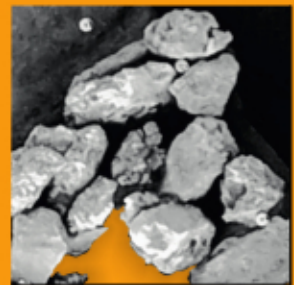
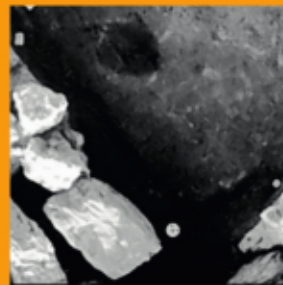


# DISSERTATIONES ARCHAEOLOGICAE

ex Instituto Archaeologico Universitatis de Rolando Eötvös nominatae



Ser. 3. No. 4. | 2016

# DISSERTATIONES ARCHAEOLOGICAE

ex Instituto Archaeologico

Universitatis de Rolando Eötvös nominatae

*Ser. 3. No. 4.*



Budapest 2016

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# Öcsöd-Kováshalom

## A retrospective look at the interpretations of a Late Neolithic site

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### **Abstract**

*The archaeological site of Öcsöd-Kováshalom became widely known to archaeological scholarship following Nándor Kalicz and János Makkay's monographic treatment of the Alföld Linear Pottery culture, published in 1977. Since the site lies halfway between two modern settlements, it was variously administratively part of Öcsöd or Kunszentmárton. The site appears as No. 207, Kunszentmárton-Érpart (Kováshalom), in the monograph's gazetteer of sites, where in addition to the pottery fragments with Szakálhát traits assigned to the Middle Neolithic, a fragment with Tisza decoration bearing an incised human figure was brought to light as well. This, then, was the reason that the site of Öcsöd-Kováshalom again attracted archaeological attention in 1980. Conforming to the period's research agendas, the settlement sparked archaeological interest as a rich site of the Tisza culture. It was generally assumed that this site, together with the other tell settlements of the Tisza region, was an exclusive source of the Late Neolithic in eastern Hungary. In line with the new research methods and approaches of European settlement archaeology, we shall here present some of our findings concerning the broader cultural context of Öcsöd-Kováshalom within the Tiszazug region. Statistical data reflect the general trend in the Tisza region, namely that the settlement concentrations of the preceding ALP period formed the basis of the later Tisza settlements. The illustrations reflect the process of settlement nucleation during the Neolithic of the Tiszazug, which could also be demonstrated in County Békés from the data of the Hungarian Archaeological Topography. Together with Öcsöd-Kováshalom, the locations of the ten Late Neolithic settlements of the Tiszazug constitute a micro-regional unit resembling the one that could be archaeologically demonstrated in the Szarvas micro-region in County Békés, neighbouring on Öcsöd. One goal of the overview of the methodological approaches employed during the excavations at Öcsöd-Kováshalom was to summarise earlier and more recent archaeological results by which certain features and assemblages of the site can be "re-constructed" in a complex, multiscalar reference system, and to thereby create a framework for future research that will be suitable both for the statistical assessment of the enormous source material and for identifying possible internal correlations.*

---

### **The site**

Nándor Kalicz can be credited with the first exact identification of the Öcsöd-Kováshalom site: while undertaking field surveys and collecting material for his undergraduate dissertation in 1954, he registered this location as Kunszentmárton-Érpart. The site in question is located on the left bank of the Körös, between the modern settlements of Kunszentmárton and Öcsöd, on the north-eastern bank of Érpart, a former meander loop of the Körös. Kalicz had conducted his surveys and site identifications in the Tiszazug region, an area ensconced between the confluence of the Tisza and the Körös (Fig. 1: Square I, Fig. 2:1). Thus, on the initiative of his supervisor János Banner, he had in fact taken one of the first major methodological steps of Hungarian archaeological topography on the Hungarian Plain between 1952 and 1953.

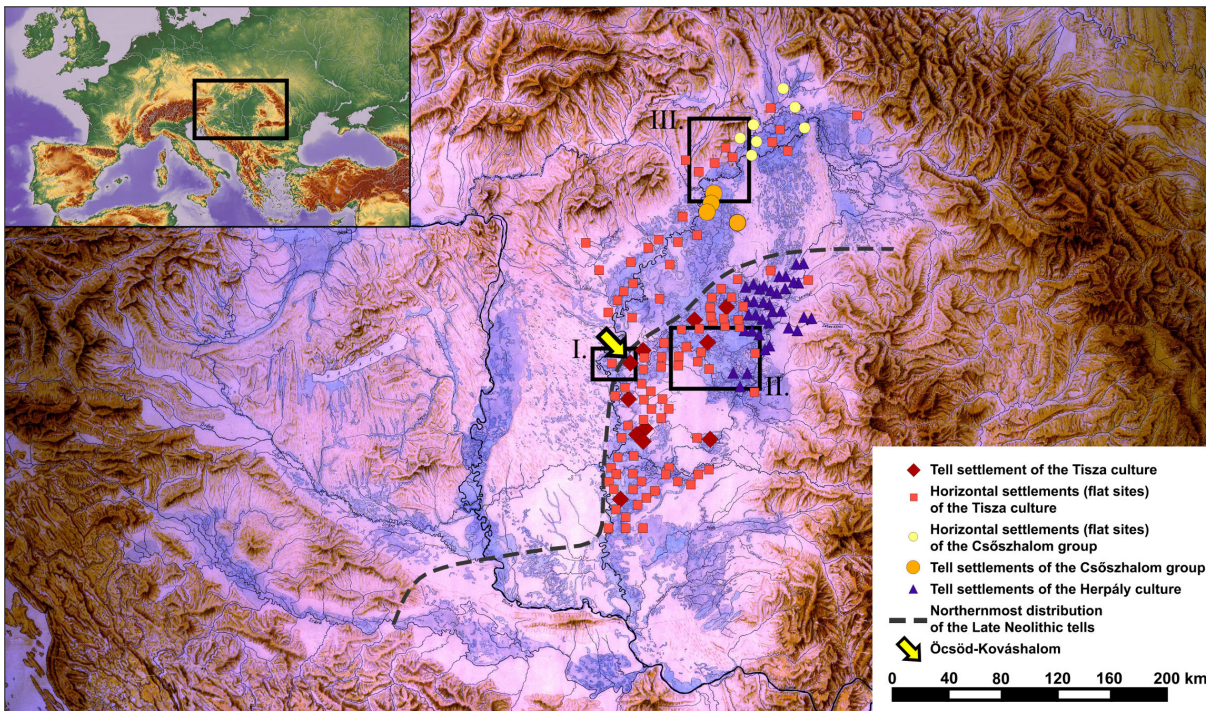


Fig. 1. Late Neolithic tells, tell-like and horizontal settlements on the Hungarian Plain (after RACZKY ET AL. 1994), showing also the locations of major regional research projects: Upper Tisza Project (UTP, CHAPMAN ET AL. 2010), Körös Regional Archaeological Project (KRAP, GYUCHA ET AL. 2015), Tiszazug.

At that time, of the settlements in the Middle Tisza region, Tiszaföldvár, Cibakháza, Nagyrév, Tiszainoka, Tizsakürt, Tiszaug, Tizsasas, Csépa, Szelevény, Istvánháza (formerly Pusztaistvánháza) and Kungyalu (formerly Gyalupuszta) as well as the parts of Kunszentmárton and Öcsöd lying north of the Körös were part of the geographic unit of the Tiszazug (Fig. 2: 1). Within this broader region, Kalicz had only surveyed the roughly 250 km<sup>2</sup> large area of the high bluffs along the Körös and the Tisza.<sup>1</sup> Thus, he did not include or discuss the site of Öcsöd-Kováshalom in his dissertation because it lay south of the Körös, while the finds he had collected became part of the collection of the Damjanich János Museum in Szolnok (DJM inv. no. 63.79.1–14). As a matter of fact, Kalicz's topographic overview reveals that compared to the twenty-five Early Neolithic (Körös culture) and the thirty-eight Middle Neolithic (Alföld Linear Pottery culture, ALPC) sites, he had only found two Late Neolithic settlements in the Tiszazug region, namely the Szelevény-Telekpart I and the Tiszaföldvár-Sziget sites.<sup>2</sup> This was so striking that the English research group led by M. R. Jarman gave it special coverage as part of the overall inquiry into the development of European agriculture: as one of the case studies of the lowland zone (Fig. 2: 2), they analysed the Neolithic settlements of the Tiszazug identified by Nándor Kalicz together with their environmental features.<sup>3</sup> Taking as her starting point the comprehensive register of sites compiled by Nándor Kalicz and János Makkay in their monograph,<sup>4</sup> K. Kosse set the topographic data from the Tiszazug in a broader context with a focus on the settlement ecology of the Körös and the Linear Pottery cultures in Hungary.<sup>5</sup>

1 KALICZ 1957, 5.

2 KALICZ 1957, 34: Site 29, 35: Site 33.

3 JARMAN ET AL. 1982, 168–184.

4 KALICZ – MAKKAY 1977.

5 KOSSE 1979.



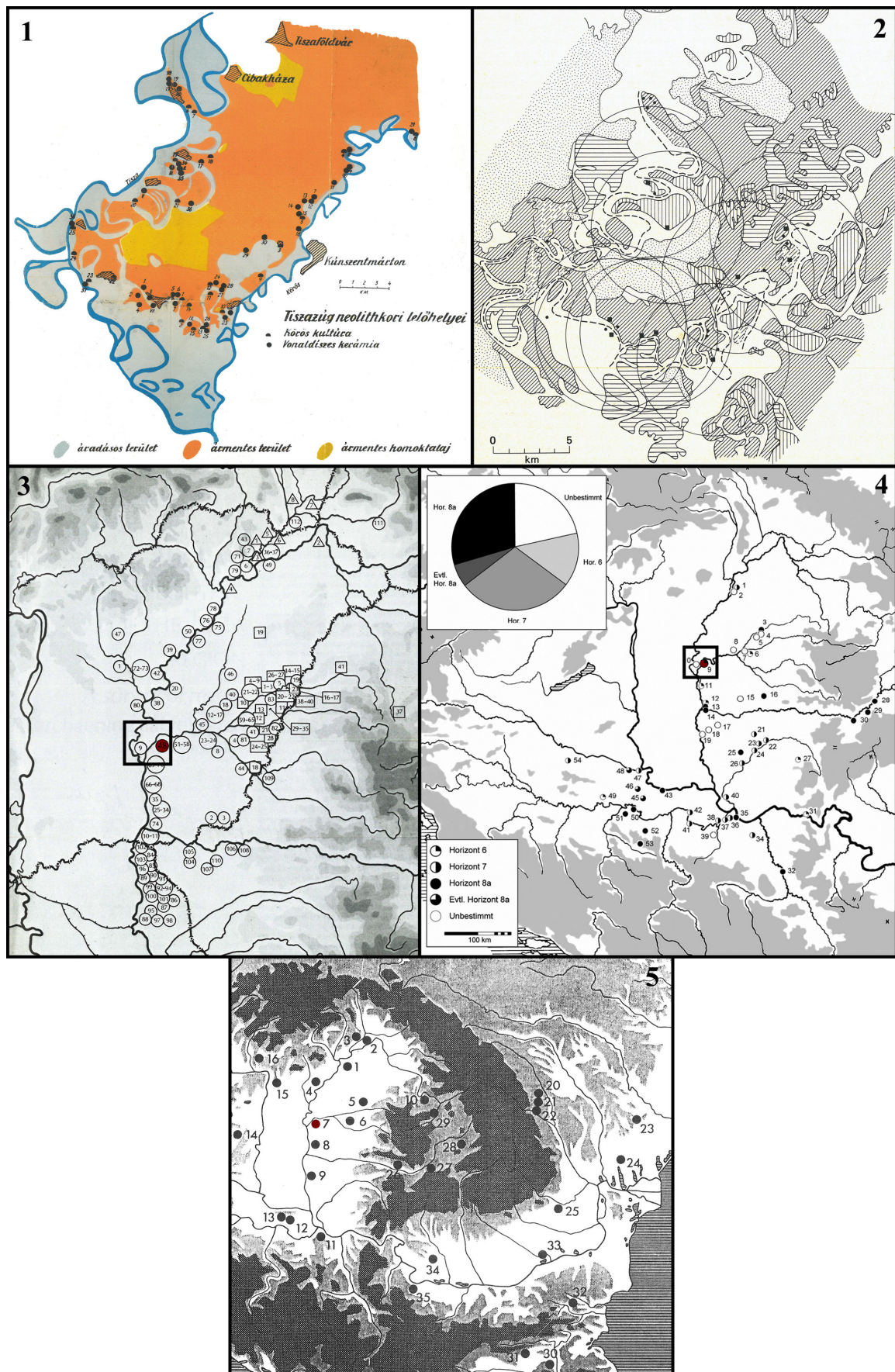


Fig. 2. The Tiszazug region and the Öcsöd-Kováshalom site in Late Neolithic research: 1 – KALICZ 1957, 2 – JARMAN ET AL. 1982, 3 – TÁLAS – RACZKY 1987, 4 – LINK 2006, 5 – LICHARDUS – LICHARDUS-ITTEN 1997.

Officially, so to say, the archaeological site of Öcsöd-Kováshalom became widely known to archaeological scholarship following Nándor Kalicz and János Makkay's monographic treatment of the Alföld Linear Pottery culture, published in 1977. Since the site lies halfway between two modern settlements, it was variously administratively part of Öcsöd or Kunszentmárton (*Fig. 1: yellow arrow; Fig. 3*). The site appears as No. 207, Kunszentmárton-Érpart (Kováshalom), in the monograph's gazetteer of sites, where in addition to the pottery fragments with Szakálhát traits assigned to the Middle Neolithic, a fragment with Tisza decoration bearing an incised human figure was brought to light as well.<sup>6</sup> This, then, was the reason that the site of Öcsöd-Kováshalom again attracted archaeological attention in 1980. Conforming to the period's research agendas, the settlement sparked archaeological interest as a rich site of the Tisza culture.<sup>7</sup> It was generally assumed that this site, together with the other tell settlements of the Tisza region, was an exclusive source of the Late Neolithic in eastern Hungary (*Fig. 2: 3*).

The exhibition showcasing the finds and findings of the investigations of the tell-type settlements excavated at Hódmezővásárhely-Gorzsa, Szegvár-Tűzköves, Öcsöd-Kováshalom, Vésztő-Mágor, and Berettyóújfalu-Herpály essentially reflected this theoretical approach.<sup>8</sup> These sites provided the archaeological assemblages from which – or so it seemed at the time – the entire Late Neolithic of the Tisza Region could be reconstructed.<sup>9</sup> Altogether 161 sites represented the Late Neolithic Tisza-Herpály-Csőszhalom cultural complex in the eastern part of the Carpathian Basin (*Fig. 1; Fig. 2: 3*).<sup>10</sup> The South-East European extension of this database and the enlargement of the cultural framework enabled a broader perspective on Neolithic tell settlements (*Fig. 2: 4, 5*).<sup>11</sup> Moreover, the five Late Neolithic sites of the Tisza region as well as their assemblages, including the finds from Öcsöd-Kováshalom, found their way into the broader cultural-historical summaries of the European Neolithic.<sup>12</sup> Simultaneously, the Neolithic tell settlements of the Hungarian Plain became part of the theoretical discourse on the “early Balkan village”.<sup>13</sup> Ultimately, this entailed a fresh look at the long-term historical correlations between form and content in the case of the Bronze Age tells too, as well as to the comparison of contexts.<sup>14</sup>

## Archaeological topography and studies on Late Neolithic settlement patterns on the Hungarian Plain

The field surveys in the Körös region, part of the Hungarian Archaeological Topography project (eventually published as MRT volumes 6, 8 and 10) (*Fig. 1: Square II in the Körös region*) were begun in 1969 in County Békés in the southern Hungarian Plain, which included Öcsöd and Kunszentmárton as well. This survey provided detailed settlement historical data

6 KALICZ – MAKKAY 1977, 140, Taf. 150, 1–4, Taf. 152, 8, Taf. 189, 9.

7 RACZKY ET AL. 1985; RACZKY 1986.

8 TÁLAS – RACZKY 1987.

9 KALICZ – RACZKY 1987, 8–30.

10 RACZKY ET AL. 1994, Colour Plate III.; SALISBURY 2016, Fig. 3, 3.

11 LICHARDUS – LICHARDUS-ITTEN 1997; GOGÁLTAN 2003; LINK 2006.

12 GIMBUTAS 1991, 70–77; WHITTLE 1996, 107–116.

13 CHAPMAN 1989; 1997; 2010; MEIER-ARENDRT 1991; BAILEY 2000, 161–177; KALICZ 2001; BORIC 2008; HORVÁTH 2009; ROSENSTOCK 2009; RACZKY 2015.

14 ANDERS ET AL. 2010; GOGÁLTAN 2003; GYUCHA ET AL. 2013; KIENLIN 2015.

from prehistory until the close of the Middle Ages over an area of 3798 km<sup>2</sup>.<sup>15</sup> From 1979 onwards, the Ashmolean Museum (Oxford) joined this archaeological project in County Békés with an intensive survey conducted in the Dévaványa area directed by Andrew Sherratt. One of the most significant results of this project was an outline of the succession of Neolithic and Copper Age settlement systems in the central part of the Hungarian Plain.<sup>16</sup> The new approach and methods introduced by Sherratt largely contributed to the success of the intensive topographic surveys in the Gyomaendrőd area covering some 42 km<sup>2</sup> as part of the County Békés Topography, conducted by the Archaeological Institute of the Hungarian Academy of Sciences from 1984 onwards.<sup>17</sup> From 2000, topographic research in the northern part of County Békés, in the area along the Körös rivers, was continued by the Hungarian-American Körös Regional Archaeological Project (KRAP), whose goal was the investigation of the long-term dynamics of prehistoric settlements through a broad application of interdisciplinary methods over a 2860 km<sup>2</sup> large area along the Körös rivers.<sup>18</sup> This work resulted in the publication of several monographs covering various prehistoric periods,<sup>19</sup> whose most significant innovation was the introduction of a multiscalar approach and the *longue durée* perspective in the analysis of Neolithic and Copper Age settlement patterns in the southern Hungarian Plain.<sup>20</sup> In sum, these advances led to the creation of a bottom-up spatial framework as well as a long-term temporal range with multiple time scales for the analysis of the topographic data.<sup>21</sup>

Parallel to A. Sherratt's two archaeological projects in eastern Hungary, János Makkay pursued a markedly different direction in Hungarian theoretical research: he proposed a different model for the emergence and development of Neolithic settlement patterns on the Hungarian Plain. He accorded special attention to the nature of the settlement concentration of the Tisza culture,<sup>22</sup> with a focus on the archaeological reconstruction of a process of urbanisation in the Balkans and the Carpathian Basin and its possible Near Eastern correlations. For Makkay, the emergence of the tells of Tisza-Herpály-Csőszhalom complex embodied one of the most striking traits of this process in the Tisza region. His model assigned this process to the 3<sup>rd</sup> millennium BC within the traditional archaeological chronological framework, specifically to the period between 2800 and 2500 BC.<sup>23</sup> In contrast, A. Sherratt dated the emergence of the Szakálhát/Tisza assemblages to around 5000 BC based on calibrated radiocarbon dates,<sup>24</sup> suggesting thereby an entirely different reconstruction of the dynamics of this process and overall historical picture. His reconstruction attests to his keen archaeological acumen since the first independent chronology of the Neolithic of the Carpathian Basin based on calibrated radiocarbon dates was constructed much later, in 1995, under the direction of Ede Hertelendi,<sup>25</sup> confirming the previously merely assumed innovative model of the "long chronology" of Central and South-East Europe.<sup>26</sup>

15 ECSEDY ET AL. 1982; JANKOVICH ET AL. 1989; JANKOVICH ET AL. 1998.

16 SHERRATT 1982a; 1982b; 1983.

17 BÖKÖNYI 1992.

18 GYUCHA – DUFFY 2008; PARKINSON – GYUCHA 2012, 110–112; GYUCHA ET AL. 2013, 158–159, Fig. 1.

19 DUFFY 2014; GYUCHA 2015; SALISBURY 2016.

20 GYUCHA ET AL. 2009; PARKINSON 2002; 2006; PARKINSON – GYUCHA 2012; DUFFY ET AL. 2013; SALISBURY 2012.

21 PARKINSON – GYUCHA 2012, 108–110; GYUCHA ET AL. 2013; DUFFY ET AL. 2013.

22 MAKKAY 1982, 104–164.

23 MAKKAY 1982, chronological chart.

24 SHERRATT 1982, Fig. 2.6.

25 HERTELENDI ET AL. 1998.

26 QUITTA 1967; NEUSTUPNÝ 1968; RENFREW 1973, 101–120; EVANS – RASSON 1984.

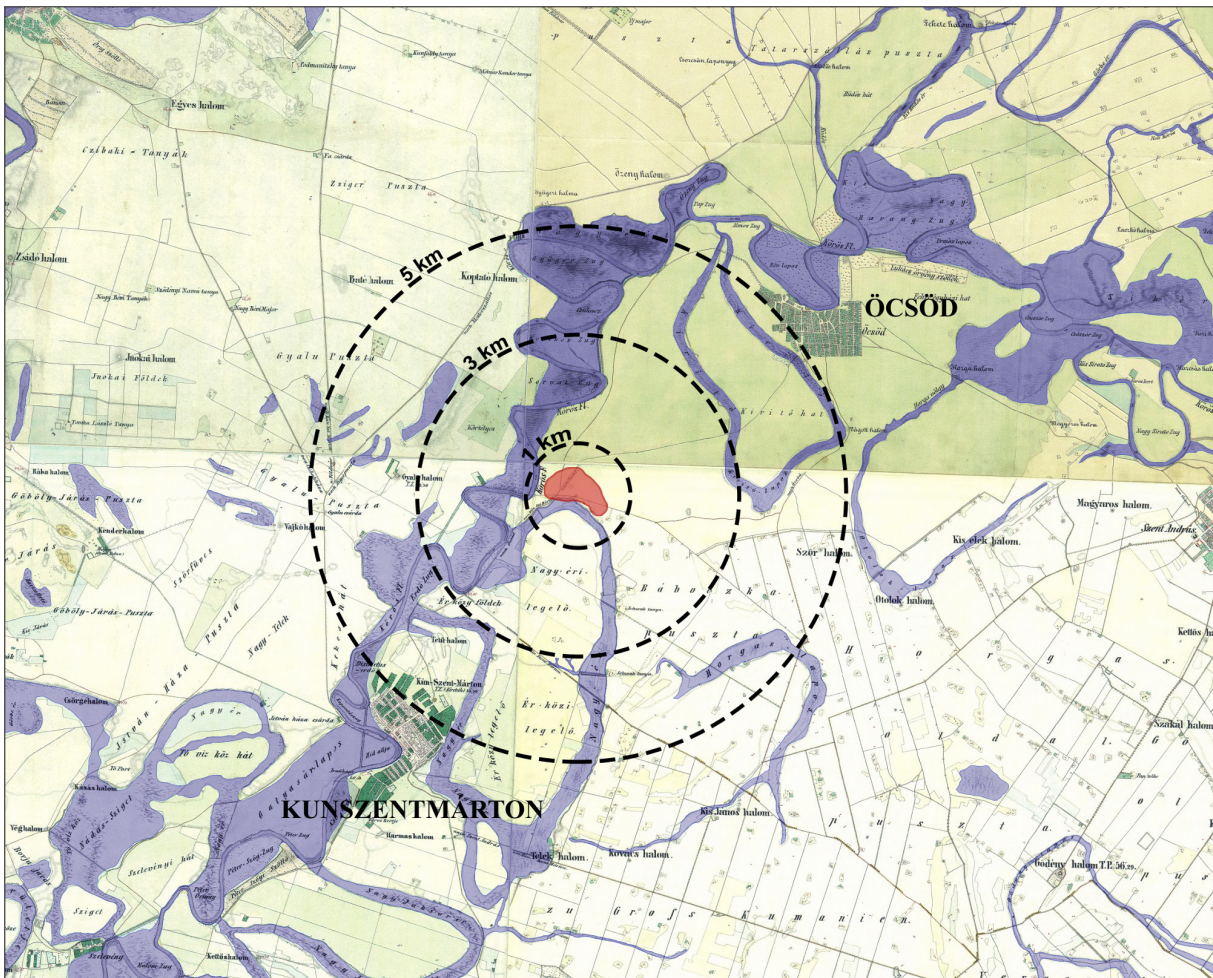


Fig. 3. The one-time environment of the Öcsöd-Kováshalom site on the map of the Second Military Ordnance Survey (1861–1863) and the site catchment areas (VITA-FINZI – HIGGS 1970).

By now, the scholarly debates over the absolute chronology of the Late Neolithic in the Carpathian Basin have abated. The dating of this period to between 5000 and 4500 BC is based on calibrated radiocarbon dates.<sup>27</sup>

Another major intensive topographic project was conducted between 1991 and 2001 in the contact zone between the alluvial and upland areas in the northern Hungarian Plain as part of the Anglo-Hungarian Upper Tisza Project (UTP) (Fig. 1: Square III). This project involved the collection and assessment of settlement historical data from an approximately 3000 km<sup>2</sup> large area.<sup>28</sup> Polgár Island lay in this wider sampling area, along the Tisza: the repeated topographic investigations from 1992 onwards in this 65–70 km<sup>2</sup> large micro-region yielded a detailed picture of the changes in local Middle Neolithic settlement patterns.<sup>29</sup> The internal spatial organisation of the settlement complex at Polgár-Csőszhalom and the Late Neolithic settlement cluster around it reflect the new principles of spatial organisation in the Upper Tisza Region around the turn of the 6<sup>th</sup> and 5<sup>th</sup> millennia BC.<sup>30</sup>

27 PARKINSON 2006, Fig. 4, Fig. 11; LINK 2006, Abb. 8; RACZKY ET AL. 2007, Fig. 10; YERKES ET AL. 2009; KIENLIN 2015, Fig. 1–2.

28 CHAPMAN 1994; CHAPMAN – LASZLOVSKY 2010, 4–27, Fig. 1.3, Fig. 1.4; MAGYARI ET AL. 2012.

29 RACZKY – ANDERS 2009.

30 RACZKY – ANDERS 2010; RACZKY ET AL. 2014; FÜZESI ET AL. 2016.

In the light of previous research as reviewed in the above, it is obvious why the Tiszazug region represents an important territorial unit between the County Békés area of the Hungarian Archaeological Topography (MRT), the Körös Regional Archaeological Project (KRAP), and the Upper Tisza Project (UTP) (*Fig. 1: Square I*), as is its geographic significance for archaeological landscape studies with a new approach.<sup>31</sup> This area connects the archaeological sites along the Körös with the Szolnok floodplain of the Middle Tisza region and, through the latter, with the entire geographic drainage network of the Tisza.<sup>32</sup> The region lies at the meeting point of an east to west communications axis represented by the Körös rivers and a north to south cultural trajectory along the Tisza. These considerations played a major role in launching the intensive topographic survey of the Tiszazug from 1979 onwards, within the framework of a project conducted jointly by the Damjanich János Museum (Szolnok), the Archaeological Department of the Eötvös Loránd University (Budapest) and the Archaeological Institute of the Hungarian Academy of Sciences (Budapest). The survey was necessitated by the planned construction of the Tisza III dam in the Csongrád area.<sup>33</sup> Although the construction itself was shelved, the archaeological fieldwork was continued during the 1980s and 1990s, largely due to the efforts of the Directorate of the Jász-Nagykun-Szolnok County Museums.<sup>34</sup> As a result, a total of 290 sites that could be securely assigned to the Neolithic were registered within the 564 km<sup>2</sup> large area in the neighbourhood of the thirteen settlements belonging to this geographical unit. Of these, fifty could be assigned to the Early Neolithic Körös culture, 178 to the Middle Neolithic ALP, while eleven to the Late Neolithic Tisza culture based on the stylistic traits of the pottery collected on the surface (*Fig. 4, Fig. 6: 1–3*).<sup>35</sup>

### **Öcsöd-Kováshalom: the centre of the Late Neolithic settlement cluster in the Tiszazug region**

In the light of the above, it became clear that the tell-like settlement of Öcsöd-Kováshalom was not a solitary phenomenon (as assumed in the 1980s), but one in a chain of settlements together with the ten other Tisza sites along the margin of the floodplain of the Tisza and the Körös rivers (*Fig. 4, Fig. 5, Fig. 6: 3*). This realisation was in itself a novelty compared to our previous perception of local Late Neolithic settlement organisation, given that comprehensive data on settlement patterns in the broader area of Öcsöd-Kováshalom were unavailable in the 1980s.<sup>36</sup>

In line with the new research methods and approaches of European settlement archaeology,<sup>37</sup> we shall here present some of our findings concerning the broader cultural context of Öcsöd-Kováshalom within the Tiszazug region. Statistical data reflect the general trend in the Tisza region, namely that the settlement concentrations of the preceding ALP period formed the basis of the later Tisza settlements.<sup>38</sup>

31 SZLANKÓ 1981.

32 MAROSI – SOMOGYI 1990; CSÁNYI – TÁRNOKI 2011; KOVÁCS ET AL. in press.

33 CSÁNYI 1981; RACZKY 1982.

34 CSÁNYI – TÁRNOKI 2011.

35 KOVÁCS ET AL. in press.

36 RACZKY 1987, 61–63.

37 MÜLLER 2009; ZIMMERMANN ET AL. 2009; TREBSCHKE ET AL. 2010; CHAPMAN 2010; FEINMAN 2015.

38 MAKKAY 1982; SHERRATT 1982a; KALICZ – RACZKY 1987, 14–19; PARKINSON 2002; 2006; PARKINSON – GYUCHA 2007, 84–86; PARKINSON – GYUCHA 2012, 110–111.

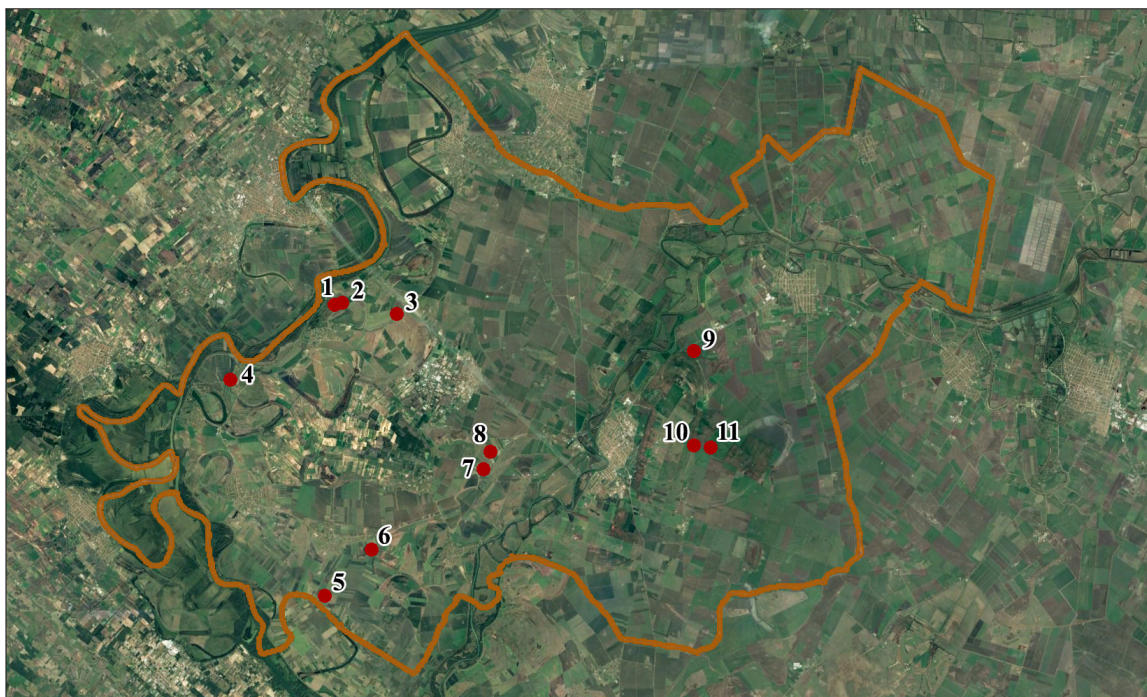


Fig. 4. The currently known Late Neolithic settlements in the Tiszazug region: 1. Tizsakürt – Buzás-sziget, 2. Tiszainoka – Buzás-sziget, 3. Tizsakürt – Téglás-lapos partja, 4. Tiszaug – Műút melléke, 5. Csépa – Compó, 6. Csépa – Csipsár-part, 7. Szelevény – Sárga-partoldal, 8. Szelevény – Telekpart, 9. Öcsöd – Kováshalom, 10. Kunszentmárton – Nagy-ér keleti partja, 11. Öcsöd – Határ-út.

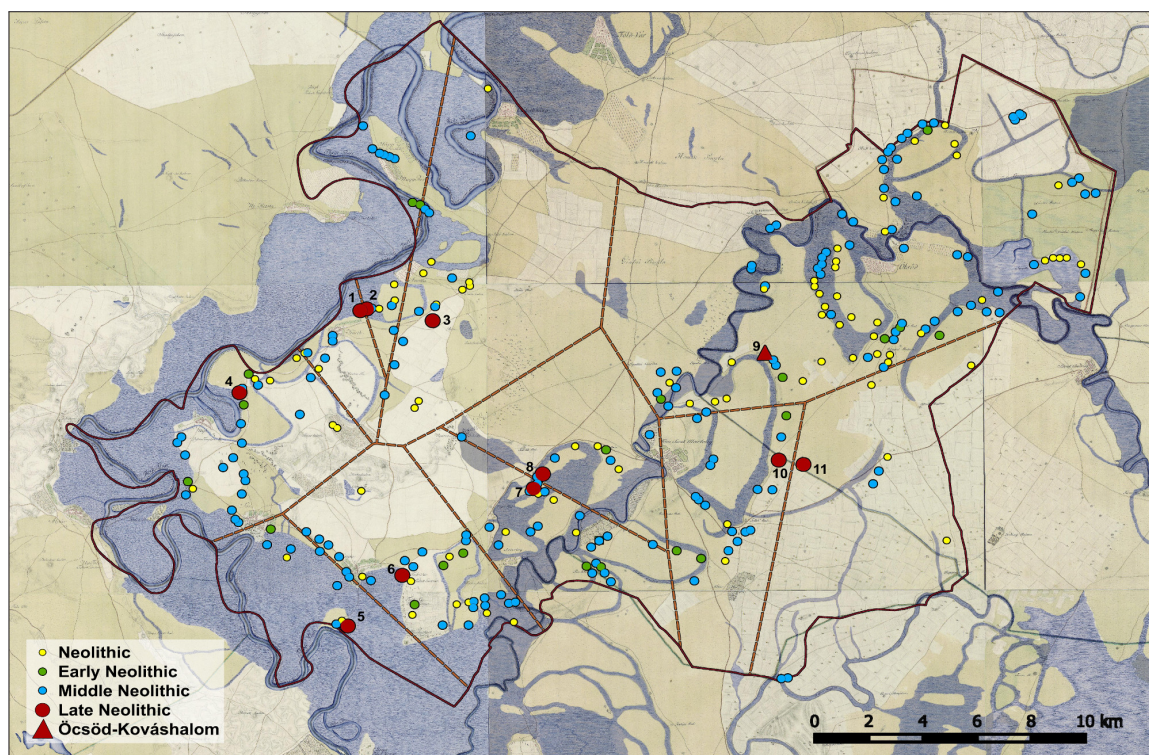


Fig. 5. Neolithic settlements in the Tiszazug region based on the field surveys in 1980s (red line showing the boundary of the surveyed area). Thiessen polygons (brown dashed line) of the Late Neolithic settlements suggested three clusters in the settlement network. The number and location of each Neolithic period's settlements reflect the process of concentration in the Late Neolithic.

This is amply illustrated by the successive settlement densities of the Early Neolithic (Körös, 0.09 site/km<sup>2</sup>), the Middle Neolithic (ALP, 0.31 site/km<sup>2</sup>), and the Late Neolithic (Tisza, 0.01 site/km<sup>2</sup>) in the Tiszazug area (Fig. 6: 1–3), which correlate well with the figures calculated from the topographic data of County Békés.<sup>39</sup> Beyond this general trend, the size of the Tisza settlements in the Tiszazug ranged between 0.4 and 15.3 ha, extents calculated from the surface scatter of finds (Fig. 7). These figures reflect the process of settlement nucleation during the Neolithic of the Tiszazug, which could also be demonstrated in County Békés from the data of the Hungarian Archaeological Topography.<sup>40</sup> Together with Öcsöd-Kováshalom, the locations of the ten Late Neolithic settlements of the Tiszazug constitute a micro-regional unit (Fig. 4, Fig. 5) resembling the one that could be archaeologically demonstrated in the Szarvas micro-region<sup>41</sup> in County Békés, neighbouring on Öcsöd, where six single layer, farmstead-like settlements covering 1000–2000 m<sup>2</sup> constituted a clearly definable settlement cluster<sup>42</sup> around the tell-like settlement of Szarvas-Kovács halom.<sup>43</sup> Comparable micro-regional Late Neolithic settlement clusters of eleven to twelve sites were identified in the context of the sixty-two Late Neolithic sites within the 2860 km<sup>2</sup> large area along the Körös in County Békés. These settlement clusters were separated from each other by 6–20 km wide empty, unoccupied zones.<sup>44</sup> In terms of their size and morphological features, these settlement clusters can be best compared to the “settlement niches” (*Siedlungskammer*) of the Central European LBK.<sup>45</sup> The geographical agglomerations of sites are more recently designated as settlement groups (*Siedlungsgruppen*) or settlement clusters, which enables a more flexible spatial labelling.<sup>46</sup>

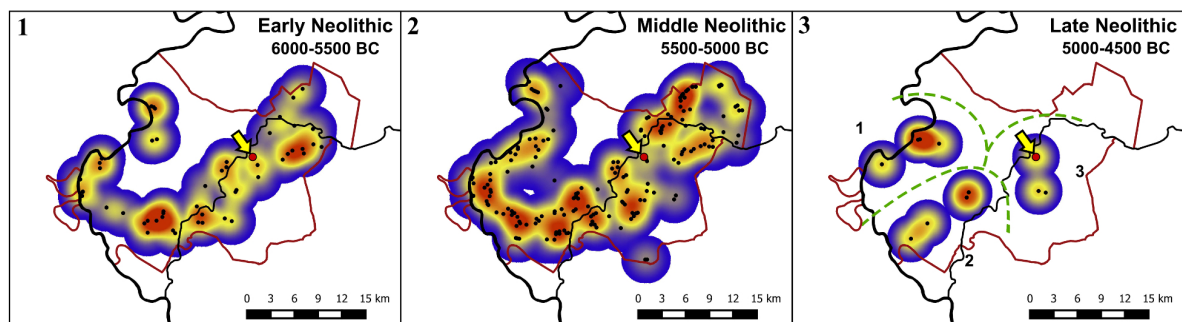


Fig. 6. Settlement density of the three Neolithic periods generated with QGIS using weighted heat maps (radius: 3 km). The settlements formed several smaller and three large clusters, which took shape clearly in the Late Neolithic (1–3). The comparison of the three heat maps suggest a concentration process characterised by both continuity and transformation.

It is perhaps a reflection of the diversity of local adaptive systems that of the eleven–twelve Late Neolithic Tisza settlement clusters reconstructed for County Békés, only in five cases were their central nuclei genuine tell types (Szarvas-Kovács halom, Szeghalom-Kovács halom,

39 PARKINSON – GYUCHA 2012, Tab. 2.

40 PARKINSON – GYUCHA 2012, Fig. 5.

41 GYUCHA ET AL. 2013, Fig. 2.; SALISBURY 2016, Fig. 10, 1.

42 MAKKAY 1982, Map 7; GYUCHA – PARKINSON 2008, Fig. 2.; SALISBURY 2016, Fig. 3. 4.

43 MAKKAY 1982, 128–129, registered this site as Szarvas-Botanical garden.

44 GYUCHA – PARKINSON 2008, Fig. 8; GYUCHA ET AL. 2013.

45 LÜNING 1997, 43.

46 CLASSEN 2009, 96–98 and note 7.

Vésztő-Mágor, Békés-Povád, and Dévaványa-Sártó).<sup>47</sup> The settlement of Öcsöd-Kováshalom, lying close to the Szarvas settlement cluster, represents the northernmost tell-like site of the Tisza culture along the Tisza (Fig. 1). Its direct southern neighbour is the settlement complex of Szegvár-Tűzköves, which lies at a distance of *ca.* 30–35 km as the crow flies.<sup>48</sup>

Site	Area (km <sup>2</sup> )	
1	Tizsakürt – Buzás-sziget	10,009
2	Tiszainoka – Buzás-sziget	26,484
3	Tizsakürt – Téglás-lapos partja	80,896
4	Tiszaug – Műút melléke	51,047
5	Csépa – Compó	27,169
6	Csépa – Csipsár-part	40,333
7	Szelevény – Sárga-partoldal	32,843
8	Szelevény – Telekpart	36,19
9	Öcsöd – Kováshalom	153,388
10	Kunszentmárton – Nagy-ér keleti partja	40,77
11	Öcsöd – Határ-út	64,983

Fig. 7. Late Neolithic settlements and the size of the associated site catchment areas.

The statistical analysis and the heat map of the eleven settlements in the Tiszazug revealed that the sites in the zones along the rivers formed three smaller clusters (Fig. 6: 3). In this analysis, the modules of the site catchment areas, represented by circles of 3 km radius around the sites, clearly outline these three adjoining settlement clusters, with centres at Öcsöd, Szelevény, and Tizsakürt. It is also obvious that the smaller settlement clusters lie 4–6 km apart. In the case of the large horizontal settlement at Szelevény-Telekpart, lying south of Öcsöd-Kováshalom, we also have excavation data: a rescue excavation in 1998 unearthed several features and the characteristic pottery of the Tisza culture.<sup>49</sup> The antecedents of the three settlement clusters of the Late Neolithic can be detected in the settlement patterns on the site maps of the preceding Early and Middle Neolithic (Fig. 6: 1, 2). At the same time, Öcsöd-Kováshalom is a good example of the temporal shifts in spatial focal points since the archaeological features and finds of the preceding Early Neolithic Körös culture and of the Middle Neolithic ALPC were also attested at this site of the Tisza culture. However, it is also obvious that Öcsöd played an entirely different role in the settlement network during the preceding periods. During the Early and Middle Neolithic, the site lay on the boundary between two local settlement clusters, while in the Late Neolithic, it clearly assumed a central role as the region's single known stratified site (Fig. 6: 3). Moreover, as the northernmost tell-type settlement module of the Tisza region, on a larger scale Öcsöd represents the northernmost “frontier centre” in the regional settlement concentration of the Tisza culture in the southern Hungarian Plain (Fig. 1).

The smaller clusters of the Tiszazug, consisting of three to four sites, embodied the associations between single settlements and micro-regional groups in the Late Neolithic, and as such, they represent a novelty in the settlement history of the Hungarian Plain. Unfortunately, in contrast

47 GYUCHA – PARKINSON 2008, 85–86; GYUCHA ET AL. 2013, Fig. 2.

48 KOREK 1987; REZI KATÓ 2009; GULYÁS – SÜMEGI 2011a.

49 MADARAS 2007, 54–56, Tables 1–2.



to our fairly good knowledge of the spatial patterns of the Late Neolithic settlement organisation, we have relatively scant information regarding the chronological relations of the Tiszazug. Still, similarly to other regions on the Hungarian Plain, we can detect the characteristic imprints of the socio-economic changes at the turn of the 6<sup>th</sup>–5<sup>th</sup> millennia BC, namely settlement nucleation and the structural transformation in their wake reflected by the emergence of new types of micro-regional clusters made up of various associations of single household sites, hamlets, villages, and tell modules.<sup>50</sup> The activities and interactions in the micro-scale spatialities were conducted within a social organisation that ranged from individuals and households embodying various identity definitions to the settlement community, to the highest-level society.<sup>51</sup> The society of the Late Neolithic on the Hungarian Plain is generally described as a tribal or a middle-range society.<sup>52</sup> The cultural spatiality created by the many different types of interactions between the social modules served as the setting for the richly diverse dimensions of life. Thus, the use of the term “house society” for describing the colourful social formations of these sites seems quite justified.<sup>53</sup>

Ecologists have suggested that the Holocene climatic optimum may also have played a crucial role in the social and economic development of Late Neolithic tell communities.<sup>54</sup> Archaeological studies on settlement history now increasingly focus on the reconstruction of the dynamics of the palaeoenvironment<sup>55</sup> and of the Tisza-Körös drainage network in particular.<sup>56</sup> The recent theoretical approach, which views social and ecological systems as interrelated complexes engaging in continuous interaction with each other on various levels,<sup>57</sup> provides a new interpretative framework for the internal changes of Tisza-type settlements as well.<sup>58</sup> Thus, the dynamics and the adaptive renewal cycle of the socio-ecological systems on the Hungarian Plain during the Late Neolithic, in the earlier 5<sup>th</sup> millennium BC, was no doubt influenced by local climatic fluctuations and their impact on the drainage network of the Tisza, similarly as in other regions as demonstrated by several case studies.<sup>59</sup> Additionally, human activities had an increasing impact on the vegetation as well by this time.<sup>60</sup>

Of the geographic elements that largely defined the paleoenvironment of Öcsöd-Kováshalom, the one-time meanders of the Körös must be highlighted. The settlement, as a village ecosystem,<sup>61</sup> was located directly besides a wide Körös channel, as can be seen on the map of the Second Military Ordnance Survey (1861–1864) (*Fig. 3*). Moreover, since two similar channels can also be detected within the catchment area of 5 km radius around the settlement, we may assume that prior to the regulation of the Tisza in the 19<sup>th</sup> century, the environment of the narrower location was largely defined by the one-time watercourses.

50 CHAPMAN 2008; PARKINSON – GYUCHA 2012.

51 WHITTLE 2003, 59–61.

52 PARKINSON 2002; PARKINSON – GYUCHA 2007; DUFFY ET AL. 2013.

53 BORIĆ 2008.

54 GULYÁS – SÜMEGI 2011a, 2690–2691.

55 SÜMEGI ET AL. 2012.

56 TÍMÁR 2003.

57 SCHREG 2014, 94–100.

58 BERKES ET AL. 1998; REDMAN 2005; FOLKE 2006.

59 ZIMMERMANN 2012; GRONENBORN ET AL. 2014.

60 MAGYARI ET AL. 2012; SÜMEGI ET AL. 2012, 45–46.

61 SCHREG 2014, 98–100.

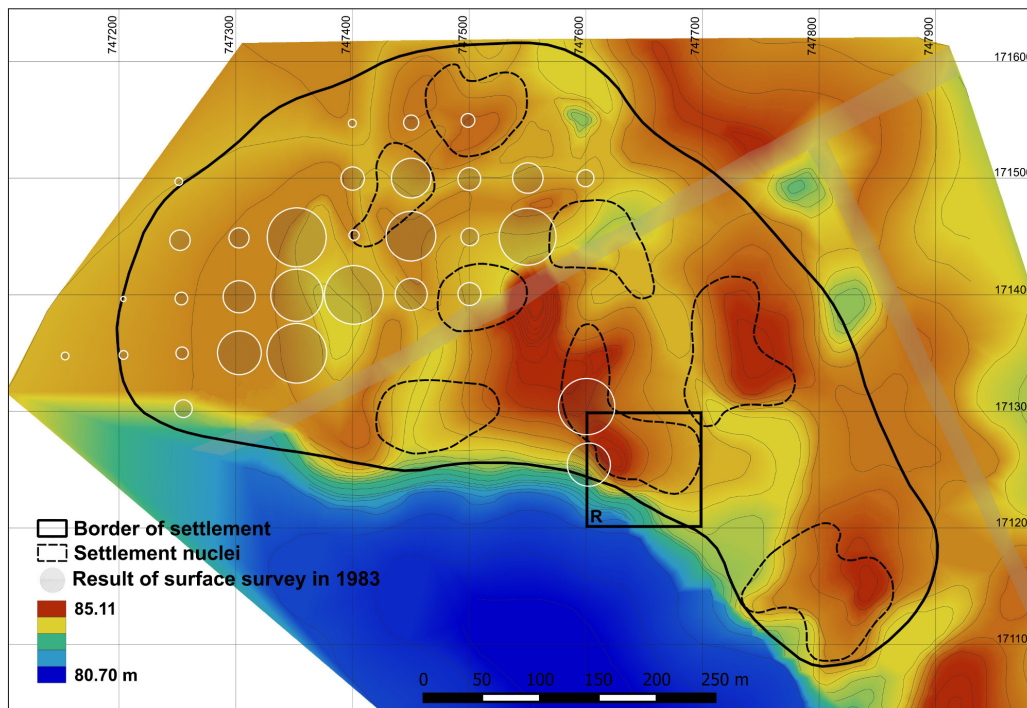


Fig. 8. Boundary and internal layout of Öcsöd-Kováshalom based on the field surveys in 1983. The density of surface finds outlined the settlement nuclei within the 21 ha extent of the site. The size of the settlement nuclei ranged between 3300 and 8700 m<sup>2</sup>.

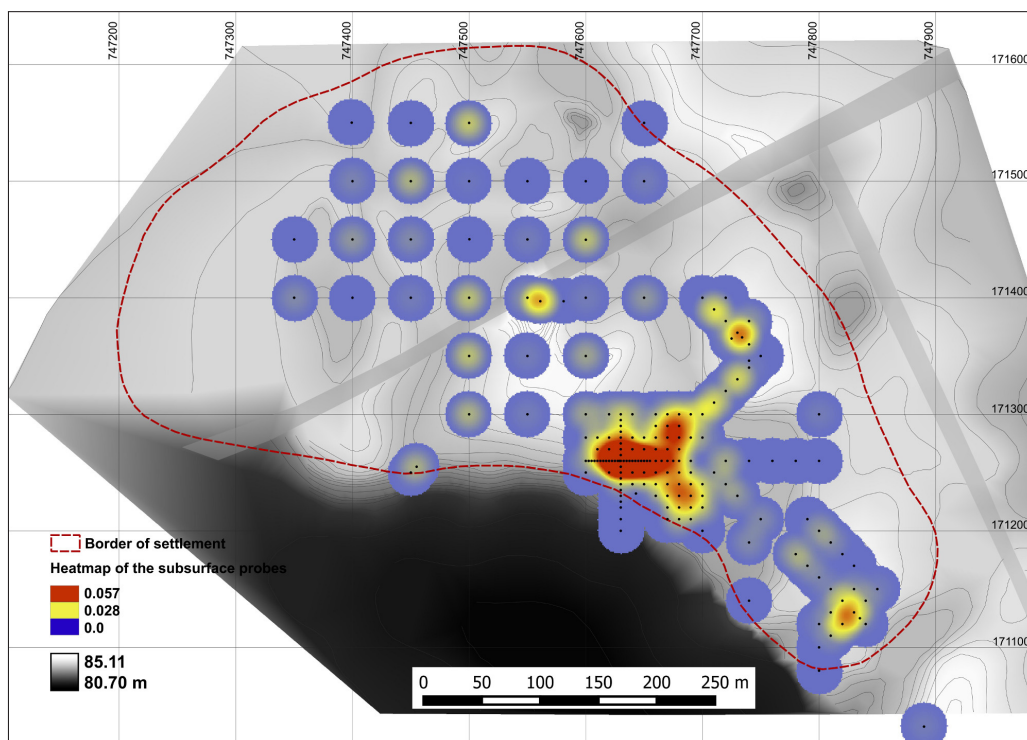


Fig. 9. Results of the corings at Öcsöd-Kováshalom shown on a weighted heat map (radius: 20 m) generated with QGIS. The heat map was weighted according to the extent of anthropogenic influences. A clustered settlement layout could be reconstructed resembling one based on the surface survey. The most intensely occupied settlement nucleus is located near the river bank in the site's south-eastern part (Square R).

It also seems likely that the reconstructed mosaic patterning of the Late Neolithic environment<sup>62</sup> had determined the lifeways of the settlement's occupants in a similar way as has been convincingly demonstrated for Szegvár-Tűzköves and Hódmezővásárhely-Gorzsa.<sup>63</sup> The floods of the Tisza occurring regularly twice a year had increasingly higher floodwaters from the early phase of the Tisza culture onwards,<sup>64</sup> which probably affected the life of the Öcsöd settlement as well. The outstandingly high diversity of hunted animals at Öcsöd, not typical at other Tisza settlements,<sup>65</sup> can perhaps be explained by the need of broadening the range of subsistence and nutrition resources. These archaeological findings reflect the recent research advances that enable the reconstruction of the broader geographic environment of the Öcsöd-Kováshalom settlement on the regional scales of the Tiszazug, the Middle Tisza region, and the Hungarian Plain.<sup>66</sup> Our goal was to remedy the shortcomings of previous research, namely that previous investigations had mainly focused on Öcsöd-Kováshalom itself, and had mostly neglected a study of its position as part of a broader region.

### **The internal spatial patterning of the settlement at Öcsöd-Kováshalom**

As part of the preliminary intensive local investigations in the early 1980s, we examined the scatter of the surface finds,<sup>67</sup> from which we estimated that the extent of the settlement was around 21 ha (*Fig. 8*). This was rather striking in itself since it was previously believed in Hungarian research that with their 10–12 ha average sizes, Szegvár-Tűzköves and Dévaványa-Sártó were the largest settlements of the Tisza culture.<sup>68</sup>

We systematically collected the surface finds in a system of circles of 50 m radius adjusted to the 100 × 100 m grid over the Öcsöd site. We generated pie charts for each circle based on the assessment of the number and size of the pottery fragments, which was then projected onto the contour map of the entire settlement in order to display the spatial concentrations in the distribution of the pottery (*Fig. 8*).<sup>69</sup> Unfortunately, because of various types of agricultural cultivation and ownership rights, this fieldwork could not be performed over the entire area of the site, thus our data from the systematic collection of surface finds only covers the central and north-western parts of the one-time settlement. Even so, we could still note a general tendency of decreasing frequencies of pottery towards the edge of the settlement. The tell-like centre of the settlement was located in Square R, an area rising above the settlement; however, the areas bordering on this square did not yield particularly high numbers of pottery (*Fig. 8*).

In order to compare the surface scatter of finds with the location of the buried features, we performed a series of corings for obtaining information on the subsurface stratification and the stratigraphic sequence of the settlement as a whole. We extracted samples from 188 coring

62 SÜMEGI ET AL. 2012; MOSKAL-DEL HOYO 2013.

63 GULYÁS – SÜMEGI 2011a; GULYÁS – SÜMEGI 2011b.

64 GULYÁS 2011, 107–111.

65 KOVÁCS – GÁL 2009.

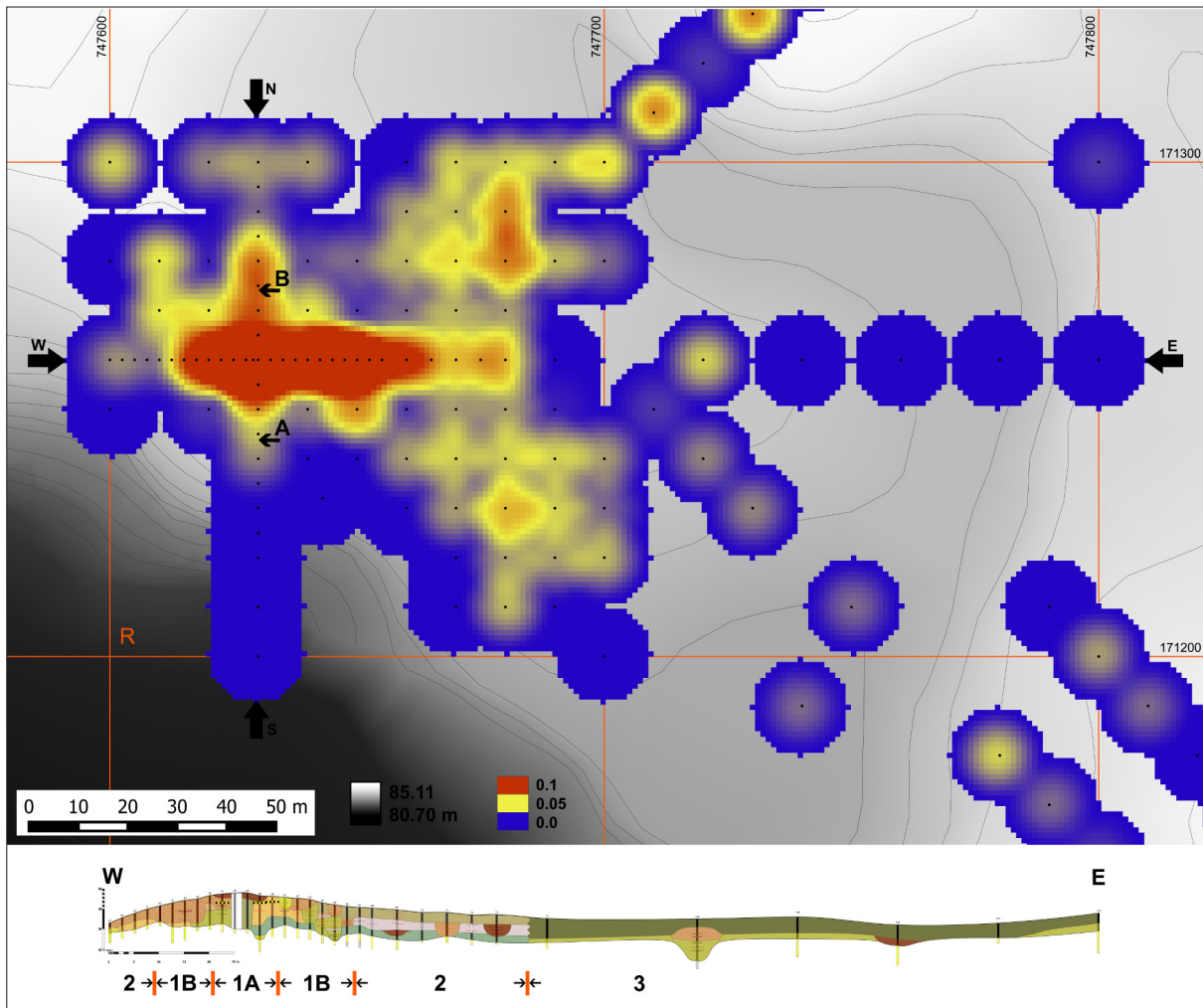
66 CSÁNYI – TÁRNOKI 2011.

67 For a detailed description and discussion of these multi-disciplinary investigations, see RACZKY ET AL. 1985; RACZKY 2009.

68 MAKKAY 1982, 133; KALICZ – RACZKY 1987, 16; KOREK 1961; SHERRATT 1983.

69 SIKLÓDI 1985, 264–265.

points in 1983 under the direction of Gábor Rózsa and András Varga.<sup>70</sup> The corings concentrated on the site's central and the eastern part. The coring points were spaced 50 m apart from each other in the middle, low-intensity area, and 10–20 m apart in the eastern, more intensive zone. Additional corings were performed at points spaced 2.5–5 m apart within the area of Square R, which according to the corings was stratified, providing a more detailed picture of this area. The depth of the corings ranged between 100 and 300 cm, depending on the thickness of the occupation layers and the depth of the pits dug into the virgin soil (*Fig. 9, Fig. 10*).



*Fig. 10.* A) Heat map (radius: 10 m) of Square R and the surrounding area. The site's stratigraphy could be reconstructed from the corings: W–E section (*Fig. 10.B* and *Fig. 11*), S–N section (*Fig. 12*), A–B section (*Fig. 17*).

During the evaluation of the cores, we focused on the nature, the colour, and the components of the layers. We accorded special attention to the so-called anthropogenic effects, identified and quantified from the presence of charcoal, ash, burnt and unburnt clay as well as of archaeological finds (pottery, animal bones, mussels). We used this data for determining the extent of human activity and for mapping potential activity areas.<sup>71</sup> While during our previous examinations we

<sup>70</sup> RÓZSA 1985.

<sup>71</sup> RÓZSA 1985.

only reconstructed three larger and two smaller settlement units,<sup>72</sup> the results of the corings and their assessment revealed that the Öcsöd site actually incorporated three major and five smaller settlement units (Fig. 8).<sup>73</sup> The total area of these reconstructed settlement units could be estimated as 4 to 5 ha, the implication being that the data gained from the primary field surveys must be treated with caution on the Hungarian Plain because these are largely dependent on local geomorphological processes and agricultural activities.

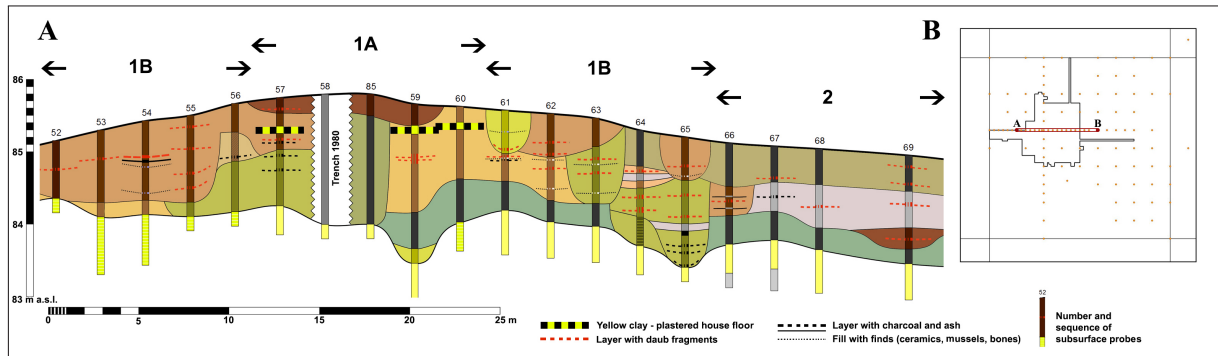


Fig. 11. Detail of the W–E section of Square R. The reconstruction was based on the corings (darker lines). The identified zones are based on stratigraphic associations: 1A – built-up area, 1B – intensive occupation area, 2 – periphery of settlement nucleus.

At Öcsöd, the scatter of the surface finds did not show an obvious correlation with the spatial position of buried features (Fig. 8, Fig. 9). However, the anthropogenic “values” of the corings confirmed the preliminary observation according to which the most intensely used area of the settlement, with the thickest layer sequence (ca. 160 cm), lay at the southern edge of the site, on the waterside elevation falling into the area of the 100 × 100 m large Square R (Fig. 9, Fig. 10). The corings of the Öcsöd settlement also indicated that the occupied areas around the tell-like primary domestic space were separated from each other by empty, unoccupied areas. The stratigraphy of the tell-like settlement centre was displayed by means of an east-west and north-south section created from the results of the corings (Fig. 10, Fig. 11, Fig. 12), which indicated that the most intensely occupied area was the highest part of Square R. Layers which could be securely identified as house floor levels were only to be found in this narrow zone, which could thus be described as a built-up area (1A). This was enclosed by a broader zone, characterised by large amounts of diverse fills (1B), and by pits dug into each other, pit complexes, and infill layers. Zone 2 represents the periphery of the occupation core, where only a few features could be identified, although successive levels of occupation could be clearly detected. Finally, Zone 3 can only partly be regarded as an integral part of the site. Even though scattered traces of archaeological features could be identified, the typical fill layers do not have an anthropogenic nature, but were naturally formed soils. This is by far the widest zone among the occupation areas, a kind of no man’s land that both separated and connected them.

Another feature of the Öcsöd settlement complex was that the outer settlement did not form a single homogeneous area, but was made up of islet-like clusters. This realisation suggested, already in 1987, that we are witnessing the outcome of a nucleation process during which

72 RACZKY 1987, 63.

73 RACZKY 2009, 101, Fig. 2.

the structures integrated in a single settlement space preserved their spatial “sovereignty”,<sup>74</sup> meaning that the settlement’s vertical and horizontal segments, constituting specific modules, formed a specific local settlement layout. Obviously, these constructed settlement spatialities can hardly be seen as an accurate reflection of the former system of social modules.<sup>75</sup> The Late Neolithic settlement of Öcsöd represents an extraordinary agglomerative cluster, which cannot be appropriately described<sup>76</sup> using the normative definitions of house, hamlet, or village formation.<sup>77</sup> For a long time, there was no similarly well-documented Late Neolithic site with a similar spatial organisation on the Hungarian Plain. The only reference point was Szegvár-Tűzköves, where József Korek reconstructed a 4 ha large central tell and a horizontal, 7 ha large settlement around it, with diachronic changes in the latter’s size.<sup>78</sup> The critical re-evaluation of this site, however, has challenged the latter claim.<sup>79</sup>

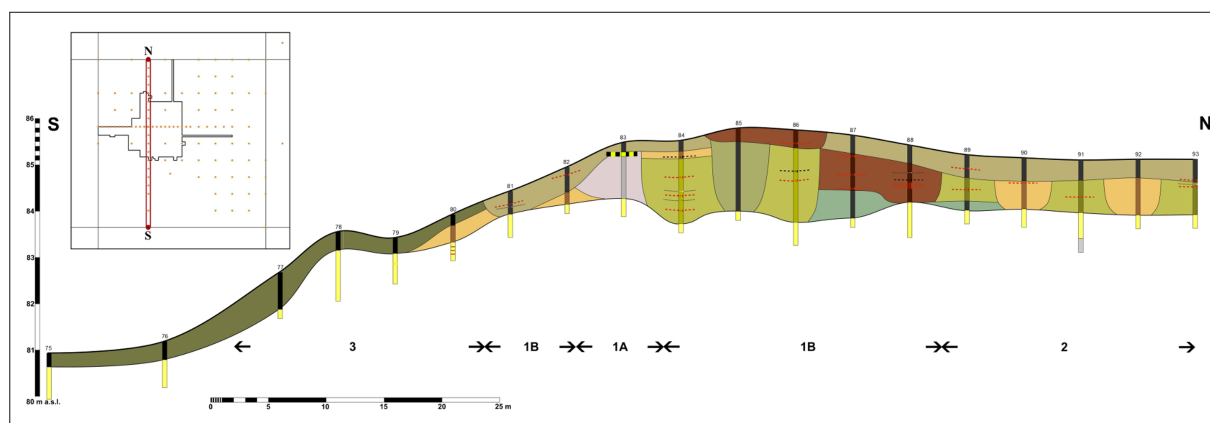


Fig. 12. S–N section of Square R based on the corings. For the legend of the identified zones (1A, 1B, 2, 3), see Fig. 10.

Between 2010 and 2012, the American-Hungarian team conducted intensive topographic and geophysical investigations at Szeghalom-Kovácsalom, a site lying by the Rapid Körös, as part of the KRAP project.<sup>80</sup> During these complex investigations, they mapped a tell encircled by a circular enclosure system and an extensive horizontal settlement around the tell. The entire settlement complex was estimated to cover some 70 ha, with the outer part consisting of solitary houses and house groups, i.e. occupation clusters spaced at larger intervals.<sup>81</sup> The investigations suggested that there was a *ca.* 25 ha large area around the tell that was more densely built up, while the area beyond it had a significantly lower building density and may have been occupied only seasonally.<sup>82</sup> The findings again confirm one particular process of settlement nucleation resulting in a three-tiered layout during the Late Neolithic in the southern Hungarian Plain, with settlement sizes that are remarkable even on a South-East

74 RACZKY 1987, 63.

75 HERBICH – DIETLER 2009; EBERSBACH 2010, 204–206, Abb. 5.

76 RACZKY 2009, 102.

77 CHAPMAN 2008.

78 KOREK 1987, 20–21.

79 REZI KATÓ 2009, 92–94.

80 GYUCHA ET AL. 2015.

81 GYUCHA ET AL. 2015, Fig. 9, Fig. 10.

82 GYUCHA ET AL. 2015, 138–140.

European scale.<sup>83</sup> The settlement layout of Öcsöd-Kováshalom, made up of clusters of buildings of various sizes around a tell-like centre bears a remarkable structural similarity to that of Szeghalom, suggesting that the multi-level adaptive processes at these sites may have been the results of similar cultural and socio-economic dynamics.

## The main results of the excavations at Öcsöd-Kováshalom

Given the findings of the intensive local topographic surveys, the excavations at Öcsöd focused on the settlement mound within Square R, which seemed to be the most intensely occupied area (*Fig. 11*). After the two small soundings in 1980, the main excavation project was carried out between 1983 and 1987 over an approximately 1143 m<sup>2</sup> large area (Trenches I–II, V–VII) (*Fig. 13, Fig. 14*). We opened two further trenches (III–IV) of 50 m<sup>2</sup> each at two other locations, where the field surveys and corings similarly indicated dense occupation. In 2006, when Road 44 traversing the site in an E-W direction was enlarged, Katalin Kovács opened four soundings of 15–20 m<sup>2</sup> near the dissected kurgan by the road.<sup>84</sup>

The investigations in the central, tell-like part of the settlement revealed a 130–160 cm thick sequence of superimposed layers containing various settlement features. This sequence was made up of six superimposed layers and represents two main building phases (Phases A and B) that can be dated to the Late Neolithic.<sup>85</sup> During the earlier phase, the excavated settlement module consisted of three closely spaced timber-framed buildings with bedding trenches and upright walls (Houses 4, 5, and 10), and of a fourth house standing slightly farther from the others (House 7) (*Fig. 15: A*). The spatial organisation of the later building phase continued that of the previous period, although the central area with eight houses was considerably more densely built up (Houses 1, 2, 3, 6, 8, 9, 11, and 12) (*Fig. 15: B*). In addition to these changes, it is also noteworthy that House 4 of the earlier phase, located on the one-time riverbank, was renewed during the later phase in a manner that its former wooden framework remained virtually unaltered, with the replastered floor and the obviously repaired walls representing the new architecture of House 1 and, so to say, the material embodiment of a continuity on the scale of this building. Curiously enough, while the timber structure of this building (documented as House 4 and House 1) remained essentially unchanged, the pottery recovered from the superimposed floor levels reflected a major stylistic change: the Tisza I phase with Middle Neolithic Szakálhát features of the earlier level was replaced by the pottery of the Tisza II phase with its distinctive textile ornamentation. A similar observation was made at the LBK site of Schernau in Germany, where the lower floor level of a house yielded pottery in the Rössen style, while the upper one pottery of the Bischheimer variant.<sup>86</sup> The obvious continuity in the house's occupation on the one hand, and the stylistic changes in the pottery on the other, expressed two different temporalities and the different rhythm of changes, which strongly challenged earlier views that the use-life of houses, the duration of ceramic styles and human generations can be correlated on a one-to-one basis.<sup>87</sup>

83 CRNOBRNJA 2012, 162–163; NIEKAMP 2013; HOFMANN 2015.

84 Database of the Damjanich János Museum, Szolnok.

85 RACZKY 1987, 64–67; 2009, 102–103, Fig. 4, Fig. 5.

86 LÜNING 1982, 108–113.

87 RACZKY 1987, 66–67.



Fig. 13. Aerial photo of Öcsöd-Kováshalom, showing the boundary of the site and the excavated areas (photo by Zoltán Czajlik).

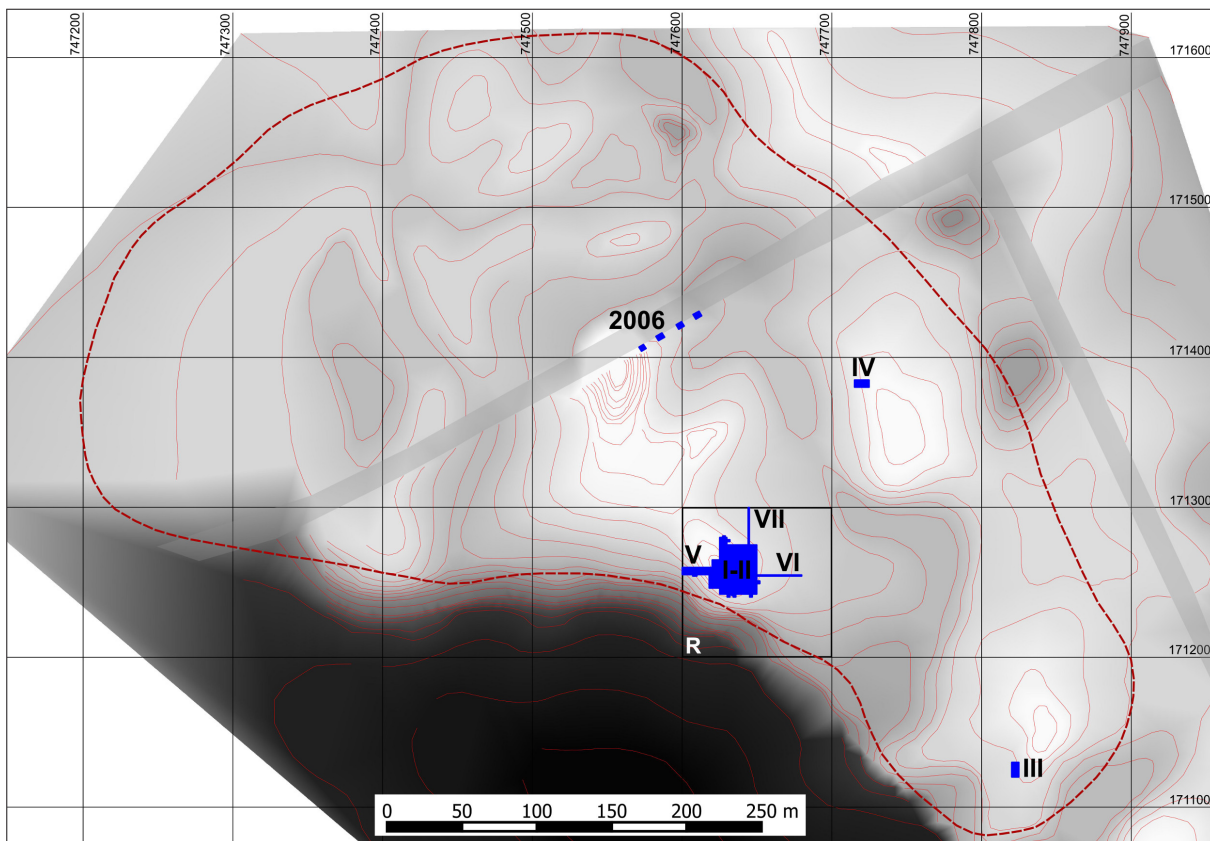


Fig. 14. Plan of the excavated areas at Öcsöd-Kováshalom. Trenches I–VII (1980, 1983–1987) and the excavation in 2006 focused on the settlement's central and south-eastern part. The largest contiguous excavated area (Trenches I–II, V–VII) was 1143 m<sup>2</sup>, Trenches III and IV were both 50 m<sup>2</sup> large, while four trenches of 15–20 m<sup>2</sup> each were opened during the rescue excavation in 2006.



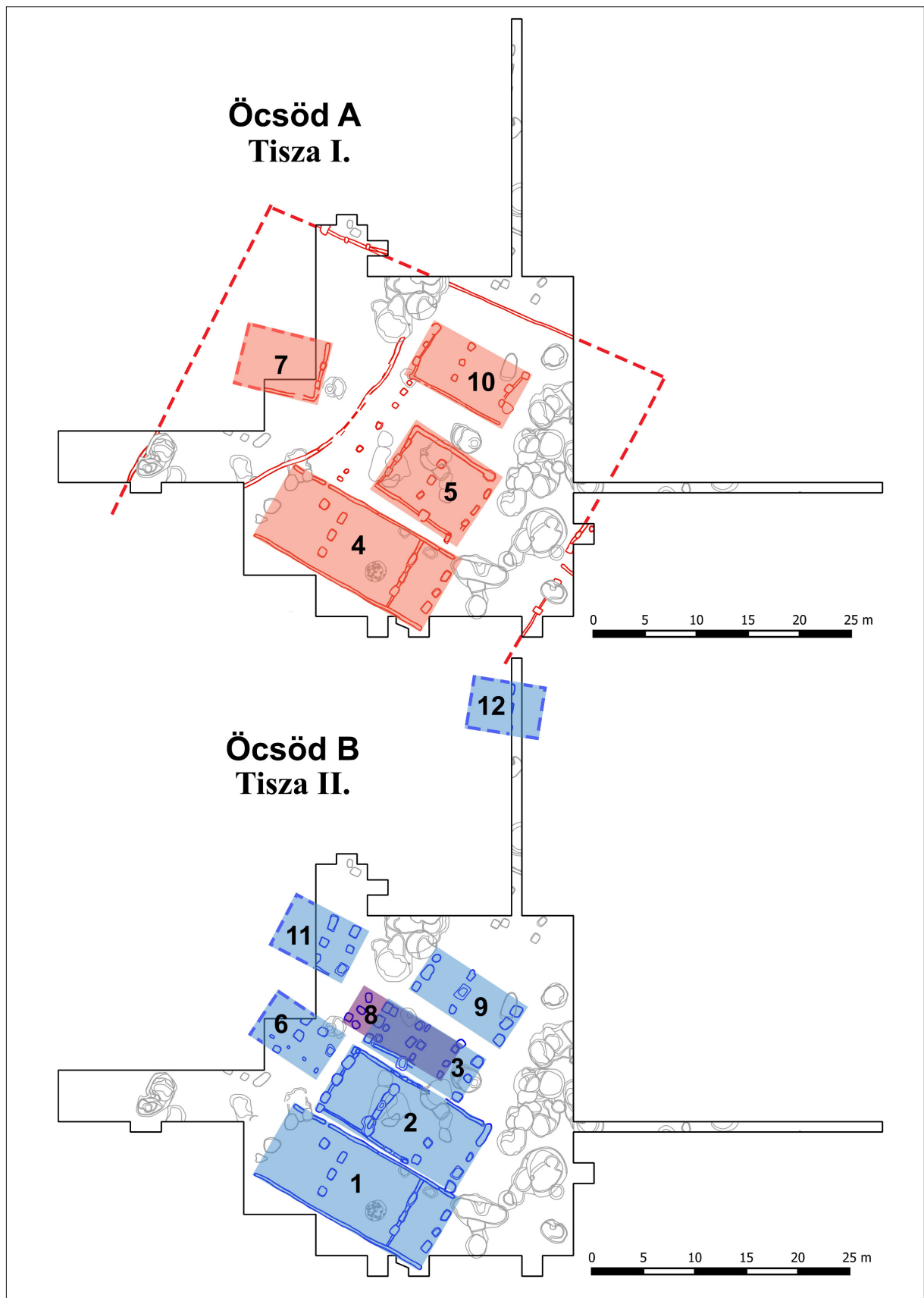


Fig. 15. Plan of the excavated area in Square R with an indication of the features dug into the ground. Certain elements of the settlement structure (buildings and ditches) of the early phase (Öcsöd A) are highlighted in red, the features of the late phase (Öcsöd B) in blue. The changes in the settlement layout are clearly illustrated by the location of different houses.

In addition to the remains of various structural elements (bedding trenches, post-holes) of the superimposed buildings dug into the subsoil, a rectangular ditch, measuring 35 × 42 m that adjoined the riverbank enclosed the occupation area of Phase A (*Fig. 15: A*).<sup>88</sup> A more flimsy wooden fence set in the ditch was perhaps a formalised expression of the sense of community. The buildings and other settlement features of the overlying Phase B extended beyond this spatial boundary, and thus the boundaries of the broader occupational space had ceased to exist by this time. It must here be noted that comparable enclosures with an almost rectangular layout are not known from the Late Neolithic of the Hungarian Plain. More recently, however, the remains of a similar, but post-framed pen-like structure and sections of like structures were brought to light at the large Middle Neolithic site of Harta-Gátórház on the left bank of the Danube.<sup>89</sup>

The section of an approximately north-south oriented, strongly curved ditch of the early phase of the Öcsöd settlement (*Fig. 15: A*) was uncovered at the western end of the early houses and was flanked by a similarly curved row of posts on the eastern side.<sup>90</sup> At present, we cannot determine its exact function since we do not know its full extent. Regarding the origin of these extraordinary constructions, we may note in general that circular and rectangular variants both occur in the later phase of the Central European LBK and that they are usually interpreted as expressions of community architecture, as “*Kultanlage*”.<sup>91</sup>

The plan of the tell-like settlement mound reveals that the built-unbuilt (BUB) ratio<sup>92</sup> increased during Phase B. In the later phase, four closely sited, adjacent houses represented the settlement’s core. There were no traces of longpits along the long sides of the houses, so typical of the ALPC, which articulated the settlement space.<sup>93</sup> At Öcsöd, the large pits formed a distinct zone that virtually enclosed the central area with the buildings, suggesting that the activities associated with them had probably been performed as part of integrated communal activities (*Fig. 15: A-B*).<sup>94</sup>

The forty-nine graves uncovered on the site (*Fig. 16*) which, similarly to the zone of the pits, lay in a wider zone east and west of the central cluster of the buildings, too bear witness to an important principle of spatial organisation.<sup>95</sup> It seems likely that the burials had been closely associated with particular buildings; however, because of the complex spatial and temporal configuration of the burials, these associations cannot be clearly defined.<sup>96</sup> The spatial syntax of the large refuse pits, together with the spatial configuration of the burials, reflects similar organisational principles. It is also rather surprising that the number of houses probably occupied simultaneously (four and seven, respectively, during Phases A and B) suggest a community of 55 to 66 persons for one generation. The obvious question here is the length of the period represented by one house generation and how it correlated with human generations.

88 RACZKY 2009, Fig. 3.

89 KUSTÁR ET AL. 2014, Fig. 3, Fig. 4.

90 RACZKY 2009, 104, Fig. 4.

91 LÜNING 2009.

92 CHAPMAN 1989.

93 DOMBORÓCZKI 2009, Fig. 3, Fig. 5.

94 RACZKY 2009, 105.

95 RACZKY 2009, 105; SIKLÓSI 2013, 145.

96 RACZKY 2009, 105; SIKLÓSI 2013, 145.

We estimated a 100 years long period for each of the two house generations at Öcsöd, which would thus correspond to four human generations,<sup>97</sup> which in turn revealed that the estimated total population of 220 to 264, based on the houses on the tell-like settlement (Phase A: 80–96; Phase B: 140–168) cannot be correlated with the number of excavated burials, which is quite remarkable compared to other Late Neolithic sites.<sup>98</sup>



*Fig. 16.* Plan of the excavated area in Square R showing the burials. Definite rows and clusters of burials aligned to buildings could be distinguished. Various superpositions could be identified between various features.

The north-south baulk between Trenches I and II in the centre of the excavated area of the tell-like settlement of Öcsöd offers a good illustration of the stratigraphic sequence of this stratified site (Fig. 17). In addition to the backfilled trench of the 1980 sounding, the layers of the earlier and later building phases can clearly be distinguished,<sup>99</sup> together with the remains of the repeatedly renewed plastered floors of the partly superimposed buildings.

We identified the archaeological features of the site and the stratigraphic associations between them using the Harris matrix (Fig. 18). We displayed all the associations identified during the excavation that were recorded in drawing, photographed, and described in the field diaries that could be helpful for clarifying the internal relations of the settlement's excavated area. We only undertook the integration of the Late Neolithic features into this model, omitting the remains

97 RACZKY 2009, 104–105.

98 SIKLÓSI 2013.

99 This section has already been published in a somewhat simplified form: RACZKY 1987, Fig. 2.

of a Late Iron Age and 10<sup>th</sup> century settlement as well as of an early Árpádian Age cemetery and a modern farmstead. These had disturbed the Late Neolithic features in several instances and therefore the determination of their exact position facilitated the interpretation of the Neolithic finds recovered from them. The central elements of the matrix and of the settlement itself are the buildings. These were built adjacent to each other and thus their stratification provides a sound basis for the site's stratigraphy. In contrast, the stratigraphic relations of the associated horizontal features such as pits and graves are less obvious. Compared to the houses occupying the central mound, the lower-lying peripheral zones have been more seriously affected by erosion and human activities, resulting in micro-spaces with varying archaeological source value for the reconstruction of the dynamics of human activity.

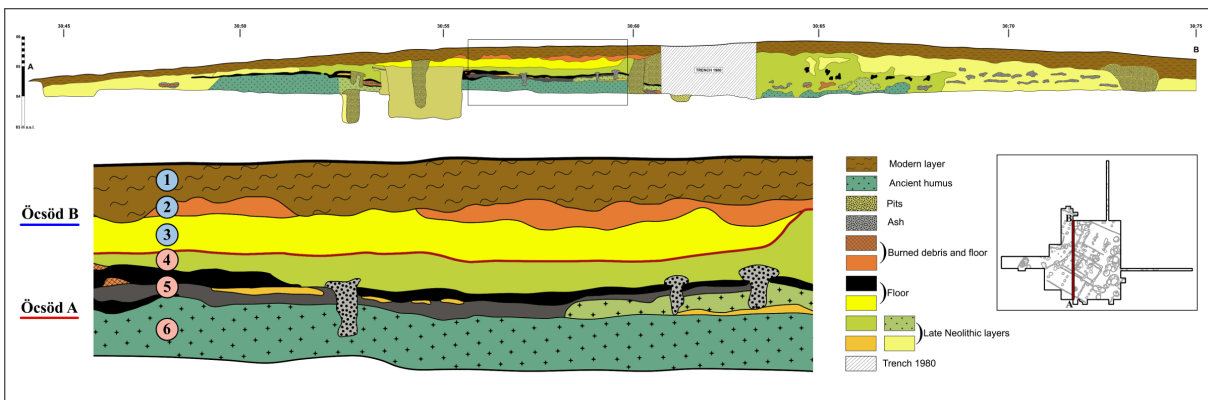


Fig. 17. Section of the excavated area of Square R (balk between Trenches I and II, for its location see Fig. 10). Two settlement horizons (Öcsöd A and B) could be identified in the section (see the enlarged part). The early phase is represented by the remains of House 7, the late phase by the remains of House 6.

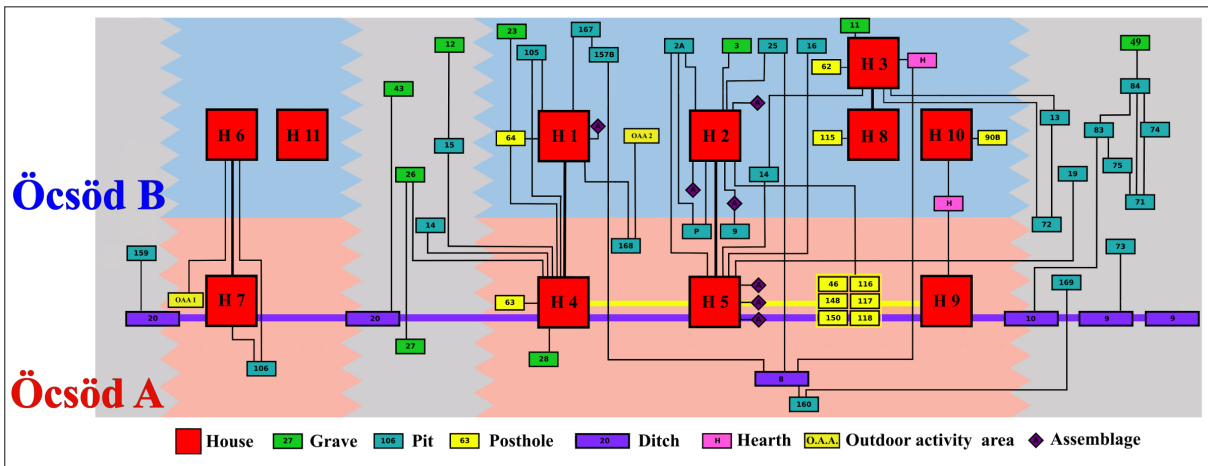


Fig. 18. The excavated features in Square R shown in a simplified Harris matrix. The central elements of the matrix and the settlement were the buildings and the associated features, which provided a clear stratigraphy.

## The spatiality of the pottery at Öcsöd-Kováshalom

Similarly to the archaeological features, the pottery finds unearthed at the site too reflect a certain duality. The greater part of the material can be associated with a particular closed feature, while another part with less clearly definable features such as house debris and infill layers. The latter were recorded according to their respective depth and spatial coordinates, which enabled their spatial positioning. The ceramic finds from the settlement were recorded by means of a grid system of 5×5 m squares. We then created a heat map sequence illustrating the quantitative distribution of the ceramic material from the tell-like settlement (Fig. 19). The seven superimposed layers display the elements of the successive 25 cm thick fills. The three uppermost layers represent the material of the later phase (Öcsöd B = Tisza II), while the underlying three layers can be associated with the earlier settlement (Öcsöd A = Tisza I). The lowermost seventh layer displays the closed features whose stratigraphic classification was not possible with the Harris matrix. However, the statistical analysis of the finds recovered from the latter as well as their comparison with units with a secure position will no doubt provide good anchors for further research.

A substantial amount of the pottery was unearthed in the pits enclosing the built-up area, whose stratigraphic classification is far from clear. This material was clearly recovered from a secondary context. The pottery from the buildings was found either on the floor or in the burnt debris of the houses, or in the sunken parts of the buildings. One part of these finds was similarly recovered from secondary contexts, but we may assume that the other part lay *in situ*. The several joining fragments of two vessels found in the area enclosed by Houses 4, 5, and 9 of the early phase, which can be interpreted as a closed area representing an occupation level, is a good example of the latter case.<sup>100</sup> The comparison of the internal arrangement of the buildings and the scatter of the finds may provide significant information as well. We also found that the quantity of finds was remarkably higher in the north-eastern parts of the buildings of both horizons and that the number of finds from the houses was also higher during the later phase. At the same time, the scarcity of finds from Houses 1 and 4 was quite striking. The assessment of the spatial distribution of the pottery finds, combined with that of other artefact types will no doubt contribute to the identification of intra-site activity areas and the determination of their function.

## The chronology of Öcsöd-Kováshalom

The relative chronology of the tell-like settlement of Öcsöd-Kováshalom is essentially based on the archaeological observation of the two superimposed building phases, and thus the estimation of the use-life of the houses became a central issue.<sup>101</sup> The recently calculated 75–100 years long use-life for the prehistoric buildings of Germany provided important reference points, particularly since these suggested fundamentally new dynamics regarding the settlements.<sup>102</sup> The AMS dates indicated a 40–50 years long lifespan in the case of the Late Neolithic houses of the outer settlement at Polgár-Csőszhalom.<sup>103</sup>

100 RACZKY 2000, 105, Fig. 14: 1–4; RACZKY – FÜZESI in press.

101 RACZKY 2009, 103.

102 SCHMIDT ET AL. 2005, 167.

103 RACZKY ET AL. 2015.

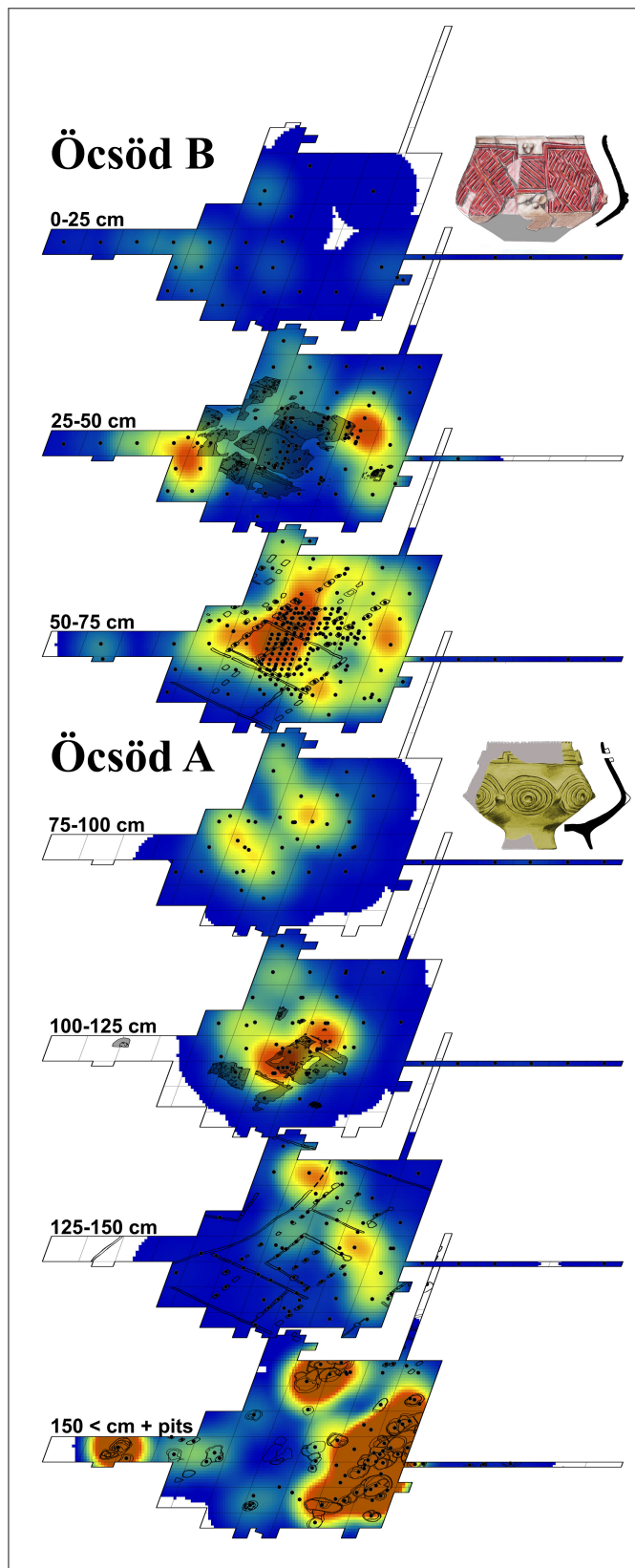


Fig. 19. Spatial distribution of the pottery excavated in Square R at Öcsöd-Kováshalom generated using QGIS, shown on weighted heat map (radius: 6 m). The pottery was associated with settlement features and spatial units (black dots), which were correlated with 25 cm thick layers of the tell-like settlement. The uppermost three layers represented the late period (Öcsöd B), the next three layer the early period (Öcsöd A). The lowermost layer represented the deep features (pits) with an uncertain stratigraphic position.

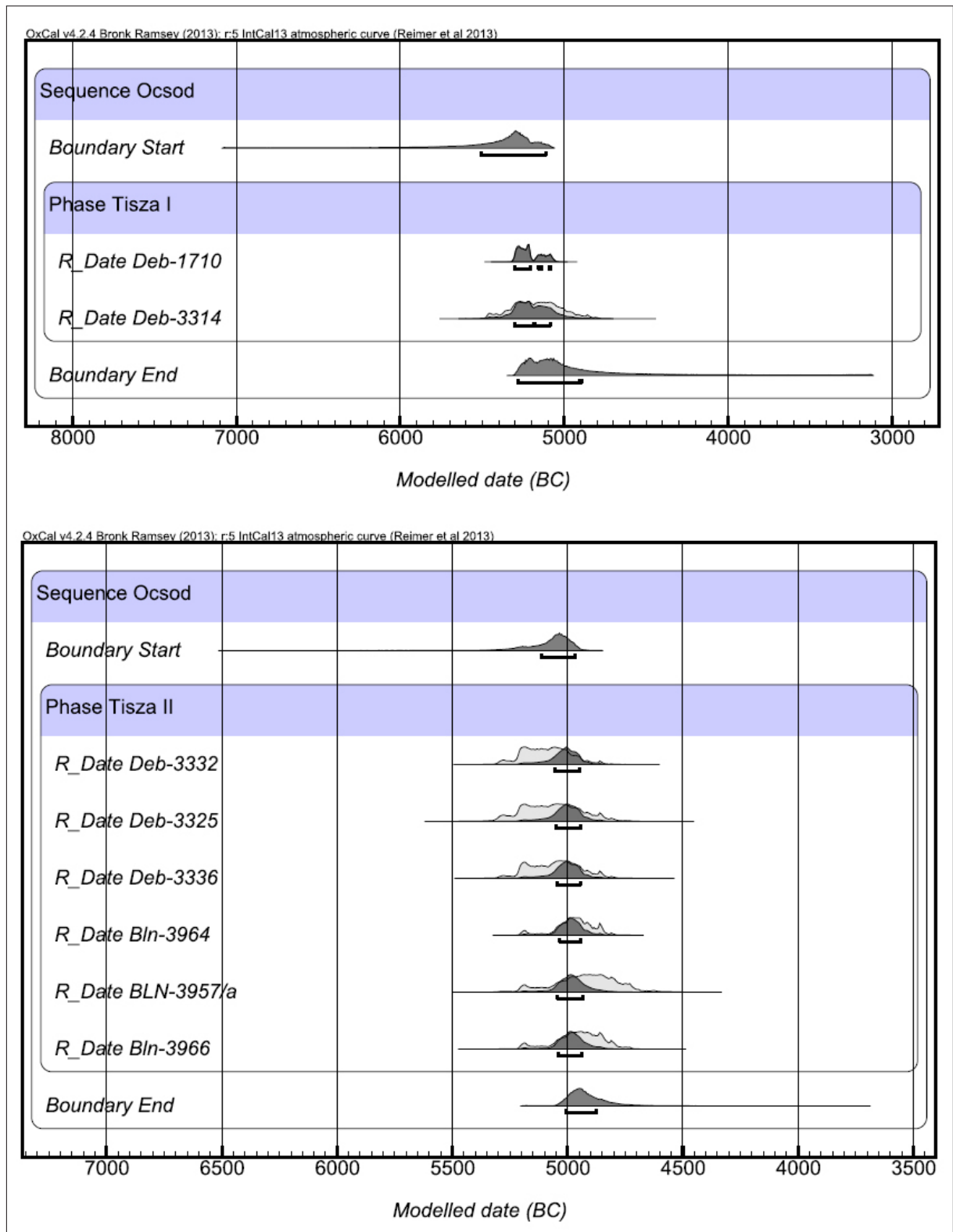


Fig. 20. Modelled  $C^{14}$  dates of Öcsöd-Kováshalom calibrated with OxCal.

In the light of these indirect data, the two building horizons of Öcsöd spanned an estimated 100–200 years in the site's central part, suggesting a rather short interval of time during the early phase of the Tisza culture.

The first absolute dates, based on charcoal samples, for the internal chronology of Öcsöd-Kováshalom were published in 1998.<sup>104</sup> At the time, we took fourteen dates into account, separating them into a Tisza I and Tisza II group, which yielded dates of 5181 (68.2 %) and 4931 calBC, and of 5020 and 4782 calBC, respectively. Later, the sum of sixteen dates gave 5200 and 4980 calBC (2 $\sigma$ ) for the lifespan. This time span of 220 years seemed realistic since it suggested an approximately hundred years' long interval for each phase,<sup>105</sup> which correlated well with our preliminary assumptions.

As part of the present critical overview, we reviewed the sixteen radiocarbon samples in the light of the finer stratigraphic details of a simplified version of the Harris matrix (*Fig. 18*) in order to create the methodological basis for Bayesian modelling. We retained eight dates, two of which related to the Tisza I and six to the Tisza II period (*Fig. 20*). The modelled radiocarbon dates for the tell sequence yielded 5507/5515 calBC (68.2 %) and 5284/4893 calBC data for the Tisza I phase, indicating a life span of between 0 and 610 years. The Tisza II phase was determined by the 5115/4968 calBC (68.2 %) and 5009/4874 calBC dates, suggesting a life span of between 0 and 193 years.<sup>106</sup> In our view, this strongly indicates that the earlier charcoal-based radiometric dates are unsuitable for calibrations using modern procedures and cannot offer more accurate dates concerning the absolute chronological position of the Neolithic site of Öcsöd.

Our plans include a new sampling strategy, our means permitting, for the Öcsöd site, and dates based on new AMS measurements in line with current standards, in order to determine and quantify the temporal dynamics of the human activities at various spatial scales of the settlement. We also intend to publish some relevant assemblages, whose artefacts embody particular space/time correlations.

One goal of the overview of the methodological approaches employed during the excavations at Öcsöd-Kováshalom was to summarise earlier and more recent archaeological results by which certain features and assemblages of the site can be “re-constructed” in a complex, multiscale reference system, and to thereby create a framework for future research that will be suitable both for the statistical assessment of the enormous source material and for identifying possible internal correlations. We have also sought to present the tell-like settlement of Öcsöd-Kováshalom as the Late Neolithic micro-regional centre of the Tiszazug region, which represented one of the “frontier” forms of the tell settlements of the southern Hungarian Plain during the earlier 5<sup>th</sup> millennium BC.

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104 HERTELENDI ET AL. 1998.

105 RACZKY 2009, 103, Fig. 6, Fig. 9, Fig.10.

106 OxCal v.4.2.4. – Bronk Ramsey 2013.



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