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## SECOND HALF OF THE 4TH MILLENNIUM BC: TIME OF CHANGES IN THE TRIPOLYE AND FUNNEL BEAKER CULTURES

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### ABSTRACT

The 2012–2019 investigations in Western Ukraine identified the reaches of the Funnel Beaker and Tripolye cultures in western Volhynia and on the upper Dniester, and syncretic phenomena produced in all likelihood by direct contacts between the representatives of these different communities. Moreover, it was found that the contacts were greatly intensified by the exchange of so-called Volhynia flint. It was distributed to both the Late Tripolye Brînzeni group in northern Moldavia and the eastern and south-eastern groups of the FBC. The intensification of contacts between the communities of the two cultures may be associated with the lifetime of the Brînzeni group. The investigations sought to answer the question what changes were induced in these cultures by the intensification of contacts between their populations.

**Keywords:** Western Ukraine, Funnel Beaker culture, Tripolye culture, 4th millennium BC, cultural changes, settlement changes

The aim of the article is to present the current state of research on the relationship between communities of the Tripolye culture (TC) and the Funnel Beaker culture (FBC) in the area between the Western Bug, Dniester and Prut Rivers. Sources and findings used in the paper are an outcome of several new Polish and Ukrainian research activities, including in particular the project entitled *Between the East and the West. Dynamic of Social Changes from the Eastern Carpathians to the Dnieper in the 4th – beginning of 3rd millennium BC* financed by the National Science Center, Poland (Opus 8 UMO 2014/15/B/HS3/02486).

#### TIME OF CHANGES IN THE TRIPOLYE AND FUNNEL BEAKER CULTURES

The second half of the 4th millennium BC was a time of disintegration of the classical settlement system of TC, based on large settlements, which disappeared at that time [Kruc 1994]. Looking for the reasons of their downfall, scholars focus on economic transformations [Kruc 1994; Videiko 2007; Harper *et al.* 2019]. Many researchers claim that these changes were strongly affected by climate changes [Harper 2013; Weninger, Harper 2015], ones that resulted in steppe-formation [Makohonienko 2011]. In addition, they could have been induced by anthropopressure.

These factors could have induced changes in the economic model and related settlement one as well. Publications on economic transformations in the context of demographic ones cursorily treat the question of subsistence [Harper *et al.* 2019; Diachenko 2019] because scholars mainly focus on the change from farming to herding in 3600–3300 BC. Curiously enough, they do not give any detailed model of the organisation of food provision to so large human groups as those that settled Tripolye mega-sites. Apart from the reasons given, the change of the economic-settlement model could have been brought about by changes in the social system or could have induced such changes in its organisation.

Such a general assessment of changes characterizes Lengyel-Polgár (LPC), FBC and Baden culture (BC) communities that settled the uplands and lowlands between the Oder and Western Bug rivers in the 4th millennium BC [Kruk, Milisauskas 1999; Pelisiak 2018]. In palynological diagrams [Kruk 1980; Nowak 1999] with a correct dating [Pelisiak *et al.* 2006; Grygiel 2008; Wacnik, Rybicka 2012; Szmyt 2013], the changes are marked by the presence of man exploring the

environment in a variety of ways. Economic changes in ‘western’ communities correlate with the changes in settlement models [Kruk 1980; Kruk, Milisauskas 1999]. Instead of settling lowlands, such as in the case of Lengyel-Polgar communities that were actively farming, the FBC communities started to settle in higher and drier areas used for agricultural purposes and took to using the slash-and-burn farming method in agriculture. At the end of the 4th millennium, the significance of breeding animals in Funnel Beaker, Baden and Globular Amphora culture communities also increased [Kruk 1980; Szmyt 2013].

The reasons for economic changes within the TC and for example FBC are differently explained. In the first case, the main reason seems to be climate changes [Harper 2017], whereas in the second the anthropogenic impact on the environment is considered [Kruk 1980; Kruk *et al.* 1996; Pelisiak *et al.* 2006]. This shows that in order to understand the phenomenon and dynamics of TC changes, regional studies that are empirical and analogical to the ones carried out in Talianky [Harper 2012] and Maidanetske [Müller *et al.* 2017; Dal Corso *et al.* 2019] should be performed. Currently, it is not possible to describe the dynamics of changes in economic systems used by the communities of the TC and western cultures (Lengyel-Polgar and FBC) in the areas from north Moldavia to western Volhynia. This is a consequence of the lack of studies on the problems of economic and settlement patterns undertaking archaeozoological and archaeobotanical research, which is particularly true of the Brînzeni group. There are no studies either on the use made of particular Brînzeni group settlement zones or the functions of individual houses. Moreover, it is not always possible to precisely date the appearance of different cultural groups of the TC [Rybicka 2017; Harper *et al.* 2019].

According to many researchers, socio-cultural changes of the TC were visibly influenced by migrations of people, e.g. from the Tomashivska group [Harper *et al.* 2019]. The same reason is given to explain the appearance of groups representing the early CII stage with the characteristics of the Moldavian Brînzeni group in Volhynia [Tkachuk 1998; 2005; Ryzhov 2007; Diachenko, Kyrylenko 2016: 126]. Similarities in pottery and other elements between northern Moldavia and western Volhynia were also interpreted as the effects of contacts provoked by the exchange of Volhynia flint [Dergachev 1980: 133]. Furthermore, some researchers assume that the Gordinești group was present in western Volhynia, e.g. settlements Lystvyn-Holyshiv [Pozikhovskij 2019b; Verteletskiy 2019a]. Others claim that the appearance of these settlements is a result of influences from the Gordinești group [Kruts, Ryzhov 2000: 108]. The question remains whether the occurrence of the above settlements may be the consequence of migrations from the south to the north. According to Mykhailo Videiko at that time *‘Migratory processes, mainly of the population of the Carpathian Basin, resulted in the appearance of the Gordinești, Troyaniv cultural types. Their subsequent translocation to the east gave rise to the Sofievka type’* [Videiko 2000: 67]. In western Volhynia

we may observe the presence of western groups (e.g. FBC) or their characteristics visible in the pottery of the TC [Rybicka 2015; 2017; Diachenko *et al.* 2016].

It is difficult to present the set of stylistic traits of TC ceramic ware, especially from the early CII stage, for both Brînzeni group and Volhynia assemblages showing affinity with it [Markevich 1981; Diachenko, Kyrylenko 2016; Rybicka 2017], which hampers the evaluation process of changes at the time of the CII stage of the TC. Bearing in mind the ongoing research, it is possible to specify the main changes that occurred in the area under study in the second half of the 4th millennium BC, in the context of changes occurring in ceramic decoration and new radiocarbon dating methods.

#### TC BRÎNZENI GROUP AND VOLHYNIA

In the second half of the 4th millennium, the Brînzeni cultural group of the TC, occupying northern Moldavia and the areas on the Dniester (Fig. 1), was characterised by medium size settlements (from a few to over ten hectares) located in the hilly terrain of varying altitudes [Markevich 1981; Król 2019]. Moldavian settlements of this group in Brînzeni, Site III, and in Costești, Site IV, were built on an oval plan with a partly built-up *maidan*. There were about 30 houses. It is difficult to specify if all houses were of a social character or maybe, there were areas intended for agriculture and rituals. Settlers grew cereals (various kinds of wheat, barley and millet?) and peas [Markevich 1981: 136; Paszkiewicz 2016: 151], using tools made of imported Volhynia flint. The main breeding animals were cattle, sheep, horses, i.e. the species that were moveable, whereas the role of pigs was not very significant [Markevich 1981: 136]. The basic consumption products were domesticated species.

Communities of that group had strong relations with the FBC, which can be exemplified by the so-called imports of FBC ceramics from settlements in Brînzeni [Markevich 1981; Movsha 1985], Costești [Markevich 1981], Zhvanets [Movsha 1985], found within houses. The issue of relations between the FBC and TC has recently been broadly discussed [Rybicka 2017; Bicbaev *et al.* 2017]. The available age determinations for sites in Brînzeni and Costești are younger than radiocarbon ones obtained for FBC settlements where imports from the Brînzeni group were identified (Table 1 and Fig. 2-3) [Włodarczak 2006; Rybicka 2017; 2019; Bicbaev *et al.* 2017]. One of such settlements is Gródek (Fig. 4) [Gumiński 1989]. This asynchronicity clearly shows that the accepted time frames for the Brînzeni group could be questionable [Rybicka 2017].

The presence of FBC imports in the Brînzeni group is an indicator of direct contact between the communities of the two cultures [Movsha 1985; Rybicka 2017].

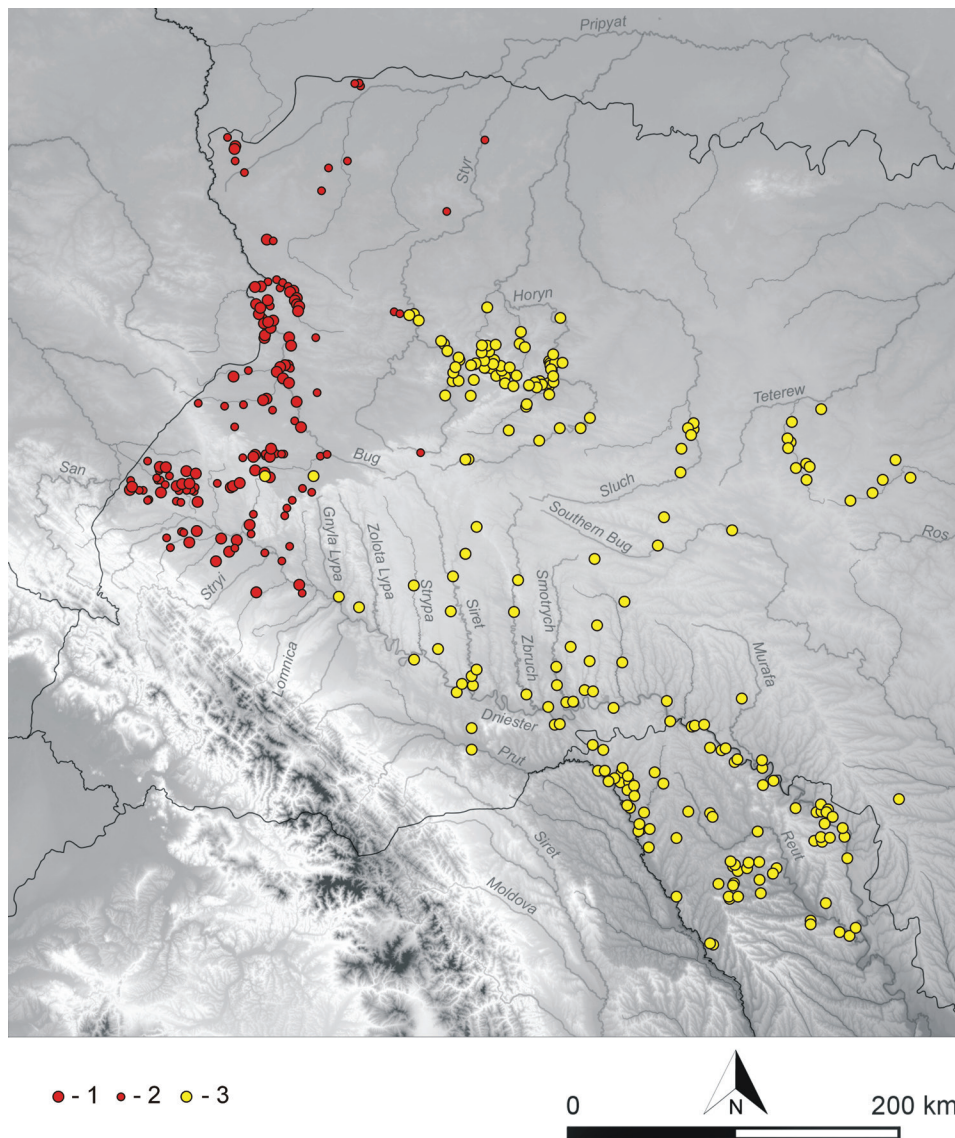


Fig. 1. Distribution of the Funnel Beaker and Tripolye culture (phase CII) sites in western Ukraine and northern Moldavia. Foll. Król 2019

Key: 1 – Funnel Beaker culture settlements; 2 – hypothetical Funnel Beaker culture settlements; 3 – Tripolye culture settlements of phase CII.

The identification of the region where FBC vessels originate and the provenance of assemblages from the sites in Brînzești and Costești, including artefacts made of Volhynia flint, is debatable [Markevich 1981; Movsha 1985].

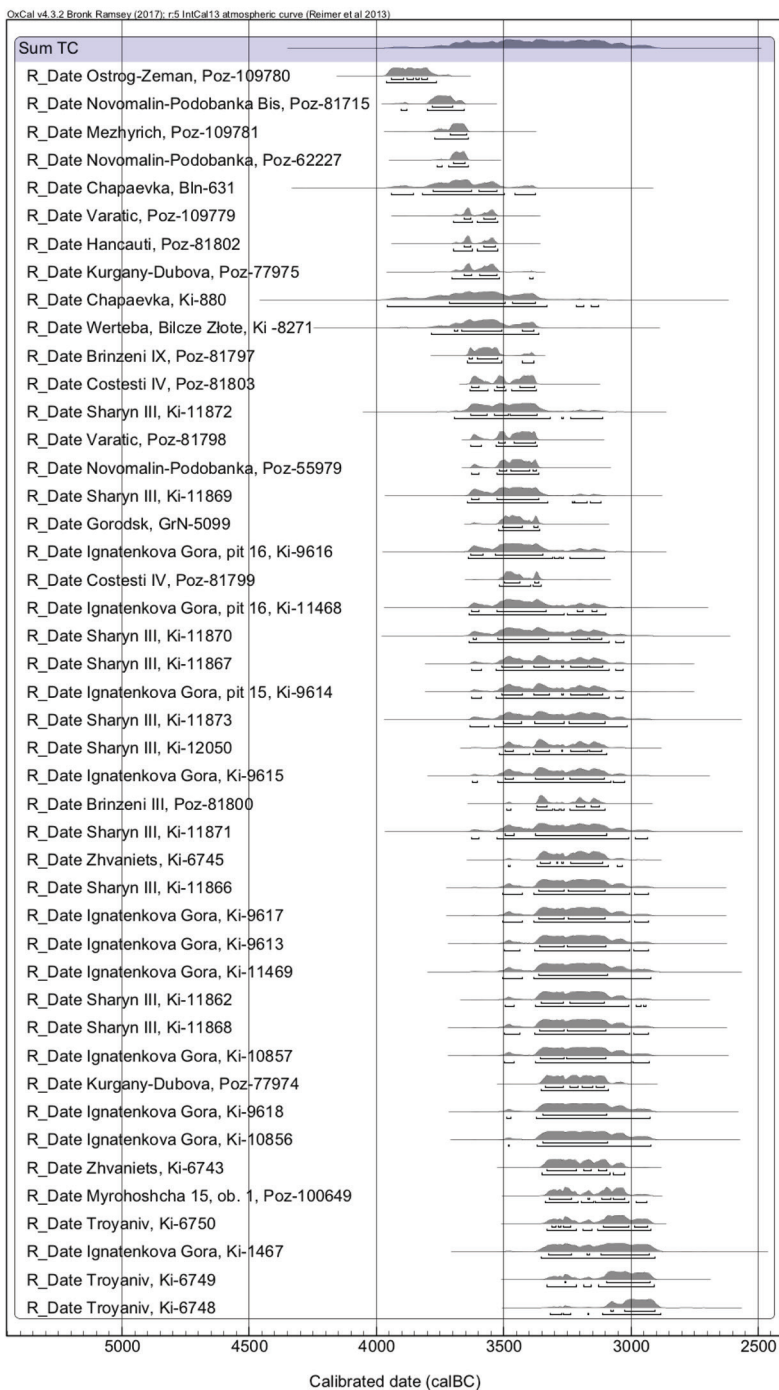


Fig. 2. Radiocarbon dates for the Tripolye culture from the 4th millennium BC from sites in northern Moldavia and Volhynia. The questionable dates from Bilshyvtsi are not included [see Rybicka 2017; Tkachuk 2002]. Calibration in OxCal v4.3.2 [Bronk Ramsey 2017], r5 IntCal atmospheric curve [Reimer et al. 2013]. Foll. Rybicka et al. 2019

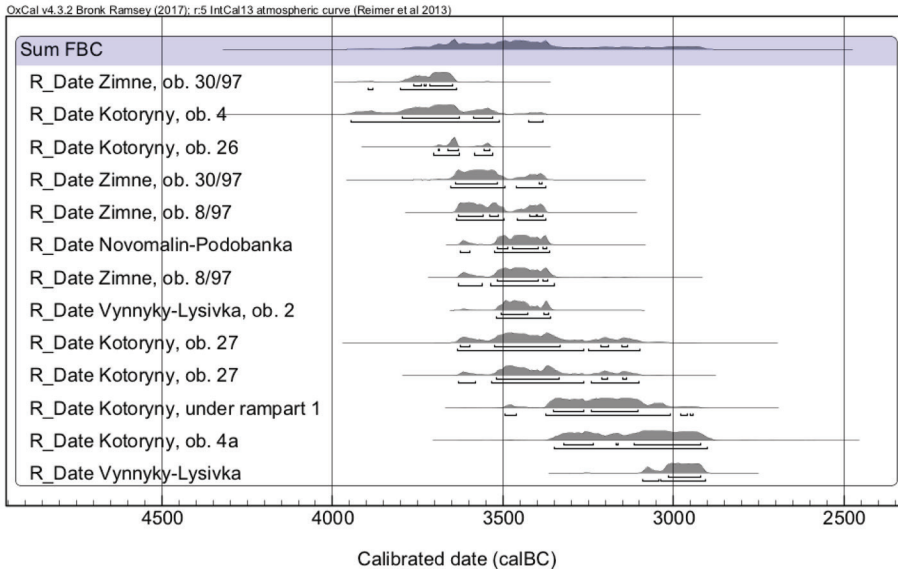


Fig. 3. Radiocarbon dates for the Funnel Beaker culture from the 4th millennium BC from sites in northern Moldavia and Volhynia. Calibration in OxCal v4.3.2 [Bronk Ramsey 2017], r5 IntCal atmospheric curve [Reimer *et al.* 2013]

Assuming that the tools made of Volhynia flint are imported from western Volhynia, where TC and FBC settlements were cultural neighbours, with syncretic ceramics linking both cultures [Rybicka 2015; 2017; Rybicka, Diachenko 2016], it may be suggested that together with Volhynia flint, FBC ceramics reached the area of the Brînzei group. However, this interpretation is not an established one. Therefore, it is worth examining closer the cultural situation in the territory between Volhynia and northern Moldavia.

As a result of recently carried out studies, the upper Dniester, in the area of Kalusch, has been found to mark the south-eastern reaches of the west Ukrainian FBC type. In that area, Kotoryny-*Grodzisko III*, region of Zhydachiv, is found the southernmost settlement of the above-mentioned culture [Hawinskyj *et al.* 2013]. The distance between Kotoryny-*Grodzisko III* and the Brînzei group is about 150 km (Fig. 1). It may be suggested, therefore, that in the borders of the FBC and TC on the upper Dniester, as in western Volhynia, cultural interactions were plainly visible and the communities of the Brînzei group had a direct contact with FBC peoples, so the pottery discovered in Brînzei settlements could have originated with the FBC [Rybicka 2017].

It is difficult to specify the original region of Volhynia flint, as the raw material from Turonian deposits known in the upper Dniester region is difficult to distinguish from the one extracted in western Volhynia [Konopla 1998]. Moreover, there is no

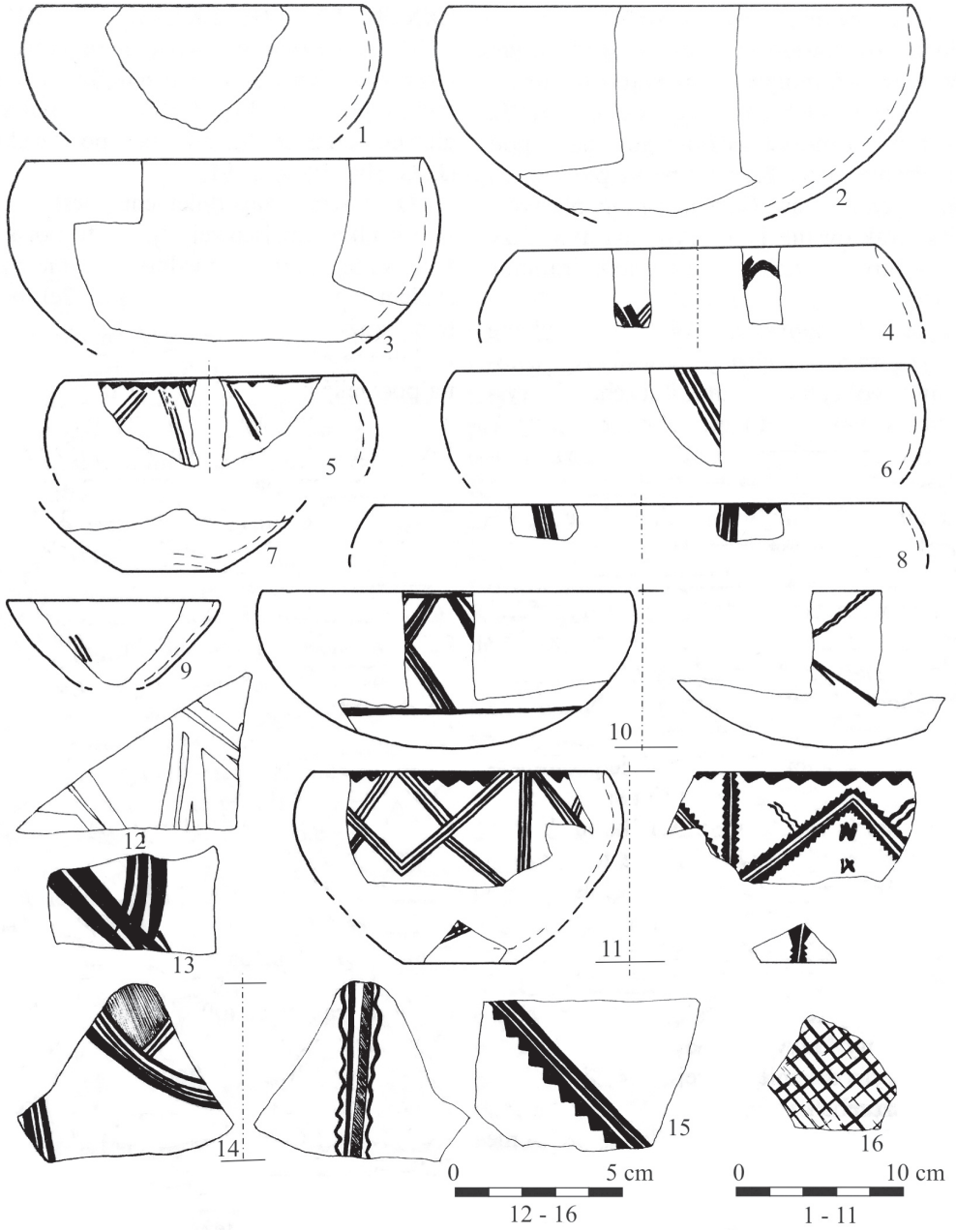


Fig. 4. Gródek, Lublin Province. Pottery of the Tripolye culture in a Funnel Beaker context. Foll. Gumiński 1989



T a b l e 1

List of radiocarbon datings from Tripolye sites in northern Moldova and Volhynia in the 4th millennium BC [Rassamakin 2012; Kadow 2013; Kushtan 2015; Sirbu 2016; Diachenko, Harper 2016; Rybicka *et al.* 2019]. Calibration in OxCal v4.3.2 [Bronk Ramsey 2017], r5 IntCal atmospheric curve [Reimer *et al.* 2013]

Site and sample material	<sup>14</sup> C	68,2%	95,4%	References
Ostrog-Zeman, Rivne District; sample material?	Poz-109780 5060±40 BP	3942 (28.6%) 3894 calBC 3882 (16.9%) 3854 calBC 3846 ( 8.4%) 3831 calBC 3824 (14.2%) 3800 calBC	3963 (95.4%) 3766 calBC	Information by A. Pozikhovskiy. Analyzes made as part of the project managed by K. Karski.
Novomalin-Podobanka Bis, Rivne District; cattle bone from the ploschadka	Poz-81715 4965±35 BP	3782 (68.2%) 3702 calBC	3905 (3.4%) 3880 calBC 3801 (92.0%) 3655 calBC	Król, Rybicka 2016: 120
Mezhyrich, Rivne District; animal bone	Poz-109781 4910±40 BP	3710 (68.2%) 3647 calBC	3770 (95.4%) 3640 calBC	Information by A. Pozikhovskiy. Analyzes made as part of the project managed by K. Karski.
Novomalin-Podobanka, Rivne District; cattle bone from the ploschadka	Poz-62227 4900±30 BP	3697 (68.2%) 3652 calBC	3761 (3.1%) 3742 calBC 3715 (92.3%) 3638 calBC	Król, Rybicka 2016: 120
Chapaevka, Kiev District; charcoal	Bln-631 4870±100 BP	3777 (49.2%) 3626 calBC 3597 (19.5%) 3526 calBC	3942 (7.4%) 3857 calBC 3821 (81.0%) 3497 calBC 3457 (7.0%) 3377 calBC	Rassamakin 2012: 55
Vărătic, Rîșcani District; animal bone	Poz-109779 4830±40 BP	3656 (30.5%) 3631 calBC 3579 (37.7%) 3535 calBC	3698 (45.4%) 3623 calBC 3604 (50.0%) 3523 calBC	Information by K. Karski. Analyzes made as part of the project managed by K. Karski.
Hancăuți, Edineț District; 1986 survey; sample material?	Poz-81802 4830±40 BP	3656 (30.5%) 3631 calBC 3579 (37.7%) 3535 calBC	3698 (45.4%) 3623 calBC 3604 (50.0%) 3523 calBC	Analyzes made as part of the project NCN UMO 2014/15/BHS3/02486
Kurgany-Dubova, Rivne District; pottery	Poz-77975 4820±50 BP	3656 (22%) 3627 calBC 3595 (46.3%) 3527 calBC	3705 (94.0%) 3516 calBC 3398 (1.4%) 3385 calBC	Król, Rybicka 2016: 120
Chapaevka, Kiev District; charcoal	Kiev-880 4810±140 BP	3712 (51.3%) 3494 calBC 3466 (16.9%) 3375 calBC	3958 (93.7%) 3331 calBC 3214 (0.9%) 3186 calBC 3156 (0.8%) 3127 calBC	Rassamakin 2012: 55

Site and sample material	<sup>14</sup> C	68.2%	95.4%	References
Bilce Zlote- <i>Herbea</i> , Termopil District; sample material?	Kiev-8271 4800±100 BP	3693 (2.4%) 3682 calBC 3664 (54.3%) 3506 calBC 3427 (11.5%) 3381 calBC	3785 (95.4%) 3364 calBC	Kadrow 2013: 15
Brânzeni IX, Edineț District; animal bones	Poz-81797 4770±40 BP	3636 (9.2%) 3623 calBC 3604 (59.0%) 3524 calBC	3644 (85.5%) 3507 calBC 3427 (9.9%) 3381 calBC	Analyzes made as part of the project NCN UMO 2014/15/BHS3/02486
Costești IV, Rîșcani District; 1973 survey, SzT-60; sample material?	Poz-81803 4710±35BP	3627 (16.3%) 3596 calBC 3527 (16.3%) 3498 calBC 3436 (35.6%) 3378 calBC	3632 (26.5%) 3561 calBC 3537 (20.9%) 3492 calBC 3469 (48.0%) 3373 calBC	Analyzes made as part of the project NCN UMO 2014/15/BHS3/02486
Sharyn III, Vynnytsa District; ploschadka 2, pottery	Kiev-11872 4700±100BP	3631 (18.5%) 3565 calBC 3536 (16.2%) 3483 calBC 3476 (33.4%) 3371 calBC	3695 (88.7%) 3318 calBC 3273 (0.3%) 3266 calBC 3237 (6.4%) 3111 calBC	Kushtan 2015: 436
Vărătic, Rîșcani District; charred plant debris	Poz-81798 4690±35BP	3519 (15.1%) 3496 calBC 3461 (53.1%) 3376 calBC	3629 (12.4%) 3587 calBC 3530 (83.0%) 3369 calBC	Analyzes made as part of the project NCN UMO 2014/15/BHS3/02486
Novomalın- <i>Podobanka</i> , Rivne District; pottery	Poz-55979 4670±40BP	3516 (16.6%) 3488 calBC 3472 (44.3%) 3398 calBC 3385 (7.3%) 3372 calBC	3627 (6.7%) 3597 calBC 3526 (88.7%) 3363 calBC	Król, Rybicka 2016: 120
Sharyn III, Vynnytsa District; ploschadka 2, daub	Kiev-11869 4670±80BP	3626 (8.1%) 3598 calBC 3526 (60.1%) 3364 calBC	3644 (89.8%) 3326 calBC 3231 (0.2%) 3225 calBC 3220 (2.8%) 3174 calBC 3161 (2.5%) 3119 calBC	Kushtan 2015: 436
Gorodsk, Zhytomyr District; sample material?	GrN-5099 4651±35BP	3506 (58.4%) 3427 calBC 3381 (9.8%) 3367 calBC	3520 (95.4%) 3360 calBC	Rassamakin 2012: 65
Ignatenkova Gora, Cherkasy District; pit 16, bone	Kiev-9616 4650±90 BP	3630 (10.4%) 3581 calBC 3533 (57.8%) 3346 calBC	3639 (79.8%) 3308 calBC 3302 (1.3%) 3282 calBC 3276 (0.8%) 3265 calBC 3240 (13.5%) 3105 calBC	Burdo, Videiko 2010: 115
Costești IV, Rîșcani District; animal bones	Poz-81799 4635±35 BP	3498 (55.7%) 3437 calBC 3378 (12.5%) 3364 calBC	3517 (75.8%) 3396 calBC 3386 (19.6%) 3354 calBC	Analyzes made as part of the project NCN UMO 2014/15/BHS3/02486

Site and sample material	<sup>14</sup> C	68.2%	95.4%	References
Ignatenkova Gora, Cherkasy District; pit 16, pottery	Kiev-11468 4630±90 BP	3627 (5.6%) 3597 calBC 3526 (55.6%) 3334 calBC 3212 (3.9%) 3190 calBC 3153 (3.2%) 3135 calBC	3635 (76.0%) 3262 calBC 3249 (19.4%) 3099 calBC	Burdo, Videiko 2010: 115
Sharyn III, Vynnytsa District; ploschadka 2, pottery	Kiev-11870 4610±100BP	3621 (1.9%) 3608 calBC 3522 (46.6%) 3323 calBC 3234 (11.2%) 3171 calBC 3163 (8.4%) 3116 calBC	3635 (93.5%) 3087 calBC 3060 (1.9%) 3030 calBC	Kushtan 2015: 436
Sharyn III, Vynnytsa District; ploschadka 2, daub	Kiev-11867 4590±80 BP	3509 (21.6%) 3426 calBC 3382 (18.2%) 3320 calBC 3273 (1.1%) 3267 calBC 3236 (15.3%) 3169 calBC 3164 (11.9%) 3113 calBC	3628 (3.0%) 3588 calBC 3530 (90.8%) 3087 calBC 3059 (1.6%) 3030 calBC	Kushtan 2015: 436
Ignatenkova Gora, Cherkasy District; pit 15, bone	Kiev-9614 4590±80 BP	3509 (21.6%) 3426 calBC 3382 (18.2%) 3320 calBC 3273 (1.1%) 3267 calBC 3236 (15.3%) 3169 calBC 3164 (11.9%) 3113 calBC	3628 (3.0%) 3588 calBC 3530 (90.8%) 3087 calBC 3059 (1.6%) 3030 calBC	Burdo, Videiko 2010: 115
Sharyn III, Vynnytsa District; ploschadka 2, pottery	Kiev-11873 4580±100BP	3501 (14.8%) 3430 calBC 3380 (24.3%) 3264 calBC 3242 (29.1%) 3103 calBC	3632 (5.1%) 3559 calBC 3538 (90.3%) 3017 calBC	Kushtan 2015: 436
Sharyn III, Vynnytsa District; ploschadka 2, animal bones	Kiev-12050 4575±60BP	3496 (10.5%) 3461 calBC 3376 (22.1%) 3321 calBC 3272 (0.8%) 3268 calBC 3236 (19.6%) 3170 calBC 3164 (15.1%) 3114 calBC	3516 (20.1%) 3397 calBC 3385 (75.3%) 3094 calBC	Kushtan 2015: 436
Ignatenkova Gora, Cherkasy District; pit 15, bones	Kiev-9615 4570±80 BP	3496 (8.1%) 3461 calBC 3376 (26.4%) 3265 calBC 3241 (33.7%) 3105 calBC	3622 (0.9%) 3606 calBC 3523 (91.0%) 3079 calBC 3071 (3.5%) 3025 calBC	Burdo, Videiko 2010: 115

Site and sample material	<sup>14</sup> C	68.2%	95.4%	References
Brînzeni, site III, Edineț District; ploschadka 7, animal bones	Poz-81800 4560±35 BP	3368 (30.2%) 3330 calBC 3216 (19.9%) 3182 calBC 3158 (18.1%) 3124 calBC	3489 (3.1%) 3471 calBC 3373 (35.2%) 3308 calBC 3302 (2.5%) 3282 calBC 3276 (1.9%) 3264 calBC 3240 (52.7%) 3104 calBC	Analyzes made as part of the project NCN UMO 2014/15/ BHS3/02486
Sharyn III, Vynnytsa District; ploschadka 2, pottery	Kiev-11871 4560±100BP	3496 (6.9%) 3460 calBC 3376 (61.3%) 3097 calBC	3627 (1.9%) 3596 calBC 3527 (90.9%) 3009 calBC 2984 (2.5%) 2935 calBC	Kushtan 2015: 436
Zhvanets, Khmelnytskyi District; dug-out dwelling I, animal bones	Kiev-6745 4530±50 BP	3357 (15.8%) 3318 calBC 3293 (1.1%) 3289 calBC 3273 (2.4%) 3266 calBC 3237 (48.9%) 3111 calBC	3483 (0.3%) 3476 calBC 3371 (93.3%) 3089 calBC 3054 (1.6%) 3033 calBC	Rassamakın 2012: 65
Sharyn III, Vynnytsa District; ploschadka 2, daub	Kiev-11866 4530+80	3363 (27.0%) 3263 calBC 3246 (41.2%) 3101 calBC	3506 (7.0%) 3427 calBC 3381 (85.5%) 3007 calBC 2988 (2.9%) 2931 calBC	Kushtan 2015: 436
Ignatenkova Gora, Cherkasy District; pit 16, bone	Kiev-9617 4530±80 BP	3363 (27.0%) 3263 calBC 3246 (41.2%) 3101 calBC	3506 (7.0%) 3427 calBC 3381 (85.5%) 3007 calBC 2988 (2.9%) 2931 calBC	Burdo, Videiko 2010: 115
Ignatenkova Gora, District Cherkasy District; pit 15, bones	Kiev-9613 4520±80 BP	3358 (25.9%) 3262 calBC 3250 (42.3%) 3099 calBC	3498(4.8%) 3438 calBC 3378 (86.9%) 3005 calBC 2990 (3.7%) 2930 calBC	Burdo, Videiko 2010: 115
Ignatenkova Gora, Cherkasy District; pit 16, pottery	Kiev-11469 4520±90 BP	3364 (68.2%) 3093 calBC	3503 (6.6%) 3428 calBC 3381 (88.8%) 2923 calBC	Burdo, Videiko 2010: 115
Sharyn III, Vynnytsa District; animal bone	Kiev-11862 4520+70	3356 (25.3%) 3262 calBC 3254 (42.9%) 3098 calBC	3497 (3.3%) 3459 calBC 3377 (87.7%) 3000 calBC 2994 (4.4%) 2929 calBC	Kushtan 2015: 436
Sharyn III, Vynnytsa District; ploschadka 2, daub	Kiev-11868 4520+80	3358 (25.9%) 3262 calBC 3250 (42.4%) 3099 calBC	3498 (4.8%) 3438 calBC 3378 (86.9%) 3005 calBC 2990 (3.7%) 2930 calBC	Kushtan 2015: 436
Ignatenkova Gora, Cherkasy District, trench 1, pottery	Kiev-10857 4515±80 BP	3356 (25.3%) 3262 calBC 3254 (42.9%) 3098 calBC	3497 (3.3%) 3459 calBC 3377 (87.7%) 3000 calBC 2994 (4.4%) 2929 calBC	Burdo, Videiko 2010: 115

Site and sample material	<sup>14</sup> C	68.2%	95.4%	References
Kurgany- <i>Dubova</i> , Rivne District; pottery	Poz-77974 4500±35 BP	3336 (26.0%) 3265 calBC 3241 (12.6%) 3210 calBC 3193 (16.6%) 3151 calBC 3138 (13.0%) 3105 calBC	3355 (95.4%) 3091 calBC	Król, Rybicka 2016: 120
Ignatenkova Gora, Cherkasy District; pit 16, bones	Kiev-9618 4500±80 BP	3348 (68.2%) 3096 calBC	3488 (1.2%) 3472 calBC 3372 (94.2%) 2926 calBC	Burdo, Videiko 2010: 115
Ignatenkova Gora, Cherkasy District; trench 1, pottery	Kiev-10856 4490±80 BP	3347 (68.2%) 3091 calBC	3482 (0.2%) 3479 calBC 3370 (95.2%) 2923 calBC	Burdo, Videiko 2010: 115
Zhvanets; Khmelnytskyi District; dwelling 2, animal bones	Kiev-6743 4480±40BP	3331 (45.3%) 3214 calBC 3186 (10.9%) 3156 calBC 3127 (11.9%) 3095 calBC	3349 (87.3%) 3082 calBC 3069 (8.1%) 3026 calBC	Rassamakin 2012: 65
Myrohoshcha, Rivne District; feature 1, animal bones	Poz-100649 4450±35 BP	3322 (31.5%) 3235 calBC 3171 (2.4%) 3163 calBC 3116 (14.5%) 3079 calBC 3071 (19.8%) 3025 calBC	3337 (40.4%) 3208 calBC 3194 (8.9%) 3149 calBC 3141 (42.7%) 3009 calBC 2981 (3.4%) 2939 calBC	Verteletskyy, Bardetskyi 2018
Troyaniv, Zhytomyr District; dwelling 25; bone	Kiev-6750 4430±45 BP	3312 (4.3%) 3295 calBC 3287 (2.9%) 3275 calBC 3265 (8.7%) 3238 calBC 3107 (39.5%) 3008 calBC 2985 (12.7%) 2934 calBC	3332 (27.3%) 3213 calBC 3188 (5.3%) 3155 calBC 3131 (62.8%) 2921 calBC	Burdo, Videiko 2010: 118
Ignatenkova Gora, District Cherkasy; pit 16, pottery	Kiev-1467 4430±90 BP	3324 (20.9%) 3233 calBC 3172 (2.2%) 3162 calBC 3118 (45.1%) 2928 calBC	3352 (95.4%) 2906 calBC	Burdo, Videiko 2010: 115
Troyaniv, Zhytomyr District; remains of the ploschadka I, animal bones	Kiev-6749 4410±50 BP	3261 (1.4%) 3256 calBC 3097 (66.8%) 2925 calBC	3331 (18.9%) 3215 calBC 3185 (3.3%) 3156 calBC 3127 (73.2%) 2909 calBC	Burdo, Videiko 2010: 118
Troyaniv, Zhytomyr District; animal bones	Kiev-6748 4360±55 BP	3081 (4.8%) 3069 calBC 3026 (63.4%) 2907 calBC	3317 (2.2%) 3273 calBC 3266 (2.7%) 3237 calBC 3168 (0.1%) 3165 calBC 3111 (90.4%) 2885 calBC	Burdo, Videiko 2010: 118

information about any settlement functioning in the area on the upper Dniester that would relate to distribution centres of Volhynia flint items within the Brînzeni group as in the case of the FBC trading post identified in Gródek on the Western Bug [Balcer 1983; Diachenko, Rybicka 2019]. It is very likely that the FBC settlement in Gródek was the distribution centre of Volhynia flint items to the south-eastern and eastern groups of this culture [Balcer 1983; Diachenko, Rybicka 2019]. Yet, another possibility to interpret the origin of Volhynia flint within the range of the Brînzeni group is the import from western Volhynia. It is hard to say whether the communities of the Brînzeni group received finished, semi-finished or processed products made of Volhynia material in its settlements [Markevich 1981].

The traits of the Brînzeni group were recorded in western Volhynia [Kruts, Ryzhov 2000], including the Ostrog area, where they are identified in settlements such as Khoriv and Novomalin-*Podobanka* [Diachenko, Kyrylenko 2016; Vertetskyi 2016]. Their presence may be the result of migration of some part of population or a small group of people [Dergachev 1980: 132; Tkachuk 1998; Ryzhov 2007; Diachenko, Kyrylenko 2016]. But it is also possible that the traits of the Brînzeni group accompanied the trade or exchange of Volhynia flint [Dergachev 1980: 133].

Why did some members of the Brînzeni group decide to migrate to the north, to Volhynia? What could have been the main reason and when did it happen?

Based on the data collected in the area of northern Moldavia and Transnistria (Fig. 1) [Król 2019], it can be claimed that the group was not very numerous and settlements were relatively small [Markevich 1981]. The authors of a recently published study, regarding the relation between the environmental status and population size, claimed that the suitability of the habitat for colonization depended on the availability of resources, with the latter decreasing together with the growth of population [Harper *et al.* 2019]. Taking into account the above mentioned data, the migration of Brînzeni groups was not a consequence of their increasing numbers and an environmental crisis caused by anthropopressure, when farming ceased to be possible. According to Harper [2017], between 3825 and 3650 BC the climate cooled down e.g. in Moldavia, causing changes in settlement and economic systems in favour of a more mobile settlement, while more convenient economic conditions appeared around 3300 BC [Harper *et al.* 2019]. On the basis of radiocarbon dating, benchmark settlements of the Brînzeni group may be dated to 3400–3100 BC, while settlements such as Novomalin-*Podobanka* may refer to 3500–3300 BC (Fig. 2 and Table 1). The last dating conforms well to the chronology of settlements of the eastern and south-eastern FBC with imports of Brînzeni group traits [Rybicka 2017; 2019].

Important results have been obtained on relationships between the environment and the size of population it supported in respect of Volhynia, *‘where habitat suitability predictably decreases as population increases during the Neo-Eneolithic, but then increases in population during the Terminal Eneolithic and EBA*

transition. This may be reflective of changes in subsistence strategy accompanying the colonization of the region by populations belonging to the Brînzeni local group' [Harper *et al.* 2019: 98].

A complicated settlement and cultural situation in western Volhynia, and relatively poor reconnaissance of the territory and observed cultural borders between the western and eastern world [Rybicka 2017] are problematic for geographical and settlement analysis. Although it is possible to determine the range of the FBC oecumene in Volhynia with the left bank of the Styr River as its border (Fig. 1), it is difficult to identify the size of the area occupied by previous western communities of the Malice culture (MC) and Lublin-Volhynia culture (LVC). The settlement strategies of these communities are well described for the regions to the west of the Western Bug River [Kruk 1980; Kruk, Milisauskas 1999; Pelisiak *et al.* 2006; Rybicka 2004; Grygiel 2008; 2016]. To the east of the river, they may not deviate significantly from the strategies typical of these communities in their original territories.

A particularly complicated settlement and cultural situation is observed in the area of Dubno and Ostrog, western Volhynia [Pozikhovskiy, Samolyuk 2008; Pasterkiewicz *et al.* 2013; Diaczenko *et al.* 2016; Verteletskiy, Bardetskiy 2018]. Materials of the MC (Ostrog-Zeman) [Pozikhovskiy 2019a] or LVC (Mezhyrich; Pozikhovskiy, personal communication), as well as FBC and MC (Novomalin-Podobanka, *cf.* Fig. 5) [Król, Rybicka 2016; Rybicka 2017], discovered within the TC context, presence of functionally differentiated remains of the TC

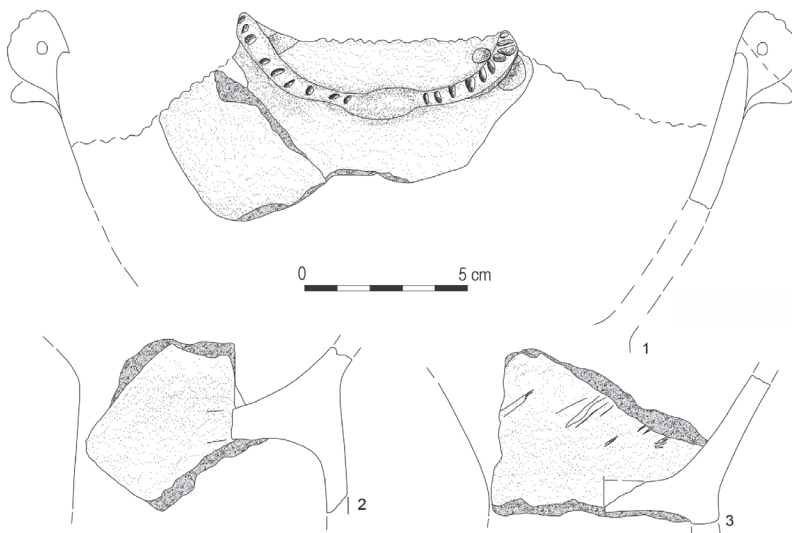


Fig. 5. Novomalin-Podobanka, Rivne District. Pottery of the Lengyel-Polgár culture in a Late Tripolye context. Foll. Król, Rybicka 2016

(e.g. flint workshop in Mezhyrich; Pozikhovskiy, personal communication), relatively high-lying permanent settlements (Ostrog-Zeman and Novomalin-Podobanka) [Pozikhovsky, Samolyuk 2008; Diaczenko *et al.* 2016; Pozikhovskij 2019a], low-lying small settlements of certain economic functions such as Kurgany-Dubova, all show that models of settlement were diversified and the choice of land for settlement purposes could have been made according to the type of activities carried out there [Kobyliński 1986; Kruk *et al.* 1996]. Settlements that combine the traditions of the TC and MC, dated to ca 4000-3800 BC, were situated on both higher stretches of land (e.g. Ostrog-Zeman) [Pozikhovsky, Samolyuk 2008; *cf.* also Pozikhovski, Karski in this volume] and lower ones (Kurgany-Dubova) [Diaczenko *et al.* 2016], as were settlements with Brînzeni group traits (low-lying: Mezhyrich, high-lying: Novomalin-Podobanka) [Pasterkiewicz *et al.* 2013; Diaczenko *et al.* 2016]. In this situation, it is hard to agree with the presented hypothesis [Harper *et al.* 2019] that the settlements with Brînzeni group traits are connected with the change of settlement and agricultural strategies especially because in neither case they are well identified.

Nevertheless, it is worth mentioning that the period of 4000-3600 BC is characterised by the presence of settlements combining the TC and MC or LVC in this region (Table 1). There is no information about culturally pure settlements such as the LVC or FBC. However, in the case of the FBC, there is a description of a region near Ostrog (on the middle Horyn River) where the relations between the communities of the FBC and TC, resulting in the appearance of syncretic phenomena, could be observed [Rybicka 2017].

Economic strategies of FBC communities between the Western Bug and Oder rivers are well identified. Their typical trait is the extensive slash-and-burn method of agriculture in the period between 3600 and 3300 BC when a significant role was played by Volhynia raw materials [Kruk, Milisauskas 1999; Pelisiak *et al.* 2006; Rybicka 2004; 2017; Grygiel 2016]. The remains of settlement of that culture and TC from Novomalin-Podobanka fit well in this time. It is difficult to determine the agricultural and settlement systems of the TC in Volhynia at that time and to find out whether the communities settling this region in the first half of the 4th millennium were actively engaged in agriculture as were the communities of the Lengyel-Polgar culture, or if a different kind of agricultural strategy was practiced. The suggested change of agricultural strategy [Harper *et al.* 2019] was not necessarily the effect of migration from the south, especially because those people were not representatives of all TC Brînzeni group traits. The migrants did not enter an unsettled area as the land had previously been inhabited by the western Lengyel-Polgar communities and TC groups. It is hard to determine what interactions took place between the respective cultures and how intensive TC settlement was. According to Diachenko and Kyrylenko: ‘*The pure complexes of Tripolye BII near Ostrog are clearly unknown. As for possible single Tripolye imports in Malice materials, the possibility of such is theoretically not excluded,*



*especially taking into account the location of monuments of stage BII to the south and east of the analyzed region* [Diachenko, Kyrylenko 2016: 126]. Taking into account the presence of a pottery kiln in Ostrog-*Zeman* [Pozikhovskyy 2019a] and the predominance of TC artefacts e.g. in a flint workshop in Mezhyrich dated to 3800–3600 BC (Table 1), it may be assumed that the identified ceramics with Polgarian traits were imported items [see Pozikhovski, Karski, in this volume]. These facts therefore show the continuity of settlement process in the Ostrog region.

The extensive and substantial knowledge on Volhynia flint-tool production technology characteristic of Novomalin-*Podobanka* settlement inhabitants in this context weakens the conception about migration of autochthons from the Brînzeni group to Ostrog [Dobrzyński, Piątkowska 2015]. The tools made of Volhynia flint are associated with the second stage of settlement by Brînzeni communities in the discussed region [Diachenko, Kyrylenko 2016: 126]. It would be desirable to compare whether the treatment method of Volhynia raw material from the previously dated workshop in Mezhyrich (Pozikhovskyy, personal communication) was analogical to the one characteristic of Novomalin-*Podobanka*. If the production technology is analogical, it means that information regarding the discussed matter was continuously passed from one generation to another.

Diachenko and Kyrylenko suggested that migrants from the south, from the range of the Brînzeni group reached Volhynia carrying its full cultural package, consisting of settlement topography, pottery traits, house construction characteristics, etc. [Diachenko, Kyrylenko 2016: 129]. It is difficult to estimate the degree of similarity between the materials from settlements on the Sluch River, i.e. Kolodyazhyn, Korzhivka-*Selysko*<sup>1</sup> and the Brînzeni group; however, it can be assumed that the observed traits of the Brînzeni group are an outcome of migration from the south. The appearance of these people in western Volhynia may be an effect of other cultural types of behaviour.

The stylistics of ceramics is another factor weakening the significance of assumptions about migration. The appearance of Brînzeni pottery in Volhynia does not mean the full identity of its assemblages with those in the native area in the south [Kruts, Ryzhov 2000; Diachenko, Kyrylenko 2016: 129]. Few traits of the Brînzeni style (i.e. motifs of figures, narrative scenes, extensive symbolic traits) were identified in the currently most distinctive complex for the early CII stage from western Volhynia in Novomalin-*Podobanka* [cf. Markevich 1981; Verteltskyy 2016]. Only the most common traits, such as the motif of hatched triangles in the type of the ‘wolf’s teeth’, were distinguished [Verteltskyy 2016].

Ornamentation of vessels from Novomalin-*Podobanka* is considerably different from the one identified in the Brînzeni settlement found in Zhvanets. If we,

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<sup>1</sup> Selective publication of materials from eastern Volhynia and mid Dniester area hampers making such comparisons [Kruts, Ryzhov 2000].

however, were to consider that settlements such as Novomalin-*Podobanka* are the result of migrations from the south, we could ask why they are not representative of the whole gamut of traits, for example stylistic traits of the Brînzeni group, but only show the most common motifs that do not pose a cultural identity [see Levi-Strauss 1979; Malinowski 1986]. Such information undermines the concept of migration of Brînzeni communities to the north.

Regarding other characteristics of the Brînzeni group such as the spatial development of these settlements, it is impossible to make such a comparison due to the lack of pertinent data for western Volhynia. Currently, we cannot determine whether the influence of the Brînzeni group decreased together with geographical distance.

Valentin Dergachev opined: '*Intensive cultural and trade-exchange relations of the tribes of Volhynia with the population that left the Brînzeni [...] monuments are clearly indicated by the presence of [...] relatively numerous products made of Volhynia flint.*' [Dergachev 1980: 133]. According to Bogdan Balcer the presence of imported flint materials may reflect the intensity of contacts between various cultural groups [Balcer 1981: 97; 1983]. It is difficult to tell what the significance of items made of Volhynia materials was in the communities of stage CII of the TC from eastern Volhynia. In the case of the Brînzeni group, items made of this material are said to have played an important role in agriculture [Markevich 1981]. The areas occupied by FBC groups, located far from the eastern borders of this culture, along with the exchange of raw materials, were reached by the traits of the TC sometimes with imports of ceramics from its own circle. It may be assumed that, as a consequence of direct contacts connected with the exchange of Volhynia flint between populations living in eastern and western Volhynia, the characteristics of the Brînzeni group reached the region of Ostrog.<sup>2</sup> This fact may indicate the presence of FBC ceramics in Korzivka-*Selysko* in eastern Volhynia [Kruts, Ryzhov 2000: 97].

To conclude, the archaeological data do not give any reasons for a total acceptance of the hypothesis about migration of Brînzeni group communities from the south to east Volhynia. Nonetheless, the presence of Volhynia raw material, identified within the assemblage, in the settlements of their homeland emphasizes the importance of material exchange. Such activities may relate to the spread of traits of the Brînzeni group from the south to the north and the appearance of imitations of its ceramic ware and anthropomorphic figures in the region of Ostrog [Verteltskyi 2016].

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<sup>2</sup> To assess the intensity and routes of contacts between the TC communities of stage CII, settling eastern and western Volhynia and lands on the Dniester, it would be necessary to study how intensively the Volhynia raw material was used and compare the traits (morphology, technology and ornamentation) of pottery from settlements there.

## FBC IN WESTERN UKRAINE (3700/3600-3000/2900 BC)

Studies on the FBC in Western Ukraine have allowed researchers to define the border of the eastern range of the culture [Hawinskyj *et al.* 2013; Havinskyi, Pasterkevich 2016a]. In western Volhynia, the range of mobile settlement is marked by the River Styr (Fig. 1) [Rybicka 2017], whereas the remains of the settlements of this culture identified in the area of Ostrog or Dubno do not confirm their permanent habitation, however, the research findings might be treated as the effect of mutual and direct contact with the TC [Rybicka 2017]. The discoveries there of many FBC artefacts within TC settlements [Pasterkiewicz *et al.* 2013], including syncretic materials combining the traits of both cultures [Rybicka 2016], justifies the treating of this region as a cultural frontier [Rybicka 2017]. In this context, of special significance are the investigation results in Novomalin-*Podobanka* that provided evidence for mutual direct contacts between FBC and TC communities [Rybicka 2017]. It is difficult to determine the culture's southern range. The south-eastern border might be set by the upper Dniester in the region of Zhuravno Kanion [Harmata *et al.* 2013]. It is defined by the settlement in Kotoryny-*Grodzisko III* situated on the upper Dniester [Hawinskyj *et al.* 2013; Król 2019].

The beginnings of settlement around Kotoryny-*Grodzisko III* by FBC groups can be dated to 3700–3600 BC (Fig. 3). The ornamental style of ceramics used at that stage refers to the early stages of the eastern group of this culture [Czerniak, Koško 1993; Grygiel 2016]. In this context, some analogical materials have recently been identified in the Rzeszów-Przemyśl loess areas [Rybicka 2016a; Sieradzka, Głowacz 2017]. One may presume, therefore, that it was from this region that early FBC ideas reached the upper Dniester. This presumption is supported by the similarity of flint raw-materials used [Rybicka 2017].<sup>3</sup>

Based on radiocarbon dating and the presence of ceramics with the characteristics of the Baden culture [Hawinskyj *et al.* 2013], one can suggest the existence of the multi-phase settlement in Kotoryny-*Grodzisko III* until around 3300/3100 BC (Fig. 3). Settlements such as Vynnyky, site *Lysivka* [Diachenko *et al.* 2019], Leżnica, site *Czub* [Rybicka *et al.* 2019], II stage of settlement in Zimne [Bronicki *et al.* 2003; Peleshchyshyn 2004; Rybicka *et al.* 2019] represent the youngest stage of this culture in Ukraine, characterised by a conservative style of ceramics. The assemblages do not include many examples with decorations suggesting younger stages of eastern and south-eastern groups of the FBC such as broad

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<sup>3</sup> In both Kotoryny-*Grodzisko III* and at the early stage of the FBC, Volhynia-type flint dominated. The difficulty in distinguishing macroscopically between Dniester and Volhynia flint prevents answering the question whether communities inhabiting these regions (i.e. ones living on the Dniester and in Volhynia) stayed in contact. For this reason, physicochemical research is carried out at Rzeszów University to find traits differentiating one kind of flint from the other. Its results will help answer this question.

decorations made with a cord or *Furchenstich* ornamentation [Koško 1981; Rybicka *et al.* 2014]. The basic ornamentation motifs are simple decorations characteristic of the early stages of the eastern group with a minor role played by the traits of the south-eastern group [Hawinskyj *et al.* 2013; Rybicka *et al.* 2019], neighbouring on the oecumene of the western Ukrainian FBC community (Fig. 1).

The main flint material used by the communities in the above-mentioned region was Volhynia raw material, both in eastern Roztocze [Sobkowiak-Tabaka 2019] and on the upper Dniester [Konopla 2013], while the role of western materials such as Świeciechów flint was minor; it could have been imported in the younger stages of the culture under discussion [Konopla 2019].

The limited presence of stylistic traits typical of the south-eastern FBC group and flint materials predominating in this region show that communities residing in the region between the upper Dniester and Upper Western Bug were not in constant contact with the communities of this culture, living in the western regions [Rybicka *et al.* 2019]. An interesting fact is that despite the short distance from Volhynia flint deposits (about 80 km), the inhabitants of a settlement in Vynnyky-*Lysivka* were very economical with the use of Volhynia flint [Sobkowiak-Tabaka 2019].

From the very beginning, FBC groups from Western Ukraine maintained relations with the communities of the TC, reflected in the imports of serving ceramics identified in both the early stages of settlements in Kotoryny-*Grodzisko III* [Hawinskyj *et al.* 2013] and Zimno [Peleshchyshyn 2004], dated to 3650–3400 BC [Włodarczak 2006], and the later stage represented by settlements such as Rudniki [Konopla, Havinskyi 2013], Małe Grzybowice [Havinskyi 2009], Leżnica-*Czub* [Rybicka *et al.* 2019] and Vynnyky-*Lysivka* [Havinskyi 2013; Rybicka *et al.* 2018; Diachenko, Rybicka *et al.* 2019].

Among the pottery of the three above-mentioned settlements, there were some examples following the technologies and style of TC ceramics [Rybicka *et al.* 2019; Rauba-Bukowska 2019]. Of particular significance, typical FBC ceramics from the Vynnyky-*Lysivka* site were made using the technology of TC serving ceramics (Fig. 6-7). Their chronology makes reference to Stage II of the settlements in Gródek and Zimne (Fig. 3) [Rybicka *et al.* 2019; Rybicka 2019]. Similarly as in the case of the TC of the CII stage in western Volhynia, adapting the patterns of FBC technologies for making cooking ceramics [Rybicka 2017], the communities living in the mentioned settlements adapted some traits of the TC [Rybicka *et al.* 2019].

Stable FBC settlements in Western Ukraine were founded on high flat hilltops [Hawinskyj *et al.* 2015; Rybicka 2017]. Similar locations were occupied by the settlements of, for instance, Brînzeni and Gordinești groups [Markevich 1981; Rybicka 2017; Król 2019; Verteletskyi 2019b].

It is not possible now to describe the rate of settlement rule changes, in particular of the FBC settlement model in the area under discussion. Nonetheless, it



Fig. 6. Vynnyky-*Lysivka*, Lviv District. Pottery of the Funnel Beaker culture with the traits of the Tripolye culture



Fig. 7. Vynnyky-*Lysivka*, Lviv District. Pottery of the Funnel Beaker culture with the traits of the Tripolye culture

must be stressed that both the oldest known settlement at Kotoryny-*Grodzisko III* [Hawinskyj *et al.* 2013] and others representing younger FBC stages in Western Ukraine such as Vynnyky-*Lysivka* [Diachenko *et al.* 2019], Małe Grzybowice [Hawinskyj 2009], Leżnica-*Czub* [Rybicka *et al.* 2019], Zimno [Peleshchysyn 2004] share the location characteristics described above.

The areas chosen for settling did not exceed 4 hectares (Vynnyky-*Lysivka*) and thus were not large [Diachenko, Rybicka 2019]. However, we do not know the rules of laying out these settlements, relations between houses and ways of using settlement space.

It is not possible to say how they were constructed or how many houses functioned there at the same time. The remains of houses were identified in the form of clusters of daub. They are not equivalent to the construction characteristics of the Brînzeni group [Markevich 1981]. Moreover, the households greatly differed from the ones characteristic of the TC [Markevich 1981; Diachenko, Rybicka *et al.* 2019]. Currently, it is not possible to describe the rate of changes in the planning of FBC settlements. It is difficult to determine whether the intensification of relations between the FBC and TC resulted in changes in the agricultural and settlement systems of the FBC. According to Agata Sady, a great deal of similarity may be observed between the FBC and TC in the range of cultivated plants with the predominance of *Triticum dicoccon*, while *Triticum monococcum* is only an additive to sowing emmer wheat and does not pose the basis for monocultural cultivation [Sady 2019].

On the basis of available data, it is impossible to tell, both in the case of the FBC and TC [Markevich 1981; Zabilska 2013] what agricultural practices were followed for cultivation and farming [Kruk 1980: 326-333] or which animals were intended for consumption. The lack of data that would allow comparison of changes between the agricultural and settlement systems hampers the description of mutual relations between the two cultures.

#### FBC TRIPOLISATION AND TC BEAKERISATION: TWO PARALLEL PROCESSES IN WESTERN UKRAINE?

Some researchers connected the first process (*tripolisation*) with FBC communities on the Western Bug River [Koško 1981; Jastrzębski 1989]. However, intensification and diversity in relations between the two cultures may be observed in Volhynia where Volhynia flint proved to be a cultural accelerant [Rybicka 2017: 148-151]. The significance of the community settling the Horyn drainage basin for the intensification of contacts between the FBC and TC was already suggested by Koško [1981].

On the basis of available data, it is suggested that in the early CII stage dated to 3500–3350 BC, there were vessels of the FBC made in TC cooking ware technology and a small assemblage of TC cooking ware made of clay mass with grog (*cf.* Novomalin-*Podobanka*) [Rybicka 2017]. In 3300–3100 BC, there was a change in the production of TC vessels [Rybicka 2016b]. In the case of Vynnyky-*Lysivka* and Ležnica-*Czub*, representing the close of the 4th millennium BC, there appeared FBC ceramics made similarly to the technology of TC serving ware [Rybicka *et al.* 2019]. In this regard, the available sources confirm the process of both *tripolisisation* of FBC pottery and *beakerisation* of TC pottery in western Ukraine.

## CONCLUSIONS

At the end of the first half of the 4th millennium BC, in the western and south-eastern FBC groups, slash-and-burn agriculture [Kruk, Milisauskas 1999; Pelisiak *et al.* 2006] and the use of tools made of imported Volhynia flint became very common [Rybicka 2017; Diachenko, Rybicka 2019]. The territory inhabited by the communities of this group grew larger and incorporated the lands between the Bug, Styr and upper Dniester [Rybicka *et al.* 2019]. In the south-east and south, it bordered on the territory inhabited by the communities of the TC Brinzeni group or groups bearing similar traits.

According to cultural anthropologists, the most intensive contacts, such as exchange and mutual interaction between the communities of different cultures, can be observed in cultural borders *sensu stricto* [Barth 2004; Wojakowski 2013; Pasterska *et al.* 2016: 7-21]. This phenomenon was noted in western Volhynia (site Novomalin-*Podobanka*) [Rybicka 2017] and within the Brinzeni group [Bicbaev *et al.* 2017]. TC communities functioning around Ostrog had direct contact with FBC communities, adapting some technologies of Funnel Beaker pottery and vice versa. These communities were responsible for the trade/exchange of Volhynia raw material [Balcer 1983; Diachenko, Rybicka 2019]. Along with the distribution of the flint to the west, Tripolye items or their imitations became more common within the FBC environment [Rybicka 2017; Rybicka *et al.* 2018]. At that time, agriculture intensified [Pelisiak *et al.* 2006]. It is not possible now to make an overall assessment how the contacts with the TC changed the economic and settlement systems of the FBC eastern and south-eastern groups. Note must be taken, however, of the emergence in the south-eastern group in 3600–3400 BC of both settlements laid out in a circle with a *maidan* left empty [Rybicka 2004] and large settlements [Kruk, Milisauskas 1999; Włodarczak 2006]. The absence of data on the layout of FBC settlements in Western Ukraine makes it difficult to arrive at a clear interpretation of the origin of this idea. These data may confirm

suggestions by Koško [1981] about the high significance of the TC for changes taking place within the FBC.

At the beginning of the second half of the 4th millennium BC, western Volhynia was the centre of distribution for items/raw material of Volhynia flint for a few hundred km to the west, east and south from its deposit [Diachenko, Rybicka 2019; Spinei 2019]. Volhynia flint was the connecting factor between various communities. Together with the flint, FBC imports of pottery or their imitations reached TC settlement, which is evidenced by materials from sites at Korzhivka-*Selysko* [Kruts, Ryzhov 2000] or Gorodsk [Videiko 2000; Burdo, Videiko 2010]. As in the case of adapting TC traits by Funnel Beaker communities also this time the further from the Funnel Beaker oecumene, the less connection between the TC and FBC can be observed.

Volhynia flint was also used by the communities of the Brînzeni group. The trade/exchange of flint disseminated some pottery motifs of this group among the communities of the TC living in western Volhynia. However, the unification of traits between the north and the south did not occur [Verteletskyi 2015]. This raises the question about the very nature of the migration of Brînzeni group communities to western Volhynia.



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