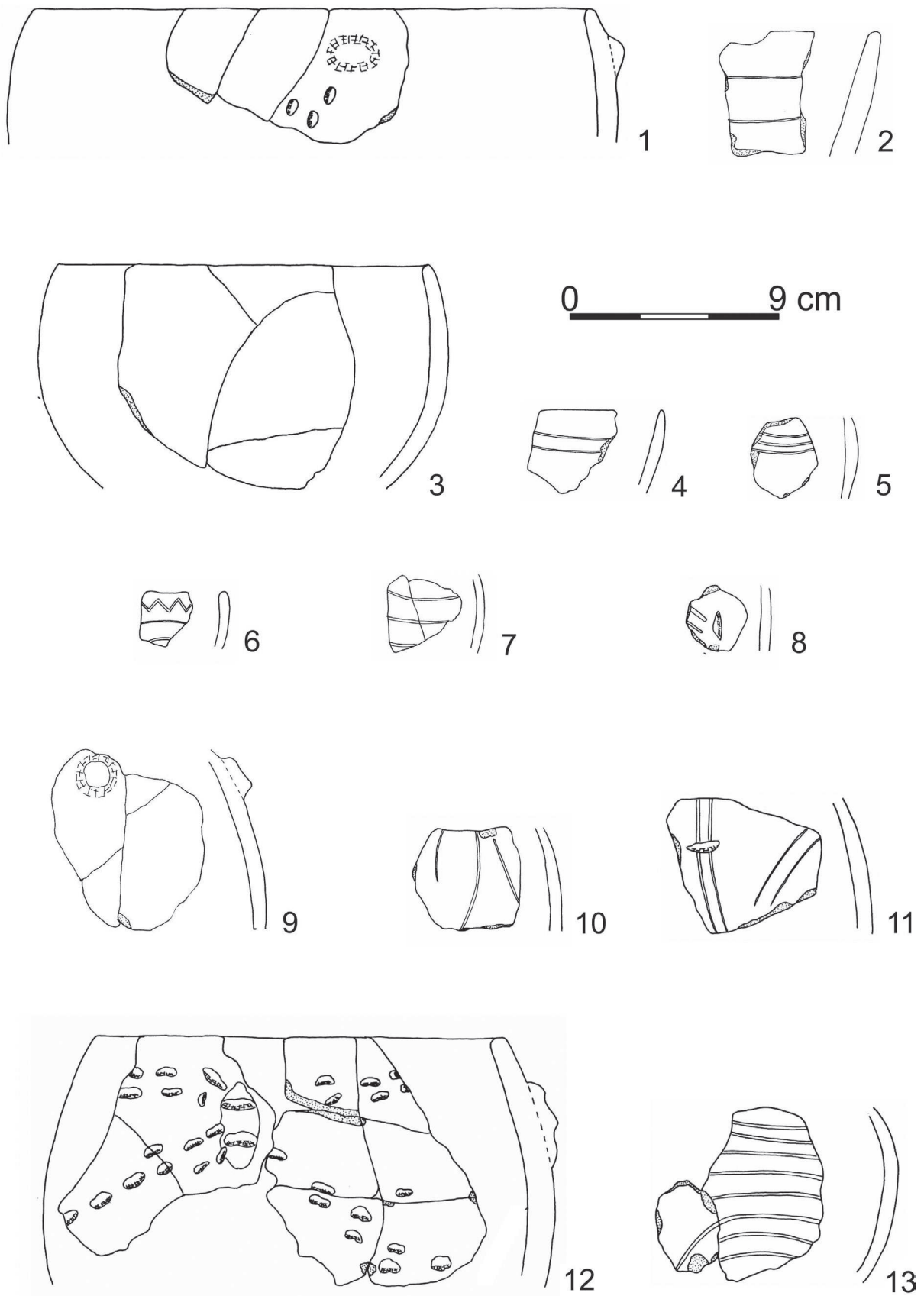


Fig. 7. Brzezie site 40. Selection of LBK pottery from the excavated house (drawn by M. Golańska and A. Krzywda).

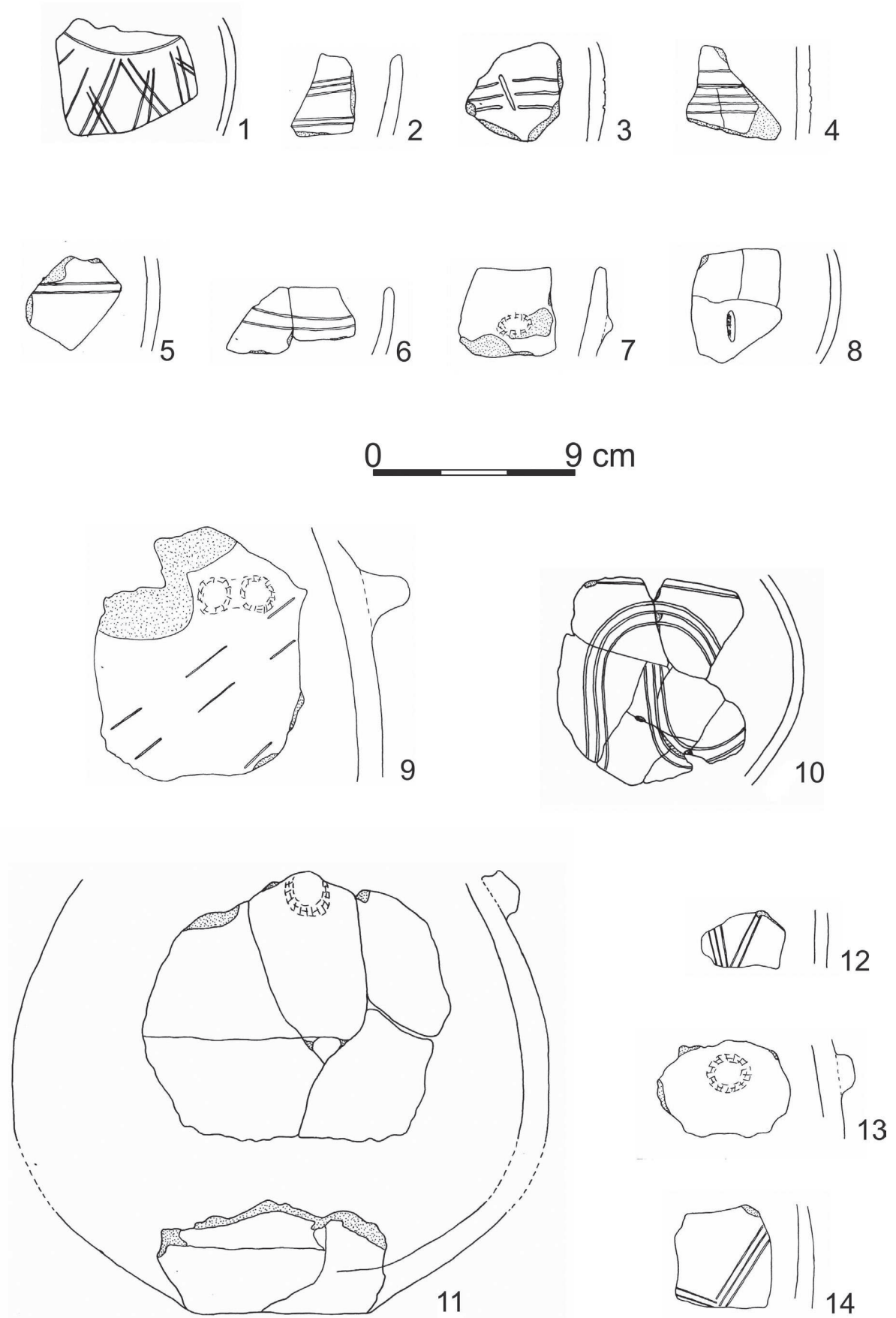


Fig. 8. Brzezie site 40. Selection of LBK pottery from the excavated house (drawn by M. Golańska and A. Krzywda).

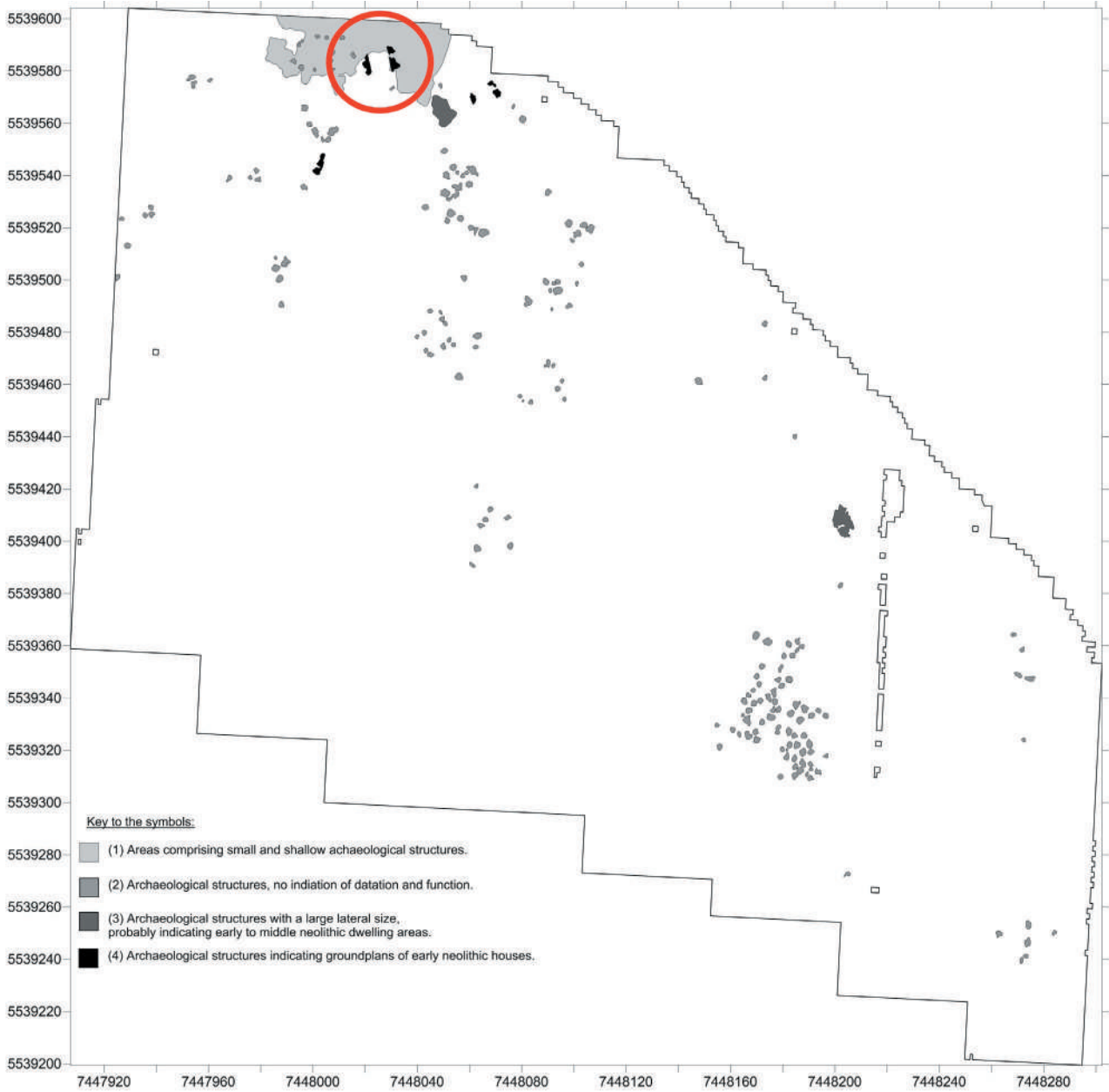


Fig. 9. Targowisko site 16. Location of LBK dwelling structure chosen for test excavations marked with red circle on the background of the results of geomagnetic prospection (according to Golański *et al.* 2019).

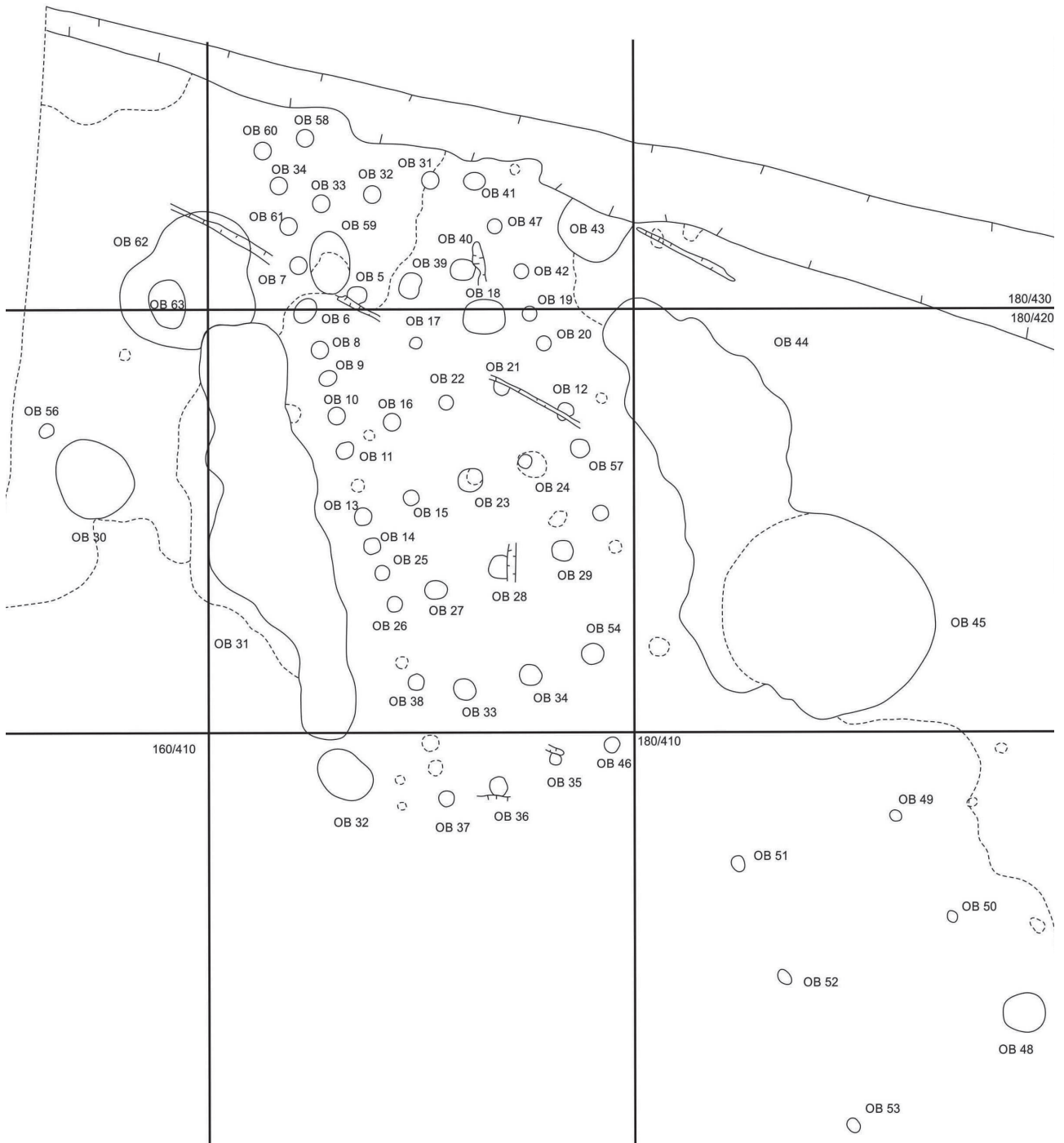


Fig. 10. Targowisko site 16. Spatial arrangement of the numbered features (objects) that are the remains of the LBK house (drawn by M. Golańska).



Fig. 11. Targowisko site 16. Spatial arrangement of the objects that are the remains of the LBK house (photo by A. Golański).



Fig. 12. Targowisko site 16. Profile of the long pit (object 31) along the W wall of the LBK house (photo by A. Golański).

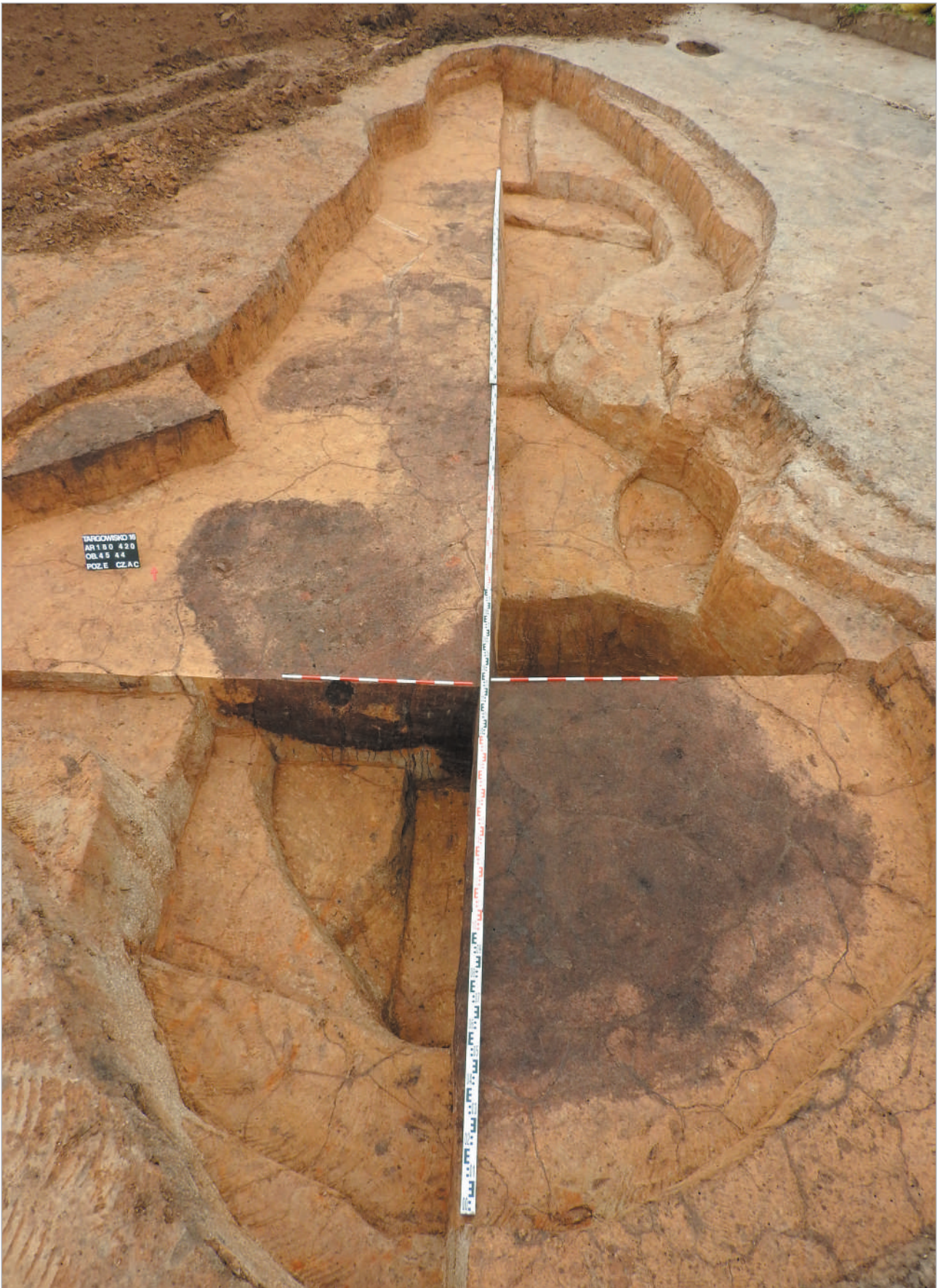


Fig. 13. Targowisko site 16. Profile of the pits (objects 44 and 45) along the E wall of the LBK house (photo by A. Golański).

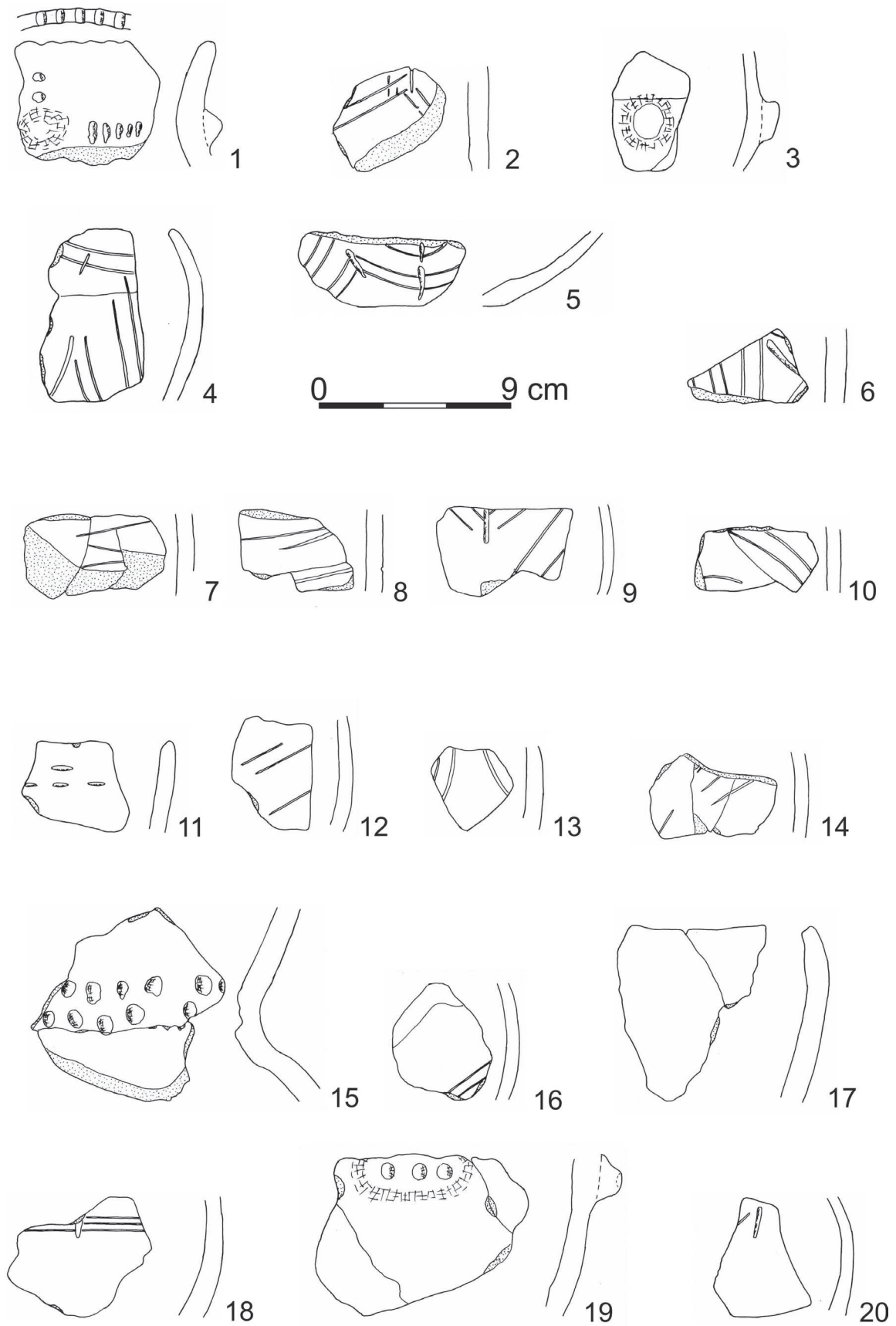


Fig. 14. Targowisko site 16. Selection of LBK pottery from the excavated house (drawn by M. Golańska and A. Krzywda).

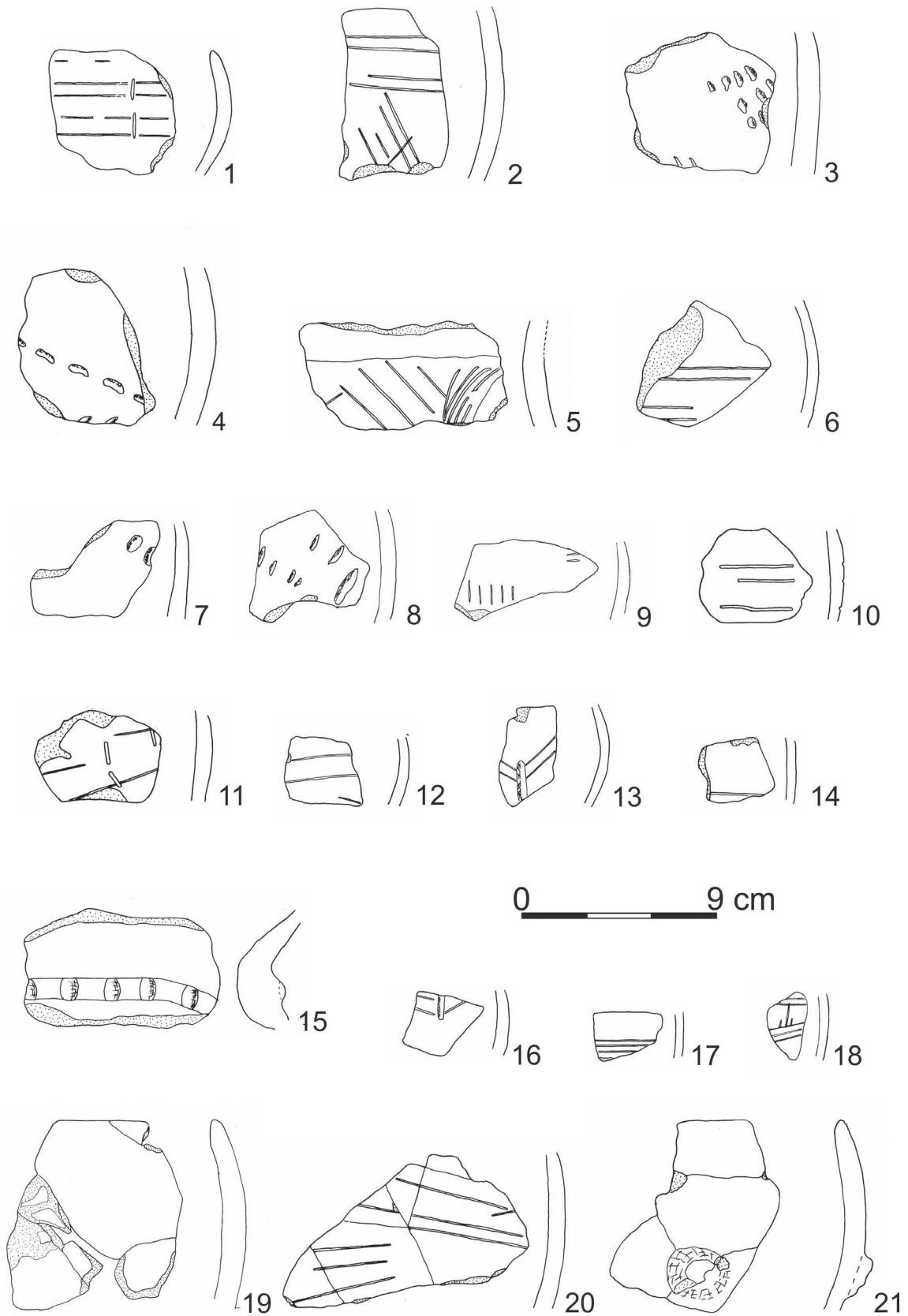


Fig. 15. Targowisko site 16. Selection of LBK pottery from the excavated house (drawn by M. Golańska and A. Krzywda).

cal and necked dishes, are decorated with plastic ornaments and fingerprints (Fig. 14: 1, 3, 11, 15, 17, 19; 15: 3, 4, 7, 8, 15, 19, 21). The large share of notches in incised ornamentation suggests a slightly younger position in the *Želiezovce* (III) phase (Kadrow 2020, fig. 7) than the pottery set from Brzezie 40.

Targowisko site 14–15

In the northern part of site 14–15 in Targowisko, traces of five MC houses were registered thanks to geomagnetic prospection (Fig. 16; cf. Golański *et al.* 2019, fig. 8–11). One of these houses was selected for excavation work (see Golański *et al.* 2019, fig. 11). Relics of a 12 m long MC house, typical for western Małopolska (Fig. 17, 18), consisting of a single row of post-holes on the perimeter of a rectangular structure and one row of post-holes separating the vestibule were discovered (see Kadrow 2015, fig. 2–4). From the north-west it is accompanied by a construction (clay) pit (Fig. 17, 18).

A total of 653 fragments of MC ceramics were discovered, of which only 92 characteristic sherds (14%). There are pear-shaped vessels decorated with a stroked ornament in the form of horizontal lines below the rim and sliding triangles on the upper part of the belly (Fig. 19: 5, 17; 20: 16), small cups (Fig. 19: 14), bowls (Fig. 20: 2), bowls on hollow pedestals (Fig. 20: 17), other vessels on feet (Fig. 20: 9), amphorae with anthropomorphic image (Fig. 20: 10; cf. Grabowska and Zastawny 2007, fig. 4–5), baggy vessels (Fig. 19: 15; 20: 6) and large biconical vessels. Kitchen pottery, ornamented with knobs, plastic lines and various imprints and incisions dominate over delicate one ornamented with strokes. The forms of these vessels and their ornamentation are typical for the classic MC phase (Kadrow 2006, 63–69).

Summary

The collection of flint artifacts and plant macroremains from above described dwellings structures are published in separate articles in this volume (respectively Wąs 2021 and Abramów 2021).

It was possible to achieve all the intended research goals, albeit to a different extent. The first two objectives were fully achieved, i.e. the detection of fragments of Neolithic settlement zones where only one building phase has survived, with this confirmed by the results of test excavations. On each test site, relics

of the remains of houses from one building phase were discovered, which is evident in the light of the ceramics obtained and the radiocarbon dates (Fig. 7, 8, 14, 15, 19–21; Tab. 1). The second goal was also achieved. Sets of arti- and ecofacts related to the shortest possible period of time, i.e. equal to the existence of one family living in one house, representing one cultural tradition, with no mix of older or younger archaeological material were acquired (cf. Abramów 2021; Kadrow *et al.* 2021; Wąs 2021).

The accomplishment of the first two objectives mentioned above has significantly contributed to the achievement of the third goal (to explain the generators and mechanisms of early Neolithic cultural transformation from a micro-regional perspective). It turned out that the above mentioned transformation in the Targowisko region was of a more complex nature than previously thought. The heterogeneous nature of MC has been confirmed, as was the profound demographic crisis at the turn of the LBK and the MC.

In addition to the results of the excavations described above, a series of radiocarbon dates were also obtained, precisely defining the absolute age of the beginning of the late (III) LBK phase and the classic (Ib) MC phase (Fig. 21; Tab. 1). As samples for age determination, macroremains of plants collected from the bottom parts of construction pits accompanying the excavated houses at the sites of Brzezie 40 and Targowisko 14–15 and 16 were used (Abramów 2021). At the same time, the assumption about the single phase nature of the explored parts of the sites and the origin of all arti- and ecofacts obtained from there from narrow time intervals was confirmed.

Thanks to the acquisition of a series of radiocarbon dates from the archaeological context (Fig. 21; Tab. 1) and the TRG core of biogenic sediments (Forysiak *et al.* 2021, fig. 4, tab. 1), it was possible to determine the sequence of settlement of the region Targowisko: LBK phase I–II – 5300–5100 BC; LBK III – 5100–5000 BC; MC Ia – 4950–4800 BC; MC Ib – 4650–4550 BC.

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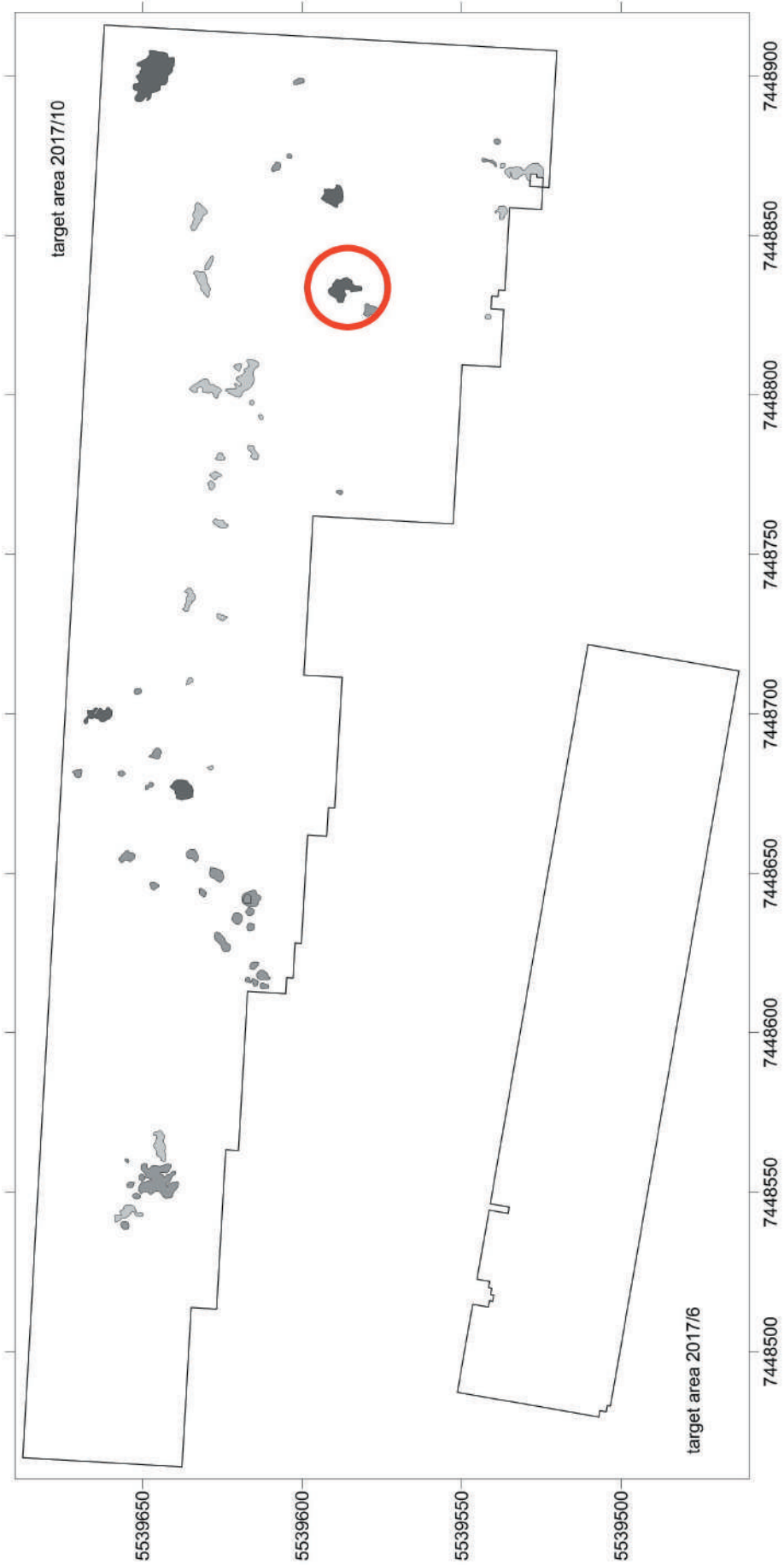


Fig. 16. Targowisko site 14–15. Location of MC dwelling structure chosen for test excavations marked with a red circle on the background of the results of geomagnetic prospection (according to Golański *et al.* 2019).



Fig. 17. Targowisko site 14–15. Spatial arrangement of the objects that are the remains of the MC house (photo by A. Golański).

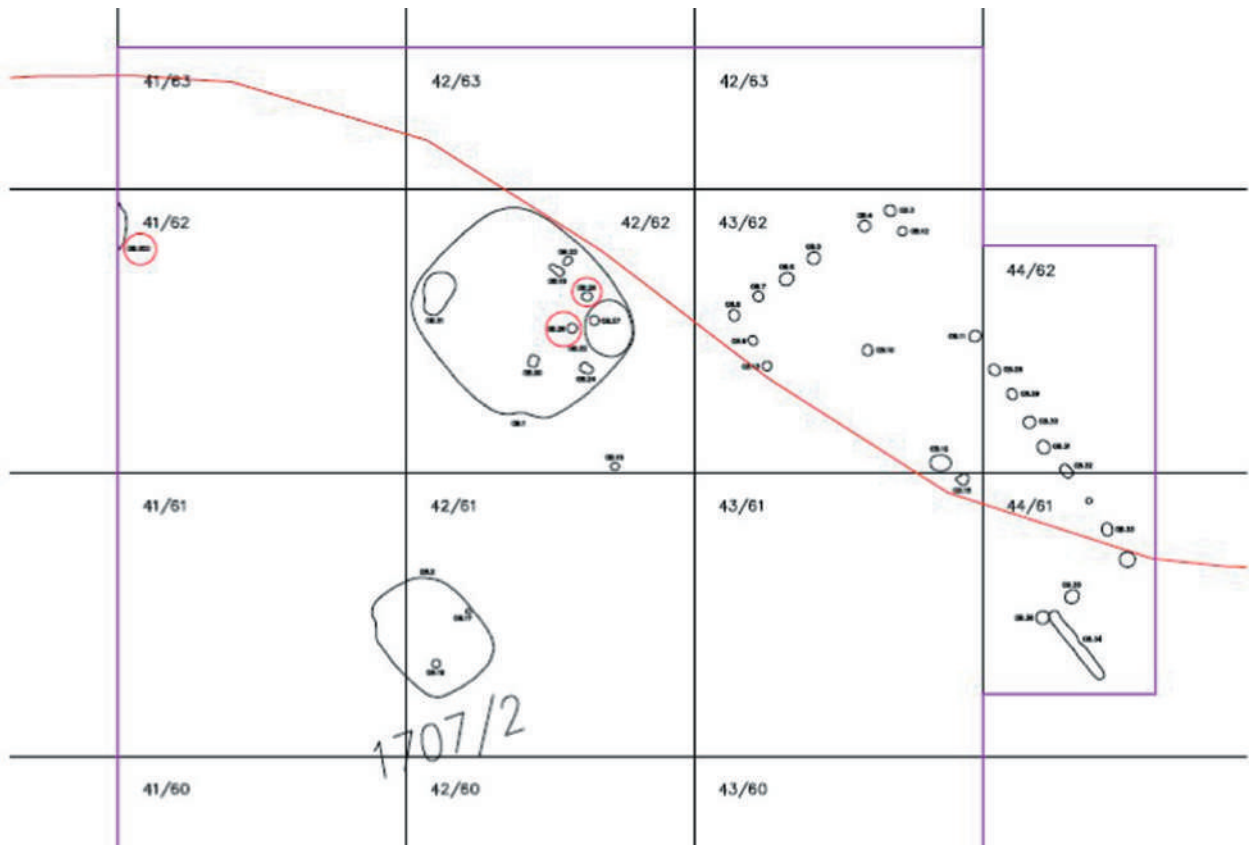


Fig. 18. Targowisko site 14–15. Spatial arrangement of the numbered features (objects) that are the remains of the MC house (drawn by M. Golańska).

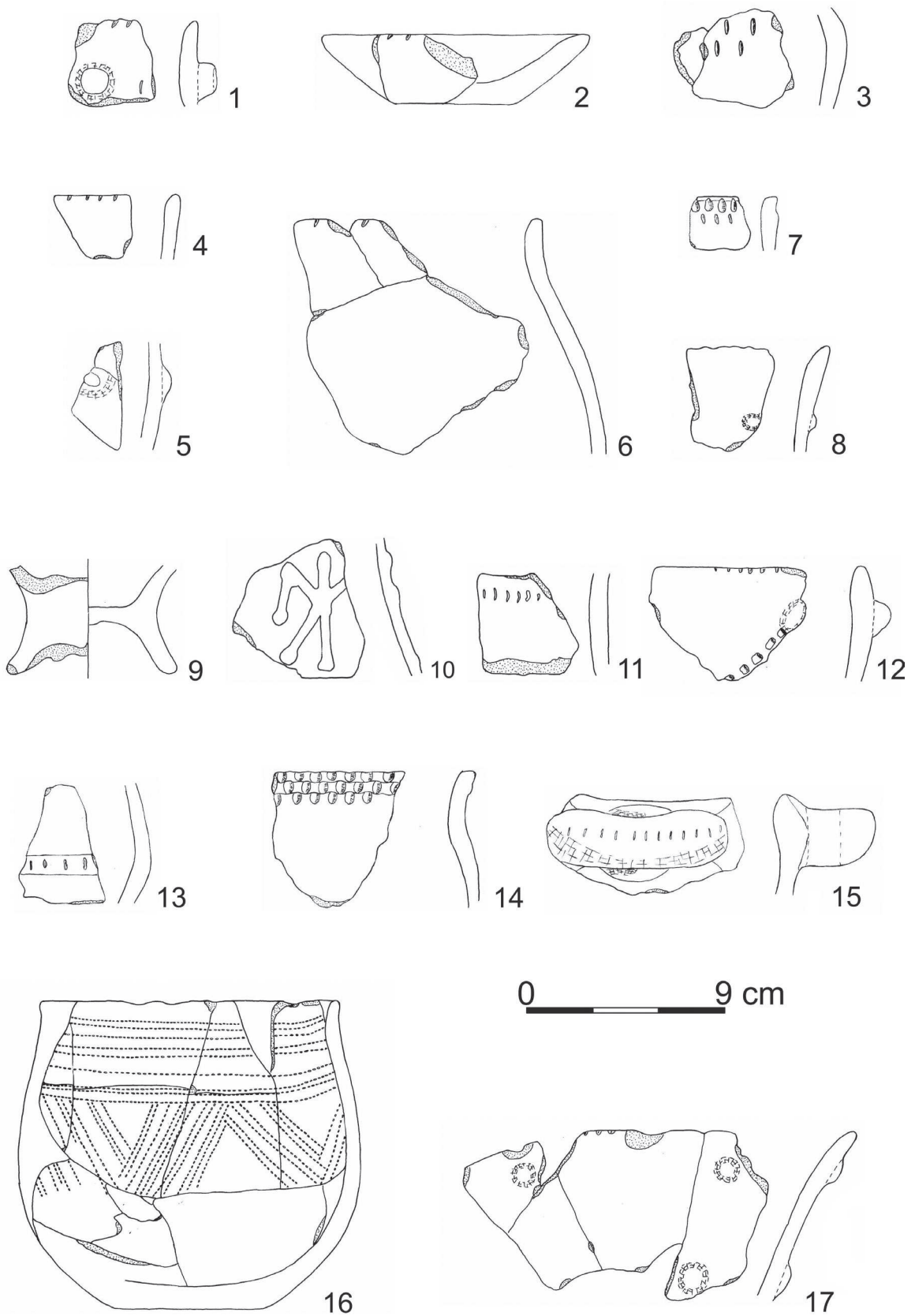


Fig. 19. Targowisko site 14–15. Selection of MC pottery from the excavated house (drawn by M. Golańska and A. Krzywda).

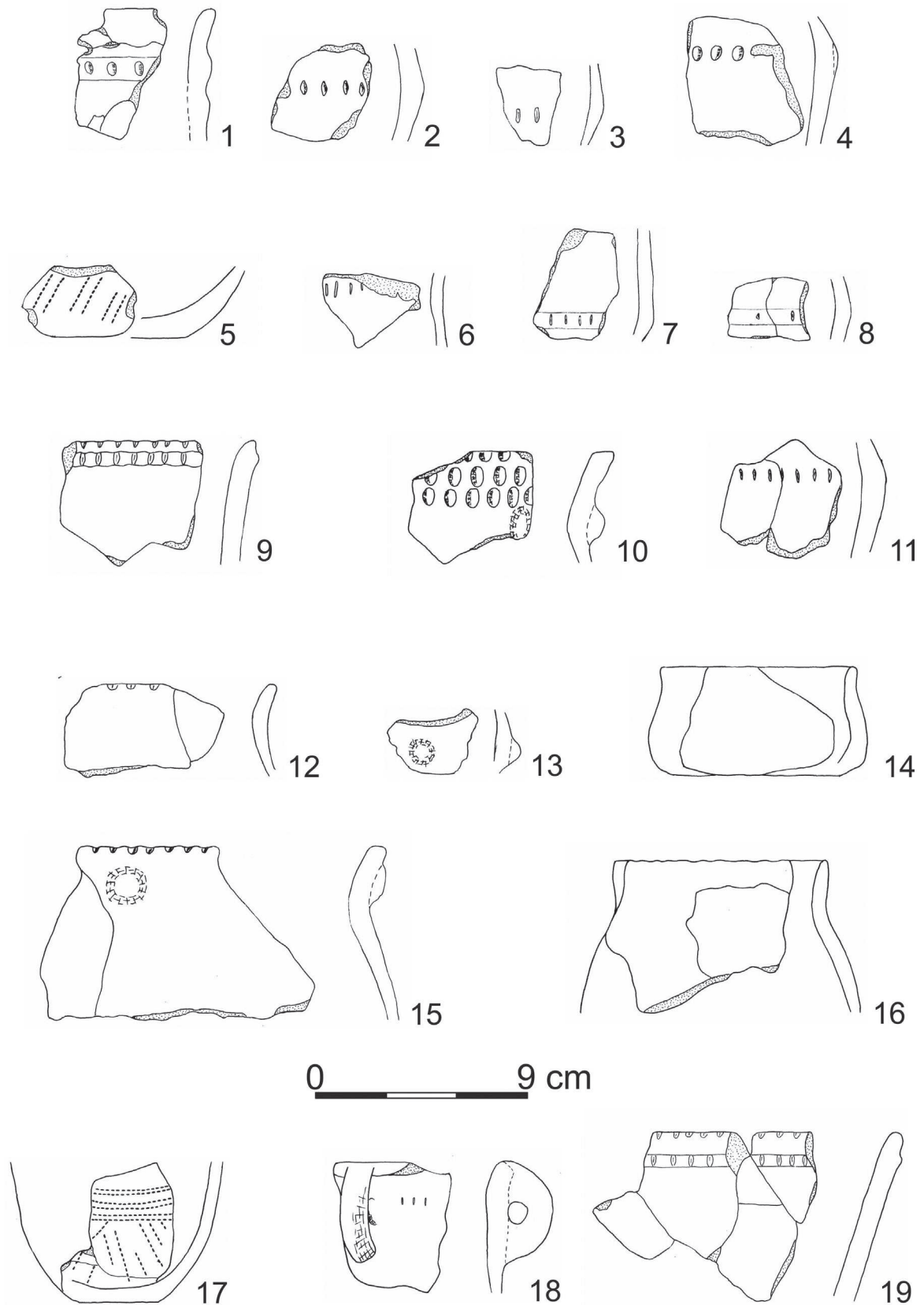


Fig. 20. Targowisko site 14–15. Selection of MC pottery from the excavated house (drawn by M. Golańska and A. Krzywda).

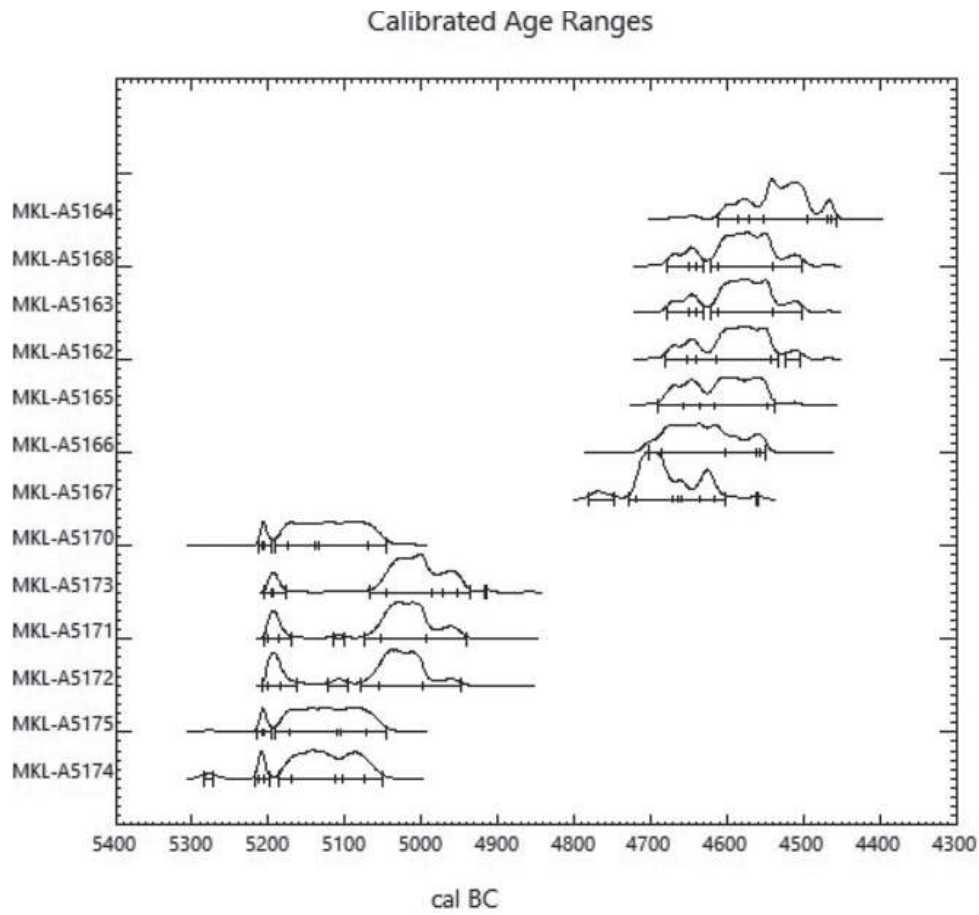


Fig. 21. Radiocarbon chronology of LBK (Brzezie 40 and Targowisko 16) and MC (Targowisko 14–15) houses (calibration after Calib Rev 8.1.0) (according to Kadrow *et al.* 2021).

Table 1. List of radiocarbon dates from LBK settlements at Brzezie site 40 and Targowisko site 16 and from MC settlement at Targowisko site 14–15. Calibration after Calib Rev 8.1.0 (according to Kadrow *et al.* 2021).

L.p.	Site	Lab	BP	BC – 68.3% probability	BC – 95.4% probability
1	2	3	4	5	6
1	Targowisko 14–15, ob. 10	MKL-A5164	5705±24	4585 (8.9%) 4569 4553 (56.6%) 4493 4469 (2.7%) 4464	4611 (95.4%) 4456
2	Targowisko 14–15, ob. 1	MKL-A5168	5737±23	4650 (4.7%) 4641 4613 (63.6%) 4540	4678 (18.0%) 4631 4621 (77.5%) 4501
3	Targowisko 14–15, ob. 1c	MKL-A5163	5737±23	4650 (4.7%) 4641 4613 (63.6%) 4540	4678 (18.0%) 4631 4621 (77.5%) 4501
4	Targowisko 14–15, ob. 1	MKL-A5162	5741±23	4652 (6.5%) 4640 4613 (61.8%) 4542	4681 (90.2%) 4531 4526 (5.2%) 4502
5	Targowisko 14–15, ob. 1	MKL-A5165	5755±23	4658 (15.0%) 4636 4616 (53.3%) 4548	4691 (95.4%) 4536
6	Targowisko 14–15, ob. 1A	MKL-A5166	5779±24	4686 (65.0%) 4602 4562 (3.3%) 4556	4703 (95.4%) 4549
7	Targowisko 14–15, ob. 1	MKL-A5167	5821±23	4604 (57.0%) 4534 4520 (11.3%) 4504	4674 (7.6%) 4636 4616 (85.9%) 4492 4472 (1.9%) 4461

1	2	3	4	5	6
8	Targowisko 16, ob. 44b	MKL-A5170	6182±23	5176 (24.4%) 5140 5132 (43.9%) 5071	5214 (95.4%) 5046
9	Brzezcie 40, ob. 7	MKL-A5173	6096±24	5197 (2.0%) 5193 5046 (55.5%) 4986 4971 (10.7%) 4954	5206 (9.9%) 5176 5069 (85.3%) 4935 4917 (0.3%) 4913
10	Brzezcie 40, ob. 10A	MKL-A5171	6108±24	5201 (11.1%) 5185 5054 (57.2%) 4992	5207 (16.2%) 5168 5116 (1.6%) 5100 5073 (77.6%) 4941
11	Brzezcie 40, ob. 7	MKL-A5172	6118±23	5202 (14.5%) 5184 5056 (53.5%) 4998	5208 (21.9%) 5162 5121 (3.7%) 5096 5079 (69.8%) 4949
12	Brzezcie 40, ob. 10A	MKL-A5175	6187±24	5173 (68.3%) 5073	5215 (95.4%) 5046
13	Brzezcie 40, ob. 7	MKL-A5174	6200±23	5212 (4.1%) 5206 5171 (43.2%) 5114 5103 (21.0%) 5074	5283 (1.3%) 5274 5218 (8.5%) 5199 5187 (85.7%) 5051

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