

**THE FOUNDATIONS OF RADIOCARBON  
CHRONOLOGY OF CULTURES BETWEEN  
THE VISTULA AND DNIEPER:  
4000-1000 BC**

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**BALTIC-PONTIC STUDIES**

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## Editor's Foreword

This volume of the *Baltic-Pontic Studies* is a record of investigations carried out under the research project begun earlier in vol. 7 ("The Foundations of radio-carbon chronology of cultures between the Vistula and Dnieper: 3150-1850 BC", Poznań 1999). Here, the approach is broader in terms of chronology and culture. Our purpose has been to fill taxonomic gaps hitherto present in the discussion (supplementing the dating of cultures, groups or phases) or reanalyze the grounds for findings considered particularly controversial. In the latter case, a very enlightening debate was provoked by the comparative chronology of the Yamnaya and Catacomb cultures presented by A.N. Nikolova. We hope that a large series of  $^{14}\text{C}$  dates and a revision of the foundations of "archaeological knowledge" (stratigraphy, typochronology and groups of co-occurrence of traits), brought together in the paper by D.Y. Telegin, S.Z. Pustovalov, N. Kovalyukh, lay the ground for a stabilization of views on this important dividing line in the chronology of the Bronze Age in the Pontic zone.

A vast majority of the new  $^{14}\text{C}$  dates have been obtained under an international research project financed by the Polish Committee for Scientific Research.

## Editorial comment

1. All dates in the B-PS are calibrated [BC; see: Radiocarbon vol.28, 1986, and the next volumes]. Deviations from this rule will be point out in notes [bc].
2. The names of the archaeological cultures and sites are standarized to the English literature on the subject (e.g. M. Gimbutas, J. P. Mallory). In the case of a new term, the author's original name has been retained.
3. The spelling of names of localities having the rank of administrative centres follows official, state, English language cartographic publications (e.g. *Ukraine, scale 1 : 2 000 000*, Kiev: Mapa LTD, edition of 1996; *Rèspublika BELARUS', REVIEW-TOPOGRAPHIC MAP*, scale 1:1 000 000, Minsk: BYELORUSSIAN CARTOGRAPHIC AN GEODETIC ENTERPISE, edition 1993).

**Jacek Górski, Sergey Lysenko, Przemysław Makarowicz**

**RADIOCARBON CHRONOLOGY OF THE TRZCINIEC  
CULTURAL CIRCLE BETWEEN THE VISTULA AND  
DNIEPER BASINS**

**INTRODUCTION**

The absolute dating of the Trzciniec complex has gained the status of one of the central issues of the Bronze Age in the prehistoriography of the eastern and central European countries over the last decade [e.g. Czebreszuk 1996; 1998a; 1998b; 2001; Górski, Kadrow 1996; Kempisty, Włodarczak 1996; Górski 1998a; 1998b; Kovalyukh *et al.* 1998a; 1998b; Makarowicz 1998a; 1998b; 1998c; 2001a; 2001b; Włodarczak 1998; Lysenko 2001b; Taras *et al.* 2002; Czebreszuk *et al.* 2003]. In the six years that have passed since the last collective publication of  $^{14}\text{C}$  determinations for the Trzciniec Cultural Circle (TCC), the number of dates obtained for this taxon has grown more than two times (from 76 to 187). A particularly high increase in the number of dates has been observed in the area on the Middle Dnieper River, Ukraine and in Małopolska, Poland. The overall number of dated sites has grown from 19 to 39 with the greatest, qualitative leap taking place in the same time primarily in the eastern subcircle of the TCC.

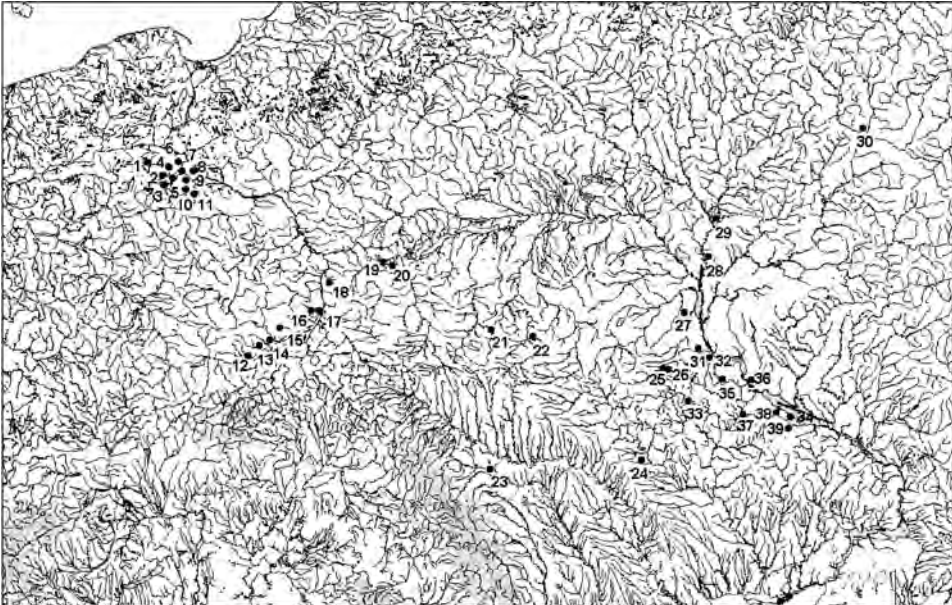


Fig. 1. Location of the Trzciniec Cultural Circle sites dated on the basis of the  $^{14}\text{C}$  method. 1 - Biskupin 2a; 2 - Krusza Podlotowa 8; 3 - Żegotki 3; 4 - Kuczkowo 1; 5 - Piecki 1; 6 - Radojewice 29; 7 - Siniarzewo 1; 8 - Grabie 4; 9 - Borowo 12; 10 - Rybiny 14; 11 - Rybiny 17; 12 - Kraków-Nowa Huta-Cło; 13 - Słonowice G; 14 - Żerniki Górne; 15 - Miernów; 16 - Dacharzewo 1; 17 - Dwikozy; 18 - Kazimierzów; 19 - Zienki; 20 - Dubeczno 1; 21 - Ivanye; 22 - Neteshin; 23 - Magala; 24 - Hordeevka; 25 - Malopolovetske-2A; 26 - Malopolovetske-3; 27 - Zdvizhevka; 28 - Pustynka; 29 - Abakumy; 30 - Rzhanita-Besets-2; 31 - Velikaya Bugaevka; 32 - Obuchov; 33 - Zhuravlikha; 34 - Borovitsa; 35 - Rossava; 36 - Bubnovaya Slobodka; 37 - Ksaverovo; 38 - Verguny; 39 - Subotov

## 1. RADIOCARBON DATABASES IN REGIONS

Out of 187  $^{14}\text{C}$  determinations obtained for the TCC\* (Tables 1-6; Fig. 1), 102 come from the western subcircle (Vistula basin) while 85 concern the eastern one (basins of the Dnieper, Pripets and Southern Bug rivers as well as Carpathian Foothills and Volhynia). The best-sampled regions, i.e. those for which we have series of  $^{14}\text{C}$  dates, include Małopolska (69) and Kujawy with Pałuki (33) in the west, and the middle Dnieper area (61) in the east. The other areas have yielded relatively few dates while there are no radiocarbon dates whatsoever for Mazowsze — one of the most important mesoregions for the study of the beginnings of the TCC.

\* Including dates for transitional assemblages from the Iwno culture (IC) to TCC and the Mnogovalikovy Pottery culture (MPC), and transitional assemblages from MPC to Trzciniec culture (TC).

The majority of analyses were made using short-living organic materials, mainly bones and, in a single case, shells (133 or 72.0%), and transformed short-living materials (charred bones — 4 or 2.1%). Forty-eight (or 25.9%) dates were obtained for long-living materials — charcoal and wood. In two cases we do not have any specific information on the nature of sample. Standard deviations range from 25 to 350 years. In the case of 57.0% of dates, the standard error is 50 years or less. An absolute majority of dates, after calibration, found their way to the plateaus of the calibration curve; only a small number of them are situated in its steep segments, which allows us to precisely determine chronologies [Czebreszuk, Szmyt 2001; Raetzl-Fabian 2001; Makarowicz 2001a].

Guided by modern methodological requirements, we have selected for calibration a group of determinations obtained from short-living and long-living organic materials coming from grave and settlement contexts unambiguously associated with the “Trzciniec” tradition [Czebreszuk, Szmyt 1998; 2001:177]. The results of radiocarbon dating were controlled by comparing them with the results of typological analyses and — less frequently — with stratigraphy, and eliminating evidently erroneous dates. For the purpose of determining the absolute chronology of units of formal systematics of both TCC subcircles (types, complexes, phases or horizons) and their chronology in particular regions, a group of most reliable dates was selected, i.e. those characterized by the highest informative value (chiefly dates of types IA and IIA) [Czebreszuk, Szmyt 1998], that did not contravene their archaeological assessment (typological and stylistic) and had a standard deviation of below 80 years. The last of the criteria was arbitrarily adopted because of a sizeable set of dates having a relatively high standard deviation (70 years). Discarding these dates would have considerably lowered the reliability of results. In some cases, these requirements were waived, especially when insisting upon them would have radically lowered the number of interpreted dates for a given region. When calculating the sums of probability distributions for dates from Kujawy and the middle Dnieper area as well as both subcircles no account was taken of radiocarbon dates referring to assemblages of an alternative cultural assignment as well as transitional complexes from the Iwno culture (IC) to the Trzciniec horizon (TH) and from the Mnogovalikovoy Pottery culture (MPC) to the Trzciniec culture (TC).

The obtained dates determine the chronology of 39 TCC sites: 15 settlements, 22 burials and 2 ritual features. They are shown in Tables 1-6, which also give commentaries on their reliability, i.e. consistency with the expected chronology of a given assemblage arrived at using strictly archaeological methods. The most representative of the dated TCC assemblages are characterized in general terms and presented in a graphic form (Figs. 2-25). In some cases, an absolute chronology was inconsistent with knowledge based on the hitherto established sequences of changes of various material culture components (mainly pottery stylistic, less frequently

metal artefacts). In the cases when datings differed much from expectations (Tables 1-6, comments column), we concluded that the sample analysed, for various reasons, did not refer to the “Trzciniec” episode at a given site and therefore was excluded from further studies.

## 2. THE WESTERN SUBCIRCLE OF THE TRZCINIEC CULTURAL CIRCLE

The western branch of the discussed cultural phenomenon was made up of two separate settlement zones that differed in terms of the natural environment and cultural traditions. In the north, on the lowlands covered mainly by sandy soils, Trzciniec structures were rather movable (only small settlements were built there) and susceptible to diverse local cultural inspirations and external influences. As a result of them, a large number of source assemblages, taxonomically diversified, developed. They are relics of activities by communities who in various degrees contributed to the emergence of the “Trzciniec world.” The process can be better explained by using the concept of *horizon* (TH) or *cultural package* rather than that of *archaeological culture* [Koško 1979; Makarowicz 1998a; Czebreszuk 1998; 2001]. In the south, after a relatively short period of mobility, some Trzciniec structures acquired characteristics of stable “village” communities. Settlements, in particular on the loess soils of western Małopolska, were long-lived and as a rule much bigger than in the north. For these reasons, the discussed phenomena can be easier explained in this zone using the traditional concept of *archaeological culture* — the TC [Górski, Kadrow 1996; Górski 1998a; 1998b].

### 2.1. THE LOWLANDS ZONE

The periodization system of the lowlands (chiefly Kujavian) branch of the TCC was developed primarily by analysing settlement assemblages and — to a lesser degree — sepulchral ones. Several units of formal systematics were distinguished and called horizons, from TH 1 to TH 7, and complexes (combining the traits of TH 1 and TH 3 — TH 1/TH 3) [Czebreszuk 1996; 1998; Makarowicz 1998a; 1998b; 1998c]. Also, transitional assemblages combining traits of the IC and the TH were distinguished. The units were systematized into four horizons of real periodization: proto-, early, classic and late Trzciniec ones [Makarowicz 1998a:156ff]. Some assem-

blages do not lend themselves to unambiguous interpretation in terms of cultural unit. Hence, there arises a dilemma, are they still IC or already TH, which we suggest to resolve by giving an alternative assignment (IC-TH) or treating them as “syncretic” assemblages (IC/TH).

The northern portion of the western subcircle, i.e. Kujawy and Pałuki, yielded 33 dates for 4 grave sites, 1 ritual feature and 6 settlement sites (Fig. 1, Table 1).

In the discussed mesoregion, <sup>14</sup>C determinations as a rule confirm conclusions following from typological analyses. One of few departures from the rule is the case of two dates concerning the assemblage from Radojewice 29, Kujawy (Table 1:7 and 12) [Makarowicz 2000a:473ff]. The dates, obtained from samples of bones coming from a mass grave containing remains of seven individuals, are inconsistent with their expected age. The sum of probability distribution of both dates is located in the time bracket of 1980 and 1870 BC, i.e. at least 400-500 years earlier than expected. The formal and stylistic traits of bronze goods (e.g. a pin and a ridgelike bracelet) as well as the technology of a vessel (now destroyed) show affinities with the Tumulus culture (TuC). This sets the chronology of the grave at the BB, i.e. 1600-1400 BC or, more precisely, at the younger period of this bracket. The pin with a head shaped like spiral disc has a long chronology — from period BA2 up to BC or even the beginnings of the BD [Gedl 1975, chronological table], i.e. from 1600 to 1300 BC. Hence, these artefacts should be placed, in accordance with the typological classification, in the late Trzciniec assemblages of TH 5 — TH 7 types [Makarowicz 2000a:531].

Another interpretation problem is posed by the dating of the material from a ritual feature of the enclosure type from site 2 in Biskupin, Pałuki (Table 1:2-4, 6) [Grossman 1998]. The obtained radiocarbon dates suggest that it was used at a maximum ca. 850 years (2350-1500 BC) or at a minimum 450 years (2350-1900 BC). Hence, the feature could have been used by both communities of the IC (phases I-III) and Early Trzciniec societies representing TH 1. Relying on sequences of <sup>14</sup>C determinations, a distinction into two major phases of its use can be made: between 2350 and 2150 BC and between 2150 and 1900 BC [contra — Grossman 1998:194ff]. Because of the nature of the feature, it is hardly possible to assign individual dates to specific materials as samples came from various parts of a vast system of “ditches” (from their bottoms and different stratigraphic levels of the fill). Generally speaking, all published vessels exhibit more or less clear “Iwno” traits. The only feature (of little diagnostic significance anyway) of a nascent TCC tradition (TH 1) at the site is an S-profile pot decorated with a cordon under the rim. In the light of these facts, it seems that it is more appropriate to assign this set of sources — as an “Iwno” one showing pre-Trzciniec characteristics — to the proto-Trzciniec horizon.

A similar interpretation dilemma presents itself when we analyse an assemblage from Grabie 4, feature 27, Kujawy [Makarowicz 1998a]. The only <sup>14</sup>C de-

Table 1

Radiocarbon datings of the Trzciniec Cultural Circle assemblages from the lower Vistula drainage basin (including syncretic — Iwno Culture/Trzciniec Complex assemblages)

No.	Site/ feature	Cultural unit/ phase	Conv BP	Cal BC (1 $\sigma$ )	Lab. code	Sample material	Context	Cat	Comments
1	2	3	4	5	6	7	8	9	10
1.	Grabie 4/ 27	IC – TH?	3650±90	2140-1880 (68,2%)	Gd-2644	bone	grave	IC	uncertain cultural context
2.	Biskupin 2a/ ditch I	IC/TH 1	3630±100	2140-1880 (66,3%)	Gd-6664	charcoal	ritual	IIC	alternative cultural identification
3.	Biskupin 2a/ ditch II	IC/TH 1	3620±45	2040-1910 (65,5%)	Ki-6308	bone	ritual	IC	alternative cultural identification
4.	Biskupin 2a/ transversal ditch	IC/TH 1	3610±45	2030-1880 (68,2%)	Ki-6309	bone	ritual	IC	alternative cultural identification
5.	Żegotki 3/ A 112	IC III-TH 1	3605±50	2030-1880 (68,2%)	Ki-6896	bone	pit	IB	transition stage
6.	Biskupin 2a/ ditch II	IC/TH 1	3600±40	1980-1880 (57,8%)	Ki-6307	bone	ritual	IC	alternative cultural identification
7.	Radojewice 29/ A 110	TH 5 – TH 7	3590±40	1980-1880 (61,7%)	Ki-6883	bone	grave	IA	too early dating no compatible with the typological analysis
8.	Żegotki 3/ A 89	IC III-TH 1	3580±30	1960-1880 (66,3%)	Ki-6102	bone	pit	IB	transition stage
9.	Rybiny 17/ 1	TH 2	3560±50	1980-1870 (45,4%)	Ki-5589	bone	pit	IB	too early (?) dating no compatible with the typological analysis
10.	Żegotki 3/ A 47	IC III-TH 1	3545±40	1940-1880 (38,2%)	Ki-6902	bone	grave	IA	transition stage
11.	Żegotki 3/ A 47	IC III-TH 1	3540±45	1940-1880 (36,0%)	Ki-6103	bone	grave	IA	transition stage
12.	Radojewice 29/ A 110	TH 5 – TH 7	3540±45	1940-1860 (36,0%) 1850-1770 (32,2%)	Ki-6884	bone	grave	IA	too early dating no compatible with the typological analysis
13.	Żegotki 3/ A 47	IC III-TH 1	3540±40	1940-1860 (34,6%) 1850-1770 (33,6%)	Ki-6908	bone	grave	IA	transition stage
14.	Żegotki 3/ A 47	IC III-TH 1	3540±30	1920-1870 (31,6%)	Ki-6904	bone	grave	IA	transition stage

1	2	3	4	5	6	7	8	9	10
15.	Żegotki 3/ A 47	IC III-TH 1	3525±30	1850-1770 (49,2%)	Ki-6905	bone	grave	IA	transition stage
16.	Żegotki 3/ A 47	IC III-TH 1	3520±35	1890-1750 (68,2%)	Ki-6903	bone	grave	IA	transition stage
17.	Rybiny 17/ 1	TH 2	3520±40	1890-1750 (68,2%)	Ki-5125	charcoal	pit	IIB	
18.	Borowo 12/ 19E	TH 1/3	3520±60	1920-1740 (68,2%)	Ki-5608	charcoal	pit	IIB	
19.	Żegotki 3/ A 47	IC III-TH 1	3515±30	1890-1770 (68,2%)	Ki-6907	bone	grave	IA	transition stage
20.	Żegotki 3/ A 47	IC III-TH 1	3505±35	1890-1750 (68,2%)	Ki-6906	bone	grave	IA	transition stage
21.	Żegotki 3/ A 47	IC III-TH 1	3490±45	1880-1740 (68,2%)	Ki-6101	bone	grave	IA	transition stage
22.	Rybiny 17/ 1	TH 2	3480±60	1880-1730 (64,2%)	Ki-5590	charcoal	pit	IIB	
23.	Rybiny 14/ 9	TH 2	3470±80	1890-1680 (68,2%)	Gd-2297	charcoal	pit	IIB	
24.	Rybiny 17/ 1	TH 2	3450±60	1780-1680 (41,4%)	Ki-5128	bone	pit	IB	
25.	Rybiny 17/ 1	TH 2	3420±55	1780-1630 (57,8%)	Ki-5127	bone	pit	IB	
26.	Siniarzewo 1/ E 95	TH 1/3	3410±40	1770-1630 (68,2%)	Ki-5907	bone	pit	IB	
27.	Rybiny 17/ 1	TH 2	3390±45	1750-1620 (68,2%)	Ki-5126	shell	pit	IB	
28.	Borowo 12/ 19	TH 1/3	3380±55	1750-1600 (67,2%)	Ki-5605	charcoal	pit	IIB	
29.	Siniarzewo 1/ G 144	TH 1/3	3310±45	1630-1520 (64,1%)	Ki-6503	bone	pit	IB	
30.	Ku czkowo 5/ D 105	TH 3	3305±40	1620-1520 (68,2%)	Ki-6490	bone	pit	IB	
31.	Biskupin 2a/ditch	IC-TH 1	3270±90	1640-1440 (64,0%)	Gd-6917	bone	ritual	IC	uncertain cultural context
32.	Piecki 1/ 47	TH 6	3240±25	1525-1485 (39,4%)	Ki-5682	bone	pit	IB	
33.	Krusza Podlotowa 8/ 3	TH 7/LC	3190±60	1520-1400 (68,2%)	Gd-5118	bone	grave	IC	transition stage?

IC - Iwno Culture; LC - Lusatian Culture; TH - Trzciniec Horizon

Data after: Czebreszuk 1996; Czebreszuk, Szmyt 2001; Makarowicz 1998a; 2001

termination obtained from bones from a collective grave (Table 1:1) seems to be too early for the Trzciniec complex, although similar dates were made for mass graves from Żerniki Górne, Małopolska [Kempisty, Włodarczak 1996; Górski, Kadrow 1996; 2001; Włodarczak 1998]. However, in view of the latest formal and stylistic analyses of pottery and bronze goods, and stratigraphic observations, these dates have been considered unreliable (cf. section 2.2 below). But again, the ritual alone — mass burial, absence of anatomical arrangement, presence of a timber structure (poles supporting a wooden (?) “ceiling” of the grave) — indicates a possibility of its assignment to the TCC. The feature might be also associated with

the IC tradition, where collective graves are encountered as well but are formally different from Trzciniec funerary rules [Koško 1993; Makarowicz 1998a]. The impossibility to verify the absolute chronology due to the lack of any grave goods makes us opt for the alternative attribution of the feature in question, i.e. to IC — TH.

For syncretic assemblages, combining traits of the late (III) phase of the IC and the early development stage of the TCC (i.e. TH 1), there are 11 determinations from site Żegotki 3, Kujawy. Two of the dates come from settlement features (feature A 112 and A 89; Table 1:5 and 8 — Fig. 2 and 3), while the remaining 9 relate to a single inhumation (feature A47) (Table 1:10, 11, 13-16, 19-21) [Makarowicz 1998b:143, Table 1; 2000a]. The sum of probability distribution of all the dates sets the chronological brackets of the transitional stage from the IC to the TH at 1940-1770 BC [Makarowicz 2001a:212]. This is in agreement with the characteristics of the materials placed in both the settlement features and in the grave. The former showed clear traits of the IC and the Single Grave culture (SGC), namely, S-profile pots of the *Riesenbecher* type (Fig. 2:1, 2, 5), a bowl (Fig. 2:6), beakers and vases (Fig. 2:3; 3:4), incised horizontal ornaments (Fig. 3:4) and relief ornaments — cordons under the rim (Fig. 2:1-3, 5; 3:6). The grave, in turn, yielded up a beaker with a “tap” (*Zapfenbecher*) decorated with incised lines and a bone pin with a rectangular, horizontally perforated head. Both artefacts find analogies in the environment of the late IC (e.g. Szelejewo, Kujawy) and the classic Únětice culture (UC) [Makarowicz 1998a].

For “pure” TH 1 materials no radiocarbon determinations are available now. However, there are 4 dates obtained from charcoal and bones, and relating to assemblages combining the traits of TH 1 and TH 3 (TH 1/TH3) from settlements in Borowo 12 (feature 19E and 19; Table 1:18 and 28; Fig. 4) and Siniarzewo 1 (feature E 95 and G 144, Table 1:26 and 29; Fig. 5), both from Kujawy [Makarowicz 1998b:Table 1]. The sum of probability distributions supports their placement in the time interval between 1770 and 1520 BC. The two sites also yielded up materials exhibiting typical Trzciniec traits such as ornaments of incised, wavy lines, both vertical and horizontal, (Fig. 4:1; 5:1, 3) and thick and bevelled lip rims of S-profile pots decorated with cordon under the rim (Fig. 4:1, 2, 4, 5, 7, 12). In Borowo, discoveries were made of the motif of a vertical cordon in the context of incised-stroked ornaments (Fig. 4:3) and pottery decorated with textile impressions (Fig. 4:11) [Ignaczak 1996].

A series of 7 radiocarbon determinations was obtained for TH 2 assemblages (Figs. 6-8). They come from settlements in Rybiny 14 (1 date from feature 9; Table 1:23) and Rybiny 17 (6 dates from feature 1, Table 1:9, 17, 22-25, 27) [Makarowicz 1989; 1998a; 2000b]. The dated material included bones, mollusc shells and charcoals from the inside of dwelling units. In the first case (Rybiny 14), it was a household feature located in the central portion of a post-structure

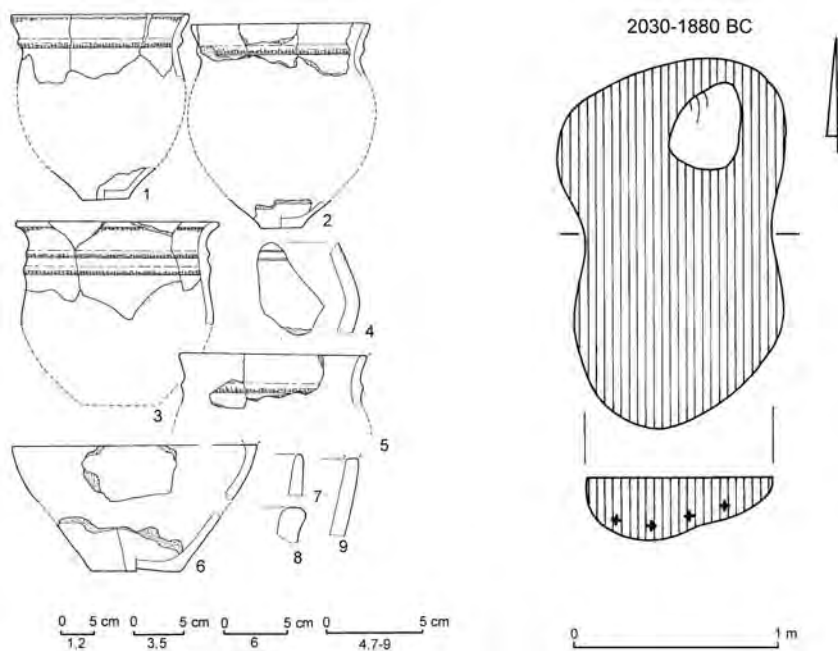


Fig. 2. Żegotki 3, Kujawy. Feature A112 and pottery from the feature. After Makarowicz 2001a

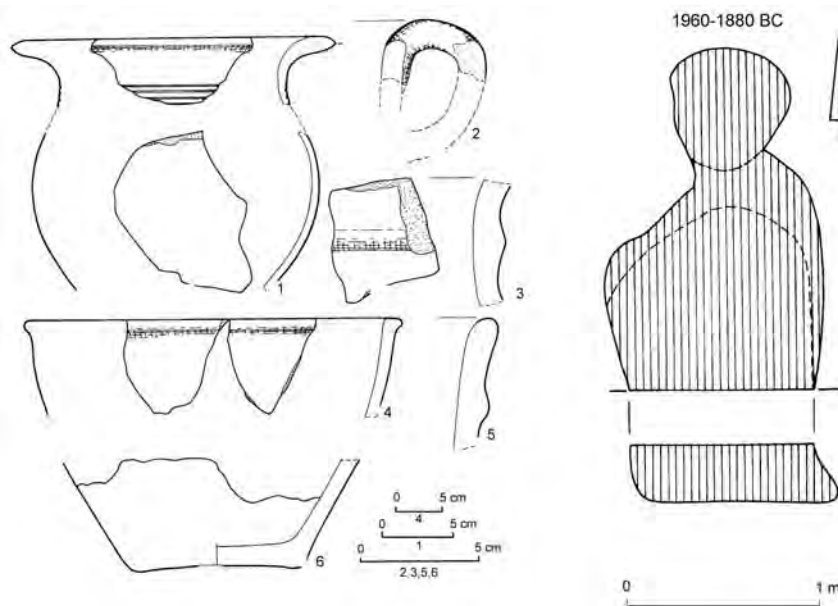


Fig. 3. Żegotki 3, Kujawy. Feature A89 and pottery from the feature. After Makarowicz 1998a; 2000a

house (Fig. 6) while in the other (Rybiny 17), it was the sunken floor house (Fig. 7). The sum of probability distributions of all the determinations indicates that TH 2 assemblages should be placed in the bracket of 1890-1680 BC. One of the dates from Rybiny 17 (feature 1), obtained from bones (Table 1:9), in the light of formal and stylistic assessment seems slightly too early. Rich ceramic material from both sites shows IC traits and early classic TCC ones. The former include beakers and vases with tulip-shaped rims (Fig. 6:1, 2; 8:1, 2, 9), bowls (Fig. 6:10), in particular bow-profile ones (Fig. 8:5, 7), vases, beakers and pots (Fig. 6:7, 8, 10; 8:2, 3, 6-11), incised ornaments (multiple horizontal and vertical lines, metopic motifs and zone-metopic ones, “chevrons”) and relief ornaments (applique bosses, cordons under the rim) (Fig. 6:1, 2; 8:1, 3, 10, 11). TCC patterns appear on S-profile pots decorated with horizontal cordons (Fig. 6:7, 8; 8:6, 7). Vessels of various types were decorated with stamp or stroke ornamentations, motifs of incised arches, vertical cordon interrupted by repeated horizontal incised lines (Fig. 6:1, 2; 8:1-7, 9, 10) and horizontal cord impressions. The stylistic analysis of these vessels is, in general, consistent with the radiocarbon dates and allows us to place both assemblages in the period between 1800 and 1700 BC.

For TH 3 we have a single date referring to a household pit (feature D 105) from a settlement site in Kuczkowo 5, Kujawy (Table 1:30). Material from the pit, showing traits characteristic of classic Trzciniec assemblages, was dated, in agreement with the typological assessment, at 1620-1520 BC [Makarowicz 2000a:528ff].

No radiocarbon dates have been obtained so far for TH 4 and TH 5. The period when they occurred was determined solely on the basis of the stylistic traits of pottery and rare bronze goods. The results of dating a grave assemblage from Radojewice 29, in which late “Trzciniec” traits (TH 5 — TH 7) are readily observable, have been already commented above.

Single determinations have been obtained for TH 6 and TH 7 assemblages (Fig. 9; Table 1). The first date comes from a settlement feature in Piecki 1, Kujawy (feature 47, Table 1:32) [Makarowicz 1998b:Table 1]. The material combines late TH stylistic patterns with early TuC inspirations, namely, cordons under the rim in pottery ornamentation (Fig. 9:1, 9), vessels with prominent shoulders (Fig. 9:2, 3, 8), undecorated containers having the morphology of a beaker, pot and bowl (Fig. 9:1, 3, 5). It was dated to the period of 1525-1485 BC, which is consistent with its typological assessment. An expecting date for TH 7 (Table 1:33) was made from charcoal coming from a grave in Krusza Podlotowa 8 (feature 3), Kujawy [Makarowicz 1998b:Table 1]. Two bodies placed there had been given a bronze pin bent in its upper part, having a spindle-shaped head and an “eye”. Typologically close specimens come from late TuC and early Lusatian culture (LC) environments [Gedl 1975:tabl. XL; Kłosińska 1997] and may be dated at BC-BD in Paul Reinecke’s periodization.

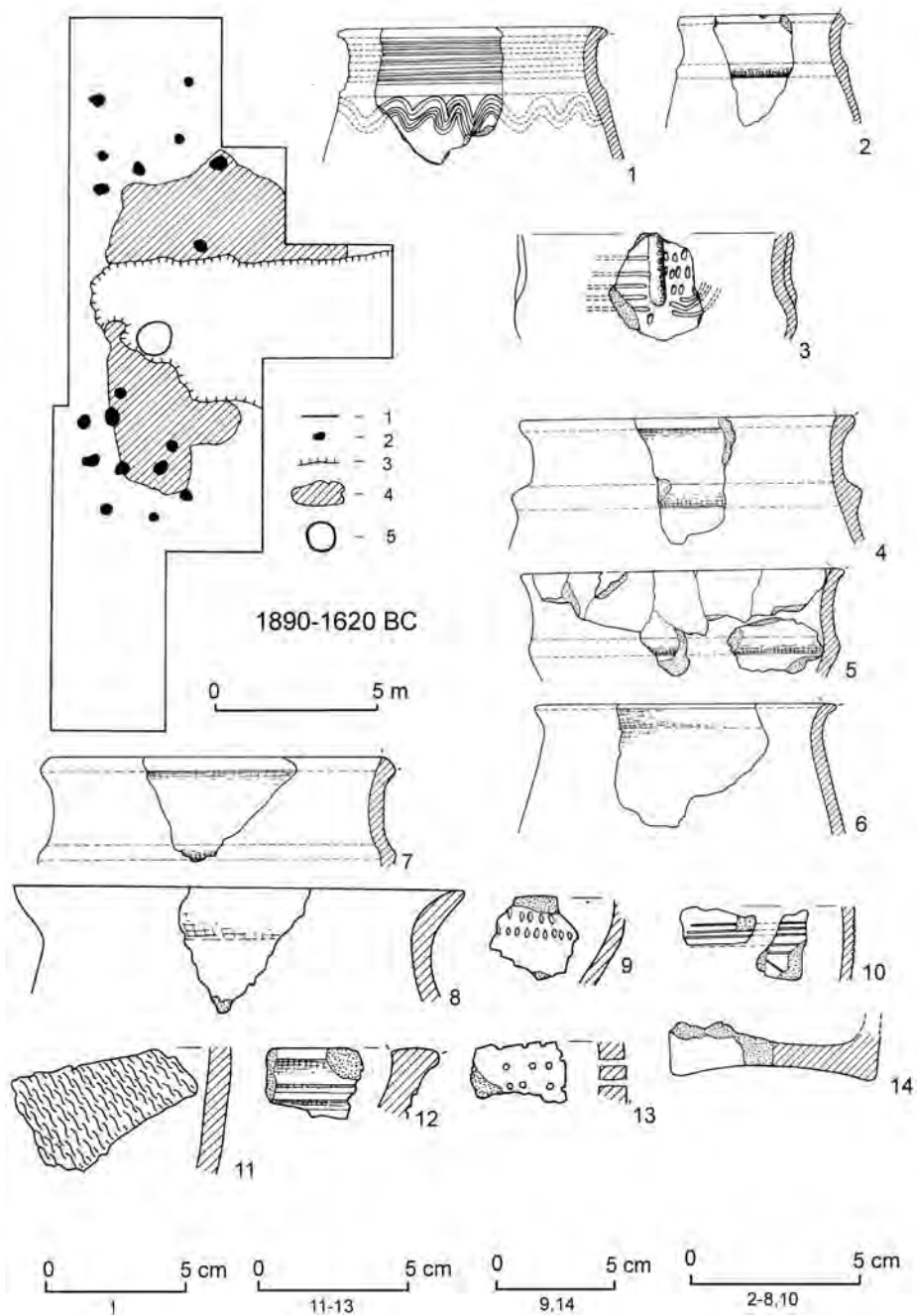


Fig. 4. Borowo 12, Kujawy. Features 19 and 19E and selection of pottery from the features. After Ignaczak 1996; legend: Makarowicz 1998a

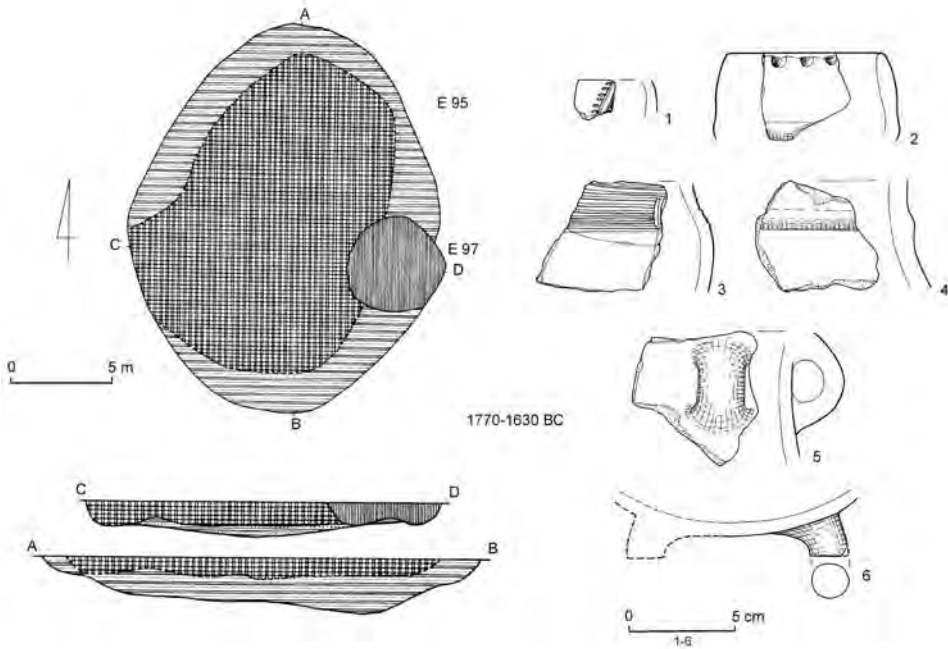


Fig. 5. Siniarzewo 1, Kujawy. Feature E 95 and pottery from the feature. After Makarowicz 2000a

The set of radiocarbon determinations obtained for the lowlands (Kujavian) assemblages of the TCC allows us to draw a few general conclusions making the time brackets of Trzciniec phenomena there more specific [see Makarowicz 1998a]. The earliest, single proto-Trzciniec traits appeared already in SGC and BB (including IC) groups beginning with the middle of the 3rd millennium BC. In the northwest of the TCC oecumene (Kujawy, Pałuki, Chełmno Land, middle Warta drainage), the transformation of Iwno structures into Trzciniec ones took place between 1950/1900 and 1800 BC (TH 1 and TH 2 assemblages). East TCC patterns occurred in TH 2 and especially in TH 1/3 and TH 3 assemblages since ca. 1700-1600 BC. In TH 1, TH 2, TH 3 and TH 1/TH 3 assemblages, until ca. 1600 BC, we can observe clear IC traits which are absent from later taxa (from TH 5 to TH 7). The traits of cultures from the south (Maďarovec culture — MaC, Otomani/Füzesabony culture — OC/FC) emerged at the earliest between 1700 and 1600 BC, while the traits of the TuC became noticeable in 1600/1500-1300 BC. In the area in question, TCC structures disintegrated ca. 1300-1200 BC, i.e. contemporaneously with the settlement of the early Lusatian culture (LC) [Czebreszuk *et al.* 1997; Ignaczak 2002; Czebreszuk *et al.* 2003].

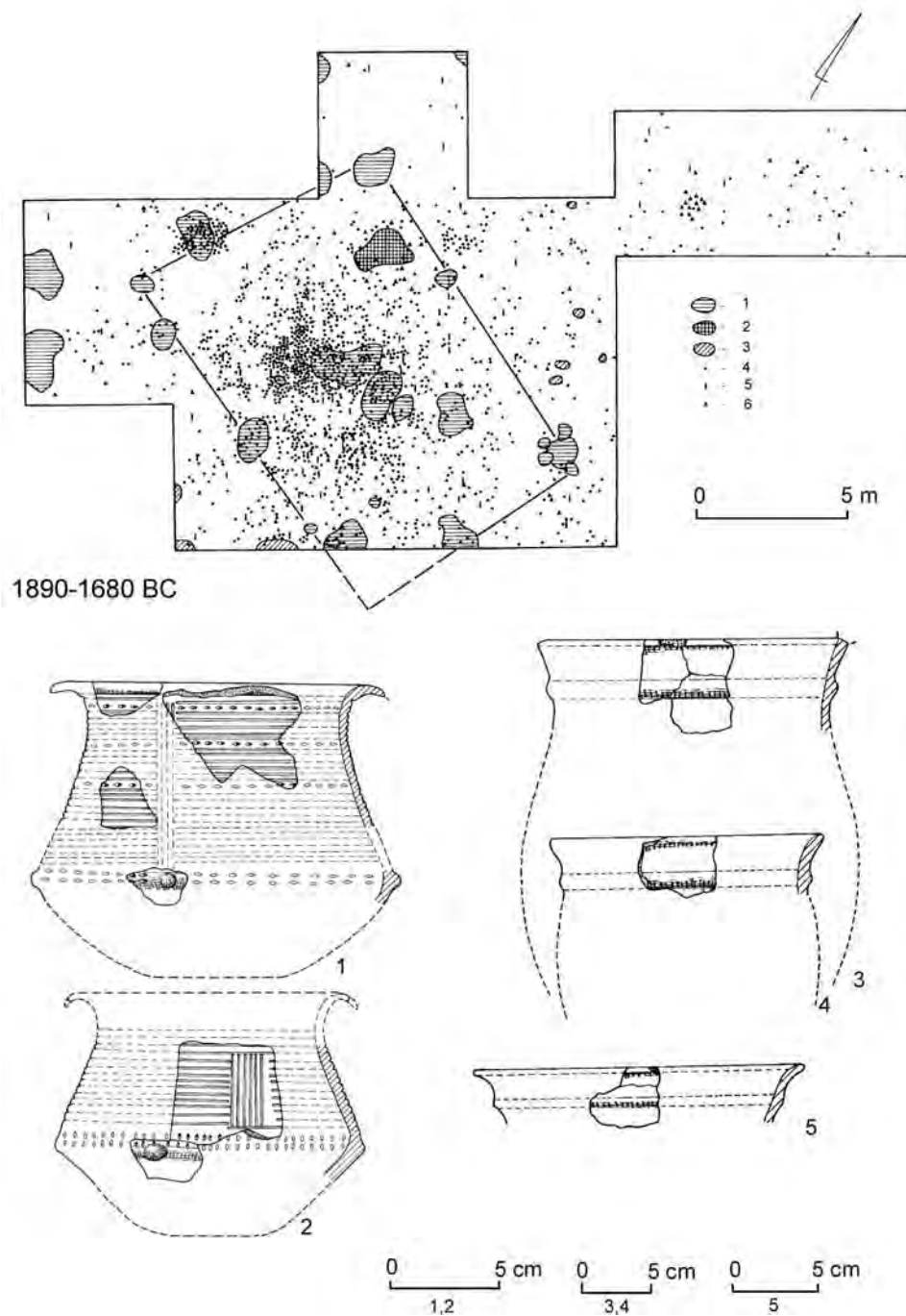


Fig. 6. Rybiny 14, Kujawy. A house and selection of pottery from the feature. Legend: Makarowicz 2000b

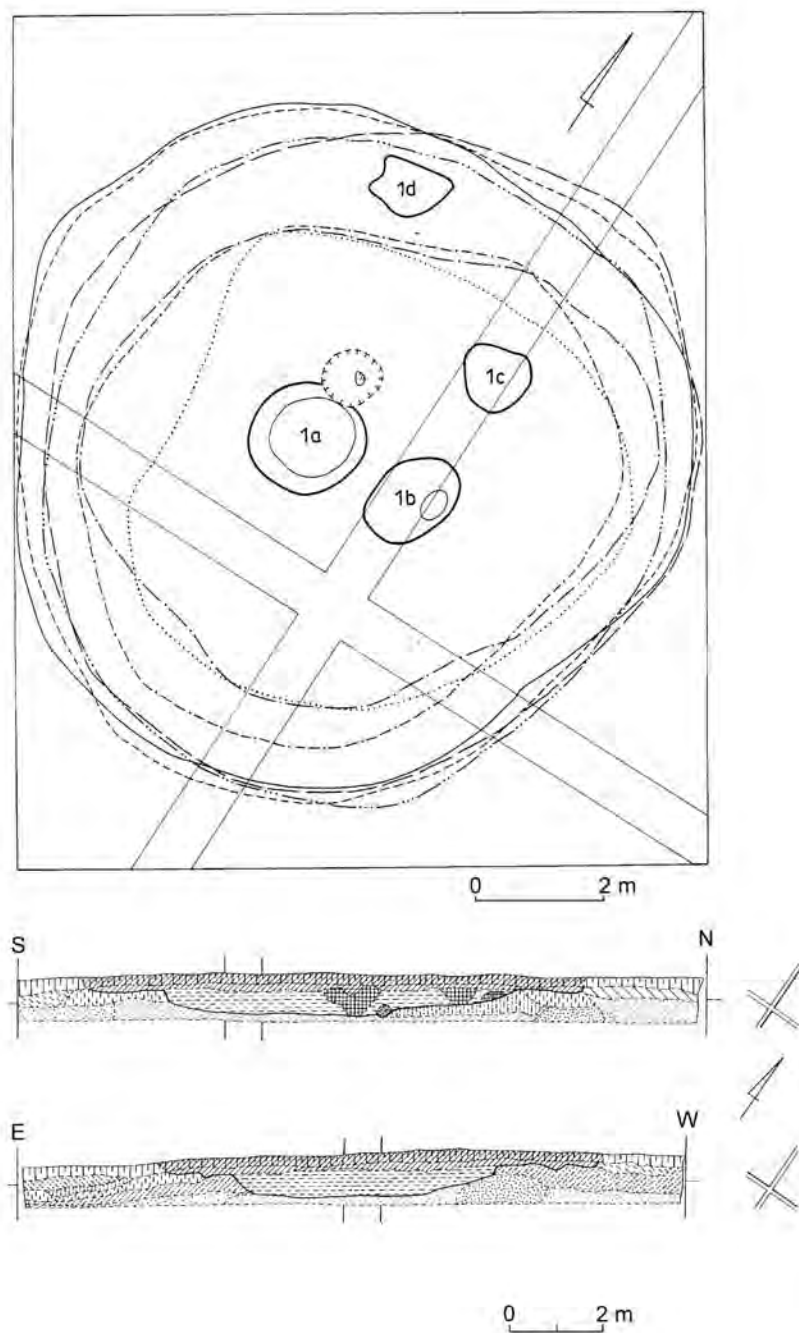


Fig. 7. Rybiny 17, Kujawy. Plan and cross section of the house (feature 1). Legend: Makarowicz 2000b

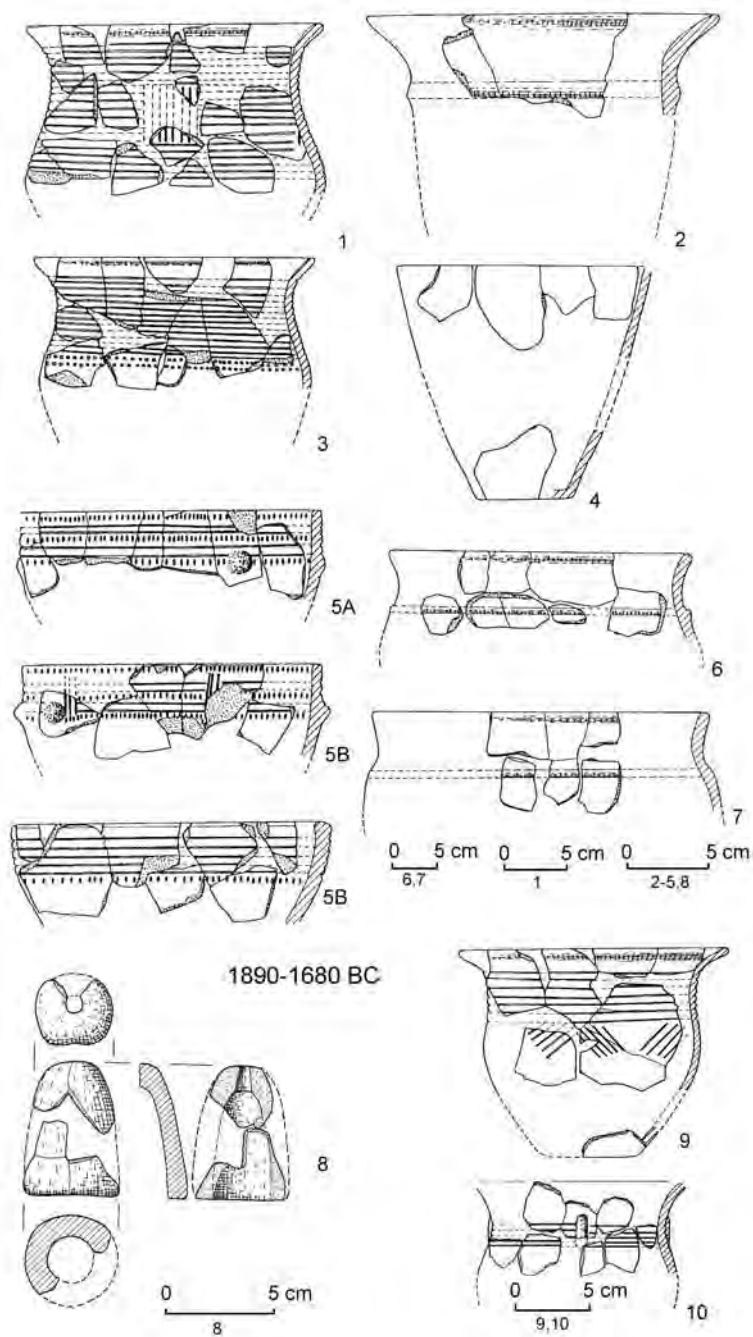


Fig. 8. Rybiny 17, Kujawy. Selection of pottery (1-7, 9, 10) and a clay tuyere (8) from the house (feature 1). After Makarowicz 2000b

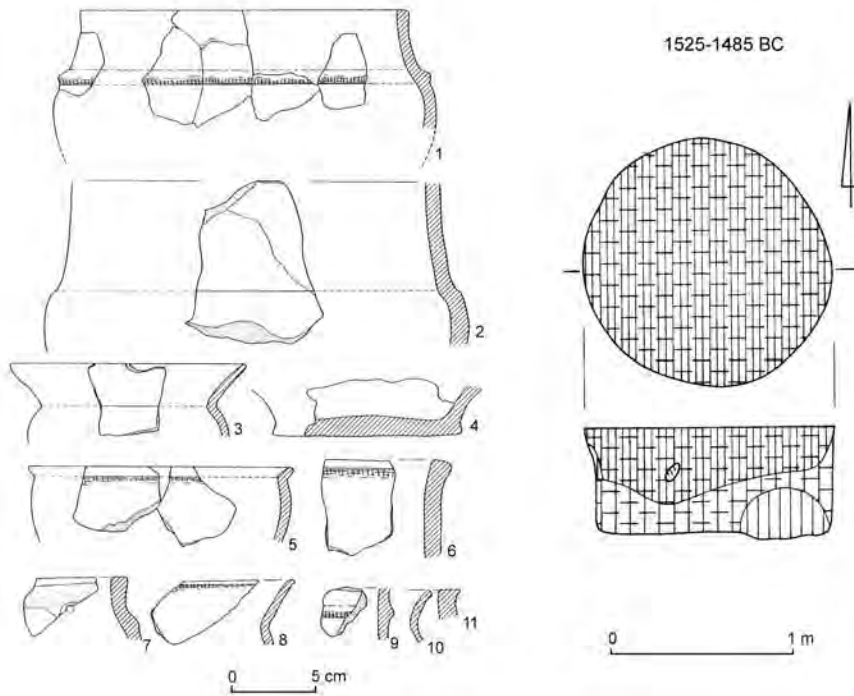


Fig. 9. Piecki 1, Kujawy. Feature 47 and pottery from the feature. After Makarowicz 1998a

## 2.2. THE UPLANDS ZONE

The periodization system of the western Małopolska branch of the Trzciniec culture was developed after analysing about 130 homogenous settlement and grave assemblages. They were divided into six types (A1, A2, A3, B, C, C/D) reflecting stylistic and formal differences of the pottery [Górski 1994; 1997; 1998a; 1998b]. The development of pottery from A1 to C/D assemblages was rather evolutionary and shifts from one type to another are not by leaps but smooth [Górski, Kadrow 1996; Górski 1998c; 1998d; 2002].

There are 68 radiocarbon determinations coming from the southern part of the discussed cultural subcircle. They concern 7 sepulchral features, 1 ritual feature (burial house) and 2 settlement ones (Fig. 1; Table 2).

The chronology of settlement materials from Słonowice needs to be verified\* [Calderoni *et al.* 2000; Górski, Kadrow 2001]. One of the dates obtained for this

\* The present authors would like to thank Dr. Krzysztof Tunia for the opportunity to verify materials from radiocarbon-dated features and kind permission to publish feature drawings.

Table 2

Radiocarbon datings of the Trzciniec Cultural Circle assemblages from the upper Vistula drainage basin (Małopolska and Lublin Upland)

No.	Site/ feature	Cultural unit/phase or assemblages type	Conv BP	Cal BC (1 $\sigma$ )	Lab. code	Sample material	Context	Cat.	Comments
1	2	3	4	5	6	7	8	9	10
1.	Żerniki Górne 1/102	TC/A2?	3590±60	2040-1870 (62,8%)	Ki-5112	bone	grave	IA	too early dating no compatible with the typological analysis
2.	Żerniki Górne 1/73	TC/A2	3570±55	1980-1870 (49,7%)	Ki-5113	bone	grave	IA	too early dating no compatible with the typological analysis
3.	Żerniki Górne 1/3	TC/A2?	3560±55	1980-1870 (45,1%)	Ki-5117	bone	grave	IA	too early dating no compatible with the typological analysis
4.	Dubeczno 1/ hearth	TC/A1	3520±50	1920-1740 (68,2%)	Gd-5124	charcoal	barrow	IIA	
5.	Żerniki Górne 1/71	TC/A2	3510±40	1890-1740 (68,2%)	Ki-5832	bone	grave	IA	too early dating no compatible with the typological analysis
6.	Żerniki Górne 1/69	TC/A2?	3495±50	1880-1740 (68,2%)	Ki-5829	bone	grave	IA	too early dating no compatible with the typological analysis
7.	Żerniki Górne 1/62	TC/A2	3470±35	1780-1730 (28,9%) 1880-1840 (25,0%)	Ki-5831	bone	grave	IA	too early dating no compatible with the typological analysis
8.	Słonowice G/ XVII/ 21	TC/A3	3450±65	1880-1680 (68,2%)	Rome-862	charcoal	pit	IIB	too early dating no compatible with the typological analysis

1	2	3	4	5	6	7	8	9	10
9.	Dacharzów 1/ 1A	TC/A1	3450±80	1890-1680 (65,2%)	Ki-8615	wood	grave	IIA	
10.	Miernów 2/ barrow II	TC/A1	3450±100	1890-1620 (68,2%)	K-1838	charcoal	grave	IIA	
11.	Zienki/?	TC/A1	3445±50	1780-1680 (48,0%)	????	charcoal	hearth under the barrow	IIA	
12.	Dacharzów 1/ 1A-I	TC/A1	3445±90	1890-1630 (68,2%)	Ki-8089	bone	grave	IA	
13.	Żerniki Górne 1/86	TC	3420±40	1770-1680 (56,9%)	Ki-5830	bone	grave	IA	too early dating no compatible with the typological analysis
14.	Dacharzów 1/ 1A-IV	TC/A1	3415±70	1780-1620 (56,3%)	Ki-8317	bone	grave	IA	
15.	Dubeczno 1/ barrow	TC/A1	3410±70	1780-1610 (58,5%)	Ki-9197	bone	grave	IA	
16.	Zienki/?	TC/A1	3390±50	1750-1610 (68,2%)	????	charcoal	hearth under the barrow	IIA	
17.	Dacharzów 1/ 1B	TC	3390±200	1940-1440 (68,2%)	Ki-8107	wood	grave	IIA	
18.	Żerniki Górne 1/5	TC/A2-B	3380±60	1750-1600 (62,2%)	Ki-5833	bone	grave	IA	too early (?) dating no compatible with the typological analysis
19.	Dacharzów 1/ 1A-IV	TC/A1	3360±70	1700-1580 (43,2%)	Ki-8318	bone	grave	IA	
20.	Dacharzów 1/ 1A	TC/A1	3350±50	1690-1580 (50,4%)	Ki-8614	wood	grave	IIA	
21.	Dacharzów 1/ 1A	TC/A1	3340±60	1690-1520 (68,2%)	Ki-8548	wood	grave	IIA	
22.	Dacharzów 1/ 1B-V	TC	3340±60	1690-1520 (68,2%)	Ki-8095	bone	grave	IA	
23.	Dacharzów 1/ 1A-IV	TC/A1	3340±70	1690-1520 (68,2%)	Ki-8094	bone	grave	IA	
24.	Dacharzów 1/ 1A-I	TC/A1	3340±160	1780-1430 (62,4%)	Ki-8090	bone	grave	IA	
25.	Dacharzów 1/ 1A	TC/A1	3335±45	1690-1580 (46,2%)	Ki-8610	wood	grave	IIA	
26.	Słonowice G/ 67/XVI	TC/A1	3335±55	1690-1520 (68,2%)	Rome-859	charcoal	pit	IIB	
27.	Dacharzów 1/ 1B	TC	3320±70	1690-1520 (68,2%)	Ki-8549	wood	grave	IIA	
28.	Dacharzów 1/ 1A-III	TC/A1	3310±70	1690-1510 (68,2%)	Ki-8316	bone	grave	IA	

1	2	3	4	5	6	7	8	9	10
29.	Dacharzów 1/ 1B	TC	3300±50	1630-1510 (63,0%)	Ki-8616	wood	grave	IIA	
30.	Dacharzów 1/ 5	TC/A2-B	3290±60	1640-1510 (61,5%)	Ki-8617	bone	grave	IA	
31.	Dacharzów 1/ 1B	TC	3280±45	1630-1500 (66,6%)	Ki-8611	wood	grave	IIA	
32.	Dacharzów 1/ 1B-V	TC	3270±70	1630-1490 (56,1%)	Ki-8319	bone	grave	IA	
33.	Dacharzów 1/ 5	TC/A2-B	3270±70	1630-1490 (56,1%)	Ki-8098	bone	grave	IA	
34.	Dacharzów 1/ 1A-III	TC/A1	3270±70	1630-1490 (56,1%)	Ki-8314	bone	grave	IA	
35.	Kazimierzów /2	TC	3260±90	1630-1430 (66,0%)	Ki-8282	wood	grave	IIA	
36.	Dacharzów 1/ 1A-III	TC/A1	3220±70	1530-1410 (58,5%)	Ki-8315	bone	grave	IA	
37.	Kazimierzów /2	TC	3210±70	1530-1400 (60,6%)	Ki-8283	bone	grave	IA	
38.	Słonowice G/ 21/XXI	TC/A1	3200±60	1520-1410 (68,2%)	Rome-858	charcoal	pit	IIB	
39.	Dacharzów 1/ 5	TC/A2-B	3180±70	1530-1390 (65,9%)	Ki-8314	bone	grave	IA	
40.	Słonowice G/ 28/XVI	TC	3170±60	1520-1390 (68,2%)	Rome-860	charcoal	pit	IIB	non- -homogenic material
41.	Dacharzów 1/ 1A	TC/A2	3170±100	1530-1310 (62,4%)	Gd-10479	bone	grave	IA	
42.	Dacharzów 1/ 5	TC/A2-B	3160±70	1520-1380 (63,0%)	Ki-8321	bone	grave	IA	
43.	Dacharzów 1/ 10	TC	3070±70	1420-1250 (63,4%)	Ki-8323	bone	grave	IA	
44.	Dacharzów 1/ 12	TC	3050±70	1410-1250 (57,4%)	Ki-8105	bone	grave	IA	
45.	Dwikozy	TC/late=C	3040±40	1320-1250 (37,5%)	Gd-3217	charcoal	burial house	IB	
46.	Dwikozy	TC/late=C	3040±50	1390-1250 (60,1%)	Gd-1940	charcoal	burial house	IB	
47.	Kraków- -Nowa Huta Cłó/S-102	TC/A2	3040±60	1400-1210 (65,8%)	Gd-11456	charcoal	pit	IIB	to late dating no compatible with the typological analysis
48.	Kraków- -Nowa Huta Cłó/G-108	TC/A1?	3040±190	1460-1010 (66,2%)	Gd-14031	bone	grave	IA	to late dating no compatible with the typological analysis
49.	Dwikozy	TC/late=C	3020±40	1320-1210 (49,1%)	Gd-1941	charcoal	burial house	IB	

1	2	3	4	5	6	7	8	9	10
50.	Dacharzów 1/10	TC	2995±70	1320-1120 (60,5%)	Ki-8324	bone	grave	IA	
51.	Dacharzów 1/10	TC	2980±70	1320-1120 (61,7%)	Ki-8102	bone	grave	IA	
52.	Dwikozy	TC/late=C	2960±40	1260-1110 (65,5%)	Gd-3218	charcoal	burial house	IB	
53.	Słonowice G/1/XIX	TC/C	2960±60	1270-1050 (66,4%)	Rome-861	charcoal	pit	IIB	
54.	Dacharzów 1/11	TC/C	2950±70	1270-1040 (67,3%)	Ki-8103	bone	grave	IA	
55.	Dacharzów 1/8	TC	2940±70	1260-1010 (68,2%)	Ki-8099	bone	grave	IA	
56.	Dwikozy	TC/late=C	2940±35	1220-1110 (48,3%)	Gd-3220	charcoal	burial house	IB	
57.	Dwikozy	TC/late=C	2920±50	1220-1010 (68,2%)	Gd-1937	charcoal	burial house	IB	
58.	Dwikozy	TC/late=C	2920±50	1220-1010 (68,2%)	Gd-1939	charcoal	burial house	IB	
59.	Dwikozy	TC/late=C	2890±40	1130-1000 (67,3%)	Gd-3219	charcoal	burial house	IB	
60.	Dwikozy	TC/late=C	2890±50	1130-990 (61,9%)	Gd-1938	charcoal	burial house	IB	
61.	Dacharzów 1/2	TC/A2-B	2840±60	1120-900 (68,2%)	Ki-8096	bone	grave	IA	to late dating no compatible with the typological analysis
62.	Dacharzów 1/1A	TC/A1	2830±70	1130-890 (68,2%)	Ki-8106	wood	grave	IIA	to late dating no compatible with the typological analysis
63.	Dacharzów 1/2	TC/A2-B	2820±60	1050-890 (66,2%)	Ki-8320	bone	grave	IA	to late dating no compatible with the typological analysis
64.	Dacharzów 1/1A-II	TC/A1	2820±80	1080-890 (57,2%)	Ki-8092	bone	grave	IA	to late dating no compatible with the typological analysis
65.	Dacharzów 1/11	TC/C	2800±70	1020-890 (53,5%)	Ki-8325	bone	grave	IA	to late dating no compatible with the typological analysis

1	2	3	4	5	6	7	8	9	10
66.	Dacharzów 1/1A-II	TC/A1	2800±80	1050-890 (68,2%)	Ki-8091	bone	grave	IA	to late dating no compatible with the typological analysis
67.	Dacharzów 1/2	TC/A2-B	2790±70	1010-830 (68,2%)	Ki-8097	bone	grave	IA	to late dating no compatible with the typological analysis
68.	Dacharzów 1/10	TC	2770±80	1000-830 (68,2%)	Ki-8101	bone	grave	IA	to late dating
69.	Dacharzów 1/1A	TC/A1	2710±350	2300-400 (68,2%)	Gd-9621	bone	grave	IA	to late dating no compatible with the typological analysis

TC – Trzciniec Culture

Data after: Włodarczak 1998; Górski, Kadrow 2001; Taras *et al.* 2001; Florek, Taras 2003

site (Rome-863) comes from a feature containing early LC materials [Calderoni *et al.* 2000, Fig. 2, 3]. Another determinations (Table 2:40) concerns a shallow feature (28/XVI) disturbed by another pit making it hardly possible to consider its fill as a homogenous assemblage [Calderoni *et al.* 2000, Fig. 7a]. The date for feature 21/XVII (Table 2:8) is not consistent with archaeological criteria (it is too early), on the basis of which it is possible to count the assemblage among materials of type A3. Three of the four other dates (feature 67/XVI, feature 21/XXI, feature 1/XIX — Table 2:26, 38, 53) fit well into the periodization scheme of TC materials in the western Małopolska area. The first two features can be classified as “progressive” type A1 assemblages (i.e. exhibiting traits of type A2 assemblages — Fig. 10A:1-6; 10B:1-13). The obtained results of absolute dating are as expected. The third measurement, whose value fits well into the scheme of TC development on loess soils around Kraków, is the dating of pit 1/XIX (Table 2:53). The pottery shows traits of type B assemblages (an amphora with “whiskers” under the handles — Fig. 11:2) and — mainly — of type C (relatively many vessels decorated with vertical flutes Fig. 11: 3, 6, 11, 18). Hence, the materials should be placed in the earlier period of occurrence of type C assemblages. The probability distribution for the date concerning a sample taken from feature 1/XIX is rather broad (1270-1050 BC) but it can be deemed as consistent with the expected one [see Górski, Kadrow 2001: Tab. 144].

Very characteristic type A1 materials were recovered from barrow II in Mierów, Małopolska (Fig. 12) [Kempisty 1978:10-18, Fig. 1-12]. The date obtained

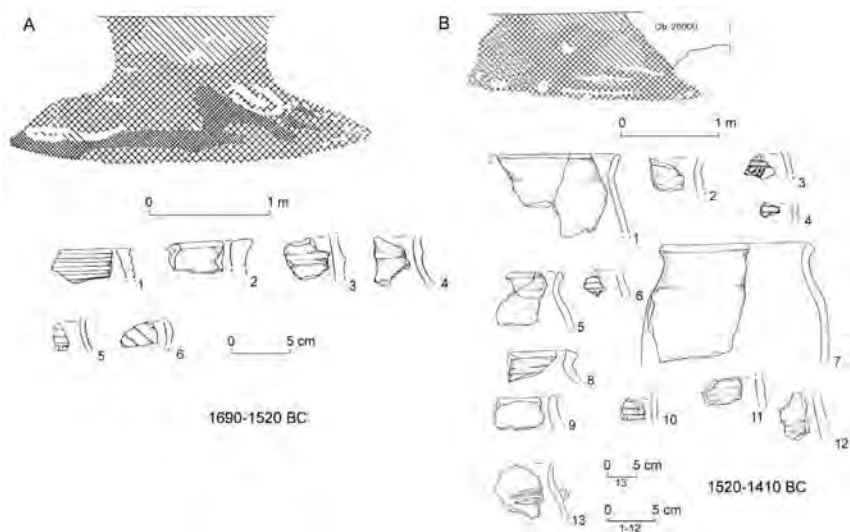


Fig. 10. Słonowice G, Małopolska. A - feature 67/XVII and pottery from the feature; B - feature 21/XXI and pottery from the feature. After Górski, Kadrow 2001. Drawn by A. Bieniek-Wiśniewska

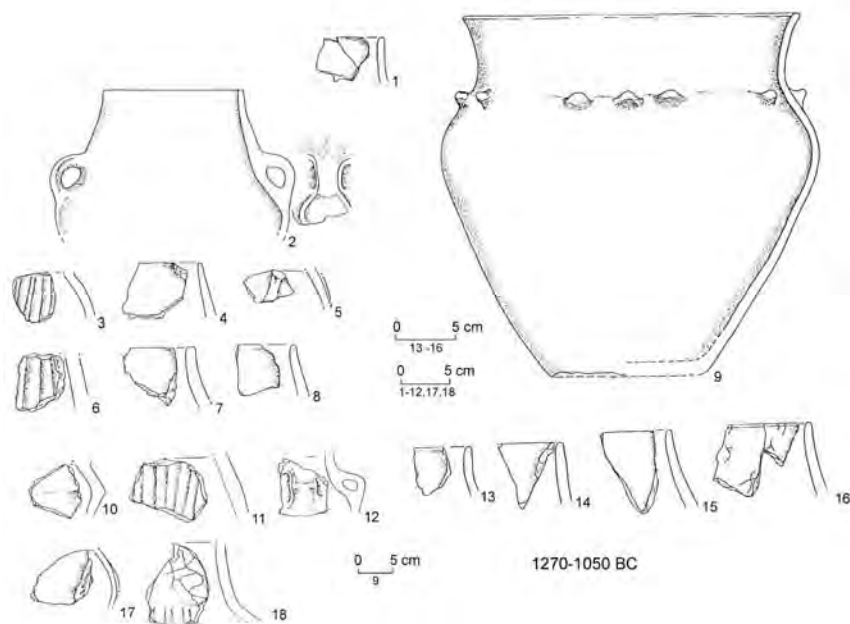


Fig. 11. Słonowice G, Małopolska. Pottery from the feature 1/XIX. After Górski, Kadrow 2001. Drawn by A. Bieniek-Wiśniewska

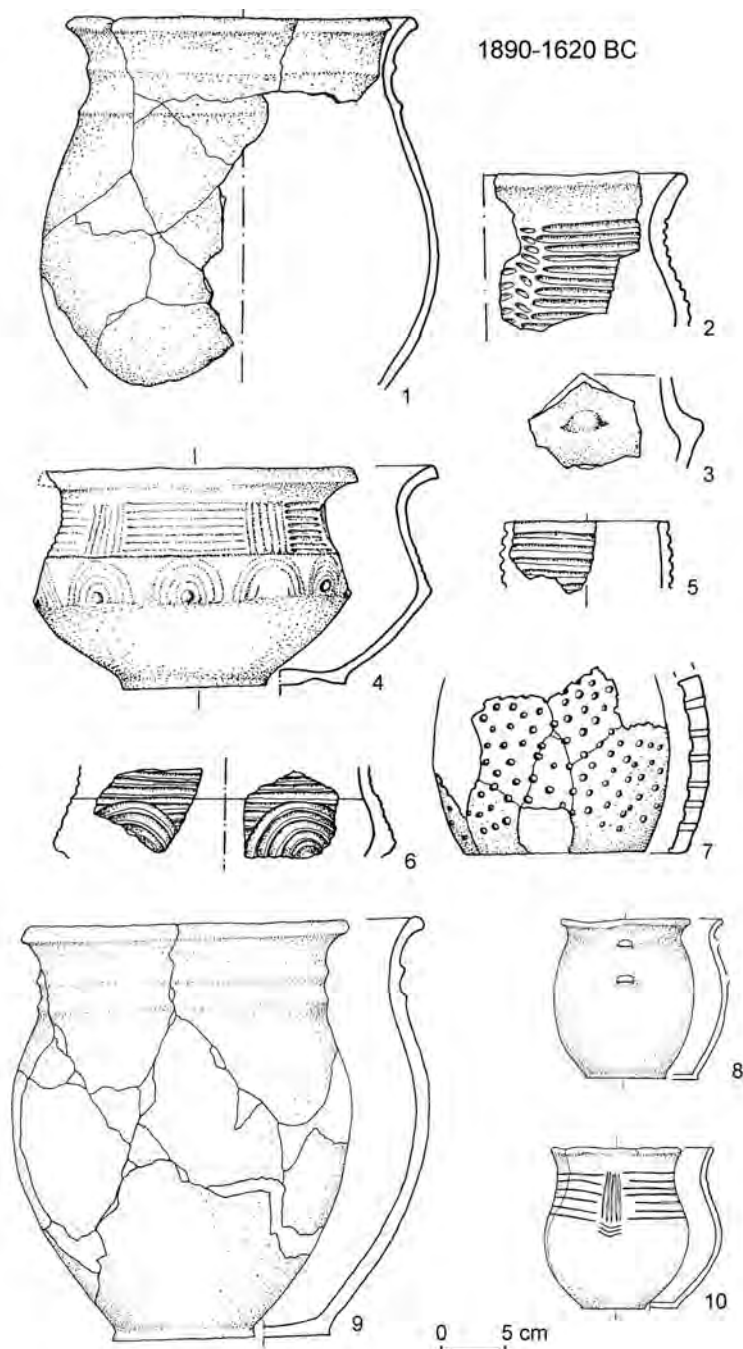


Fig. 12. Miernów 2, barrow II, Małopolska. Pottery from the barrow. After Kempisty 1978. Drawn by A. Bieniek-Wisniewska

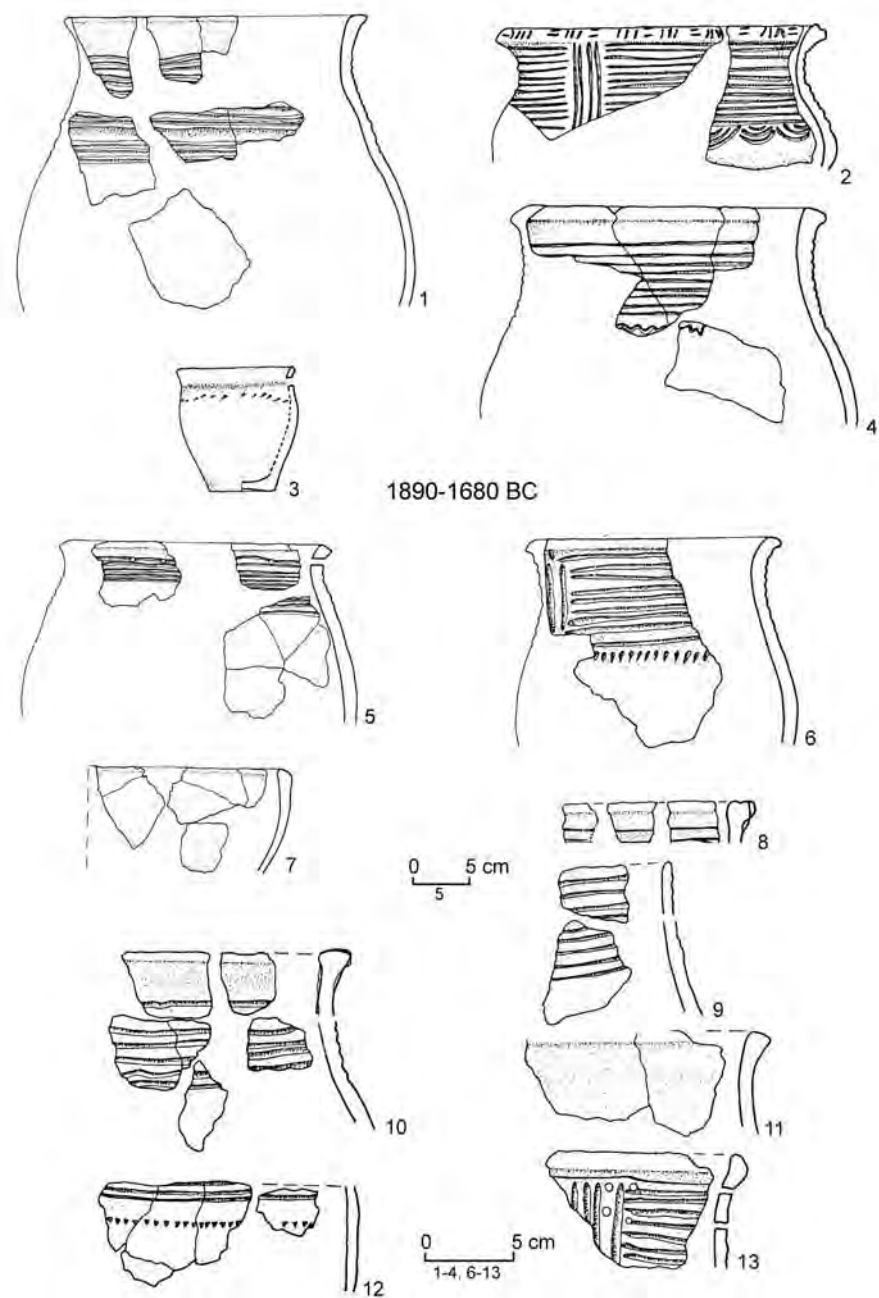


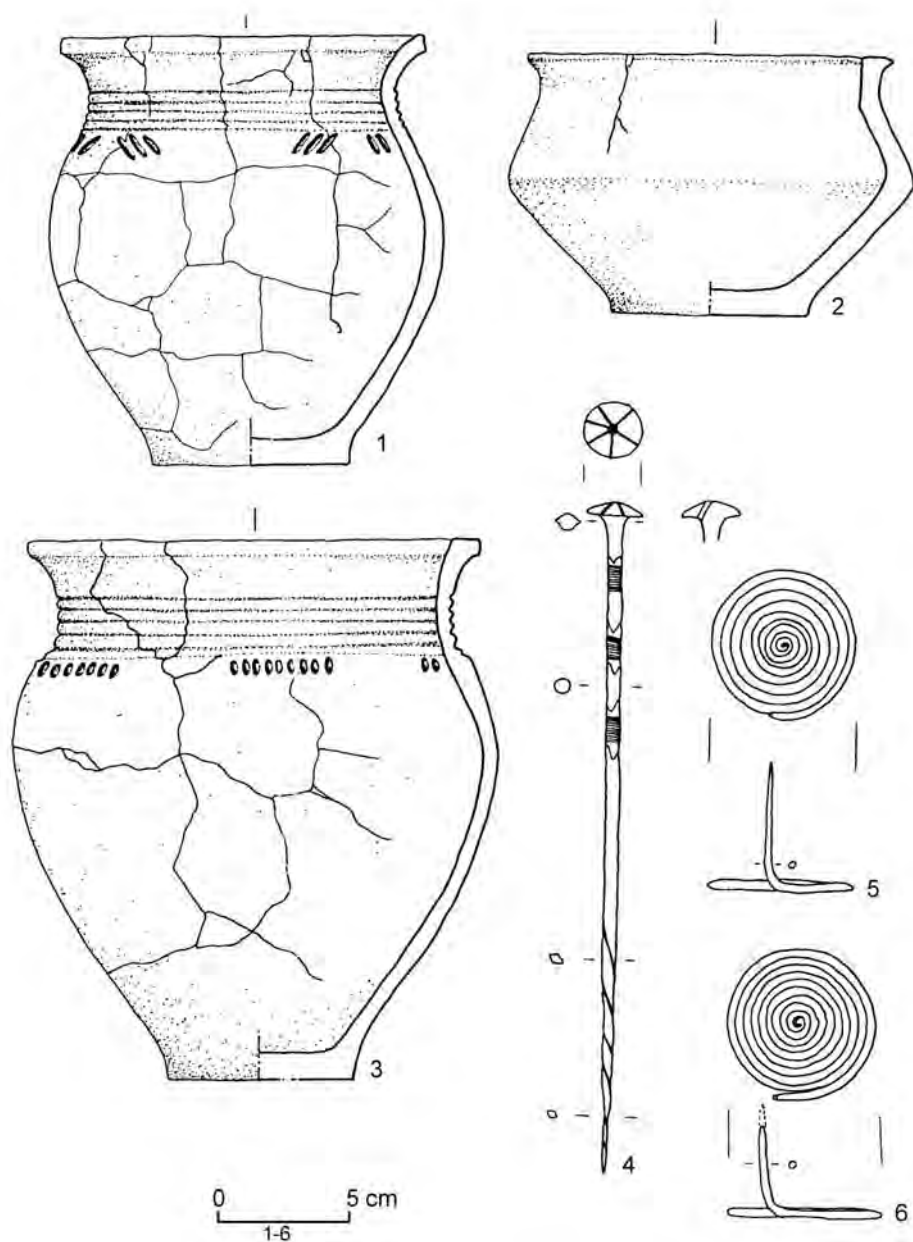
Fig. 13. Dubeczno 1, Lublin Upland. Pottery from the barrow. After Taras 1995. Drawn by A. Bieniek-  
-Wiśniewska

from charcoals found in the pit under the barrow mound carries a relatively large standard error (Table 2:10) but it does not contradict typological observations or findings from Słonowice [Górski, Kadrow 1996:Tab. 1]. In stylistic terms, the vessel set from barrow II in Miernów, including S-profile pots with a double cordons and a bevelled rim (Fig. 12:1, 9), vases bearing incised ornaments (metope and repeated horizontal lines — Fig. 12:2, 4, 10) as well as spiral and boss ones (Fig. 12:4, 6), is older than materials from the features in Słonowice.

Also older are radiocarbon dates made for materials from a barrow in Dubeczno 1 in the Lublin province (Table 2:4 and 15) [Taras 1995; Florek, Taras 2003:61, Fig. 23]. Vessel forms and stylistics, e.g. pots decorated with incised and wavy lines (Fig. 13:1, 4-6), metopic ornaments (Fig. 13:2, 6, 13), wedge-shaped stamp impressions (Fig. 13:12) [cf. Taras 1995:202, Table. XV-XXIII], correspond to western Małopolska assemblages of type A1. It seems justified to believe that the oldest TC assemblages in the Lublin province in terms of stylistics, similarly to the lowlands zone (cf. absolute dating of TH 1 and TH 2 assemblages in Kujawy) [Makarowicz 1998a:102-105], emerged much earlier than in western Małopolska.

Relatively late dates are assigned to TC materials from Kraków-Nowa Huta-Cło, Małopolska, found in a collective grave (feature G-108, Table 2:48) and a settlement feature (feature S-102, Table 2:47). Pottery from the grave may be classified as type A1, whereas that from pit S-102 may be attributed to type A2 (however, with a high share of traits of type A1) [Górski, Kadrow 2001:145, Tab. 23, Abb. 43-44]. The results do not fit, in principle, into the chronological brackets set for this type of TCC assemblages in the south of Poland.

A very long series of radiocarbon dates comes from a sepulchral complex in Dacharzów, Małopolska (Table 2) [Taras *et al.* 2002; Florek, Taras 2003]. The oldest and at the same time central part of the complex was formed by graves built of stone (1A and 1B) under a barrow. From the perspective of the vicinity of Kraków, the goods found in grave 1A should be classified as type A1 (pots with incised-stroked ornament — Fig. 14:1, 3) with the proviso that they are not the oldest materials of this type. The formal and stylistic assessment of ceramic materials and the dating of a bronze pin (Fig. 14:4) [Florek, Taras 1997:78-79, Abb. 6:a-f] found in the grave, placing them at the older part of BB period [Blajer 1998:338], are consistent with their radiocarbon dating at around the turn of the 17th century BC (Table 2:9, 12, 14, 17, 19-25, 27-29, 31, 32, 34, 36, 41, 62, 64, 66, 69) [Taras *et al.* 2002:161, tab. 1, 2, Fig. 3]. Very late dates were obtained for grave 2 (Table 2:61, 63, 67), which yielded up a large set of pottery [Florek, Taras 1997:Abb. 10]. The goods found in the grave certainly correspond to the younger development stages of the TC, but the set is not very distinctive. A vase on a slender and empty stem indicates connections to vases and beakers on stems known from this area and dated at the late phase [cf. Gardawski 1959:tabl. XXXV:1; XXXVI:8]. The only vessel of this type, well seated in the realities of relative chronology, comes from pit 5 at the cemetery in Żerniki



1750-1510 BC

Fig. 14. Dacharzów 1, Małopolska. Pottery from feature 1A. After Florek, Taras 2003. Drawn by A. Bieniek-Wisniewska

Górne 1, Małopolska the dates for which can be, in principle, fitted into phase B of the Bronze Age. The dating of this assemblage virtually after 1000 BC seems to be too late [Taras *et al.* 2002:tab. 2. Fig. 3]. In terms of pottery stylistics, the grave goods can be placed within rather broad brackets whose limits are determined by western Małopolska assemblages of types A1-A2 and C. This assessment is based above all on the stressing of vessel tectonics by giving prominence to “shoulders” [Florek, Taras 1997:Abb. 10:b-d, g, h]. Consequently, the absolute dating of this grave should be much earlier. This opinion corresponds well with the dating of grave 5, containing a pot with identical traits as vessels from grave 2 [Florek, Taras 1997:Abb. 9a], at 1620-1400 BC (Table 2:18, 33, 39, 42). The question of the chronology of grave 2 in Dacharzów, however, should be approached for the time being with great care. Taking into account the differences between its stylistic and radiocarbon dating, it must be remembered that our knowledge of the chronological differentiation of the TC and the cultural situation in the region of Sandomierz at the time is highly unsatisfactory.

For determining the chronology of the late TC in the region of Sandomierz, valuable information is furnished by the dating of a mass grave in Dwikozy [Ścibior, Ścibior 1990]. It was a burial of the “burial house” type (Fig. 15). Nine radiocarbon dates were obtained from the burnt timber structure (Table 2:45, 46, 49, 52, 56-60) [Ścibior, Ścibior 1990:Tab. 2]. The ceramic grave goods correspond to the latest TC pottery from western Małopolska (type C assemblages — Fig. 15:1-10, 12) but have peculiar, local traits [Ścibior, Ścibior 1990:Fig. 9-10]. As the sepulchral structure in Dwikozy was used only once, wiggle matching analysis was performed assuming that in all probability the time span of the timber used to build the structure over the grave was not greater than 100 years. In this way the most probable date, i.e. ca. 1050 BC [Górski, Kadrow 2001:Tab. 19, Abb. 7], for this feature was obtained. The assemblage found in the grave included two vessels decorated with vertical flutes (Fig. 15:6, 9), which in the vicinity of Kraków are characteristic of type C assemblages. A similar ornament is found on the bottom part of a vessel unearthed in grave 11 in Dacharzów. The absolute dating of this grave (Table 2:54) is very close to the chronometry of the Dwikozy assemblage. The materials from both features (in particular from Dwikozy) mark the last (terminal) phase of the TC in the region of Sandomierz. In comparison to the assemblages from the vicinity of Kraków, these dates are relatively late. If we consider, however, the fact that early LC settlement in the region of Sandomierz is rather enigmatic, we can assume that Trzciniec structures lasted there for a long time.

From Żerniki Górne 1, Małopolska we have a series of 8 radiocarbon determinations (Table 2:1-3, 5-7, 13, 18), according to which the barrow and the accompanying cemetery of collective graves were used between 1900 and 1700/1600 BC [Włodarczak 1998:Table 3], hence in phases A1 b and A2 of the Bronze Age [Włodarczak 1998:175; Górski, Kadrow 2001:133]. Samples for <sup>14</sup>C measurements were

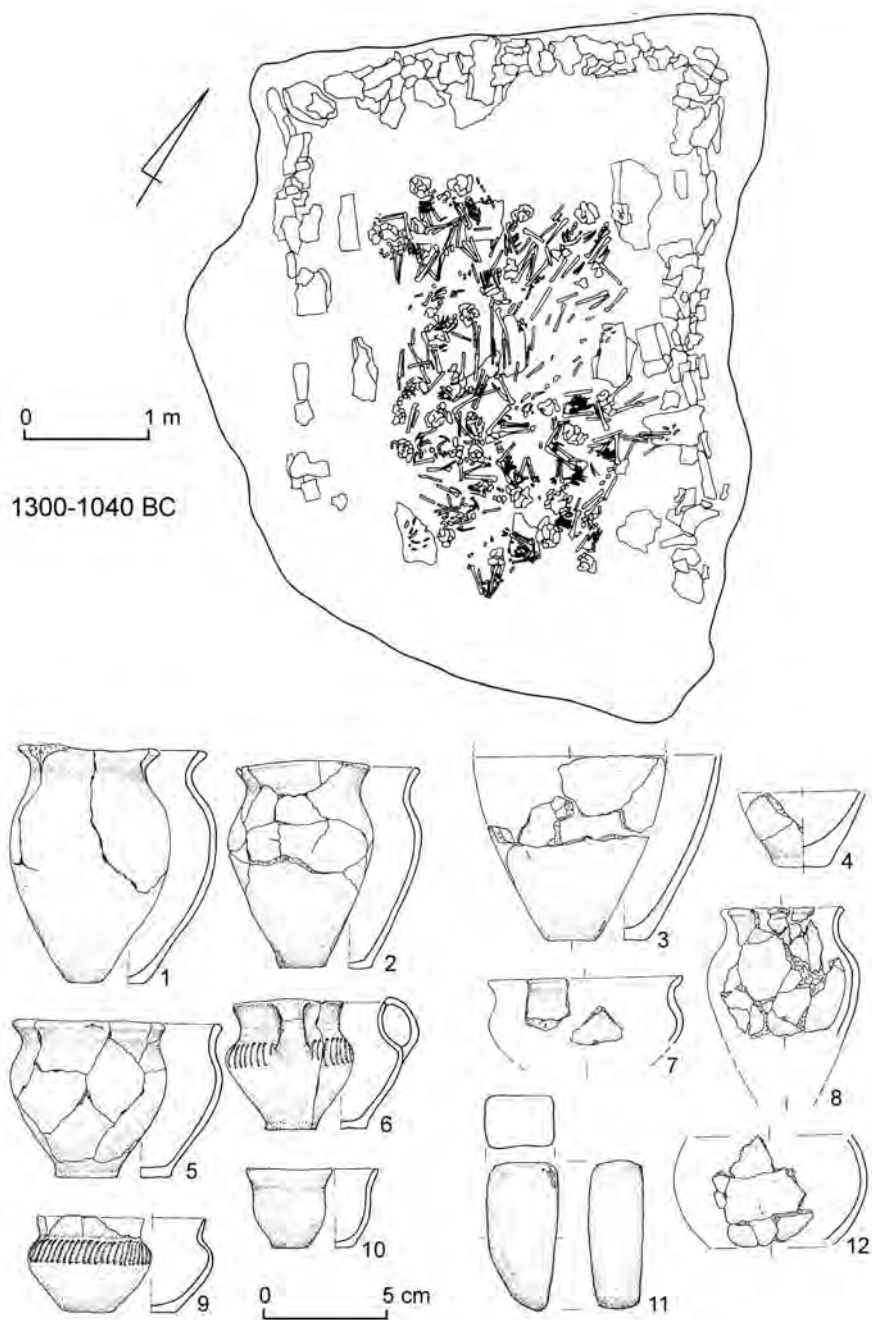


Fig. 15. Dwikozy, Małopolska. A burial house and pottery from the house. After Ścibior, Ścibior 1990. Drawn by A. Bieniek-Wiśniewska

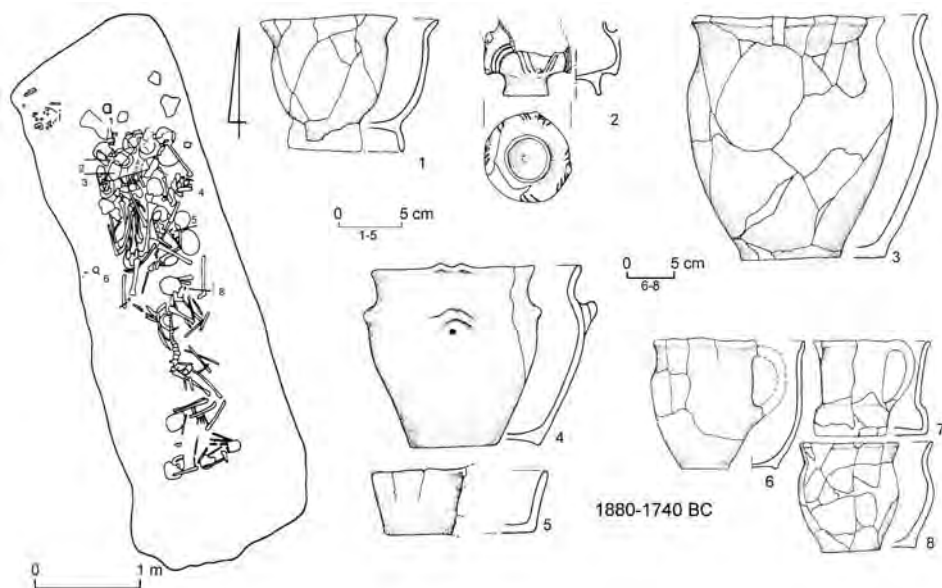


Fig. 16. Żerniki Górne 1, Małopolska. Grave 69 and pottery from the house. After Kempisty 1978. Drawn by A. Bieniek-Wiśniewska

taken from bones of individuals buried in the mass graves used for a long time. Approved until now, the results of dating the cemetery seem to contradict in most cases the dating based on typological criteria. Some materials should be identified with A2 assemblages whereas others indicate Transcarpathian connections forming a stylistically separate group of vessels. In the southern zone of the TC range, vessels showing traits of southern cultures (FC MaC, Veterov culture — VC, TuC, Piliny culture — PC) sporadically occur with pottery identified as type A1 assemblages and much more frequently with that of types A2 and A3. Pottery finds showing Transcarpathian traits as a rule do not occur in homogeneous assemblages with leading pottery forms characteristic of type A1 assemblages. Some Żerniki Górne determinations come from scanty assemblages which for this reason are difficult to assess typologically (graves 3, 5, 62, 71, 86, 102) [Kempisty 1978:Fig. 213, 215, 223, 224, 235, 236, 246, 259]. A rather unimpressive collection comes from grave 73 [Kempisty 1978:Fig. 244, 245]. Besides bones, however, it yielded up a bronze pin dated with certainty at phase B1 of the Bronze Age [Gedl 1983:77]. The radiocarbon date (Table 2:2) is, however, at least 200 years older than the age following from the analysis of the artefacts. An analogous situation takes place in the case of mass grave 69 (Table 2:6). It yielded up two highly characteristic vessels — jugs [Kempisty 1978:Fig. 228/2, 229/5]. One of them finds analogies in the late phase

of the MaC (Fig. 16:7) while the other (a specimen on a stem, with an undercut lower portion of the belly, decorated with “drooping” bosses) was made following the style of the late FC (Fig. 16:2). Analogies to the sets of vessels exhibiting southern traits and found at the cemetery in Żerniki Górne as well as, generally, on loess soils in the vicinity of Kraków are encountered in the environment of the late phases of the MaC and in the early phases of the PC, Suciú de Sus and generally TuC [Górski 2003]. This, in turn, makes it impossible to move the dating of these materials far beyond the transition period between phases A and B of the Bronze Age. Hence, it seems that for some unknown reasons most (all?) measurements of the absolute age concerning the TC in Żerniki Górne are too old. This assessment is corroborated by the analysis of dating of graves dug into the barrow. The highest probability of dating the older of them (grave 3 — Table 2:3) fits into the interval between 1980-1870 BC. Meanwhile, in the barrow, hence in an older stratigraphic position, two vessels were discovered of which one is decorated in a manner typical of the FC [Kempisty 1978:ryc. 260:1, 2]. It is out of the question that such vessels could be produced in the cultural environment of western Małopolska in the 20/19th century BC.

Stylistically the oldest FC materials beyond the northern arch of the Carpathians were found in a fortified settlement in Trzcinica [Gancarski 1994; 2002]. Relying on a numerous series of radiocarbon dates, we suggest to date the early FC settlement on the northern Carpathian piedmont at the end of the 17th century BC [Gancarski 1999; Calderoni *et al.* 2000]. The emergence of the settlement fits well into the history of territorial development of FC societies which expanded to the north, including Spisz, in the latter period of the culture’s middle phase (a younger portion of BA2) [Furmánek, Veliačik, Vladár 1991:82, 84]. The youngest materials of phase BB1 can also be found in Małopolska and they do not have any analogy in older FC assemblages.

Summing up, it has to be noted that in the vicinity of Kraków, TCC groups appeared in a mature form and do not show any significant connections with the Mierzanowice culture (MC) [Górski, Kadrow 1996]. In the northern stretch of the Central Polish Uplands (regions of Sandomierz and Lublin) and on the Polish Lowlands, assemblages close to the oldest A1 and A2 types from Małopolska, e.g. TH 1 and TH 2 in Kujawy, are dated considerably earlier [Czebreszuk 1996:159-164; Markowicz 1998a:102-105]. Radiocarbon chronology confirms the “moving” of TC pottery stylistics from the Polish Lowlands in the direction of old uplands. In western Małopolska, a confirmation was obtained of a reliable dating of A1 assemblages at as late as the end of the 17th and the 16th centuries BC although successive attempts to determine their absolute chronology may push back the dating by at least one century. Theoretically, one can expect slightly earlier dates in the region of Sandomierz. It has to be stressed, however, that similarly to the situation in western Małopolska, a “barrier” to the Trzciniec settlement could have been for-

med by intensive and long-lasting settlement of the MC. In the vicinity of Kraków, only a single date determines the chronology of the youngest, type C assemblages (13th-12th century BC). The TCC disappeared relatively soon in the vicinity of Kraków due to the emergence of LC societies. However, it lasted much longer in areas where new trends had a weaker impact, which is shown by the dating of its late assemblages in the region of Sandomierz (especially Dwikozy and Dacharzów, feature 11).

### 3. THE EASTERN SUBCIRCLE OF THE TRZCINIEC CULTURAL CIRCLE

The eastern subcircle of the TCC occupied the forest and forest-steppe areas of the drainages of the Pripets, Dnieper, Southern Bug, Dniester and Prut rivers (Black Sea drainage) as well as portions of the drainage of the upper and middle Neman River (Baltic Sea drainage). The relationships between culture and environment (landscape zones) allow us to distinguish in the eastern branch of the TCC two development trends, namely, Trzciniac (forest) and Komarov (Carpathian Foothills-forest steppe) [Lysenko 2002a:128-130].

The sites of the “Trzciniac” development trend, connected to the zone of Europe’s mixed-pine forests, chiefly occupy sod-podzol soils of Polissya. In this zone cremation burials dominate. The sites of the “Komarov” development trend are found in the landscape zones of the Carpathian Foothills and the forest-steppes of right-bank Ukraine (in particular black soil on loess), where oak and hornbeam-oak forests were interspersed with meadow steppes. The land surface features are more varied in this zone in comparison to the areas occupied by the “Trzciniac” line. In the “Komarov” funerary rituals inhumations prevailed including the ritual of dismemberment of corpses; cremation was rare [Lysenko 2001a].

From the eastern subcircle of the TCC 83 dates were obtained for 7 settlements and 11 sepulchral features (Fig. 1, Tables 3-6).

#### 3.1. THE “TRZCINIEC” DEVELOPMENT TREND

The “Trzciniac” development trend of the eastern subcircle of the TCC includes the following groups: Pripets [Berezanskaya 1972:130] (Turovo-Mozyr according to M.M. Kryvaltsevich [1995:7; 1997]), Sosnitsa (Bryansk and Chernikhiv Po-

Radiocarbon datings of the Trzciniec Cultural Circle assemblages from Ukrainian Belarussian, and Briansk Polissya

No.	Site/ feature	Cultural unit/ phase	Conv BP	Cal BC (1 $\sigma$ )	Lab. code	Sample material	Context	Cat.	Comments
1	2	3	4	5	6	7	8	9	10
1.	Rzhanica-Besets-2/ barrow 1/9, sample 137	TCC	3600±90	2050-1870 (49,6%)	Ki-648	?	grave	?	too early dating
2.	Rzhanica-Besets-2/ barrow 1/9, sample 136	TCC	3270±80	1630-1440 (65,5%)	?	?	grave	?	
3.	Pustynka	TCC	3140±100	1520-1290 (65,6%)	Ki-588	charcoal	house?	IIB	
4.	Zdvizhevka/1	TCC	3095±30	1410-1370 (39,9%) 1345-1315 (23,5%)	Ki-6221	bone	house	IB	
5.	Abakumy-1	TCC	3100±30	1415-1370 (41,8%)	IGS-641	charcoal	house	IIB	
6.	Pustynka/X	TCC	3060±40	1400-1260 (68,2%)	Ki-6220	bone	house	IB	
7.	Abakumy-1	TCC	2900±30	1130-1010 (68,2%)	IGS-643	charcoal	house	IIB	too late dating no compatible with the typological analysis
8.	Abakumy-1	TCC	2850±30	1070-970 (56,7%)	IGS-642	charcoal	house	IIB	too late dating no compatible with the typological analysis

TCC - Trzciniec Cultural Circle

Data after: Berezanskaya 1974; 1982; Telegin, Subotovich, Kovaliukh 1981; Kovalyukh *et al.* 1998; Krivalcevič 2001

lissya) [Berezanskaya 1972:130-134; Artemenko 1987:106-113], North Polissya [Kryvaltschevich 1995:16; 1997], Neman [Lakiza 2001, Fig. 4; Rimantienė, Ostrauskas 1998:203-215], and Kiev-Zhitomir [Lysenko 2001a:5-7]. The Kiev-Zhitomir group corresponds to the sites of the Kiev variety of the Eastern TC distinguished by S.S. Berezanskaya and located on sod-podzol soils of Kiev Polissya and the Dnieper valley [1972:129-130].

The lower date of the TCC's appearance in Ukrainian and Belarussian Polissya is marked by the life of the Middle Dnieper culture (MDC), i.e. the interval between 2900 and 1700 BC [Kryvaltsevich, Kovalyukh 1999:151-162]. The formation of TCC groups in the area in question may be dated at ca. 1700 BC.

For TCC assemblages from Ukrainian and Belarussian Polissya, we have dates concerning settlements in Zdvizhevka (Kiev-Zhitomir group), Pustynka and

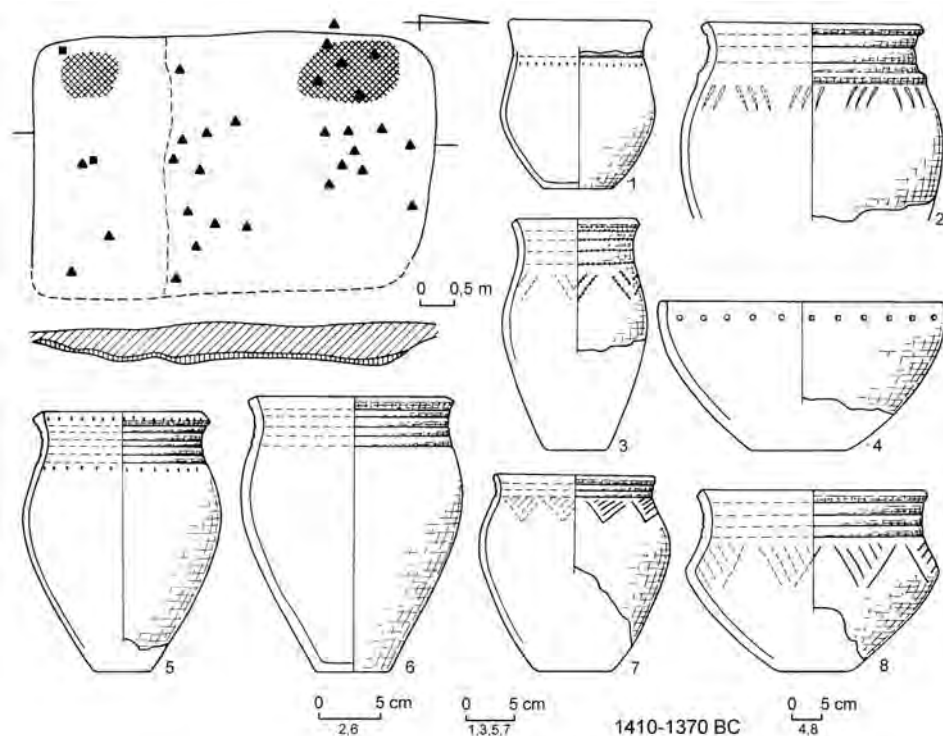


Fig. 17. Zdvizhevka, Zhitomir, Polissya. A house and pottery from the house. After Berezanskaya 1972; 1982

Abakumy-1 (Sosnitsa group) as well as graves from a cemetery in Besets-Rzhanitsa-2 (Table 3).

The date for the settlement in Zdvizhevka, Ukrainian Polissya (Table 3:4) is a result of a measurement made on a tooth of a bull unearthed in the fill of house 1. Dated at the 15/14 century BC, the pottery exhibits early Trzcinec traits (S-profile pots — Fig 17:1-3, 5, 6, incised horizontal lines, barbed wire and triangle ornament — Fig. 17:3, 7, 8) [Berezanskaya 1972:170, 171, 173, Fig. III and IV], which is consistent with its stylistic assessment.

For the settlement in Pustynka, Ukrainian Polissya there are two dates (Table 3:3 and 6). The first was made on charcoal discovered in a house (the number of feature is not known) [Berezanskaya 1974:143; 1982:21]; while the second was made on animal bones discovered in house 10 [Kovalyukh *et al.* 1998b:140]. The pottery from the settlement, published only in part, has both early traits (corded and multi-cordons ornament, barbed wire) and late ones (punctures, holes). For this reason, until materials from the settlement are published in full, there is no

1405-1310 BC

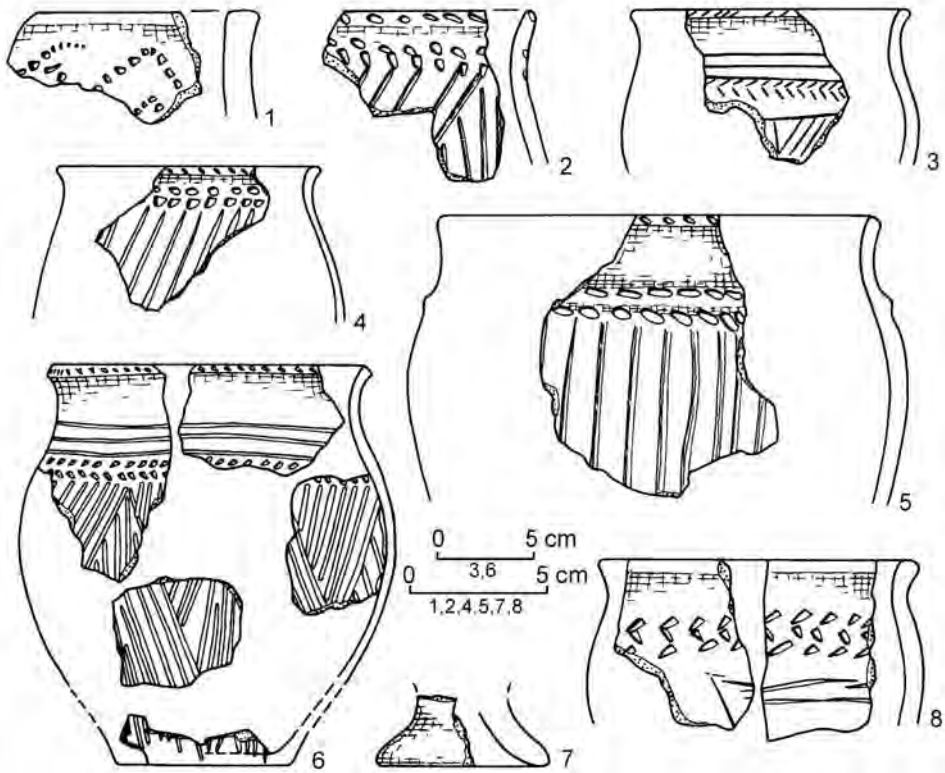


Fig. 18. Abakumy-1, Chernikhov, Polissya. Pottery from the feature. After Kryvalcevič 2001

evidence to consider it as developing at the same time and to make the obtained dates refer to the whole site.

A Sosnitsa type set of vessels, close to the ceramic assemblage from Pustynka, was discovered in the settlement in Abakumy-1, Belarussian Polissya (e.g. incised lines, stamp impressions — Fig. 18:1-8) [Kryvalcevič 2001:323-324, Table 2, Fig. 6]. Three dates refer to this set. The measurements were made on coal from the burnt walls of the feature (Table 3: 5, 7, 8). Only the first of the three dates seems to be consistent with the stylistic assessment of the ceramic material.

For the group of materials in question, two radiocarbon determinations were obtained by making measurements on timber from grave 1 in barrow 12 and on unknown organic material from grave 9 in barrow 1 from the cemetery in Besets-Rzhanitsa-2 (Table 3:1, 2) [Telegin *et al.* 1981:80, 84]. The author of the excavations,

I. I. Artemenko, classified these graves as belonging to the middle stage of the Sosnitsa culture (SC) [Artemenko 1987:110]. One of these two dates, obtained by measurements made in the Kiev laboratory (Table 3:1), is definitely too early if one considers the chronology of the feature determined on the basis of the stylistics of the ceramic material.

For late TCC assemblages from Polissya (Lebedov culture according to S. S. Berezanskaya, Late SC according to I. I. Artemenko) no radiocarbon dates have been obtained so far.

### 3.2. THE "KOMAROV" DEVELOPMENT TREND

The "Komarov" development trend of the eastern subcircle of the TCC includes the following groups: Komarov (Dniester area) [Sveshnikov 1990:79-82], Volhynia (forest-steppe part of the Pripets drainage [Sveshnikov 1990:82-86] — Rovne variety of the Eastern TC according to S.S. Berezanskaya [1972:126-129]), Hordeevka-Bilogrudovka (forest-steppe part of the Southern Bug area) and Kiev-Cherkasy [Lysenko 2001a:7-11].

#### 3.2.1. THE ABSOLUTE CHRONOLOGY OF THE KOMAROV AND VOLHYNIA GROUPS

A periodization of the Komarov culture (KC; primarily assemblages from the Carpathian Foothills and Volhynia) was suggested by I.K. Sveshnikov who relied on the typology of ceramics and metal goods [Swieszniokow 1967:73].

For TCC assemblages from western Ukraine there are four <sup>14</sup>C dates: three for the Volhynia group, including one from Ivanye, barrow 2 (Table 4:2; Fig. 19:1-18) [Sveshnikov 1968:167] and two from a cemetery in Netishin, barrow 7, grave 13 (Table 4:2, 4) [Berezanska *et al.* 2003] as well as a single date for the Komarov group, specifically for Horizon I of the settlement in Magala, Carpathian Foothills (Table 4:1) [Sementsev *et al.* 1969:255].

The material from the barrow in Ivanye, Volhynia can be classified as the younger development phase of the Volhynia group. It is characterized by the co-occurrence of bronze and gold goods of Transcarpathian origin (Fig. 19:1, 2, 4, 5, 7, 9-14, 18) and vessels of the KC type (Fig. 19:3, 7, 8, 16, 17) [Sveshnikov 1968].

The sources (especially pottery stylistic) from the cemetery in Netishin, Volhynia can be attributed to the Volhynia group. It shows some traits of the so

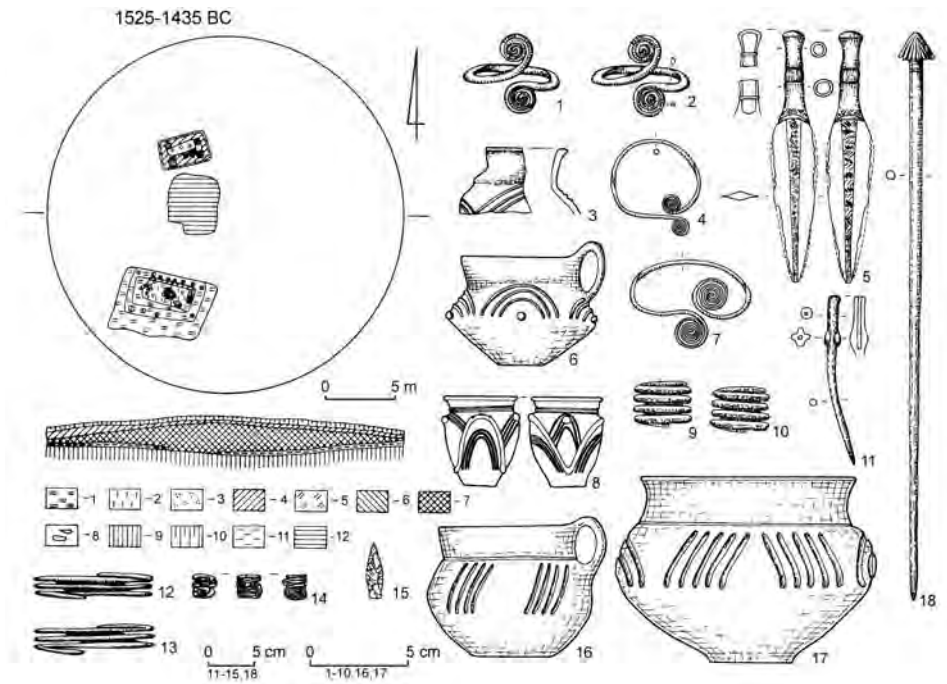


Fig. 19. Ivanye, barrow 2, Volhynia. A barrow and artefacts from the barrow. 1, 2, 4, 5, 7, 9-13, 18 - bronze; 3, 6, 8, 16, 17 - clay; 14 - gold; 15 - flint. Legend - see: Sveshnikov 1968, 161; Dąbrowski 1972. After Sveshnikov 1968; Dąbrowski 1972

Table 4

Radiocarbon datings of the Trzciniec Cultural Circle assemblages from Carpathian Foothills and Volhynia

No.	Site/ feature	Cultural unit/ phase	Conv BP	Cal BC (1 $\sigma$ )	Lab. code	Sample material	Context	Cat.	Comments
1	2	3	4	5	6	7	8	9	10
1.	Magala I/?	TCC	3380 $\pm$ 80	1750-1520 (68,2%)	Le-489	charcoal	hearth	IIB	
2.	Netishyn, barrow 7/13	TCC	3280 $\pm$ 50	1630-1490 (65,9%)	Ki-????	charcoal	grave	IIA	
3.	Ivanye, barrow 2	TCC	3235 $\pm$ 35	1525-1435 (68,2%)	GrN-?	wood	grave	IIA	
4.	Netishyn, barrow 7/13	TCC	3220 $\pm$ 50	1525-1435 (68,2%)	Ki-????	charcoal	grave	IIA	

TCC - Trzciniec Cultural Circle

Data after: Sveshnikov1968; Semencov *et al.* 1969; Florek, Taras 2003

called Podlasie-Mazowsze group of the western subcircle of TCC (multiple horizontal, diagonal and vertical lines, cordons under the rim, motifs of incised arches, “chevrons”, stamp or stroke ornamentations) [Berezanska *et al.* 2003:Fig. 21-26].

Horizon I of the Magala site is characterized by the presence of pots with cordons under the rim, thin-walled pottery decorated by repeated incised lines, punctures or dents and hatched triangles [Smirnova 1976:Fig. 3-6]. Horizon II at Magala already represents the Noa culture (NC) although some assemblages (e.g. material from dugout 3) still show certain “Komarov” traits. The co-occurrence of elements of both groups can be interpreted in two ways: as an effect of the spreading of the NC in the region or as the adoption of NC traits by local societies of Komarov group as a result of intensive contacts.

The lack of new radiocarbon dates prevents us from precisely determining the chronology of the change of TCC structures into the NC in the Carpathian Foothills or the period when the formations thrive in the forest-steppe part of Volhynia.

### 3.2.2. THE ABSOLUTE CHRONOLOGY OF THE HORDEEVKA-BILOGRUDOVKA GROUP

The most important site of the late Bronze Age, practically fully explored and dated using the  $^{14}\text{C}$  method, located in the forest-steppe part of the Southern Bug valley, is the cemetery in Hordeevka (Gordievka) [Berezanskaja, Kločko 1998]. The site is considered an independent cultural phenomenon related to the interactions with groups of the TuC from the Carpathian Basin. Next, these people “assimilated” the traits of the following local cultures: Komarov, Eastern Trzciniec, Bilogrudovka, Vysotsk, Mnogovalikovoy Pottery, Srubnaya and Belozerka [Berezanskaya, Lobay 1994:152; Berezanskaya 1999:147]. Sometimes it is also considered a product of “the local, autochthonous culture of the Middle Dniester area” [Krushelnitska 1998:193-196, Fig. 108].

It seems that there are no grounds whatsoever for distinguishing a separate Bilogrudovka culture within the TCC. Until now, the distinction has been based chiefly on prehistoriographic tradition rather [Lysenko 2002b:92-93] than true differences [cf. a similar view by S.S. Berezanskaya 1985:512].

Next to Hordeevka, in the forest-steppe drainage of the Southern Bug, we know of tens of sites that can be associated with the Bilogrudovka culture [Berezanskaya 1985:map 12:I], e.g. a number of less spectacular cemeteries that supply artefacts analogous to Hordeevka ones, such as Belyi Kamen [Makarevich 1940:463-466], Chebotarka [Kozlovska 1930:31], or Pechera [Rybalova 1961:21-23]. Against their background, the Hordeevka cemetery can be interpreted not as a foreign phenome-

Radiocarbon datings of the Trzcinec Cultural Circle assemblages from forest-steppe part of Southern Bug basin

No.	Site/ feature	Cultural unit/ phase	Conv BP	Cal BC (1 $\sigma$ )	Lab. code	Sample material	Context	Cat.	Comments
1	2	3	4	5	6	7	8	9	10
1.	Hordeevka, barrow 27	TCC/ Hord. I	3460 $\pm$ 70	1890-1680 (68,2%)	Ki-5080	bone	grave	IA	too early dating no compatible with the typological analysis
2.	Hordeevka, barrow 26	TCC/ Hord. I	3240 $\pm$ 50	1530-1430 (56,5%)	Ki-9253	wood	grave	IIA	
3.	Hordeevka, barrow 26	TCC/ Hord. I	3180 $\pm$ 50	1520-1410 (68,2%)	Ki-9252	wood	grave	IIA	
4.	Hordeevka, barrow 26	TCC/ Hord. I	3120 $\pm$ 50	1450-1310 (66,7%)	Ki-9254	wood	grave	IIA	
5.	Hordeevka, barrow 28	TCC/ Hord. I	3110 $\pm$ 50	1440-1310 (68,2%)	Ki-9257	wood	grave	IIA	
6.	Hordeevka, barrow 32/2	TCC/ Hord. IV	3020 $\pm$ 55	1320-1210 (44,8%)	Ki-5079	bone	grave	IA	
7.	Hordeevka, barrow 33	TCC/ Hord. IV	3010 $\pm$ 50	1320-1210 (48,2%)	Ki-5083	bone	grave	IA	
8.	Hordeevka, barrow 31	TCC/ Hord. III	3005 $\pm$ 50	1320-1190 (58,2%)	Ki-9258	wood	grave	IIA	
9.	Hordeevka, barrow 27	TCC/ Hord. I	2980 $\pm$ 50	1310-1120 (68,2%)	Ki-9255	wood	grave	IIA	too late dating no compatible with the typological analysis
10.	Hordeevka, barrow 35	TCC/ Hord. IV	2980 $\pm$ 60	1320-1120 (66,1%)	Ki-5081	bone	grave	IA	
11.	Hordeevka, barrow 27	TCC/ Hord. I	2950 $\pm$ 50	1220-1050 (58,0%)	Ki-9256	wood	grave	IIA	too late dating no compatible with the typological analysis
12.	Hordeevka, barrow 37	TCC/ Hord. IV	2920 $\pm$ 50	1220-1010 (68,2%)	Ki-5082	bone	grave	IA	

TCC – Trzcinec Cultural Circle; Hord.I-IV – horizons of Hordeevka cemetery (substantial for Hordeevka-Bilogrudovka group of TCC)

Data after: Berezanskaja, Kločko 1998; Ślusarska 2003

non but as an elite necropolis of “Bilogrudovka” populations located at the junction of two important routes crossing the forest-steppe, both on the Southern Bug and in the south [Lysenko 2002c:104-111].

Hordeevka is the only Late Bronze Age cemetery in the region under discussion that has been radiocarbon-dated (Table 5:1-12). Relying on  $^{14}\text{C}$  dates and the analysis of metal goods, V.I. Klochko distinguished four chronological horizons at the cemetery: I (BB-BD/1500-1300 BC — barrows 6, 22-28), II (BD-HaA1/1300-1200 BC — barrows 2, 3, 5, 7-19, 21, 29, 40), III (HaA2/1200-1100 BC — barrows 31, 38, 39, 42) and IV (HaB/1100-1000 BC — barrows 32-35, 37) [Klochko 1998:343-351; see also Ślusarska-Michalik, Radiocarbon..., in this volume]. The first two horizons are synchronous with the emergence of the developed TCC on the Dniester and in Volhynia and considered by V. I. Klochko as early Bilogrudovka. The late horizons are contemporaneous with the Bilogrudovka horizon of the Middle Dnieper area.

We believe that the periodization of the cemetery in Hordeevka may be taken as a benchmark for the absolute chronology of the Hordeevka-Bilogrudovka group of the TCC. Horizon I was preceded by a pre-Hordeevka horizon — a stage when the TCC spread from the Dniester area into the Southern Bug area (cemetery in Bar, the older cultural stratum in Sandraki or Gaysine).

### 3.2.3. THE ABSOLUTE CHRONOLOGY OF THE KIEV-CHERKASY GROUP

The set of radiocarbon dates concerning the TCC on the forest-steppes on the Middle Dnieper numbers 61 measurements (Table 6) [Kovalyukh *et al.* 1998b:130-140; Klochko *et al.* 1998:667-673; Klochko 1999:163-195; Lysenko 2001a].

Of key importance for the periodization of the Kiev-Cherkasy group prove to be the materials from the cemetery in Malopolovetske-3 and the settlement in Malopolovetske-2A [Kravchenko, Petrauskene 1993:79-80; Lysenko 1998a:95-117; Lysenko, Lysenko 1998:101-106; 2000:86-88; 2001:147-159; 2002:168-177; Lysenko *et al.* 1999:116-121]. Relying on radiocarbon dates, both published earlier and new ones, and after a comparison of the materials of the Malopolovetske group of sites with other sites from the same region was made, the distinction into five chronological horizons within the group is suggested: MP-I (Mnogovalikovoy Pottery culture — MPC), MP-II (Malopolovetske), MP-III (Tëklino), MP-IV (Moshny), MP-V (Bilogrudovka) [Lysenko 2001a].

#### **Horizon MP-I (horizon of the Mnogovalikovoy Pottery culture)**

At the cemetery in Malopolovetske-3, in this stage one can include grave 25 (Table 6:3). The deceased was buried in a pit with a niche, in a contracted posture,

Radiocarbon datings of the Trzciniac Cultural Circle assemblages from forest-steppe part of Middle Dneper

No.	Site/ feature	Cultural unit/ phase	Conv BP	Cal BC (1 $\sigma$ )	Lab. code	Sample material	Context	Cat.	Comments
1	2	3	4	5	6	7	8	9	10
1.	Rossava, barrow 7/ 1	MP-I/ III	3610±30	1980-1910 (48,1%)	Ki-5827	bone	grave	IA	too early dating no compatible with the typological analysis
2.	Velikaya Bugaevka/ 109-2001	MP-I	3450±70	1880-1680 (68,2%)	Ki-9555	bone	grave	IA	
3.	Malopolovetske-3, c. 6/ 2 (25-1997)	MP-I	3430±35	1770-1680 (62,3%)	Ki-6213	bone	grave	IA	
4.	Malopolovetske-3, c. 5/ 4 (20-1996)	TCC/ MP-II	3350±40	1690-1600 (54,3%)	Ki-6211	bone	grave	IA	
5.	Malopolovetske-3, c. 2/ 1 (12-1995), sample 2	TCC/ MP-II	3345±35	1690-1600 (55,8%)	Ki-6356	burnt bone	grave	IIIA	
6.	Malopolovetske-3, c. 5/ 2 (18-1996)	TCC/ MP-II	3340±40	1690-1600 (49,9%)	Ki-6209	bone	grave	IA	
7.	Malopolovetske-3, c. 7/ 1 (28-1997), sample 4	TCC/ MP-II	3340±40	1690-1600 (49,9%)	Ki-6319	bone	grave	IA	
8.	Malopolovetske-3, c. 4/ 1 (15-1994-97)	TCC/ MP-II	3330±40	1690-1600 (49,9%)	Ki-6207	bone	grave	IA	
9.	Rossava, barrow 8/5	MP-I	3325±50	1690-1520 (68,2%)	Ki-5829	bone	grave	IA	
10.	Malopolovetske-3, c. 5/ 1 (19-1996)	TCC/ MP-II	3310±35	1620-1520 (68,2%)	Ki-6210	bone	grave	IA	
11.	Malopolovetske-3, c. 2/ 2 (11-1995)	TCC/ MP-II	3310±50	1640-1520 (61,5%)	Ki-6354	bone	grave	IA	
12.	Malopolovetske-3, c. 5/ 5 (21-1996)	TCC/ MP-II	3300±35	1620-1520 (68,2%)	Ki-6212	bone	grave	IA	
13.	Malopolovetske-3, c. 7/ 1 (28-1997), sample 2	TCC/ MP-II	3300±40	1620-1520 (68,2%)	Ki-6317	bone	grave	IA	
14.	Malopolovetske-3, c. 2/ 1 (12-1995), sample 1	TCC/ MP-II	3300±45	1630-1510 (64,6%)	Ki-6355	burnt bone	grave	IIIA	

1	2	3	4	5	6	7	8	9	10
15.	Malopolovetske-3, c. 7/ 1 (28-1997), sample 1	TCC/ MP-II	3290±40	1620-1515 (68,2%)	Ki-6316	bone	grave	IA	
16.	Ksaverovo, barrow 2/5	MP-I/ III	3290±35	1620-1500 (68,2%)	Ki-6225	bone	grave	IA	
17.	Malopolovetske-3, c. 14/ 6 (10-1995)	TCC/ MP-III	3290±40	1620-1515 (68,2%)	Ki-6348	bone	grave	IA	
18.	Malopolovetske-3, c. 5/ 3 (17-1996)	TCC/ MP-III	3280±40	1620-1510 (68,2%)	Ki-6208	bone	grave	IA	
19.	Bubnovaya Slobodka, barrow 9/2	MP-I	3275±40	1620-1500 (68,2%)	Ki-6223	bone	grave	IA	
20.	Malopolovetske-3, c. 5/ 3 (17-1996), sample 1	TCC/ MP-III	3270±12	1600-1560 (47,4%)	Ki-6325	bone	grave	IA	
21.	Malopolovetske-3, c. 1/ 3 (3-1994 ?.)	TCC/ MP-III	3270±30	1610-1500 (68,2%)	Ki-6204	bone	grave	IA	
22.	Malopolovetske-3, c. 14/ 4 (8-1995)	TCC/ MP-III	3270±40	1620-1490 (68,2%)	Ki-6350	bone	grave	IA	
23.	Malopolovetske-3, c. 7/ 1 (28-1997), sample 3	TCC/ MP-II	3270±45	1620-1490 (66,3%)	Ki-6318	bone	grave	IA	
24.	Malopolovetske-3, c. 14/ 1 (2-1993)	TCC/ MP-III	3260±40	1610-1550 (28,8%) 1540-1490 (27,8%)	Ki-6353	bone	grave	IA	
25.	Borovitsa, barrow 1/2	MP-I/ III	3250±35	1530-1440 (50,4%)	Ki-6222	bone	grave	IA	
26.	Malopolovetske-3, c. 1/ 4 (5-1994)	TCC/ MP-III	3250±40	1530-1440 (49,2%)	Ki-6205	bone	grave	IA	
27.	Rossava, barrow 8/7	MP-I/ III	3240±30	1525-1445 (68,2%)	Ki-6218	bone	grave	IA	
28.	Malopolovetske-3, c. 14/ 3 (7-1995)	TCC/ MP-III	3240±50	1530-1430 (56,5%)	Ki-6349	bone	grave	IA	
29.	Malopolovetske-3, c. 1/ 1 (1-1993)	TCC/ MP-III	3225±45	1525-1430 (68,2%)	Ki-6352	bone	grave	IA	
30.	Malopolovetske-3, c. 5/ 3 (17-1996), sample 3	TCC/ MP-III	3220±12	1480-1455 (38,1%) 1515-1495 (30,1%)	Ki-6327	bone	grave	IA	
31.	Malopolovetske-3, c. 14/ 5 (9-1995)	TCC/ MP-III	3220±45	1520-1435 (68,2%)	Ki-6351	bone	grave	IA	
32.	Rossava, barrow 8/ 2	MP-I/ III	3210±30	1515-1440 (68,2%)	Ki-6217	bone	grave	IA	

1	2	3	4	5	6	7	8	9	10
33.	Malopolovetske-3, c. 1/ 5 (6-1994)	TCC/ MP-III	3210±30	1515-1440 (68,2%)	Ki-6206	bone	grave	IA	
34.	Rossava, barrow 4/ 2	MP-I/ III	3200±30	1500-1430 (68,2%)	Ki-6215	bone	grave	IA	
35.	Malopolovetske-3, c. 5/ 3 (17-1996), sample 2	TCC/ MP-III	3190±12	1460-1439 (42,3%)	Ki-6326	bone	grave	IA	
36.	Rossava, barrow 7/ 1, Sample 2	MP-I/ III	3190±30	1500-1425 (68,2%)	Ki-6216	bone	grave	IA	
37.	Rossava, barrow 2/ 1	MP-I/ III	3180±40	1465-1410 (46,0%)	Ki-6214	bone	grave	IA	
38.	Malopolovetske-3, c. 7/ 4 (72-2000)	TCC/ MP-III	3180±70	1530-1390 (65,9%)	Ki-9549	bone	grave	IA	
39.	Zhuravlikha, barrow 3/ 6	MP-I/ III	3170±35	1465-1405 (50,0%)	Ki-6224	bone	grave	IA	
40.	Subotov/ 4, floor, sample 2	TCC/ MP-V	3100±40	1430-1310 (68,2%)	Ki-5505	charcoal	house	IIB	too early dating no compatible with the typological analysis
41.	Obukhov-1	TCC/ MP-V	3090±70	1440-1260 (68,2%)	Ki-872	wood	house	IIB	too early dating no compatible with the typological analysis
42.	Malopolovetske-3, c. 16/ 1 (83-2001)	TCC/ MP-IV	3080±45	1410-1290 (64,3%)	Ki-9557	wood	grave	IIA	
43.	Malopolovetske-3, c. 17/ 1 (87-2001)	TCC/ MP-II	3080±80	1440-1250 (62,8%)	Ki-9551	bone	grave	IA	too late dating no compatible with the typological analysis
44.	Malopolovetske-3, c. 16/ 1 (83-2001)	TCC/ MP-IV	3060±45	1400-1260 (68,2%)	Ki-9558	wood	grave	IIA	
45.	Malopolovetske-3, c. 16/ 1 (83-2001)	TCC/ MP-IV	3050±60	1400-1250 (61,5%)	Ki-9561	burnt bone	grave	IIIA	
46.	Malopolovetske-3, c. 16/ 1 (83-2001)	TCC/ MP-IV	3050±45	1390-1250 (66,3%)	Ki-9559	wood	grave	IIA	
47.	Malopolovetske-3, c. 16/ 1 (83-2001)	TCC/ MP-IV	3040±45	1390-1250 (61,6%)	Ki-9556	wood	grave	IIA	

1	2	3	4	5	6	7	8	9	10
48.	Subotov/ 4, floor, sample 1	TCC/MP-V	3040±50	1390-1250 (60,1%)	Ki-5502	charcoal	house	IIB	too early dating no compatible with the typological analysis
49.	Subotov/ 4, pit 1	TCC/MP-V	3030±60	1390-1210 (63,6%)	Ki-5504	charcoal	house	IIB	too early dating no compatible with the typological analysis
50.	Subotov/ 4, sample 4	TCC/MP-V	3010±50	1320-1210 (48,2%)	Ki-5508	bone	house	IB	too early dating no compatible with the typological analysis
51.	Subotov/ 4, sample 5	TCC/MP-V	2980±60	1320-1120 (66,1%)	Ki-5503	bone	house	IB	
52.	Malopolovetske -3, c. 7/ 2 (63-2000)	TCC/MP-III	2970±60	1300-1110 (60,5%)	Ki-9560	bone	grave	IA	too late dating no compatible with the typological analysis
53.	Subotov/ 4, sample 3	TCC/MP-V	2950±45	1220-1110 (47,1%)	Ki-5501	bone	house	IB	
54.	Subotov/ 4, sample 2	TCC/MP-V	2940±50	1220-1040 (61,7%)	Ki-5506	bone	house	IB	
55.	Malopolovetske-2/1 (1992 ?)	TCC/MP-V	2910±30	1130-1040 (57,5%)	Ki-6219	bone	house	IB	
56.	Subotov/ 4, sample 1	TCC/MP-V	2910±55	1220-1000 (68,2%)	Ki-5507	bone	house	IB	
57.	Malopolovetske -3, c. 7/ 3 (68-2000)	TCC/MP-III	2900±70	1220-970 (66,4%)	Ki-9548	bone	grave	IA	too late dating no compatible with the typological analysis
58.	Malopolovetske -3, c. 16/ 1 (83-2001)	TCC/MP-IV	2790±80	1020-839 (68,2%)	Ki-9550	burnt bone	grave	IIIA	too late dating no compatible with the typological analysis
59	Verguny/ 5	TCC/MP-V	2785±60	1000-890 (52,2%)	Ki-9552	bone	grave	IA	too late dating no compatible with the typological analysis

60	Verguny/ 13	TCC/ MP-V	2730±60	930-820 (66,2%)	Ki-9553	bone	grave	IA	too late dating no compatible with the typological analysis
61.	Malopolovetske -3, c. 7/ 2 (63-2000)	TCC/ MP-III	2710±80	930-800 (65,2%)	Ki-9547	bone	grave	IA	too late dating no compatible with the typological analysis

\* **MP-I, II, III, IV, V** – horizons of Malopolovetske complex (substantial for Kiev-Cherkasy group of TCC;  
TCC - Trzcinec Cultural Circle

c. - complex

Data after: Klochko 1999; Kovalyukh *et al.* 1998; Kločko *et al.* 1998; Lysenko 2001

lying on his right side, the head pointing west and hands stretched along the body [Lysenko 1998a:Fig. 18:10].

As horizon MP-I, one can classify grave 109 from a cemetery at Velikaya Bu-gaevka (Table 6:2). The deceased lay crouched, on the right side, the head facing north-northeast; his right hand was extended towards a knee while the left one — elbow bent — situated perpendicularly to the body [Babenko, Lysenko 2001; 2002].

A number of burials related to the MPC were explored in barrows in the village of Bubnovaya Slobodka, Cherkasy District [Belyaev *et al.* 1983]. Grave 2 in barrow 9 was dated at 1620-1500 BC (Table 6:19) [Lysenko 2001b]. The deceased lay crouched, on his left side, the head facing north. The pit was rectangular and had a wooden cover. Next to the knees, a bone belt buckle was discovered. Analogous buckles could be found in the other MPC graves in the barrow. It must be noted that grave 2 was the main feature in the barrow, and that in grave 1, with which mound III was associated, next to a buckle, a find was made of a large piece of a Babino-type vessel (MPC) decorated with cordons.

V. I. Klochko dates the burials of the MPC unearthed at a cemetery in Rossava between 1950-1600 BC [Klochko 1999:195, Table 1, 2]. It seems that in the MPC horizon one can include — in a reliable way (relying on the obtained <sup>14</sup>C date, Table 6:9, and the characteristics of the burial ritual) — only grave 5 in barrow 8 [Klochko 1999:Fig.14]. Over a rectangular burial pit, a wooden cover was built. The deceased lay in a contracted posture on his left side with the head pointing northeast. The other burials from Rossava, similarly to the graves from Ksaverovo, Zhuravlikha and Borovitsa should not be classified as belonging to the MPC horizon. <sup>14</sup>C dates from these features correspond to horizons MP-I and MP-III (Table 6:1, 9, 16, 25, 27, 32, 34, 36, 37, 39). Most of these burials lack any grave goods and the arrangement of the dead is analogous to that practiced in both horizons at the cemetery in

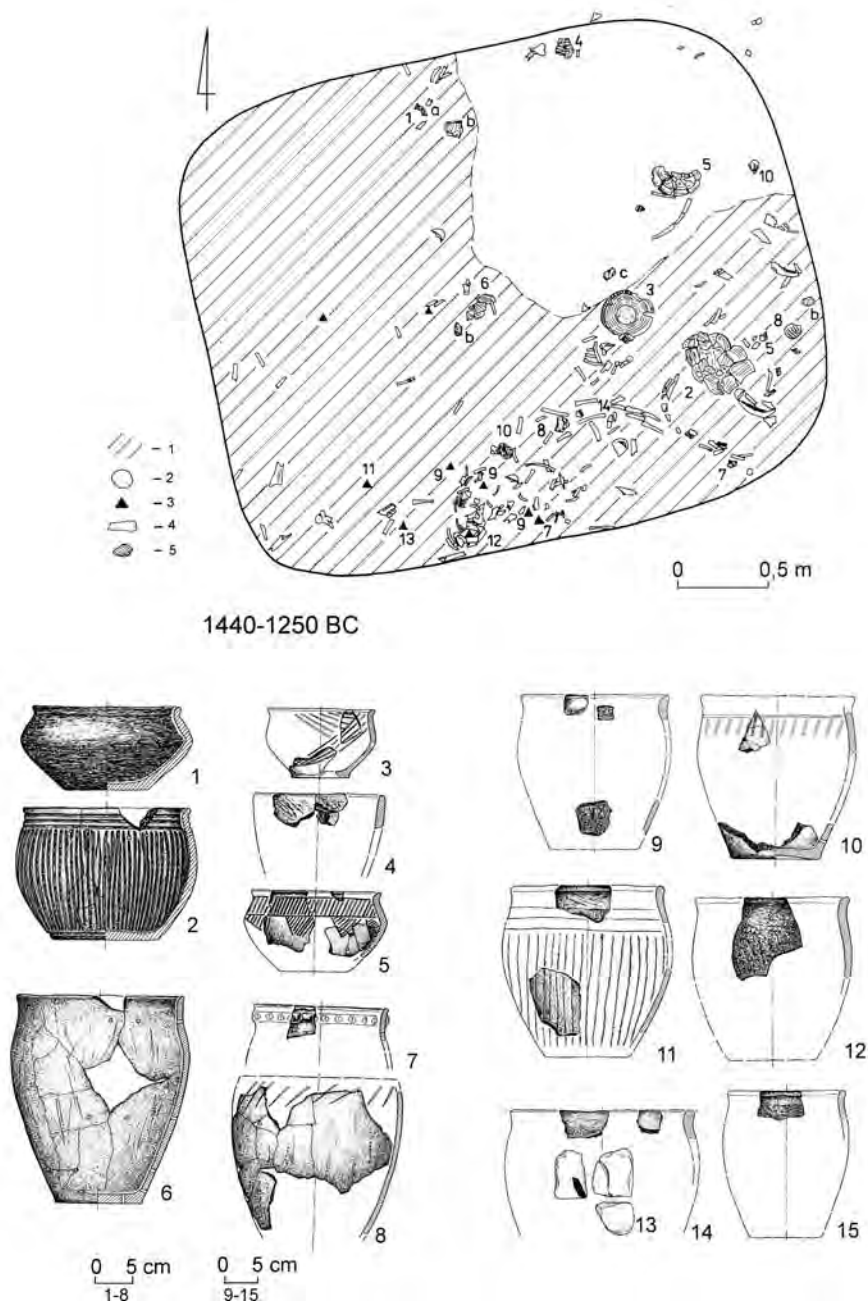


Fig. 20. Malopolovetske-3, Middle Dnieper area. Grave 87 and pottery from the grave. Legend: a - bone artefact; b - stone artefact; c - clay artefact (non-ceramic). 1 - soil containing animal bones; 2 - soil without animal bones; 3 - sherd (small fragment); 4 - larger animal bone; 5 - sherd (large fragment). After Lysenko 2001b

Malopolovetske. The graves are related to the relics of “mnogovalikovoy” traditions from late stages when Babino-type pottery [Litvinenko 2003] was undergoing transformations in the region under the influence of other traditions (Malopolovetske, TCC, Srubnaya) [Palaguta 1996; 2001; Kushtan 2001; Lysenko 2001b].

Therefore, the Mnogovalikovoy horizon (MP-I) can be interpreted as an initial period in the formation of the Kiev-Cherkasy group of the TCC and dated between 1800 and 1600 BC.

#### **Horizon MP-II (Malopolovetske horizon)**

The horizon is represented at the cemetery in Malopolovetske-3 by burial complexes no. 2, 4, 5 (graves 11, 12, 15, 16, 18-23), containing Trzciniac and Srubnaya culture (SrC) pottery [Lysenko 1998b, Fig. 7; 8:1-12; 10; 11; 14-16], and by ditch 5 from complex 7 (graves 28-31, 66). The burials of this horizon are dated between 1600-1500 BC (Table 6:4-8, 10-15, 23) [Kovalyukh *et al.* 1998b:132, 140, Tabl. 3, Fig.3]. Analogous pottery comes from a cenotaph (?) — grave 87 from complex 17. A radiocarbon date obtained for it (Table 6:43, Fig. 20) seems to be too late. The rectangular burial pit measuring 3.4 x 2.2 m contained over 700 bones (exclusively animal ones) and fragments of at least 15 vessels (Fig. 20:1-15).

A characteristic trait of horizon MP-II is the presence of Malopolovetske pottery combining patterns of Babino III (MPC) and Trzciniac traditions of pottery production [Lysenko, Kushtan 1997:109-112; Lysenko 1998:91-97]. Vessels following the SrC tradition in the horizon find direct analogies in the Berezhnovka-Maevka SrC, in particular, in the pottery of the Maevska group in the region of Dnepropetrovsk and Luhansk [Kovalova, Valkoboy 1976:3-22; Otroshchenko 2001, Fig. 26, 29].

Using the <sup>14</sup>C method, one may date horizon MP-II of the Kiev-Cherkasy group between 1650/1600 and 1500 BC.

#### **Horizon MP-III (Teklino horizon)**

At the cemetery in Malopolovetske-3, this horizon was dated at 1500-1400 BC [Kovalyukh *et al.* 1998a:137, 140, Table 3, Fig. 3]. It is represented by two, spatially separate, groups of burials. In the first one, the dead were strongly contracted, lay on their sides and were oriented mainly eastwards (graves 2, 7-10, 17, 46, 73-75), whereas in the other group, the dead lay flat on their backs and were oriented mainly westwards (graves 3, 32, 37, 41, 48, 55, 62, 69, 71, 90, 100, 101, 106). The chronology of the first group is determined by ten dates (graves 2, 7-10, 17) while the second group's chronology is defined by a single date (grave 3) (Table 6:17, 18, 20-22, 24-26, 28-31, 33, 35). The dating of grave 1 introduces a correction to the lower chronological limit of grave 3, which is dug into complex 1. The burials of both funerary rituals did not have any grave goods [Lysenko 1998a:Fig. 4:1; 5:1-4].

The third group as far as the funerary ritual is concerned comprises elite burials containing bronze ornaments of “Komarov” type and “Trzciniac” pottery (Fig. 21 and 22). It must be noted that all burials in horizon MP-III at the discussed ce-

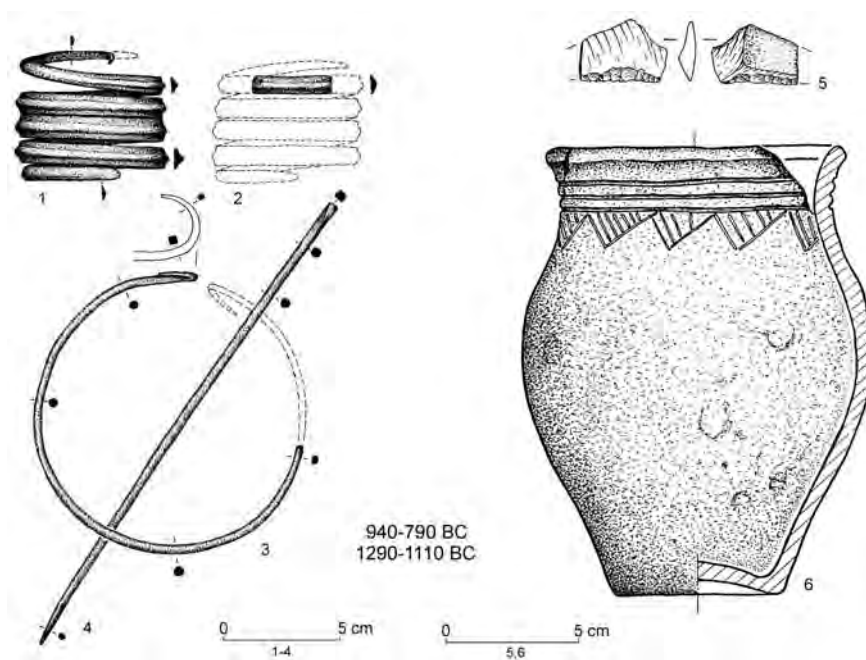


Fig. 21. Malopolovetske-3, Middle Dnieper area. Artefacts from grave 63. 1-4 - bronze; 5 - flint; 6 - clay. After Lysenko 2001b

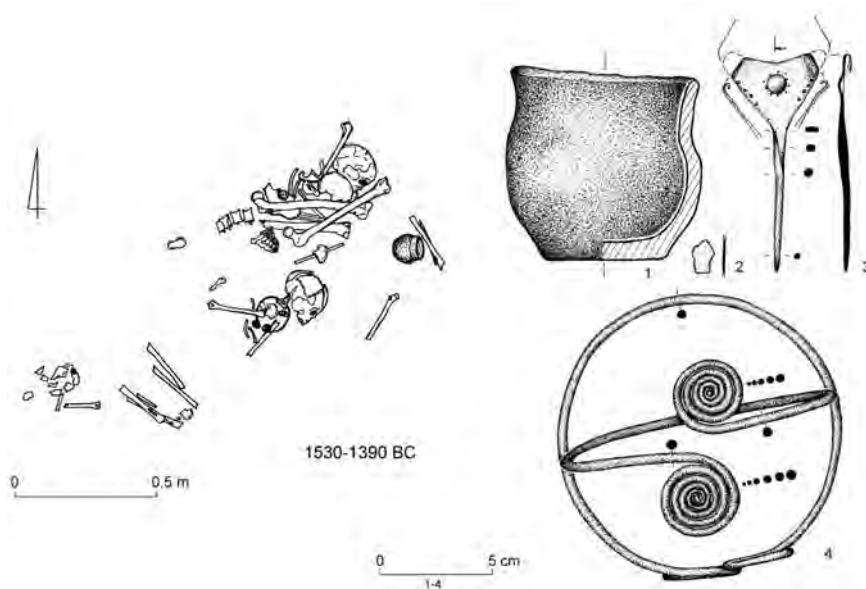


Fig. 22. Malopolovetske-3, Middle Dnieper area. Grave 72 and artefacts from the grave. 1 - clay; 2-4 - bronze. After Lysenko 2001b

metry that contained metal objects were characterized by corpse dismemberment. Radiocarbon dates were obtained for graves 1, 63, 68, 72 (Table 6:29, 38, 52, 57, 61) [Lysenko 2001b].

Burials 63 and 68 contained skull fragments and long bones of the legs of the dead [Lysenko 2001b]. In grave 63 the following items were discovered: two multicoil bracelets, a necklace, a pin with its head broken-off (Fig. 21:1-4), a flint tool (Fig. 21:5) and a tulip-shaped pot (Fig. 21:6). In grave 68, two necklaces with spiral discs, of which one bore traces of repairing, were found. Grave 72 contained remains of three bodies laid in three clusters (Fig. 22) [Lysenko 2001b]. In it, a discovery was made of an undecorated cup (Fig. 22:1), a piece of a bronze sheet (Fig. 22:2), a pin with a disk-like head and a necklace with spiral discs (Fig. 22:4). Radiocarbon dates concerning graves 63 and 68 (Table 6:52, 61 and 57) are too late and inconsistent with the typological analysis of artefacts recorded in them. These burials, located under the mound in the complex centre, could not have been later than burial 72 dug into the mound. The date obtained for it (Table 6:38) harmonizes well with the dating of burial 1-1993 (Table 6:29), in which similar ornaments were unearthed [Lysenko 2001b]. The stratigraphy of complex 7a and the similarity of ornaments in graves 1, 63, 68 and 72 justify their inclusion in the discussed horizon.

Generally speaking, horizon MP-III of the Kiev-Cherkasy group may be dated between 1500 and 1400 BC.

#### **Horizon MP-IV (Moshny horizon)**

The best-explored site of this horizon is the eponymous settlement in Moshny. Materials from this site, however, have been published only selectively [Ilinskaya 1960].

At the Malopolovetske-3 cemetery, <sup>14</sup>C determinations were obtained for grave 83 (Table 6:42, 45-47, 58; sum of probability distributions — 1400-1260 BC) [Lysenko 2001b]. The grave pit was rectangular with its longer side oriented along the east-west axis; its dimensions were 1.8 x 1.3 m (Fig. 23). Along its edges lay burnt logs. Dismembered bones of an adult had been put at the southern side of the pit in three clusters. The grave goods included: a cup (Fig. 23:1, 2), a spindle bob/whorl (Fig. 23:3) and a miniature, “bulbous” vessel (Fig. 23:4). Four to five meters north and south from the burial, outside of the mound limits, 0.45-0.50 m below the ground, fragments of a bowl decorated with appliqué bosses were found (Fig. 23:5). Materials found in the grave were used in six radiocarbon measurements made on burnt human bones (2) and burnt wood (4) (Table 6:42, 44-47, 58). One of them, made on burnt bones, (Table 6:58), is too late. When the other radiocarbon measurements are taken into account, the feature may be dated between 1400-1250 BC.

On the basis of above mentioned informations, MP-IV horizon of the Kiev-Cherkasy group may be dated between 1400 and 1200 BC.

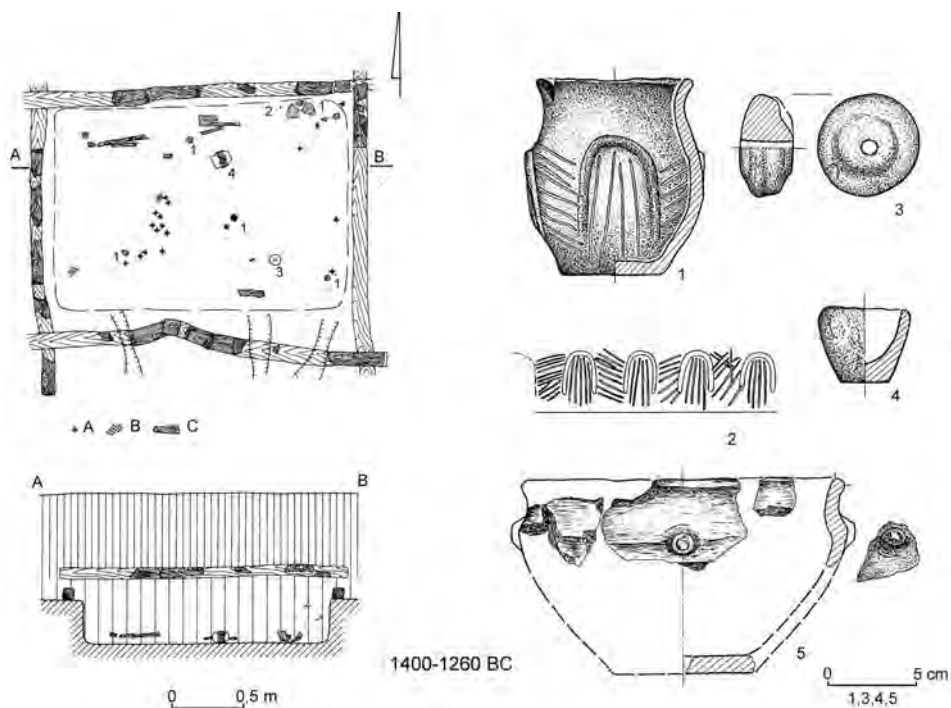


Fig. 23. Malopolovetske-3, Middle Dnieper area. Grave 83 and artefacts from the grave. 1-5 - clay. Legend: 1 - fragment of a skull; 2 - stone; 3 - spindle whorl; 4 - pottery. A - calcified bones; B - burnt soil; C - log. After Lysenko 2001b

### Horizon MP-V (Bilogrudovka horizon)

The  $^{14}\text{C}$  method was used to date settlements at Obukhov, Malopolovetske-2A, Subotov and graves 5 and 13 at the cemetery in Verguny (Table 6:40, 41, 48-51, 53-56, 59, 60).

At the settlement in Obukhov (Podgorodishche Woods), E.A. Petrovskaya explored a sunken floor house in 1973-1974. Wood from its fill was dated in the Kiev laboratory (1440-1260 BC, Table 6:41) [Telegin *et al.* 1981:82].

At site 2A in Malopolovetske, in horizon MP-V one can include feature 1, a house (Fig. 24A and C) and feature 2, a hearth (Fig. 24B and C) [Lysenko 2001b]. The sunken floor house is a semi-dugout 3.15 m in length, 2.6 m in width and 1.02 m deep measuring from the present ground surface. The floor level in its western part was higher than in the eastern part by 0.17 m. In the centre of the western part a cluster of pottery was found. Six vessels were reconstructed: upper and bottom parts of large tulip-shaped pots (Fig. 24:2, 3, 7), a small tulip-shaped pot and three large bowls with their rims turned inwards (Fig. 24:4-6). The fill also

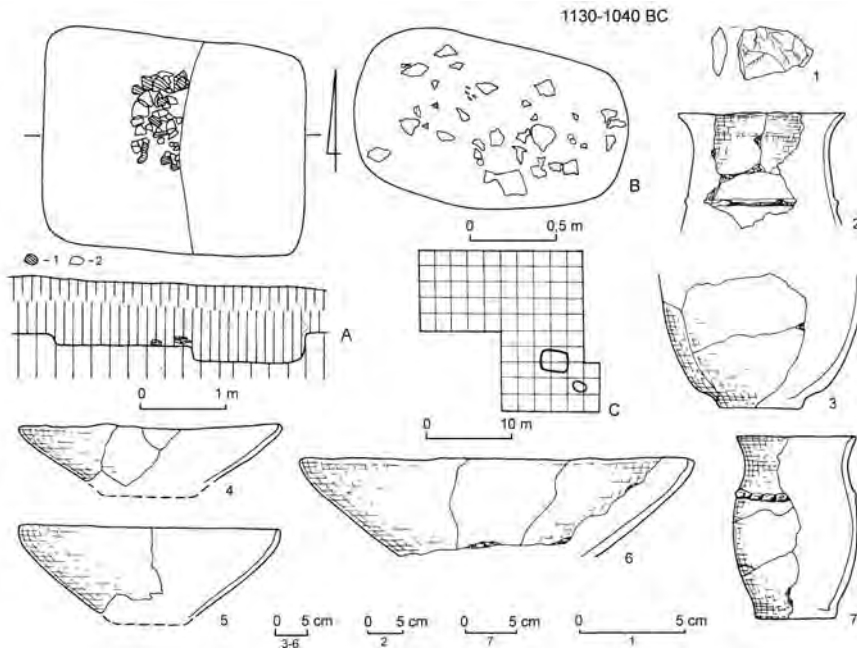


Fig. 24. Malopolovetske-2A, Middle Dnieper area. A - house; B - hearth. Legend: 1 - shard; 2 - burnt stone; C - planigraphy of features (house and hearth). 1-7 - artefacts from the house. 1 - flint; 2-7 clay. After Lysenko 2001b

yielded up a fragment of a flint sickle of the “Bilogrudovka” type (Fig. 24:1). Next to the house, a hearth was discovered consisting of a cluster of burnt stones and earth about 1 sq m in size (Fig. 24B). The date obtained for the dwelling feature (Table 6:55) [Kovalyukh *et al.* 1998b:140] is consistent with the typological-stylistic assessment of the materials.

S.S. Berezanskaya [1985:503] classifies seven dugouts excavated by A.I. Terezhkin in Subotov as belonging to the Bilogrudovka culture. The  $^{14}\text{C}$  method was used to date house 4 from the Subotov settlement and a grave discovered there (Table 6:40, 48-51, 53, 54, 56) [Klochko *et al.* 1998:667-673].

Considering the funerary ritual and finds, one may also assign to this horizon the cemetery at Verguny near Cherkasy explored by M.P. Sivolap in 1995-1996. Of the greatest interest there are mass graves 5 and 13 (Fig. 25) [Lysenko 2001b]. Rectangular pits contained five non-anatomically arranged (dismembered) bodies each. Grave 13 (Fig. 25A) yielded up a short fragment of copper wire (Fig. 25:3). Grave goods found in grave 5 (Fig. 25B) included four copper ornaments: two fragments of a wire coil and two tutulus-beads, of which the larger one was decorated with the motif of concentric circles (Fig. 25:1, 2, 4, 5).  $^{14}\text{C}$  determina-

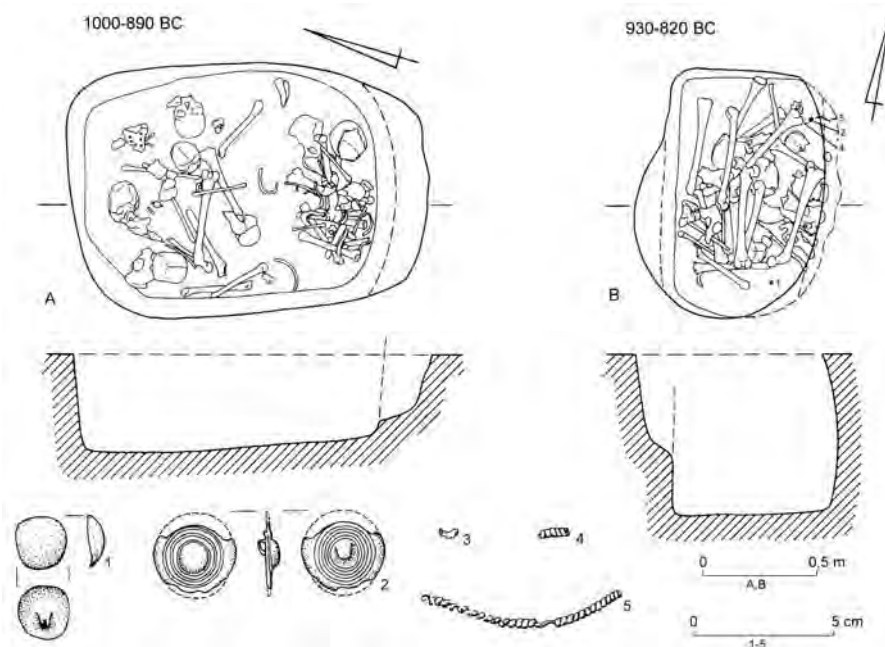


Fig. 25. Verguny, Middle Dnieper area. A - grave 13; B - grave 5. Bronze artefacts from the graves. 1, 2, 4, 5 - grave 5; 3 - grave 13. After Lysenko 2001b

tions concerning both graves (Table 6:59, 60) seem to be much later than expected. The dismemberment ritual, prevailing at the cemetery in Verguny (including mass graves), finds direct analogies in horizons MP-II, MP-III and MP-IV in Małopolovetske and in TCC assemblages in Poland [Rybakov 1981:252; Kłosińska 1987:Fig. 4; Grygiel 1987:Fig. 5, 8; Matoga 1987:Fig. 2, 3; Makarowicz 2000a:Fig. 35; 2000c].

Horizon MP-V of the Kiev-Cherkasy group may be dated between 1200-1000 BC. Whereas in the eastern subcircle of the TCC, Biligrudovka pottery is related to the later development stages of the Trzciniac ceramic tradition, in the western subcircle of the TCC similar pottery is found in an earlier period, specifically in younger assemblages of TH 1 and TH 3 in Kujawy (1650-1500 BC) [Czebreszuk 1996:190; Makarowicz 1998a:97, ryc. 38] and in A1-A3 assemblages in Małopolska [Górski 1998a; 1998b], hence, in the time when Babino type pottery (mnogovalikowoy) still dominated in the Middle Dnieper area. The explanation of this phenomenon goes beyond the scope of this paper.

Summing up, we believe that the Kiev-Cherkasy group of the TCC should be dated between 1800/1700 and 1000 BC.

The chronology of the eastern subcircle of the TCC covers the period of 1800/1700-1000 BC. Assemblages combining traits of the MPC and TC appeared in the period of 1800-1600 BC, while “purely” Trzciniec assemblages emerged ca. 1650-1600 BC. The lower chronological limit of the Trzciniec development trend of the eastern subcircle of the TCC is marked by the life of the Middle Dnieper culture, i.e. 1700 BC. Thus, the formation of TCC groups in Belarussian and Ukrainian Polissya may be dated at the beginning of the 17th century BC. Dates for the Kiev-Zhitomir and Sosnitsa groups of the TCC fit into the interval of 1600-1200 BC. However, in the Middle Dnieper and Desna basins, these groups (Lebedovka/late Sosnitsa assemblages) survived until ca. 1000 BC.

To be able to determine the absolute chronology of the assemblages of the Komarov and Volhynia groups of the TCC, there are too few dates. It can be said, however, that after 1300 BC, in the Dnieper area, the Komarov group of the TCC was gradually superseded by the NC.

On the Southern Bug, a benchmark for dating the Hordeevka-Bilogrudovka group is the cemetery in Hordeevka, the chronology of which may be set at 1500-1000 BC. Horizon Hordeevka I must have been preceded by a pre-Bilogrudovka horizon — the time when the TCC spread from the Dniester area to the Southern Bug.

In the Middle Dnieper area, the formation of the Kiev-Cherkasy group of the TCC may be synchronized with horizon MP-I (mnogovalikovoy), i.e. 1800/1700-1600 BC. It is also in this period that early forms of the Malopolovetske type pottery appear and co-occur with late Babino pottery (mnogovalikovoy). Bilogrudovka type assemblages forming horizon MP-V in the Middle Dnieper area mark the upper limit of the Kiev-Cherkasy group. They are dated there between 1200 and 1000 BC.

#### 4. CONCLUSIONS

Conclusions concerning the absolute dating of both TCC subcircles and individual regions discussed here using the radiocarbon method may be set out as follows:

1. Taking into account exclusively the sum of probability distributions, the life of the TCC in the western province should be dated between 1900 and 1400 BC, i.e. earlier than in the eastern province where it seems to have lasted from 1640 to 1420 BC. This estimate does not take into account dates for “transition” assemblages from the IC to the TH in the lower Vistula drainage and from the MPC to the TC in the Dnieper drainage.

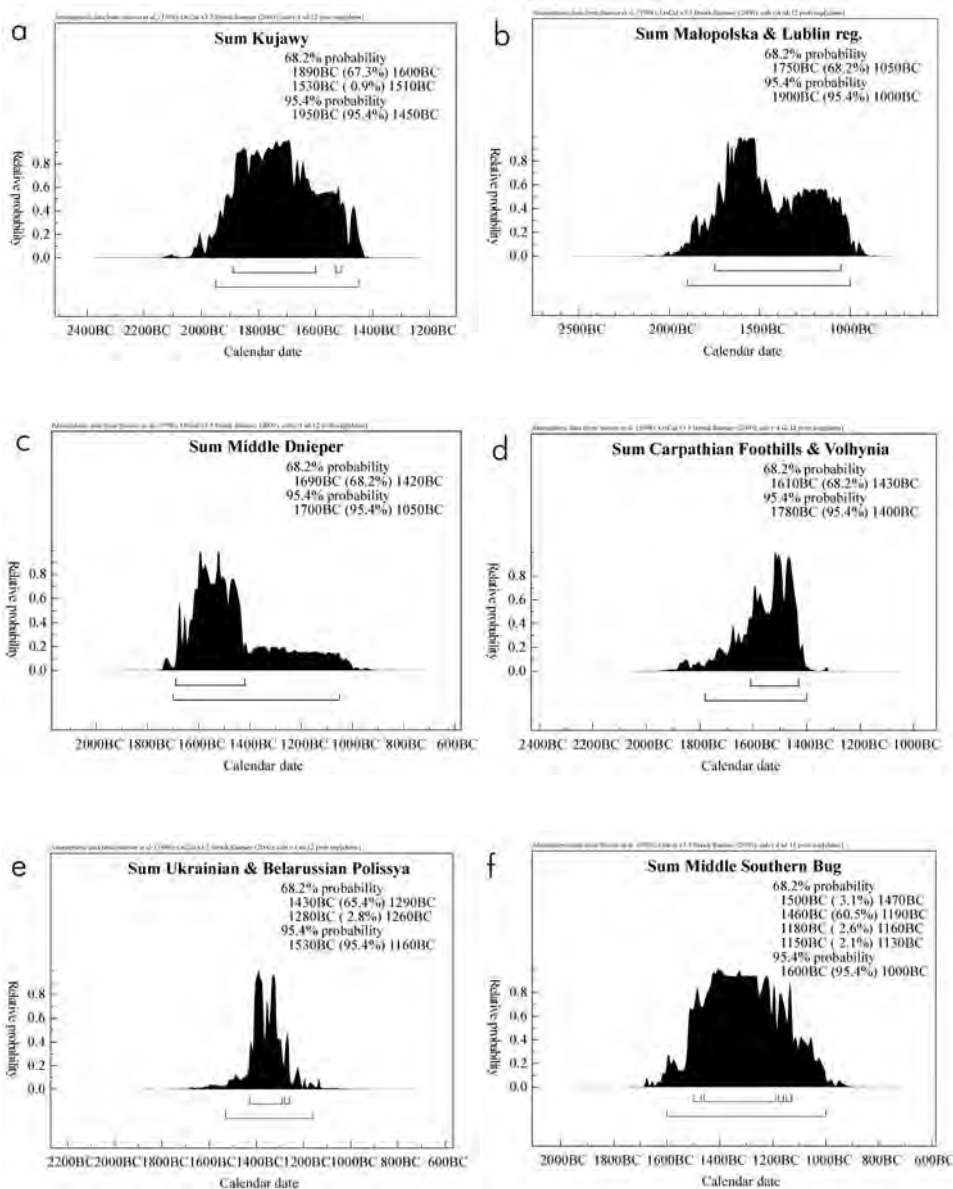


Fig. 26. The sum of probability distributions for Kujawy (a); Małopolska & Lublin area (b); Middle Dnieper (c); Carpathian Foothills & Volhynia (d); Ukrainian & Belarussian Polissya (e); Middle Southern Bug (f)

2. The comparison of the sum of probability distributions in individual regions where the TCC formed (Fig. 26a-f) shows the movement of Trzciniec structures (“migration of Trzciniec stylistics”) from the northwest (Kujawy, 1890-1600 BC) and doubtless the northeast (Mazowsze, specifically the Warsaw Basin, no <sup>14</sup>C dates) to the southeast (Małopolska and Lublin area, 1750-1050 BC) and the east (Middle Dnieper drainage, 1690-1420 BC). The chronology of regional TCC varieties in the Carpathian Foothills and Volhynia (1540-1430 BC), Belarussian and Ukrainian Polissya (1430-1290 BC) and the Middle Southern Bug drainage (1460-1190 BC), due to the scarcity or low representativeness of dates obtained so far, may only suggest that these varieties formed later. For a more comprehensive assessment of the chronological position of the Trzciniec complex in the said regions we should wait until a longer series of dates is available.

3. Taking into consideration all the reliable dates, we can fit the TCC chronology in the Vistula drainage into the period of 1900-1200 BC in the north and 1700-1100 in the south. Transition assemblages from the IC to the TH should be placed between 2000 and 1900 BC. If the same criteria are applied, the life of the eastern TCC subcircle may be dated between 1650/1600 and 1000 BC, while transition assemblages from the MPC to the TC (mnogovalikovoy horizon) may be dated between 1800 and 1600 BC.

*Translated by Piotr T. Żebrowski*

## ABBREVIATIONS

AAC	– Acta Archaeologica Carpathica, Kraków
Annales UMCS	– Annales Universitatis Mariae Skłodowska-Curie, Lublin
AP	– Archeologia Polski, Warszawa
APŚ	– Archeologia Polski Środkowoschodniej, Lublin
BerRGK	– Bericht der Römisch-Germanischen Kommission, Mainz
BPS	– Baltic-Pontic Studies, Poznań
BSA	– Annales of the British School of Archaeology at Athens
JIES	– The Journal of the Indo-European Studies, Washington D.C.
KSIA	– Kratkiye soobshcheniya Instituta Archeologii, Moskva
MANH	– Materiały Archeologiczne Nowej Huty, Kraków
NA IA NAN	– Nauchnyy Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy, Kiev
PA	– Przegląd Archeologiczny, Wrocław
PBF	– Prähistorische Bronzefunde, München
PZP	– Prahistoria ziem polskich, Wrocław-Warszawa-Kraków-Gdańsk
RA	– Rossiyskaya Arkheologiya, Moskwa
SA	– Sovetskaya Arkheologiya, Moskwa
SIA	– Slovenska Archeologia, Bratislava
SPA	– Sprawozdania Archeologiczne, Kraków
WA	– Wiadomości Archeologiczne, Warszawa

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