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THE RADIOCARBON CHRONOLOGY OF THE URNFIELD COMPLEX AND THE DATING OF CULTURAL PHENOMENA IN THE PONTIC AREA (LATE BRONZE AGE AND EARLY IRON AGE)

The study of development relationships — “contacts” between taxa generally associated with the Urnfield Complex (UC) and Pontic Area cultures — holding in the late Bronze Age and in the early Iron Age calls for — already in the initial stage — making the absolute chronology more accurate (Fig. 1).

At present, for the areas of interest to us here, there is a chance for developing an integrated periodization scheme supported by references to absolute dates and covering the Lusatian culture (LC) in the Baltic area and the Biligrudovka (BgC), Chornoles (ChC) and Bilozerka (BzC) cultures in the Pontic area (Fig. 1). An obstacle in developing such a scheme is the “fragmentariness” of data coming from individual zones. This is particularly true for UC contact areas — its eastern frontiers and steppe and forest-steppe cultures of the Northern Pontic Area west of the Dnieper.

In the studies of the development relationships carried out so far, two branches can be distinguished: an “eastern” one and a “western” one. The “eastern” branch is concerned chiefly with pre-Scythian — read Cimmerian — influences on the cultures of the Carpathian Basin and the LC [cf. Bukowski 1976; Kosack 1980:109-143; Chochorowski 1992]; while in the “western” branch, the key issue is whether western or southwestern elements (Mediterranean) had a share in the origins of cultures of the western Dnieper drainage. As the groundwork for such studies served the “traditional”, typochronological dating [cf. Otroshchenko, Radiocarbon..., in this volume, see there for further literature]. The prevailing view was that the presence of eastern — Scythian — traits and western — “Lusatian” — ones (mainly in weaponry) in cultures west of the Dnieper justified the formulating of hypotheses of *expansion* of the Scythian and Lusatian cultures in the

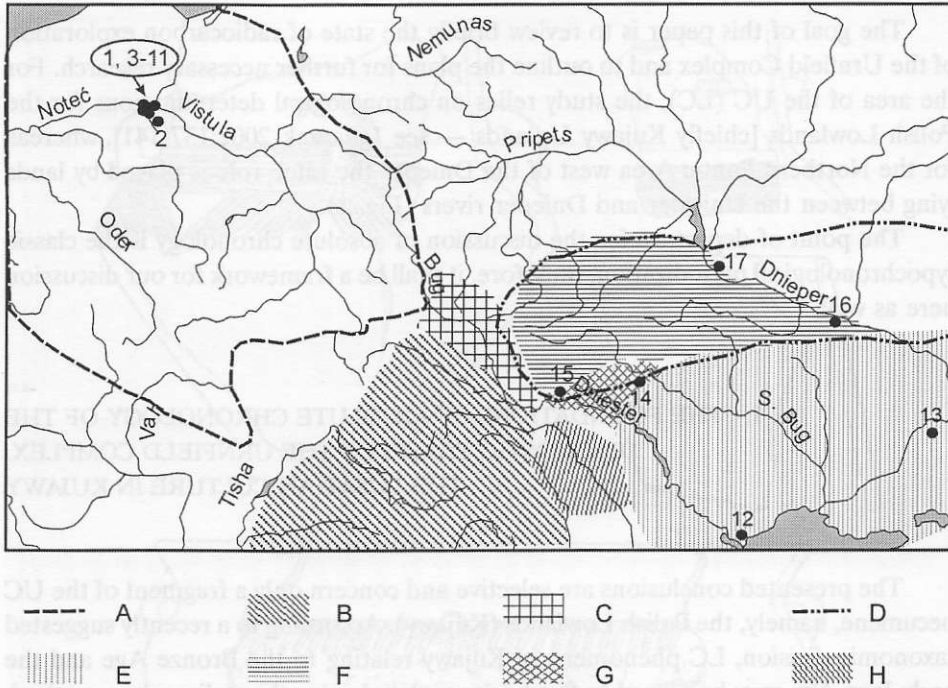


Fig. 1. The range of cultural units encountered in the area between the Baltic and Black seas in the late Bronze Age and early Iron Age. Culture groups: A - Lusatian culture, B - Gava-Goligrady culture, C - Vysotsko culture, D - Chernoles culture, E - Bilozerka culture, F - Bilogrudovka culture, G - Hordeevka type, H - Chišinau-Corlăteni; ^{14}C dated sites: 1 - Narkowo 9, 2 - Zgłowiączka 3, 3 - Sławsko Wielkie 12, 4 - Kuczkowo 5, 5 - Ciechrz 2, 6 - Bożejewice 22, 7 - Żegotki 3, 8 - Siniarzewo 1, 9 - Czerniak 3, 10 - Kruszewica 2/4, 11 - Radojewice, 12 - Kochkovatoo, 13 - Stepnoy, 14 - Hordeevka, 15 - Dnestrovka-Luka, 16 - Subotiv, 17 - Obukhiv

late Bronze Age and early Iron Age [Sulimirski 1936:40-54; Klochko 1992:183-190; 1993; 2001]. The studies cited seem to suggest a pulsative nature of information flow within the Baltic-Pontic ecological and cultural borderland. It has to be kept in mind, however, that the absence of consistent chronological scales may result in a false picture. Any further study of these matters must be preceded by an accurate dating of relevant cultural phenomena, i.e. taking into account radiocarbon dates. This task requires making a series of measurements for diagnostic assemblages to identify internal divisions of taxa. Settling this matter seems particularly interesting when viewed from the perspective of the subsequent cultural changes that affected central and eastern Europe in the decline of the Bronze Age and the dawn of the Iron Age, specifically, the substitution of UC traits by those of the Hallstatt culture and the appearance of nomads related to Cimmerians and Scythians on Pontic steppes.

The goal of this paper is to review briefly the state of radiocarbon exploration of the Urnfield Complex and to outline the plans for further necessary research. For the area of the UC (LC), the study relies on chronological determinations for the Polish Lowlands [chiefly Kujawy Uplands — see Ignaczak 2002:137-141], whereas for the Northern Pontic Area west of the Dnieper the same role is played by lands lying between the Dniester and Dnieper rivers (Fig. 1).

The point of departure for the discussion of absolute chronology is the classic typo-chronological periodization, therefore, it shall be a framework for our discussion here as well.

1. THE FOUNDATIONS OF ABSOLUTE CHRONOLOGY OF THE DIAGNOSTIC TRAITS OF THE URNFIELD COMPLEX. THE LUSATIAN CULTURE IN KUJAWY

The presented conclusions are selective and concern only a fragment of the UC oecumene, namely, the Polish Lowlands (Kujawy). According to a recently suggested taxonomic division, LC phenomena in Kujawy relating to the Bronze Age and the early Iron Age may be placed in five horizons dated using the radiocarbon method. The horizons cover the period of 1550-800/700 BC [Ignaczak 2002:87ff, see Fig. 1 and Tab. 1].

Two groups of artifact assemblages are the most interesting for the subject at hand. They are dated approximately at (a) the Bronze Age IV-V periods and (b) the Hallstatt C/D periods (according to classic periodizations by Montelius and Kostrzewski) for they make up a supraregional set of artifacts typical of the younger development phases of the LC.

a. A significant analytical advantage offered by the assemblages of the first group is the possibility of their synchronization with macrospatial identifiers of UC traditions such as socketed axeheads with loops, Reutlingen and Hemigkofen type swords and lancet spearheads. This set of traits is supplemented by the stylistics of ceramic goods featuring mainly ornaments of incised lines (Fig. 2). Absolute dating based on calibration using *wiggle matching* [Weninger 1986:38-40] permits us to place the assemblages in the interval from the beginning of the 14th until the end of the 11th century BC (cf. Table 1, lines 15-25).

b. In the case of the second group, an important characteristic is the possibility of synchronizing the artifacts with late Lusatian phenomena identified by their ornaments and pottery morphology. The chief reference is assemblages containing pottery decorated with pricks under the rim and incised lines (arranged in a traditional Lusatian way — horizontal lines enhanced by angular elements arranged horizontally as well — see Fig. 3). They are recorded throughout the oecumene of

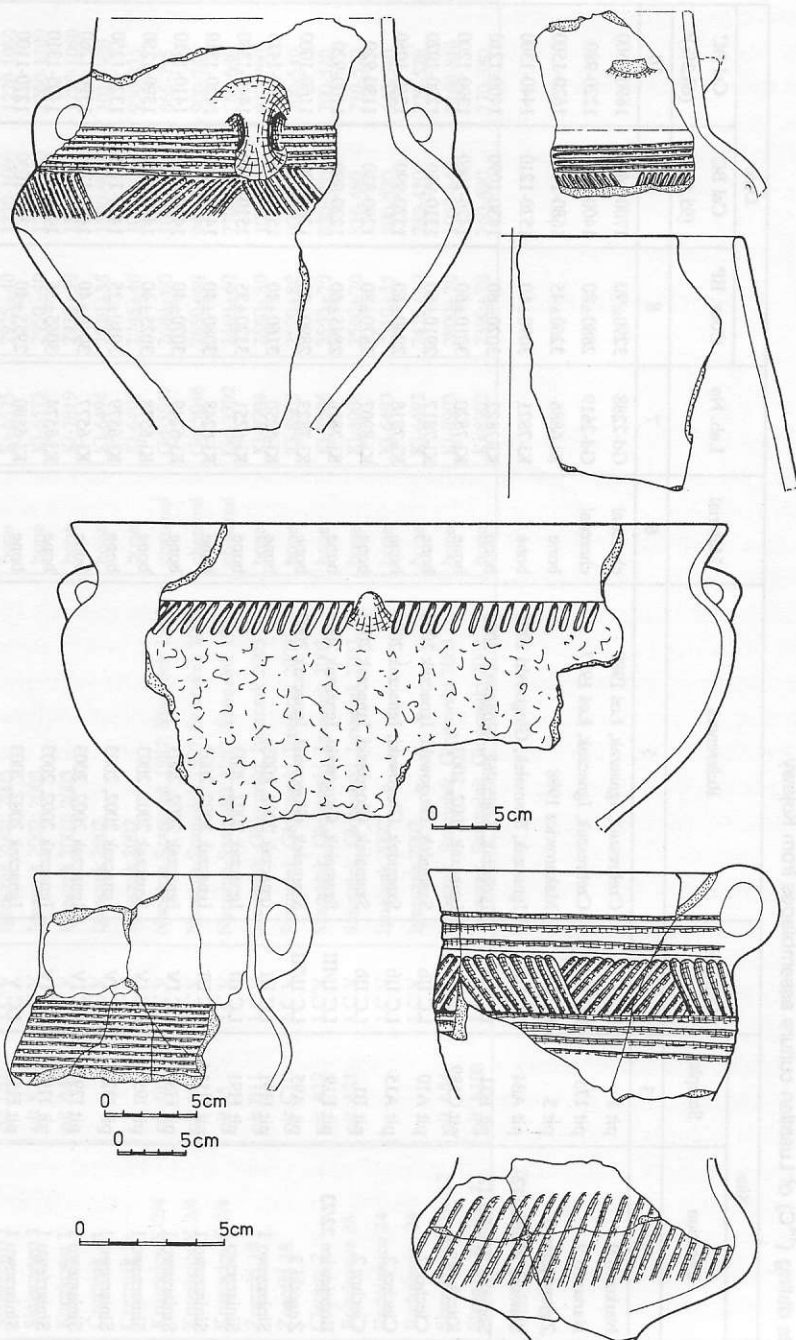


Fig. 2. A selection of ceramic forms of the Lusatian culture in Kujawy from the Bronze Age IV-V periods. Siniarzewo, site 1, Kujawy-Pomerania Province

Table 1

Absolute dating (^{14}C) of Lusatian culture assemblages from Kujawy

No	Site		Culture ^a	References	Material	Lab. No	Date		
	Location	Sample					Conv. BP	Cal BC (95,4%) ^b	Cal BC (68,2%) ^c
1	2	3	4	5	6	7	8	9	10
1.	Narkowo 9	pit 1	LC I	Czebreszuk, Ignaczak, Łoś 1987	charcoal	Gd-2288	3290±90	1780-1400	1690-1500
2.	Narkowo 9	pit 175	LC I	Czebreszuk, Ignaczak, Łoś 1987	charcoal	Gd-2619	2880±80	1400-800	1220-980
3.	Zgłowiączka 3	pit 3	LC IIa	Makarowicz 1998	bone	Ki-6886	3260±45	1680-1440	1620-1500
4.	Sławsko Wielkie 12	pit A84	LC IIa	Ignaczak, Szamałek, Głogowski 2003	bone	Ki-7821	3090±60	1520-1210	1440-1300
5.	Sławsko Wielkie 12	pit B31	LC IIa	Ignaczak, Szamałek, Głogowski 2003	bone	Ki-7822	3020±60	1430-1090	1400-1210
6.	Kuczkowo 5	pit C189	LC IIa	Ignaczak 2002, 2003	bone	Ki-7820	3010±60	1420-1060	1390-1200
7.	Ciechrz 2	pit A10	LC IIb	Szamałek, Głogowski, Ignaczak 2003	bone	Ki-7817	2910±60	1310-920	1220-1020
8.	Ciechrz 2	pit A15	LC IIb	Szamałek, Głogowski, Ignaczak 2003	bone	Ki-7818	2940±60	1320-990	1260-1050
9.	Ciechrz 2	pit B1	LC IIb	Szamałek, Głogowski, Ignaczak 2003	bone	Ki-8907	2870±80	1290-830	1130-920
10.	Bożejewice 22/23	pit E19	LC II/III	Szamałek, Głogowski, Ignaczak 2003	bone	Ki-7816	2845±60	1220-890	1100-920
11.	Żegotki 3	pit A95	LC II/III	Szamałek, Głogowski, Ignaczak 2003	bone	Ki-7823	2890±50	1260-920	1160-1000
12.	Siniarzewo 1	pit H91	LC III	Ignaczak 2002, 2003	bone	Ki-6250	3160±40	1520-1390	1460-1415
13.	Siniarzewo 1	pit H91	LC III	Ignaczak 2002, 2003	bone	Ki-6251	3120±35	1510-1310	1440-1380
14.	Siniarzewo 1	pit H114	LC III	Ignaczak 2002, 2003	bone	Ki-6248	3080±40	1440-1260	1420-1310
15.	Siniarzewo 1	pit H80	LC IV	Ignaczak 2002, 2003	bone	Ki-6249	3070±40	1430-1250	1410-1310
16.	Siniarzewo 1	pit I95	LC IV	Ignaczak 2002, 2003	bone	Ki-6578	3025±40	1410-1200	1390-1250
17.	Siniarzewo 1	pit I320	LC IV	Ignaczak 2002, 2003	bone	Ki-6579	3010±35	1400-1130	1320-1250
18.	Siniarzewo 1	pit I392	LC IV	Ignaczak 2002, 2003	bone	Ki-6577	3040±40	1420-1210	1390-1260
19.	Siniarzewo 1	pit J103	LC IV	Ignaczak 2002, 2003	bone	Ki-6574	3065±35	1420-1260	1405-1310
20.	Siniarzewo 1	pit H54	LC V	Ignaczak 2002, 2003	bone	Ki-6580	2955±40	1320-1030	1270-1100
21.	Siniarzewo 1	pit II	LC V	Ignaczak 2002, 2003	bone	Ki-6576	2970±35	1320-1060	1270-1120
22.	Siniarzewo 1	pit I282	LC V	Ignaczak 2002, 2003	bone	Ki-6581	2960±40	1320-1040	1270-1100

1	2	3	4	5	6	7	8	9	10
23.	Siniarzewo 1	pit J202	LC V	Ignaczak 2002; 2003	bone	Ki-6575	2925±40	1270-1000	1220-1060
24.	Siniarzewo 1	pit K164	LC V	Ignaczak 2002; 2003	bone	Ki-6573	2950±40	1310-1030	1260-1100
25.	Kuczkowo 1	pit A44	LC V	Ignaczak 2002; 2003	bone	Ki-7819	2930±50	1310-990	1220-1060
26.	Czerniak 3a	-	LC V	Ignaczak 2002	bone	Ki-6494	2820±35	1100-900	1010-920
27.	Czerniak 3a	-	LC V	Ignaczak 2002	bone	Ki-6495	2745±40	1000-820	930-835
28.	Kruszwica K-2/4	pit 48	LC V	Narożna-Szamałek 1987; Szamałek 1992.	charcoal	Gd-5047	2680±60	1000-760	865-795
29.	Kruszwica K-2/4	pit 46	LC V	Narożna-Szamałek 1987; Szamałek 1992.	charcoal	Gd-5046	2650±60	940-750	900-780
30.	Kruszwica K-2/4	pit 45	LC V	Narożna-Szamałek 1987; Szamałek 1992.	charcoal	Gd-3302	2460±60	770-400	760-680
31.	Żegotki 18	pit B11	LC V	Szamałek, Głogowski, Ignaczak 2003	bone	Ki-8904	2680±80	1050-750	920-790
32.	Żegotki 18	pit C10	LC V	Szamałek, Głogowski, Ignaczak 2003	bone	Ki-8905	2590±80	900-480	700-540
33.	Ciechrz 2	pit A12	LC V	Szamałek, Głogowski, Ignaczak 2003	bone	Ki-8906	2550±70	830-480	700-520
34.	Bożejewice 28	pit A21	LC V	Szamałek, Głogowski, Ignaczak 2003	bone	Ki-8908	2540±70	810-480	710-520
35.	Radojewice 24	-	LC V	Ignaczak 2002	bone	Ki-6493	2510±35	800-520	640-540
36.	Radojewice 24	-	LC V	Ignaczak 2002	bone	Ki-6492	2470±40	780-410	770-520
37.	Sławsko Wielkie 12	pit A34	LC V	Ignaczak, Szamałek, Głogowski 2003	bone	Ki-8903	2800±70	1050-840	1160-810
38.	Sławsko Wielkie 12	pit A108	LC V	Ignaczak, Szamałek, Głogowski 2003	bone	Ki-8902	2390±70	760-690	770-380

^a After Ignaczak 2002

^{b c} OxCal 3.4.

the “eastern LC”¹ (the area east of the Noteć River line — see Fig. 1). A significant factor is certain spatial continuity of these traits in Kujawy [Ignaczak, Głogowski 2003] as well as in southeastern Poland [Czopek 1996, Fig. 11]. This group of cultural traits may be dated at the time interval from the middle of the 10th to the end of the 7th century BC (see Tab. 1, lines 31-38).

2. THE TYPOCHRONOLOGY OF “WESTERN” TRAITS IN THE NORTHERN PONTIC AREA WEST OF THE DNIEPER

It must be observed first that Ukraine west of the Dnieper was covered by two zones of east-west circulation of cultural information in the late Bronze Age and the early Iron Age. These were (a) Polesie-forest-steppe and (b) steppe zones.

a. The first zone was inhabited by the groups that had grown from the tradition of the Trzciniec Cultural Circle (TCC): the BgC and ChC, genetically related to the former and being its continuation, as well as the Vysotsko culture (VC, the question of its origin and the participation of TCC environment in it is debatable). Among “western” traits, associated chiefly with the LC, a number of metal goods are counted in this environment. They include weapons (socketed axeheads with loops, Reutlingen and Hemigkofen type swords and lancet spearheads) and ornaments. It is worth mentioning here that the origins of a certain group of ornaments demonstrating central European traits may be related to the genetic substratum of these cultures — the TCC environment. Furthermore, it was to the impact of western influences that cremations in vessels-urns was attributed. The range and dynamics of the spreading of these traits east are, however, a subject of discussion [cf. Berezanskaya 1982; Klochko 2001].

b. In the other — steppe — zone, BzC groups developed in the late Bronze Age and early Iron Age. They were related to the environment of the Srubnaya or Sabatinovka culture [cf. Otroshchenko 1986]. In the assemblages of this taxon, “western” traits — characteristic of the environment of Thracian Hallstatt — were treated as elements helpful in building chronologies. They were most readily observable in pottery assemblages, with ornamentation (fluting), surface treatment (burnishing) and morphology of vessels being the major tell-tale signs. Pottery showing “western” traits is found mainly in burials. Another element displaying “western” or “southwestern” characteristics in the contexts of the BzC is the bow-like fibula [see Otroshchenko, Radiocarbon. . . , in this volume].

It must be stressed that the impact of the cultural centre related to the circle of Gava-Goligrady (and client cultures) is readily observable in both the steppe

¹ Identified by the absence of “boss style” in pottery [more on this issue — Ignaczak, Głogowski 2003].

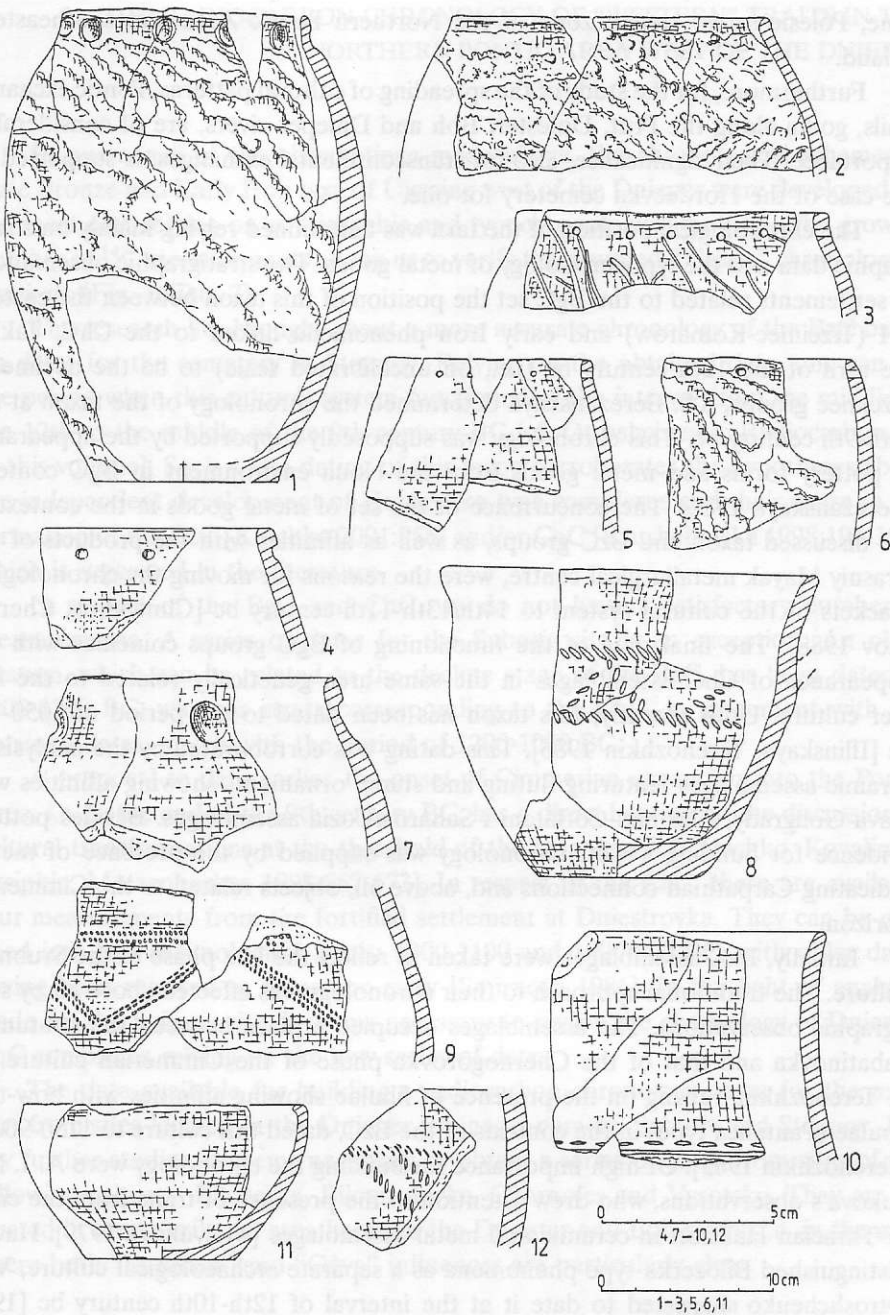


Fig. 3. A selection of ceramic forms (with eastern influences) of the Lusatian culture in Kujawy from the Hallstatt C/D periods. Piecki, site 8, Kujawy-Pomerania Province: 1-12

zone, Polesie-forest steppe zone of the Northern Pontic Area and southeastern Poland.

Furthermore, for the study of the spreading of cultural patterns, Pontic exchange trails, going along the Prut, Dniester, Boh and Dnieper rivers, are of considerable importance. Their significance, also for transcontinental exchanges, is supported by the case of the Hordeevka cemetery for one.

The chronological position of the taxa was determined relying mainly on stratigraphic data and the typochronology of metal goods. The stratigraphic observations of settlements related to the BgC set the position of this taxon between the eastern TH (Trzciniec-Komarów) and early Iron phenomena linked to the ChC. Taking the turn of the 12th century bc (i.e., on uncalibrated scale) to be the decline of Trzciniec groups, S.S. Berezanskaya determined the chronology of the taxon at the 11th-9th century bc. This chronology was supposedly supported by the appearance of pottery forms and metal goods from the Noua environment in BgC contexts [Berezanskaya 1982]. The concurrence of the set of metal goods in the context of the discussed taxon and BzC groups, as well as affinities with the products of the Krasniy Mayak metallurgical centre, were the reasons for moving the chronological brackets of the cultural system to 14th/13th-11th century bc [Chmykhov, Chernyakov 1988]. The final date of the functioning of BgC groups coincides with the appearance of ChC assemblages in the same area genetically related to the former culture. Until recently, this taxon has been dated to the period of 1050-725 bc [Illinskaya, Terenozhkin 1986]. This dating was corroborated by the analysis of ceramic assemblages featuring fluting and stamp ornaments showing affinities with Gava-Goligrady, Chişinau-Corlăteni i Saharna/Cozia assemblages. Besides pottery, evidence for building a ChC chronology was supplied by the presence of metals indicating Carpathian connections and, above all, objects related to the Cimmerian horizon.

Initially, BzC assemblages were taken to reflect the late phase of the Srubnaya culture. The traditional approach to their chronology was affected above all by stratigraphic observations. The assemblages occupied a place between the stratum of Sabatinovka and that of the Chernogorovka phase of the Cimmerian culture. O. T. Terenozhkin, relying on the presence of fibulae showing affinities with bow-type fibulae (Pantalica type) in the contexts of the BzC, dated this culture to 1150-900 bc [Terenozhkin 1965]. Of high importance for building the chronology were A. I. Meliukova's observations, who drew attention to the presence of traits from the circle of Thracian Hallstatt in ceramic and metal assemblages [Melyukova 1979]. Having distinguished Bilozerka-type phenomena as a separate archaeological culture, V.V. Otroshchenko suggested to date it at the interval of 12th-10th century bc [1981; 1985]. Such chronological brackets, synchronous with the BD/HaA1-HaA2/B1 period, have been maintained in V. P. Vanchugov's monograph [1990].

3. THE RADIOCARBON CHRONOLOGY OF "WESTERN" TRAITS IN THE NORTHERN PONTIC AREA WEST OF THE DNIEPER

In pursuance of the observations made above, the chronological schemes of Late Bronze and Early Iron taxa of Ukraine west of the Dnieper were developed for the most part relying on stratigraphic and typochronological findings. The growing number of ^{14}C measurements allows us to verify the assumed, "classic" chronological brackets (Fig. 1; Tab. 2).

The research has brought about a more accurate chronology of the BzC based on dates for the cemetery in Stepnoy. Relying on the obtained data, one can set the period when this cultural system functioned at the interval from the middle of the 12th to the middle of the 9th century BC [cf. Otroshchenko, Radiocarbon. . . , in this volume]. Such a late dating of this taxon corroborates the hypotheses about the independent development of Hordeevka-type complexes and their share in the formation of the BzC [Klochko 2001:256] and/or ChC [Krushelnitska 1998:193-197], which is suggested in the literature.

In respect of the BgC and ChC, we do not have a satisfactory number of measurements. A series of dates for the Subotiv site is an exception. An older stratum, which can be related to the decline stage of the BgC, has been dated at 1300-1200 BC, whereas strata corresponding to the ChC, in agreement with the obtained dates, match with the period of 1200-1000 BC.

A proposal to date earlier the onset of Cimmerian expansion into the Pontic Area, i.e. to the end of the 9th century BC, has a direct bearing on the discussion of cultural transformations at the threshold of the Iron Age [cf. Klochko, Kovaliukh, Skripkin, Motzenbecker 1998:667-673]. In respect of the ChC, there are available four measurements from the fortified settlement at Dniestrovka. They can be grouped into two chronological levels: 1300-1100 and 1000-800 BC, with older dates having been rejected as being too early [Smirnova 1986]. In the light of analyses made for the Subotiv site, it seems necessary to review the chronology of Dniester ChC complexes relying on the new series of dates.

The data available for building a radiocarbon chronology come for the most part from sites located in the Dnieper drainage, namely, Subotiv and Stepnoy. For any further studies, it seems necessary to obtain a series of dates from sites of the following cultures: Bilozerka, Bilogrudovka, Chornoles and Vysotsko. They are all located in the interfluvial area between the Dniester and Boh rivers, i.e. in the area where both "Lusatian" and "Gàva" influences are particularly clear.

Table 2

Absolute dating (^{14}C) assemblages from the Northern Pontic Area West of the Dnieper

No	Site		Culture	References*	Material	Lab. No	Date	
	Location	Sample					BP	BC
1	2	3	4	5	6	7	8	9
1.	Kochkovatoe, Odessa Region	barrow 32, grave 1	Bilozerka	Vanchugov 1990	?	Ki-1714	2880±45	1140-980
2.	Stepnoy, Zaporizhzhia Region	barrow 2 grave 1	Bilozerka	Otroshchenko 2003	wood	Ki-887	2700±45	900-820
3.	Stepnoy Zaporizhzhia Region	barrow 11 grave 3	Bilozerka	Otroshchenko 2003	charcoal	Ki-889	2850±40	1090-940
4.	Stepnoy Zaporizhzhia Region	barrow 9 grave 1	Bilozerka	Otroshchenko 2003	wood	Ki-575	3050±70	1390-1180
5.	Stepnoy Zaporizhzhia Region	barrow 3 grave 1	Bilozerka	Otroshchenko 2003	wood	Ki-885	2805±55	1030-880
6.	Stepnoy Zaporizhzhia Region	barrow 15 grave 2	Bilozerka	Otroshchenko 2003	charcoal	Ki-886	2690±50	900-815
7.	Stepnoy Zaporizhzhia Region	barrow 15 grave 2	Bilozerka	Otroshchenko 2003	charcoal	Ki-9823	2920±50	1210-1030
8.	Stepnoy Zaporizhzhia Region	barrow 3 grave 1	Bilozerka	Otroshchenko 2003	wood	Ki-9596	2915±45	1200-1030
9.	Stepnoy Zaporizhzhia Region	barrow 9 grave 1	Bilozerka	Otroshchenko 2003	wood	Ki-9820	2880±55	1160-970
10.	Stepnoy Zaporizhzhia Region	barrow 11 grave 3	Bilozerka	Otroshchenko 2003	charcoal	Ki-9821	2830±55	1080-910
11.	Stepnoy Zaporizhzhia Region	barrow 2 grave 1	Bilozerka	Otroshchenko 2003	wood	Ki-9822	2780±55	1000-850
12.	Hordeevka Vinnytsia Region	27	Type Hordeevka	Šusarska-Michalik 2003	bone	Ki-5080	3460±70	1870-1680
13.	Hordeevka Vinnytsia Region	32/2	Type Hordeevka	Šusarska-Michalik 2003	bone	Ki-5079	3020±55	1360-116
14.	Hordeevka Vinnytsia Region	33	Type Hordeevka	Šusarska-Michalik 2003	bone	Ki-5083	3010±50	1350-1150
15.	Hordeevka Vinnytsia Region	35	Type Hordeevka	Šusarska-Michalik 2003	bone	Ki-5081	2980±60	1310-1090
16.	Hordeevka Vinnytsia Region	37	Type Hordeevka	Šusarska-Michalik 2003	bone	Ki-5082	2920±50	1210-1030
17.	Hordeevka Vinnytsia Region	26	Type Hordeevka	Šusarska-Michalik 2003	wood	Ki-9252	3180±50	1505-1405
18.	Hordeevka Vinnytsia Region	26	Type Hordeevka	Šusarska-Michalik 2003	wood	Ki-9253	3240±50	1590-1450
19.	Hordeevka Vinnytsia Region	26	Type Hordeevka	Šusarska-Michalik 2003	wood	Ki-9254	3120±50	1440-1310
20.	Hordeevka Vinnytsia Region	27	Type Hordeevka	Šusarska-Michalik 2003	wood	Ki-9255	2980±50	1300-1110
21.	Hordeevka Vinnytsia Region	27	Type Hordeevka	Šusarska-Michalik 2003	wood	Ki-9256	2950±50	1250-1060
22.	Hordeevka Vinnytsia Region	28	Type Hordeevka	Šusarska-Michalik 2003	wood	Ki-9257	3110±50	1430-1300
23.	Hordeevka Vinnytsia Region	31	Type Hordeevka	Šusarska-Michalik 2003	wood	Ki-9258	3005±50	1340-1150
24.	Dnestrovka-Luka, Chernivtsy Region	pit 24	Chornoles	Smirnova 1986	charcoal	Le-2163	3010±40	1340-1170

1	2	3	4	5	6	7	8	9
25.	Dnestrovka-Luka, Chernivtsy Region	pit 5	Chormoles	Smirnova 1986	charcoal	Le-2161	2970±40	1270-1110
26.	Dnestrovka-Luka, Chernivtsy Region	pit 4	Chormoles	Smirnova 1986	charcoal	Le-2165	2800±40	995-890
27.	Dnestrovka-Luka, Chernivtsy Region	pit 5	Chormoles	Smirnova 1986	charcoal	Le-2164	2630±50	845-770
28.	Subotiv, Cherkasy Region	hut 4	Bilogrudovka	Klochko, Kovaliuhk, Motzenbecker 1998	charcoal	Ki-5505	3100±40	1410-1310
29.	Subotiv, Cherkasy Region	hut 4	Bilogrudovka	Klochko, Kovaliuhk, Motzenbecker 1998	charcoal	Ki-5502	3040±50	1370-1210
30.	Subotiv, Cherkasy Region	hut 4, pit 1	Bilogrudovka	Klochko, Kovaliuhk, Motzenbecker 1998	charcoal	Ki-5504	3030±60	1370-1170
31.	Subotiv, Cherkasy Region	hut 4	Bilogrudovka	Klochko, Kovaliuhk, Motzenbecker 1998	bone	Ki-5501	2950±45	1250-1070
32.	Subotiv, Cherkasy Region	hut 4	Bilogrudovka	Klochko, Kovaliuhk, Motzenbecker 1998	bone	Ki-5503	2980±50	1310-1090
33.	Subotiv, Cherkasy Region	hut 4	Bilogrudovka	Klochko, Kovaliuhk, Motzenbecker 1998	bone	Ki-5506	2940±50	1240-1050
34.	Subotiv, Cherkasy Region	hut 4	Bilogrudovka	Klochko, Kovaliuhk, Motzenbecker 1998	bone	Ki-5507	2910±55	1210-1010
35.	Subotiv, Cherkasy Region	"sq. 0-11"	Chormoles	Klochko, Kovaliuhk, Motzenbecker 1998	bone	Ki-5863	2935±40	1220-1050
36.	Subotiv, Cherkasy Region	"sq. 0-11"	Chormoles	Klochko, Kovaliuhk, Motzenbecker 1998	bone	Ki-5859	2930±40	1210-1050
37.	Subotiv, Cherkasy Region	"sq. 0-11"	Chormoles	Klochko, Kovaliuhk, Motzenbecker 1998	charcoal	Ki-5858	2910±35	1180-1030
38.	Subotiv, Cherkasy Region	"sq. 0-11"	Chormoles	Klochko, Kovaliuhk, Motzenbecker 1998	bone	Ki-5862	2890±30	1090-960
39.	Subotiv, Cherkasy Region	"sq. 0-11"	Chormoles	Klochko, Kovaliuhk, Motzenbecker 1998	bone	Ki-5869	2860±30	1090-960
40.	Subotiv, Cherkasy Region	"sq. 0-11"	Chormoles	Klochko, Kovaliuhk, Motzenbecker 1998	bone	Ki-5861	2875±40	1120-980
41.	Subotiv, Cherkasy Region	"sq. 0-11"	Chormoles	Klochko, Kovaliuhk, Motzenbecker 1998	bone	Ki-5865	2850±35	1080-940
42.	Subotiv, Cherkasy Region	"sq. 0-11"	Chormoles	Klochko, Kovaliuhk, Motzenbecker 1998	bone	Ki-5860	2845±35	1070-940
43.	Subotiv, Cherkasy Region	"sq. 0-11"	Chormoles	Klochko, Kovaliuhk, Motzenbecker 1998	bone	Ki-5866	2870±50	1130-960
44.	Subotiv, Cherkasy Region	"sq. 0-11"	Chormoles	Klochko, Kovaliuhk, Motzenbecker 1998	bone	Ki-5864	2820±30	1005-925
45.	Subotiv, Cherkasy Region	"sq. 0-11"	Chormoles	Klochko, Kovaliuhk, Motzenbecker 1998	bone	Ki-5868	2830±40	1040-920
46.	Obukhiv, Kiev Region	hut	Bilogrudovka	Otroshchenko 1986	wood	Ki-872	3090±70	1430-1240

* 2003 = . . . in this volume

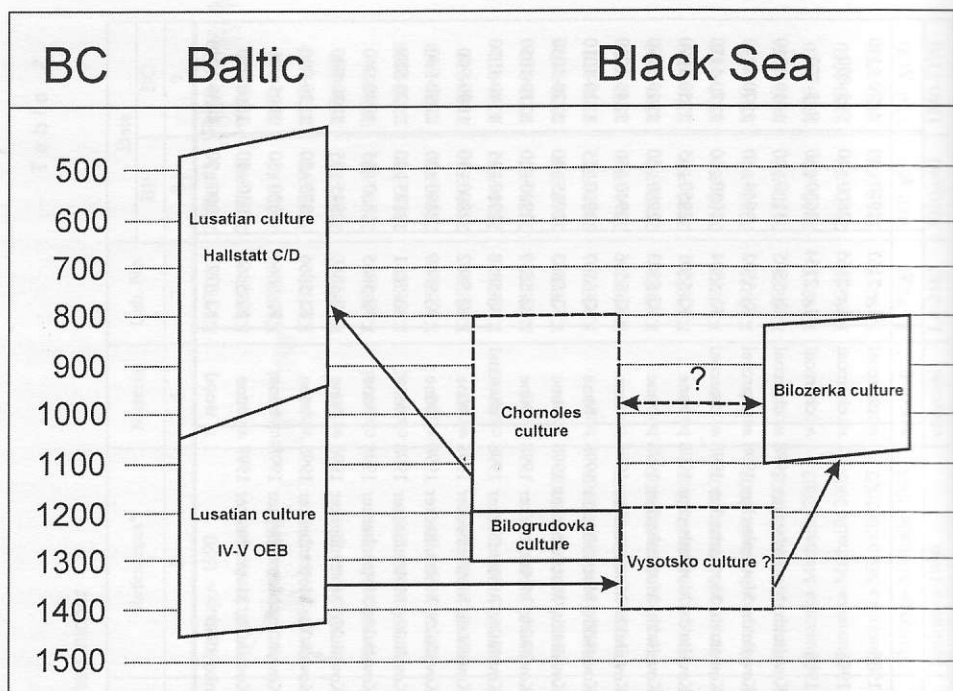


Fig. 4. A radiocarbon chronology scheme in the area between the Baltic and Black seas in the late Bronze Age and early Iron Age

CONCLUSIONS

Relying on the presented radiocarbon measurements concerning taxa found in the lands stretching between the Baltic and Black seas, specifically between the drainages of the Vistula and Dnieper rivers, one can venture to outline their development relationships. The outline should take into account the fact that the area in question witnessed multiple and multidirectional transmissions of cultural elements. The differences revealed in the dating of similar cultural elements in the areas under investigation permit us to surmise what the dynamic of cultural contacts looked like in the late Bronze Age and early Iron Age (see Fig. 4).

At present, one can discern two opposing trends in the transmission of cultural traits in the archaeological materials:

1. The first trend continued along the following path: the LC (late Bronze Age) → presumed VC (group) → the BzC (Fig. 4). An earlier appearance of the cultural patterns mentioned above in the LC setting justifies the view that the LC could be

the carrier of early Urnfield traits. We do not wish to deny a possibility, though, that the said cultures had other traits testifying to their separate genetic connotations.

2. The other trend of cultural transmissions should be placed in a spatially opposite direction of cultural contacts. The existence of such a direction is strongly suggested by the latest research into late (originating in the early Iron Age) LC assemblages in Kujawy [Ignaczak, Głogowski 2003 — cf. Fig. 3]. They are a record of a possibility that cultural traits infiltrated along the east-west line reflected by the following cultural trail: the Chornoles culture → Scythians → late LC groups (or, possibly, the Chornoles culture → Scythians → the Milograd culture → late LC groups). This transmission trail should be treated as opposite to that outlined under 1 above, both culturally and chronologically. Its substratum could have been a cultural element identified with nomadic Scythian populations. Materials exhibiting markers of this trend (“egg-shaped pots” with perforations under the rim, iron razors and nail-like earrings) have been identified so far in assemblages found in southeastern Poland [Lewandowski 1979:124-126] and Kujawy [Grygiel 1996; Ignaczak, Głogowski 2003].

The picture of cultural infiltration between the two seas briefly outlined above needs elaborating. The proposals presented here are, therefore, highly preliminary. A major shortcoming was an insufficient number of ^{14}C dates from the direct “contact zone” (eastern Poland and western Ukraine) and a narrow scope of reference of the chronology to the existing periodization schemes based, for the most part, on metal goods.

Translated by Piotr T. Żebrowski