

**THE FOUNDATIONS OF RADIOCARBON
CHRONOLOGY OF CULTURES BETWEEN
THE VISTULA AND DNIEPER:
3150-1850 BC**

**Ivan T. Chernyakov
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Aleksander Koško
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Jan Machnik
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Alla V. Nikolova
Vadim V. Skripkin
Marzena Szmyt
Mihailo Y. Videiko**

BALTIC-PONTIC STUDIES

V O L U M E 7 • 1999

BALTIC-PONTIC STUDIES
61-809 Poznań (Poland)
Św. Marcin 78
Tel. (061) 8536709 ext. 147, Fax (061) 8533373

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INSTITUTE OF EASTERN STUDIES
INSTITUTE OF PREHISTORY
Poznań 1999
ISBN 83-86094-06-0
ISSN 1231-0344

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Cover Design: Eugeniusz Skorwider

Linguistic consultation: John Comber

Printed in Poland

Computer typeset by PSO Sp. z o.o. w Poznaniu

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Editor's Foreword

This volume of the *Baltic Pontic Studies* focuses on the results of the research carried out so far into the absolute (radiocarbon) chronology of the area lying between the Vistula and Dnieper or the bio-cultural borderland between the West and East of Europe. Absolute chronology is treated here both as a research goal and fundamental premise in the broader studies of the chronometric and development synchronization of "borderland" cultural systems. In a series of articles devoted to individual taxa a considerable number of new ^{14}C dates have been compared. The dates concern source materials that have been chosen from the point of view of their representativeness and chronometric value ("short-lived" materials were preferred to minimize a potential error). The vast majority of analyses were purposefully made in the same ^{14}C laboratory of the *State Scientific Center of Environmental Radiogeochemistry of Ukrainian Academy of Sciences* in Kiev taking advantage of funds generously provided by the *Polish Committee for Scientific Research*.

The volume devoted to the "dark" section of the "borderland" history (3150-1850 BC) is the first but not the last publication on the broader issues mentioned above that we intend to present in the near future.

Editorial comment

1. All dates in the B-PS are calibrated [see: Radiocarbon vol.28, 1986, and the next volumes]. Deviations from this rule will be point out in notes.
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).

Mikola M. Kryvaltsevich, Nikolay Kovalyukh

RADIOCARBON DATING OF THE MIDDLE DNEIPER CULTURE FROM BELARUS*

Until now, radiocarbon chronology had yet to be obtained for the Middle Dnieper culture (MDC). I.I. Artemenko suggested only one ^{14}C date. Barrow 5 of the **Belynets** cemetery was dated to 2350 ± 50 conv BC using the ^{14}C method [Artemenko 1987: 41]. This date was published without any laboratory number or calibration. The date was obtained in 1970 from grave 1, in which many remains of burnt wood were found. This grave also contained small pieces of cremated bones, some red ochre, a stone axe, two polished flint axes with a rectangular cross-section, a flint knife and two flint blades [Artemenko 1976a: 156].

The elaboration of a more accurate chronology was provided by a programme of investigation of MDC from Belarus which includes radiocarbon dating (Fig. 1). ^{14}C analyses were carried out at the State Scientific Center of Environmental Radiogeochemistry of the National Academy of Sciences of Ukraine in Kiev (head Dr. N.N. Kovalyukh).

A series of ^{14}C dates were obtained from 5 graves of **Prorva site 1** (near the town of Ragachow, Homel Region), which was excavated by Mikola Kryvaltsevich and Igar Yazepenko in 1994-1997. Cemetery Prorva 1 is located in the valley of the left bank of the Dnieper and on the southern bank of the Prorva lake. There were more than 20 graves at this cemetery, with some remains of inhumed and cremated individuals. Prorva site 1 is one of the numerous cemeteries of MDC which have been opened and excavated in Ragachow micro-region by I.I. Artemenko (some barrow cemeteries near Hodasavichy), and M. Kryvaltsevich with I. Yazepenko (Prorva site 1 and 2, barrow near lake Kamaryn). Two radiocarbon dates from Prorva site 1 have already been presented in *Baltic-Pontic Studies* [Kryvaltsevich 1996:98-102; Kadrow, Szmyt 1996b:109-110]. Charcoal for radiocarbon analysis was taken from burnt wooden structures of grave 1. The dates of *grave 1* were cal. 4150 ± 80 BP

* Project financed with grant no. 1H01G01810 provided by the Polish Committee for Scientific Research in 1996-1998.

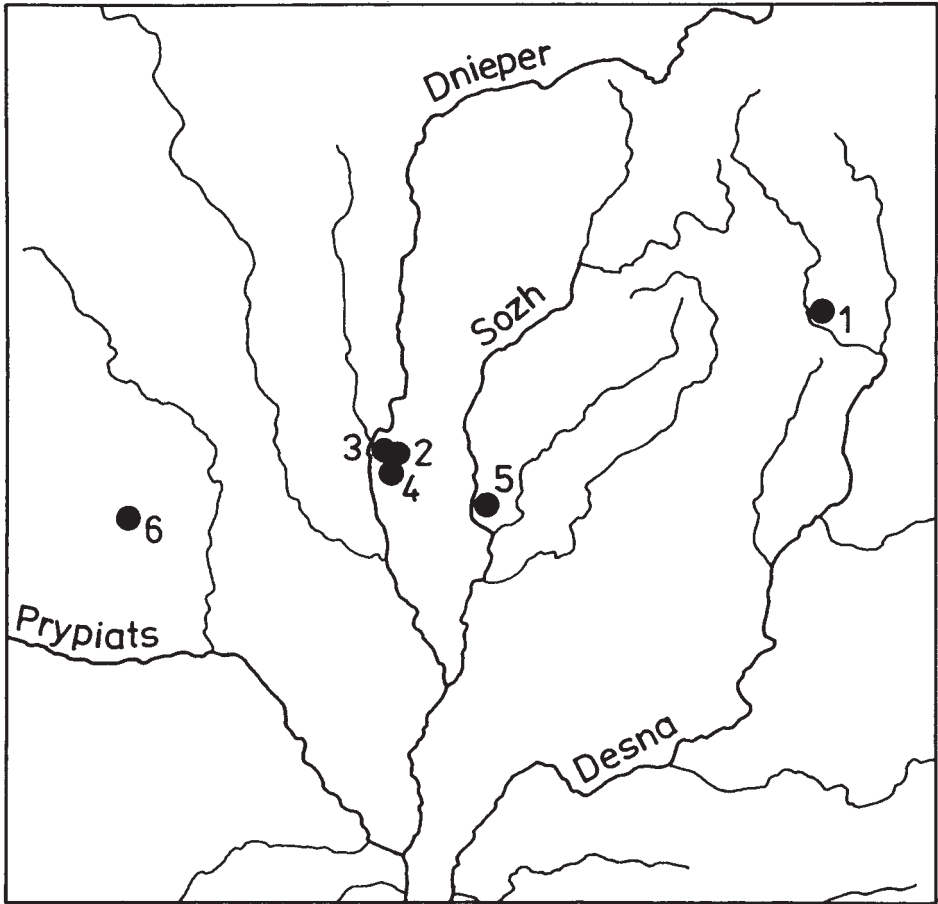


Fig. 1. Location of sites.

Legend: 1 - Belynets; 2 - Prorva site 1; 3 - Prorva site 2; 4 - Hodasavichy; 5 - Stralitsa; 6 - Aziarnoye site 1

(Le-5020), 2736 ± 119 BC and 4060 ± 45 (Ki \pm 5140), 2548 ± 78 BC [Kadrow, Szmyt 1996b:109-110].

Grave 2 was situated in the highest part of the barrow mound. A circular trench (nearly 7m in diameter) had been made around this grave in ancient times. Traces of graves were found 0.43-0.45m below the present ground level. The burial pit penetrated the ground more than 0.2m deeper than the ancient surface. The grave was rectangular in shape and oriented along the NE-SW line (Fig. 2). Charcoal from burnt wood was found along the edges of the burial pit. Two samples for radiocarbon analysis were taken from these burnt wooden structures (Ki-5612; Ki-5613 - Tabl. 1).

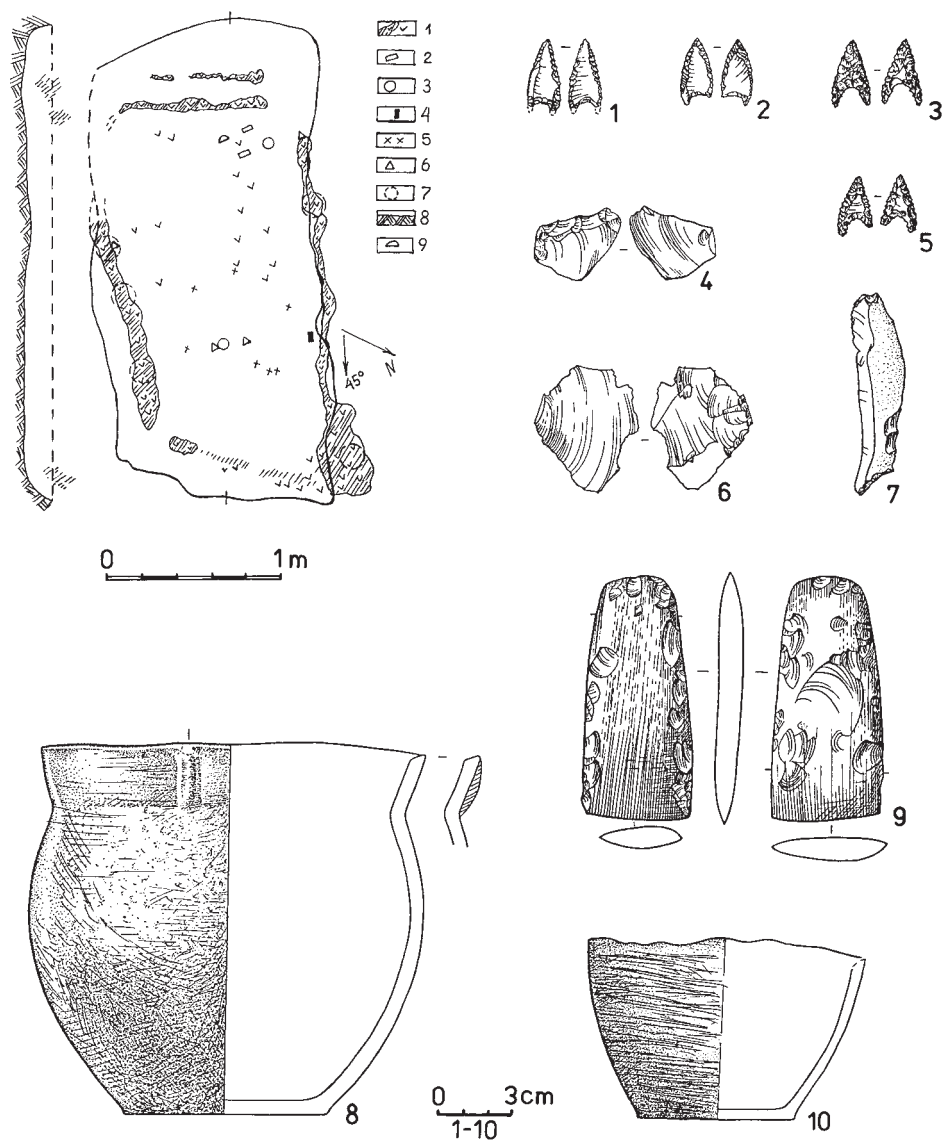


Fig. 2. Prorva site 1, Homel Region, grave 2.

Cross-section and plan of grave showing location of grave-goods (Legend: 1 - dark-grey layer and charcoal, 2 - laminar flake, 3 - pottery, 4 - blade, 5 - fragments of burnt bones, 6 - flint arrowheads, 7 - places where charcoal samples were taken for radiocarbon analysis, 8 - sand, 9 - flint axe). Grave goods (1-7, 9 - flint, 8, 10 - pottery).

Table 1

List of ^{14}C datings of Middle Dnieper culture from Belarus

Sites	Lab. No.	^{14}C age, BP	Intervals of calibrated ages, cal BC	
			1σ	2σ
Prorva 1 grave 1	Le-5020	4150 \pm 80	2874 - 2826	2894 - 2549
			2824 - 2807	2525 - 2485
			2796 - 2772	2485 - 2473
			2759 - 2716	
			2714 - 2655	
			2655 - 2623	
			2610 - 2600	
			2587 - 2582	
Prorva 1 grave 1	Ki-5140	4060 \pm 45	2828 - 2821	2853 - 2811
			2664 - 2654	2756 - 2740
			2627 - 2608	2731 - 2721
			2602 - 2545	2704 - 2646
			2527 - 2473	2643 - 2466
Prorva 1 grave 2	Ki-5612	3490 \pm 45	1878 - 1834	1896 - 1684
			1822 - 1794	
			1788 - 1744	
Prorva 1 grave 2	Ki-5613	3570 \pm 40	1952 - 1960	2026 - 2002
			1950 - 1877	1982 - 1864
			1838 - 1818	1848 - 1768
			1798 - 1784	
Prorva 1 grave 10	Ki-6205	3890 \pm 50	2456 - 2418	2468 - 2198
			2410 - 2312	
			2306 - 2294	
Prorva 1 grave 10	Ki-6206	4010 \pm 40	2568 - 2522	2614 - 2456
			2502 - 2468	2422 - 2408
Prorva 1 grave 18	Ki-6207	3960 \pm 40	2560 - 2532	2570 - 2520
			2496 - 2452	2504 - 2390
			2430 - 2402	2388 - 2332
			2370 - 2360	
Prorva 1 grave 20	Ki-6208	3830 \pm 40	2330 - 2196	2452 - 2430
			2154 - 2152	2404 - 2366
				2364 - 2182
				2170 - 2140
Prorva 2 grave 1	Ki-6590	3870 \pm 55	2454 - 2424	2466 - 2190
			2408 - 2280	2162 - 2144
			2224 - 2208	

Sites	Lab. No.	¹⁴ C age, BP	Intervals of calibrated ages, cal BC	
			1 δ	2 δ
Hodasavichy (Siargeeva Gryva) barrow 3 grave2	Ki-6592	3855 \pm 40	2448 - 2438	2456 - 2418
			2400 - 2376	2410 - 2196
			2352 - 2276	2156 - 2150
			2246 - 2204	
Stralitsa grave 14?	Ki-6585	3425 \pm 45	1862 - 1850	1876 - 1836
			1764 - 1674	1820 - 1798
			1650 - 1640	1784 - 1610
				1550 - 1536
Stralitsa grave 43?	Ki-6586	3500 \pm 60	1886 - 1742	1964 - 1678
Stralitsa grave 53?	Ki-6587	3460 \pm 70	1878 - 1836	1936 - 1606
			1822 - 1796	1560 - 1532
			1788 - 1682	
Stralitsa grave 53?	Ki-6588	3515 \pm 60	1892 - 1746	1972 - 1684
Stralitsa grave 56?	Ki-6589	3440 \pm 55	1872 - 1840	1884 - 1610
			1812 - 1808	1550 - 1538
			1780 - 1676	
Aziarnoye 1	Ki-6209	3580 \pm 50	2014 - 2010	2100 - 2098
			1976 - 1876	2036 - 1858
			1878 - 1818	1854 - 1752
			1798 - 1784	
Aziarnoye 1	Ki-6210	3520 \pm 40	1886 - 1864	1934 - 1740
			1850 - 1766	

The vessel (Fig. 2:8) from the burial complex was standing bottom up in the grave. At the bottom of the pit a flint axe (Fig. 2:9), 2 laminar flakes (Fig. 2:4, 6) and a blade (Fig. 2:7), 4 flint arrowheads (Fig. 2:1-3, 5), a bowl (Fig. 2:10), and fragments of burnt bones were found. It is possible that cremation was used as the burial custom in this grave.

According to horizontal and vertical stratigraphy, grave 2 could be one of the latest MDC burials at Prorva-1. This may be confirmed by ¹⁴C dating (Table 1). *Grave 10* (dimensions of the pit were 2.70x1.95m) was oriented along the E-W axis (Fig. 3). The depth of the pit, measured from the ancient surface, reached more than 0.70 m. A large vessel (Fig. 3:19) was standing bottom up in the burial pit. The surface of the vessel was decorated with cord ornaments and imprints of a stamp with a pattern of short lines. A portion of soot from the inside of this vessel was submitted to the ¹⁴C analysis (Ki-6205 - Table 1).

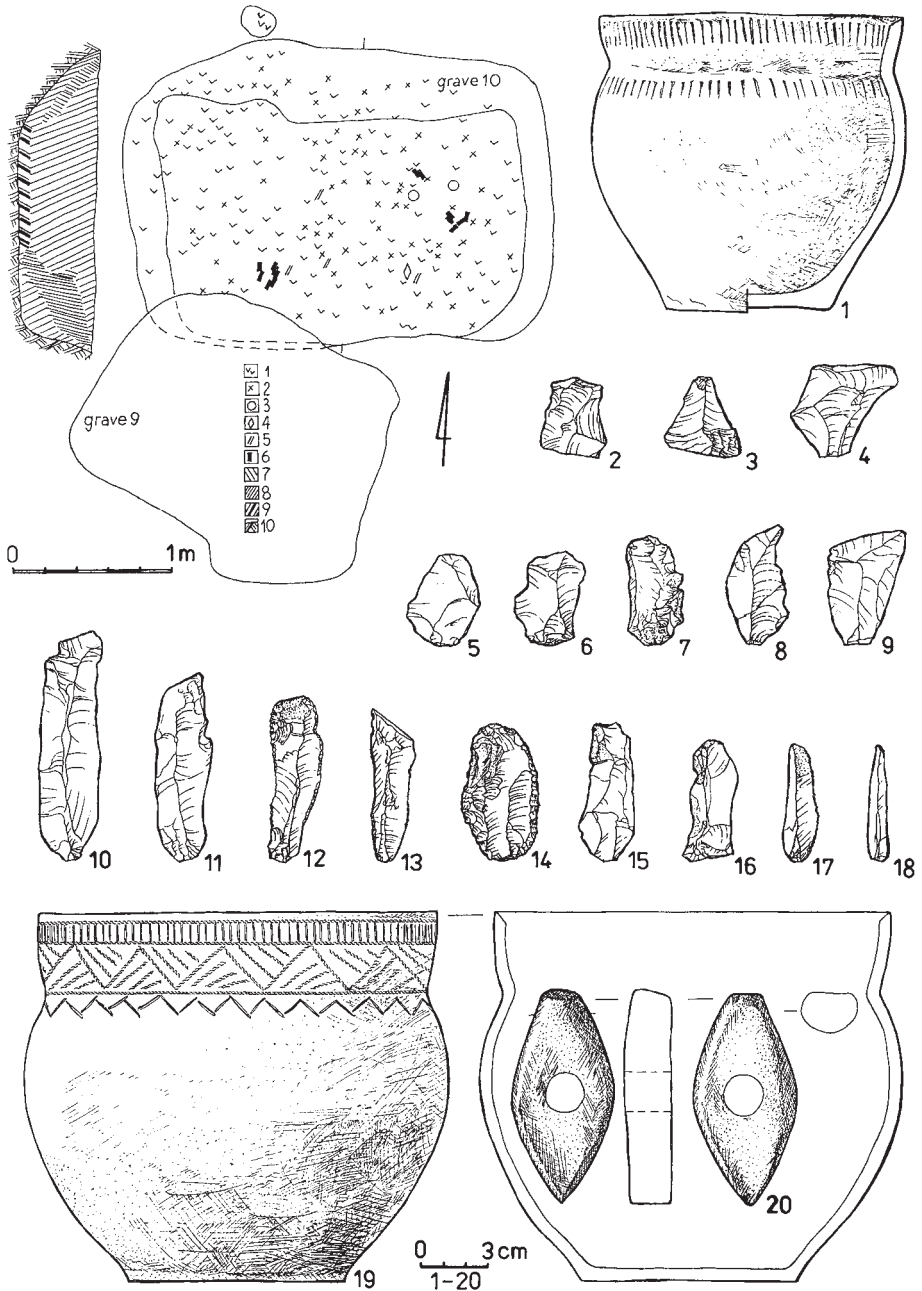


Fig. 3. Prorva site 1, Homel Region, grave 10.

Cross-section and plan of grave showing location of grave-goods (Legend: 1 - charcoal, 2 - fragments of burnt bones, 3 - pottery, 4 - stone axe, 5 - bones, 6 - flint products, 7 - grey layer, 8 - dark-grey layer, 9 - brown layer with remains of bones, 10 - sand). Grave goods (1, 19 - pottery, 2-18 - flint, 20 - stone).

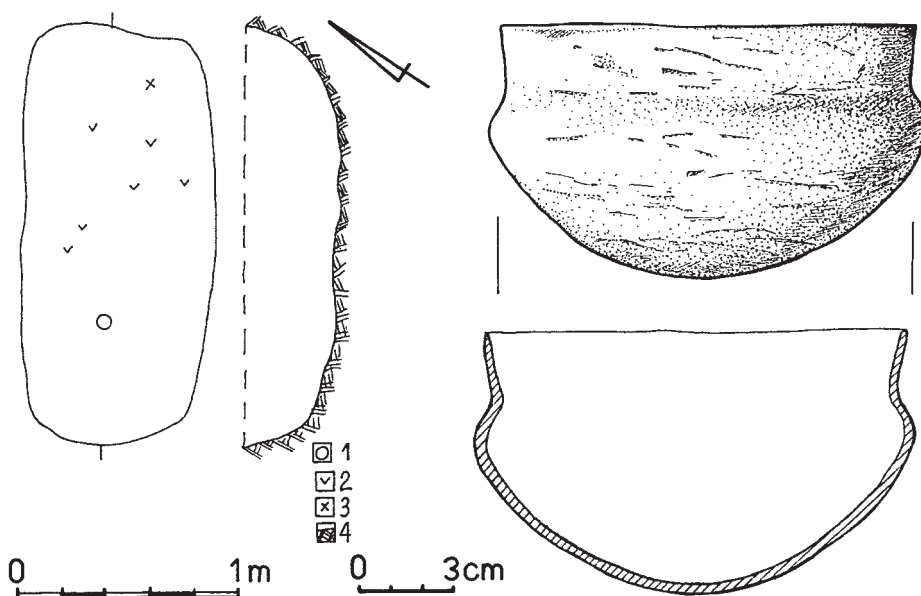


Fig. 4. Prorva site 1, Homel Region, grave 18. Cross-section and plan of grave showing location of finds (Legend: 1 - bowl, 2 - charcoal, 3 - a fragment of cremated bone, 4 - sand). A bowl from the grave.

Besides this vessel, the feature included the following elements: a pot decorated with rows of imprints (Fig. 3:1), flint products (blades, knives, laminar flakes; Fig. 3:2-18), and a stone axe (Fig. 3:20). There were some small fragments of cremated bones and the remains of uncremated bones in the filling and at the bottom of grave 10. The cremated bones were human and animal. The remains of a tortoise testa were among them¹. The remains of uncremated bones were found in piles of brown layer (traces of some animal carcasses?). The same fragments were also submitted to the ¹⁴C analysis (Ki-6206 - Table 1).

Grave 18 (dimensions of the pit were 1.85x0.83m) was oriented along the NE-SW axis. The depth of the pit, measured from the ancient surface, reached more than 0.45m. There were several separate minor pieces of charcoal and cremated bones in the filling of the grave pit (Fig. 4). A round-bottomed bowl was standing in the grave (Fig. 4). Many pieces of charcoal were found in the bowl, some of which were submitted to the ¹⁴C analysis (Ki-6707 - Table 1).

Grave 20 was covered by a firm cultural layer, in which traces of a building with Sosnitsa-type ceramics were found. At a depth of 0.37 m below the outline of

¹ All investigations of the bone materials from Prorva sites 1 and 2 were made in Poznań by Prof. J. Piontek, M. Krenz-Niedbala M. Sc., Dr D. Makowiecki.

the grave, traces of burnt wooden structures were discovered along three walls of the grave pit, below the Sosnitsa cultural layer. The burial pit (dimensions were 2.80x1.85 m) was oriented along the NE-SW line (Fig. 5). The depth of the pit reached more than 0.20m from the ancient surface. There were traces of burnt wooden structures along three walls (excepting the NE edge of the grave). Some charcoal for the ^{14}C analysis was taken from the south-eastern wall of the grave-pit (Table 1). Traces of posts (?) 10-15 cm in diameter were found in the corners of the grave. The filling of the pit contained small fragments of burnt bones, some pieces of charcoal, a stone cylinder from the hole of a stone axe (Fig. 5:10), and fragments of a bowl (Fig. 5:9). At the bottom of the grave pit, there were two patches with the remains of human teeth, which may be interpreted as traces of two human skeletons (?). Possibly, one of them lay along the grave pit and was oriented with its head towards the north (?). Underneath the grave pit, there was a layer of sand, in which many fragments of MDC ceramics were found (Fig. 5:1-2, 4-8, 9-11).

Thus, an analysis of the series of radiocarbon datings of the Prorva site 1 graves may lead to the conclusion that the cemetery was a long-standing burial complex. In accordance with a preliminary assumption, this corresponds to its archaeological date. The earliest dating obtained for the Prorva graves is 2740-2550 BC (grave 1). According to ^{14}C chronology, the latest MDC grave at the Prorva site 1 was grave 2. Its intervals of calibrated age are 1960-1740 BC. A ^{14}C chronology of the cemetery is to be corrected and calibrated; some dates have yet to be received.

An MDC grave was also found at **Prorva site 2**. Excavations were carried out by I. Yazepenko in 1994-1998. *Grave 1* was located on the highest part of the hill. A circular trench was probably made around this grave in ancient times. The feature must have been oriented along the W-E axis. There were many grave goods at the bottom of the burial pit (Fig. 6): (1) a vessel with the clay mass tempered with pieces of fine-grained charcoal (Fig. 6:1); this vessel was standing bottom up in the grave pit; (2) flint knives, blades and laminar flakes with retouch (Fig. 6:4, 6-11); (3) arrowheads (Fig. 6:12-16); (4) a flint axe (Fig. 6:3); (5) a stone axe (Fig. 6:2); (6) a large core (Fig. 6:5); (7) a bronze awl with some traces and remains of a wooden helve.

Small fragments of cremated animal bones (birds, a pike, and a tortoise testa) were found among the contents of the pit. The pieces of charcoal from the clay mass of the vessel (Fig. 6:1) were submitted to the ^{14}C analysis (Ki-6590 - Table 1).

Some materials from old collections of I.I. Artemenko were used for the ^{14}C dating, too. In particular, a sample from the *barrow cemetery Hodasavichy site "Siar-geyeva Gryva"* (Homel Region). Some teeth and remains of human bones from *grave 2 (barrow 3)* were taken for the ^{14}C analysis (Ki-6592 - Table 1). Barrow 3 (0.65m in height and 10 m in diameter) yielded 5 burials. According to I.I. Artemenko, the central grave 1 was the earliest burial in this barrow. Burial 2 was carried out some time later [Artemenko 1964:67-68]. This grave must have been oriented along the

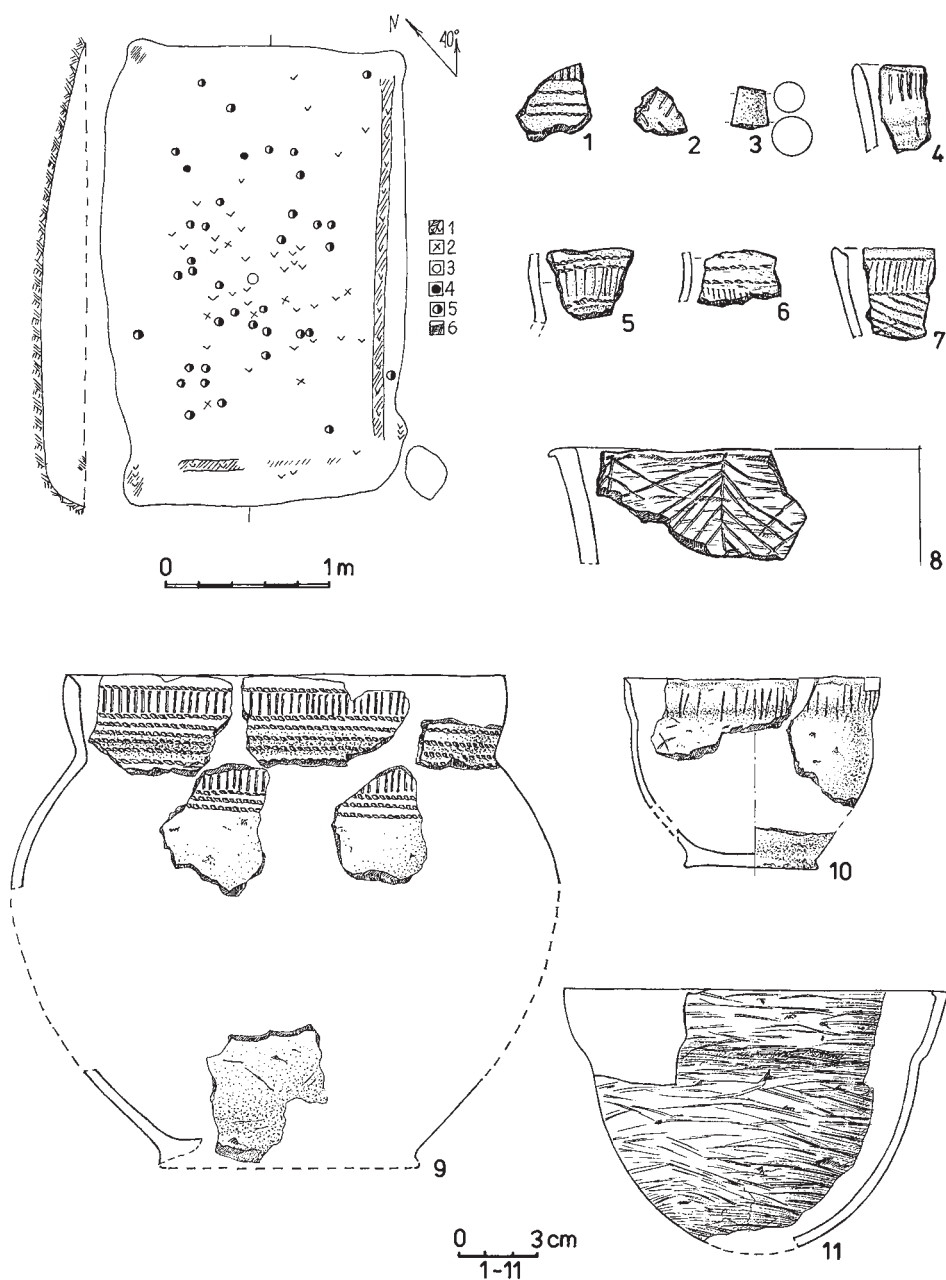


Fig. 5. Prorva site 1, Homel Region, grave 20.

Cross-section and plan of grave showing location of grave-goods (Legend: 1 - dark-grey layer and charcoal, 2 - fragments of burnt bones, 3 - pieces of the bowl, 4 - remains of human teeth, 5 - pieces of ceramics, 6 - sand). Grave goods.

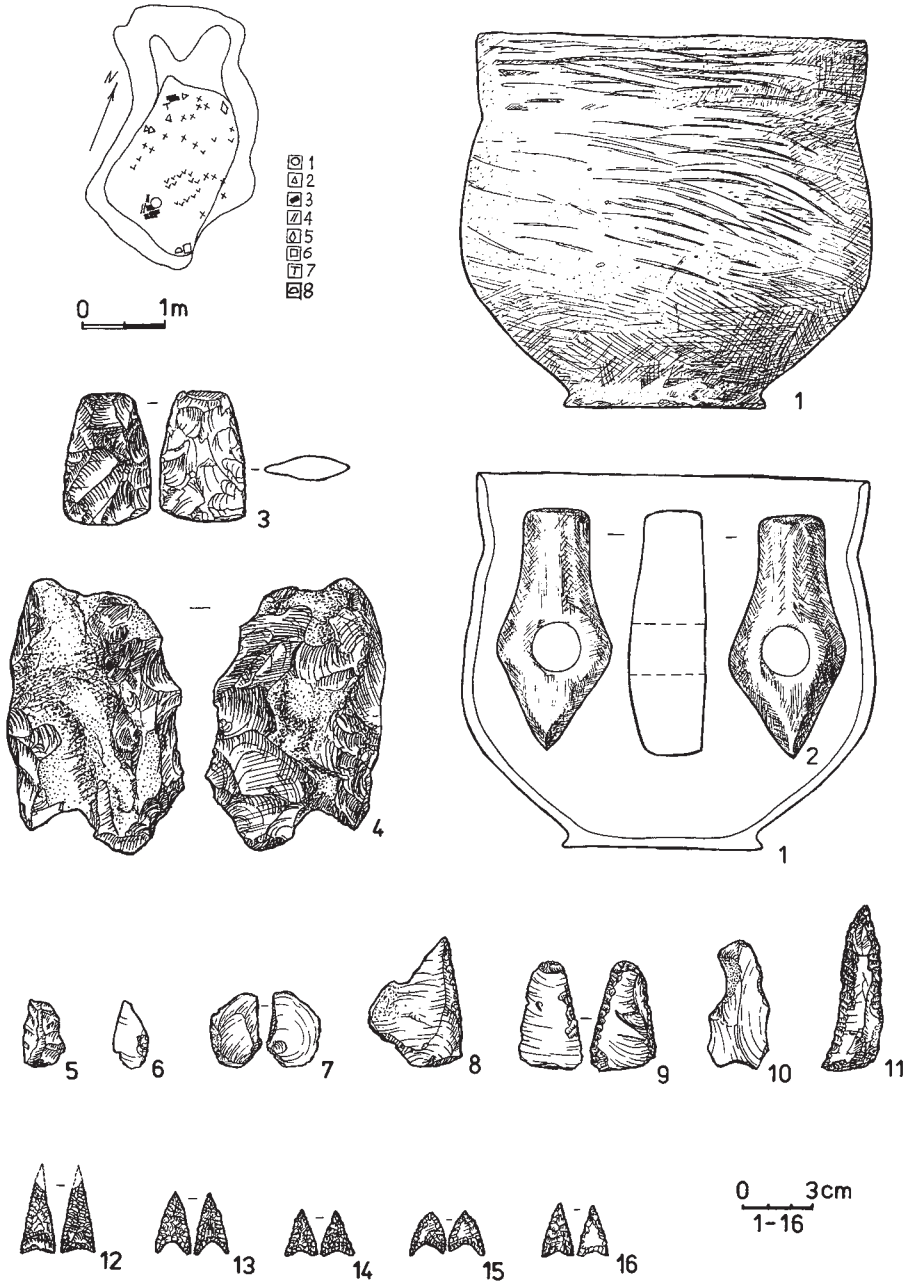


Fig. 6. Prorva site 2, Homel Region, grave 1.
 Plan of grave showing location of grave goods (Legend: 1 - vessel, 2 - arrowheads, 3 - flint knives, blades and flakes, 4 - bones, 5 - stone axe, 6 - core, 7 - bronze awl, 8 - flint axe). Grave goods (1 - vessel, 2 - stone, 3-16 - flint).

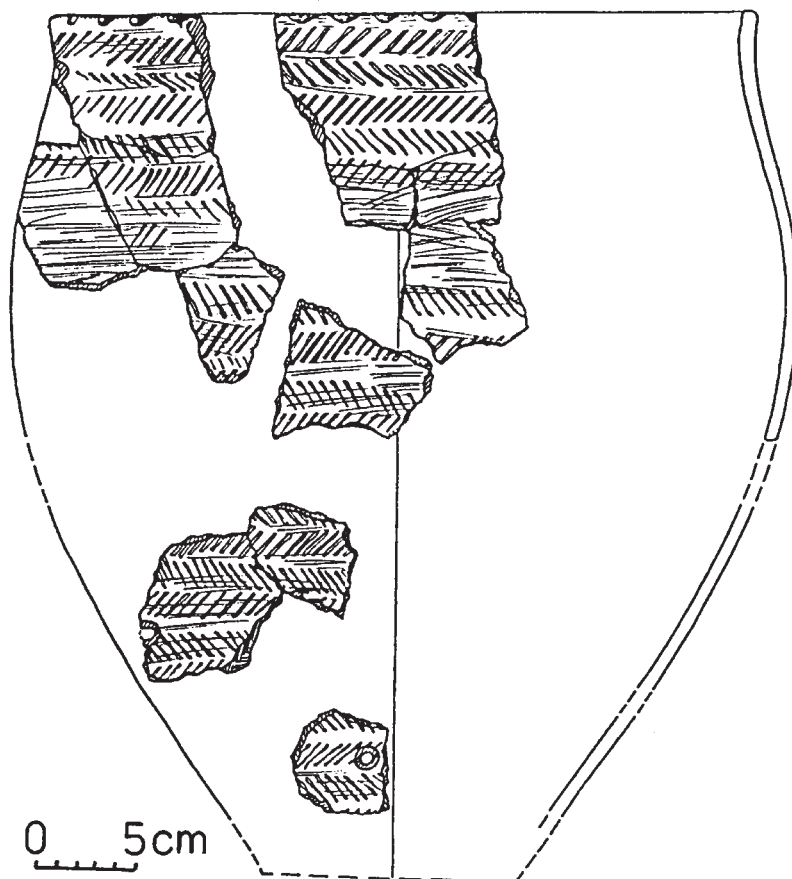


Fig. 7. Aziarnoje site 1. Minsk Region. One pot of type 1 which was dated using the ^{14}C - method.

N-S axis, and contained the remains of a human skeleton². The bones belonged to a child whose age was estimated to have been 5-6 years. The body could have been oriented with its head towards the north. The grave goods included an ornamented clay vessel, a stone axe, flint knives and blades, an arrowhead, and a flint axe [Artemenko 1964:67-68]. Judging from the ^{14}C chronology, it may be stated that some MDC graves of barrow 3 were contemporary with the intervals of calibrated age of the Prorva sites 1 and 2 (except for grave 2).

We made an attempt to carry out ^{14}C dating of some materials from the well-known cemetery at **Stralitsa** (near the villages of Yurkovichy and Rudnia Shlia-

² Its teeth were submitted to the anthropologists L.I. Tegaka and I.I. Salivon (of the Institute of Ethnography of the National Academy of Sciences of Belarus).

ginskaya, in the Vetka District of the Homel Region). The Stralitsa cemetery was excavated in 1963-1965 by I.I. Artemenko. According to I.I. Artemenko, the MDC graves at Stralitsa dated from the first half of the 2nd millennium BC [Artemenko 1976b:89-96].

Many of the inscriptions on the boxes in which the organic remains and some finds from the Stralitsa cemetery were kept did not fit the description of the separate features. This being the case, ¹⁴C dates obtained from the Stralitsa cemetery should be perceived as ¹⁴C chronology not for any separate graves but for the whole cemetery (Table 1).

Teeth (grave 14?), some remains of the organic facing of a copper artefact (grave 43? and grave 53?), some bone beads (grave 56?), and the remains of some animal bones (grave 53?) were used as the samples for radiocarbon data (Ki-6585-6589 - Table 1). We should note that the dates obtained for Stralitsa have a late ¹⁴C age. Several intervals of calibrated age are of approximately the same time as that for grave 2 from the Prorva site 1.

The majority of materials from the **Aziarnoye site 1** settlement (Luban District of the Minsk Region) corresponded to the late phase of MDC in Palessye. The settlement was excavated by M. Kryvaltsevich in 1985-1988 [Kryvaltsevich 1999]. The shards of two pots of type 1 (the final stage of MDC; Fig. 7) were dated according to the results of an analysis of soot using the ¹⁴C method (Ki-6209-6210 - Table 1). The same intervals of calibrated age may be found at the Prorva site 1 (grave 2) as at Stralitsa. They possibly represent the late age of MDC in Belarus.

This paper submits the first series of ¹⁴C dates obtained from several sites of MDC in Belarus. It is only the beginning of our investigative project. We intend to increase the number of ¹⁴C dates, which will make it possible for us to complete the calibration of some MDC radiocarbon dates.

Translated by author

ABBREVIATIONS

AO	– Arkheologicheskiye otkrytya, Moskva.
AJA	– American Journal of Archaeology, New York.
BPS	– Baltic-Pontic Studies, Poznań.
EA	– Eurasia Antiqua, Berlin.
FPP	– Folia Praehistorica Posnaniensia, Poznań.
KSIA	– Kratkiye soobshcheniya Instituta Arkheologii, Moskva.
KSIA AN USSR	– Kratkiye soobshcheniya Instituta Arkheologii AN USSR, Kiev.
KSIIMK	– Kratkiye soobshcheniya Instituta Istorii Materialnoy kultury, Moskva.
KSOGAM	– Kratkie Soobshcheniya Odesskogo Gosudarstvennogo Arkheologicheskogo Muzeya, Odessa.
MIA	– Materialy i issledovaniya po arkheologii, Moskva.
NA IA NANU	– Naukovy Arkhiv Instituta Arkheologii Nacionalnoi Akademii Nauk Ukrainu, Kiev.
SA	– Sovetskaya Arkheologia, Moskva.
SpA	– Sprawozdania Archeologiczne, Kraków.
ZFA	– Zeitschrift für Archäologie, Berlin.

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LIST OF AUTHORS

Ivan I. Chernyakov
Institute of Archaeology
Ukrainian Academy of Sciences
Geroiv Stalingrada 12
254655 Kiev
Ukraine

Elke Kaiser
Seminar für Ur- und Frehgesichte
Freie Universität Berlin
Altensteinstraße 15
14195 Berlin
Germany

Viktor I. Klochko
Institute of Archaeology
Ukrainian Academy of Sciences
Geroiv Stalingrada 12
254655 Kiev
Ukraine

Aleksander Koško
Institute of Prehistory
Adam Mickiewicz University
św. Marcin 78
61-809 Poznań
Poland
E-mail: koskom@man.poznan.pl

Nikolay N. Kovalyukh
Department of Environmental Radiogemistry
Institute of Geochemistry
and Physics of Minerals
Ukrainian Academy of Sciences
Palladina 34
252142 Kiev
Ukraine

Vladimir A. Kruts
Institute of Archaeology
Ukrainian Academy of Sciences
Geroiv Stalingrada 12
254655 Kiev
Ukraine

Mykola N. Kryvaltsevich
Institute of History
Academy of Sciences of Belarus
F. Skaryna 1
Minsk 220072
Belarus

Vadim L. Lakiza
Institute of History
Academy of Sciences of Belarus
F. Skaryna 1
Minsk 220072
Belarus

Jan Machnik
Institute of Archaeology and Etnology
Polish Academy of Sciences
Sławkowska 19
31-016 Kraków
Poland

Sergey V. Nazarov
Department of Environmental Radiogemistry
Institute of Geochemistry
and Physics of Minerals
Ukrainian Academy of Sciences
Palladina 34
252142 Kiev
Ukraine

Alla V. Nikolova
Institute of Archaeology
Ukrainian Academy of Sciences
Geroiv Stalingrada 12
254655 Kiev
Ukraine

Vadim V. Skripkin
Department of Environmental Radiogemistry
Institute of Geochemistry
and Physics of Minerals
Ukrainian Academy of Sciences
Palladina 34
252142 Kiev
Ukraine

Marzena Szmyt
Institute of Eastern Studies
Adam Mickiewicz University
Nowowiejskiego 55
61-734 Poznań
Poland
E-mail: marzena@main.amu.edu.pl

Mihailo Y. Videiko
Institute of Archaeology
Ukrainian Academy of Sciences
Vydubickaya 40
252014 Kiev
Ukraine
E-mail: videiko@mail.i.com.ua

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The publications is carried out within the research project No. 1H01G05912 (in part No. 1H01G01810) financed in the years 1997–1999 by the Committee for Scientific Research and supplied with funds of the Ministry of National Education and Adam Mickiewicz University Foundation.

ISBN 83-86094-06-0
ISSN 1231-0344