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RADIOCARBON RESULTS FOR THE CORDED WARE CULTURE FROM SOUTHERN POLAND

KEY WORDS: Neolithic, Corded Ware Culture, Graves, Radiocarbon dating, Southern Poland

INTRODUCTION

In recent years, the absolute chronology of the Corded Ware Culture (CWC) graves from south-eastern Poland has been determined and the results published (Kempisty, Włodarczak 1996; 2000; Machnik 1999; Włodarczak 1998; 2001). Owing to these publications it has become possible to determine with greater accuracy the absolute chronology of the above-mentioned culture, and particularly of its local groups on the Little Poland Upland (*Wyżyna Małopolska*) and on the Sokal Ridge (*Grzęda Sokalska*). In this paper we present six graves from southern Poland [five from Little Poland Upland and

one from the Głubczyce Plateau (*Plaskowyż Głubczycki*) – Fig. 1], dated by radiocarbon means¹. All of the graves were discovered in the course of systematic archaeological excavations, and already published.

The program used to present the ¹⁴C chronology of the graves was OXCAL 3.0.3 (Bronk Ramsey 1995) together with the highly precise calibration curve INTCAL98 from the year 1998 (Stuiver *et al.* 1998). In order to interpret the probabilistic dating we used the generally accepted 1 σ limit (68.2%).

PRESENTATION OF THE GRAVES DATED BY RADIOCARBON METHOD

1. Kietrz, Głubczyce district, site 1

During excavations conducted over many years on the cemetery of the Lusatian culture, two CWC graves were found (Gedl 1974; Chochorowski 1976). The site is situated on the slope of a hill. The slope inclines gently to the N towards the valley of the Troja river and - more steeply - to the W, towards the valley of the Morawa river, which is the right-bank tributary of the Troja. The CWC

features were found on an elevation, and originally, they must have been covered with barrows. The finds from Kietrz are kept in the Institute of Archaeology of the Jagiellonian University in Cracow.

¹ The authors would like to cordially thank Albert E. Lanting, thanks to whom it was possible to undertake radiocarbon datings of the graves from Kietrz and Koniusza in the laboratory in Groningen.



Fig. 1. Location of sites. 1 - Kietrz, 2 - Koniusza, 3 - Kraków-Zesławice, 4 - Samborzec.

Grave n° 2711

In the upper part, the grave was oval in shape, and its bottom part was a regular rectangle. At the depth where the burial was placed (*ca* 165-175 cm from the surface of the ground) the niche was 300x240 cm. The fill consisted of a more lightly coloured rim and a darker inner part. In the niche a well-preserved burial of an adult male was discovered, oriented along the N-S axis, with the head towards S. The bones of the lower limbs were bent outwards and closely contracted in the knee joints. The grave was richly furnished with an amphora, a stone battle axe, a flint axe, a blade tool and two bone tools (probably a chisel and a baton; Chochorowski 1976). The absolute chronology (on the basis of the skeletal bones' datings) is **3960±40 BP (GrN-20926)**, or 2570-2520, 2500-2400, 2370-2350 BC (Fig. 2).

2. Koniusza, Proszowice district, site 1

In the years 1971-1972, there were some rescue excavations conducted at the CWC cemetery in Koniusza by Janusz Kruk. The site is situated on

a prominent loess-covered elevation on the right bank of the Szreniawa river. As a result a grave surrounded with a circular groove was found (grave n° 14; Kruk 1973). The excavations were continued in the years 1974-1976 by Krzysztof Tunia, who investigated a large barrow with a much-eroded mound, 4 niche graves and several other CWC features, whose character was difficult to determine (Tunia 1979). The finds are kept in the Cracow Branch of the Institute of Archaeology and Ethnology of the Polish Academy of Sciences.

Grave n° 2

It was a niche grave dug into a barrow mound. The entrance pit was situated to the NE of the niche and it cut the groove surrounding the barrow. The niche was rectangular and, at the bottom, measured 250x165 cm. Inside the feature were two burials. They were situated on different levels. The „upper” burial was found in the entrance pit, at the depth of 40-60 cm from the present ground surface. The body was contracted, and was lying on its left side, with the head to the N. It was a man at the age of *maturus/senilis* (Gleń 1979). The other

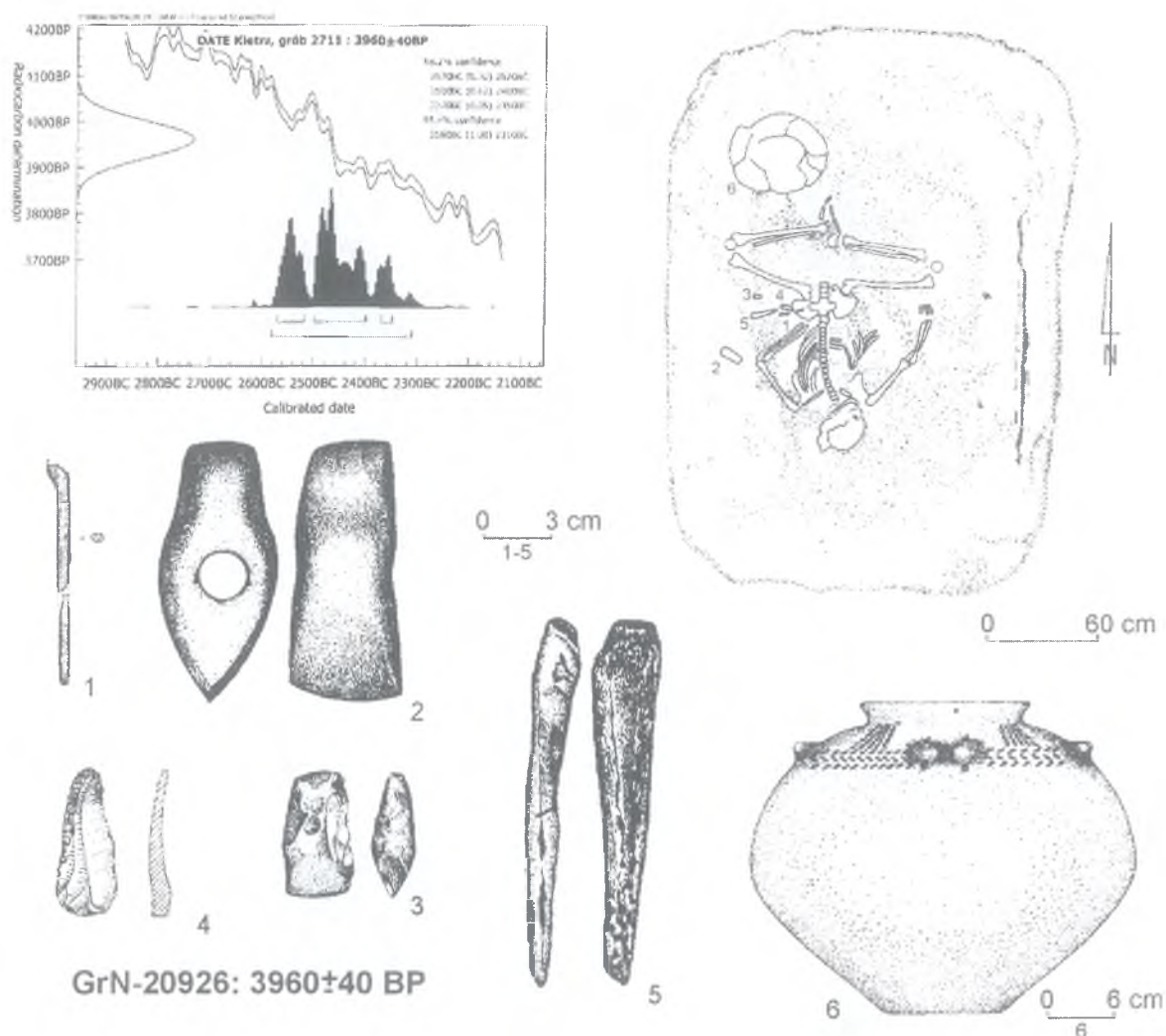


Fig. 2. Kietrz, Głubczyce district. Grave n° 2711.

(„lower”) burial of a man at the age of *maturus* was situated at the bottom of the niche (160-175 cm below the present ground surface). The body was positioned on its back, with the head and legs turned to the right, on the N-S axis, with the head to the S. The burial goods consisted of a blade tool in the shape of a point, a fragment of a bone baton and a flint flake (Tunia 1979, 49). The radiocarbon dating was obtained from the bones of the „lower” burial. The result of the dating was **4055±35 BP (GrN-12515)**, or 2660-2650, 2630-2490 BC (Fig. 3B).

Grave n° 14

It was a grave surrounded with a circular groove, whose diameter was slightly above 4 m. The pit of the grave was round in shape, with the diameter of *ca* 200 cm at the bottom. In its vertical cross-section it was a rectangle, widening like a trapeze at the bottom. The burial of a man at the age of *maturus* was found at the bottom, in the eastern part of the pit. The skeleton was placed in a contracted position, on its right side. It was oriented along the N-S axis, with the head to the S. The burial goods found in the grave consisted of a stone battle axe, a flint axe, a bone awl and two other bone

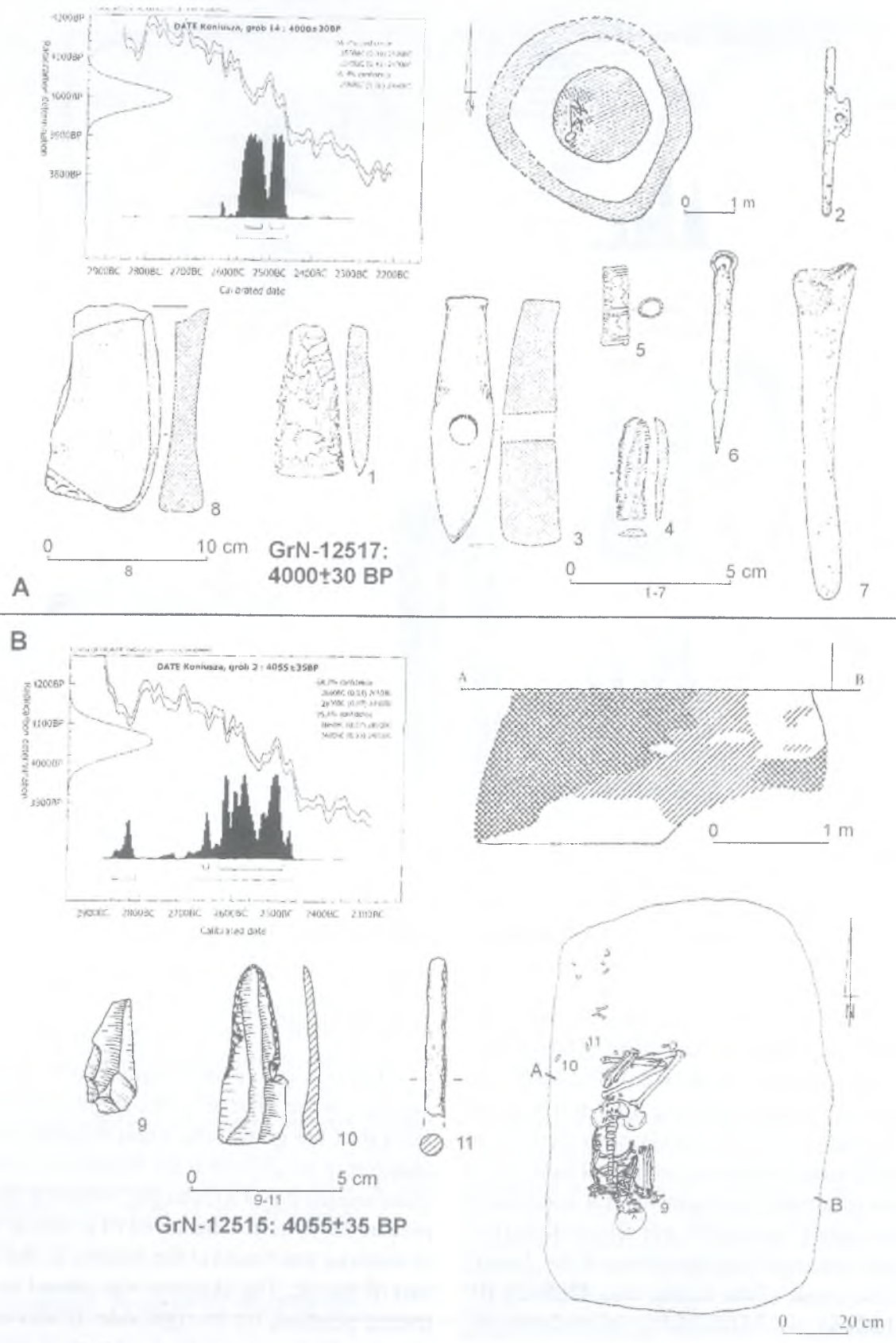


Fig. 3. Koniusza, Proszowice district. Graves n° 2 (B) and 14 (A).

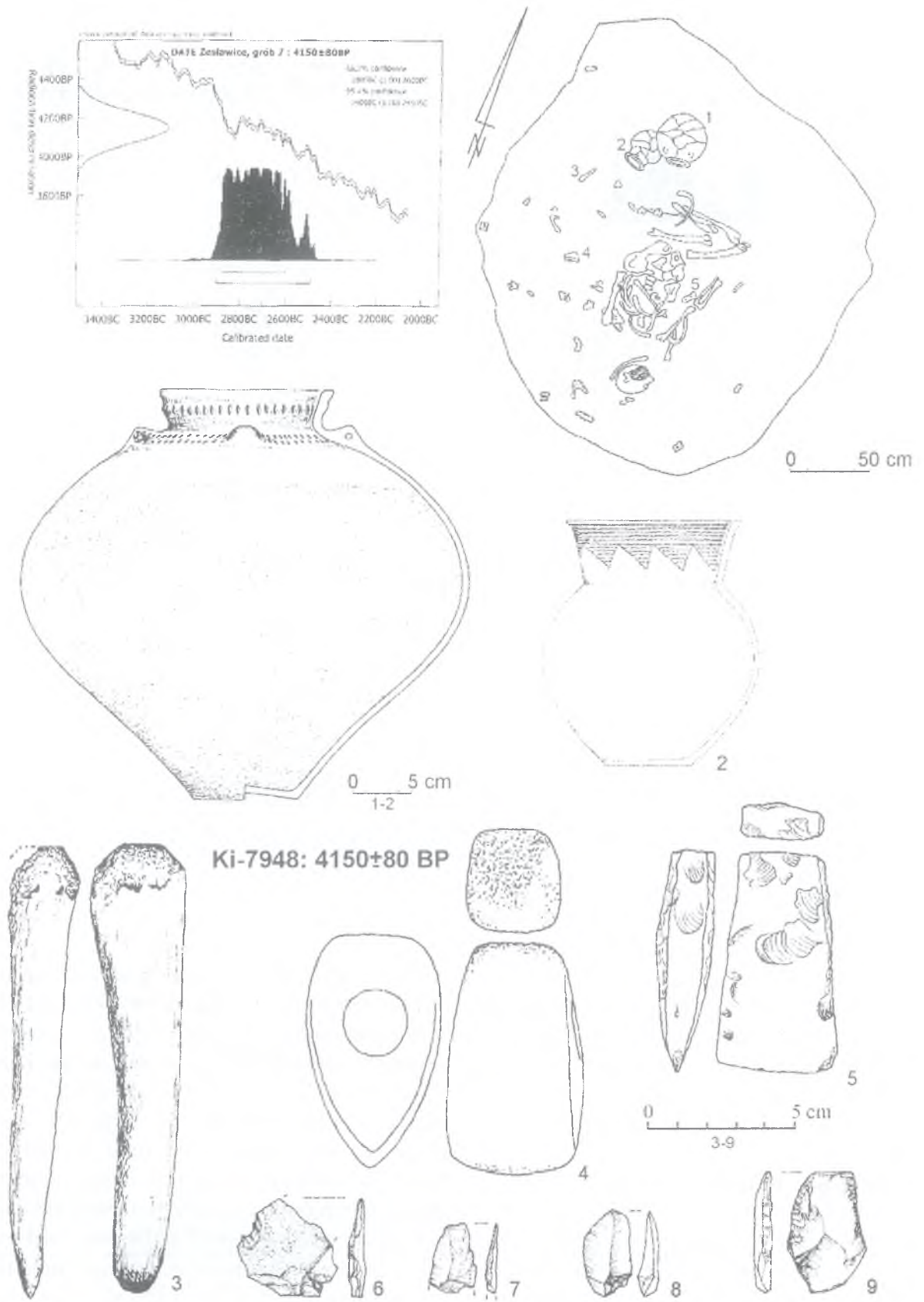


Fig. 4. Kraków-Zesławice. Grave n° 7.

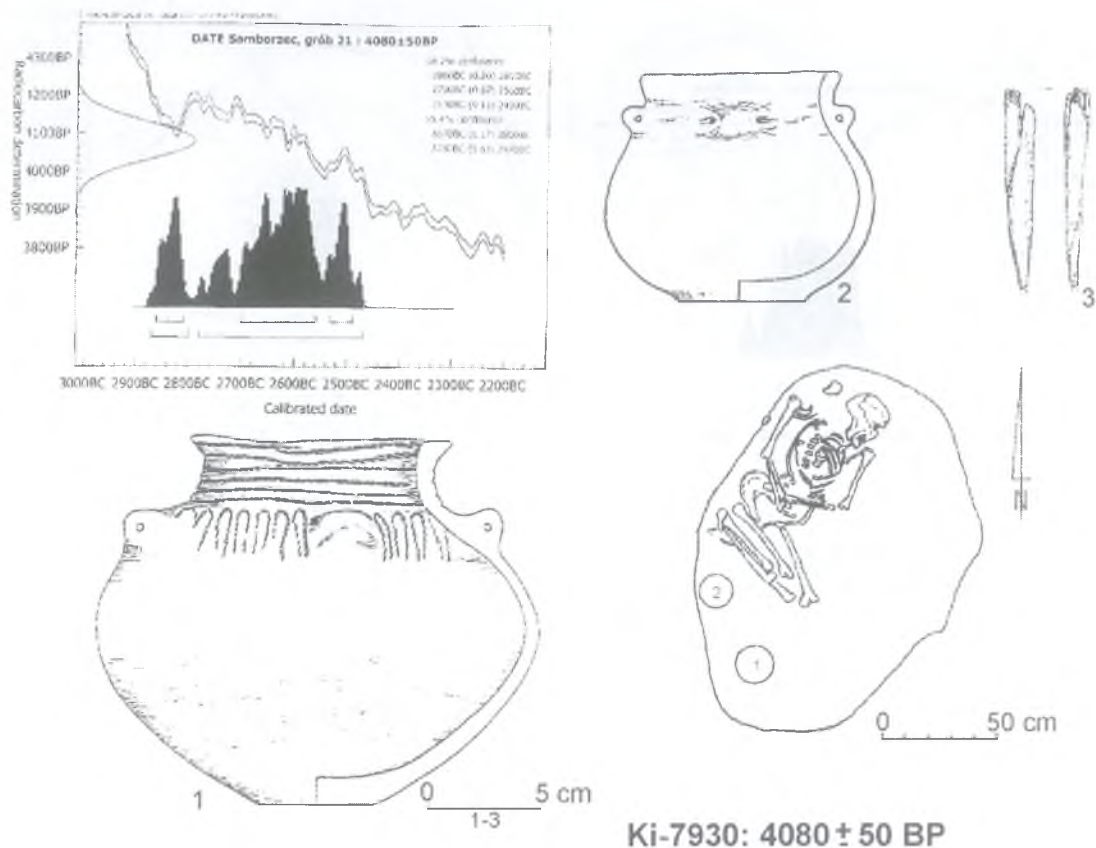


Fig. 5. Samborzec, Sandomierz district. Grave n° 21.

objects: a tubular artifact and an artifact with a hole in the thickened central part (a bit barb?), a grinding slab and a flint blade tool (Kruk 1973). The radiocarbon dating was done on the skeletal bones. It is 4000 ± 30 BP (GrN-12517), or 2560-2520, 2500-2470 BC (Fig. 3A).

The results of the radiocarbon dating of the richly furnished niche grave n° 3 from the cemetery in Koniusza have already been published. They are: 3925 ± 30 BP (GrN-12516), or 2470-2400, 2380-2350 BC (Budziszewski, Tunia 2000, 104).

3. Kraków - Ześlawice, site 22

On the northern periphery of the Baden culture site, excavated in the years 1954 and 1958 by Zdzisław Sochacki, one CWC grave was discovered (Sochacki 1964). The site is located in the western part of a high loess-covered hill, towering above

the bend of the Dłubnia river. The finds are kept in the Nowa Huta Branch of the Archaeological Museum in Cracow.

Grave n° 7

The upper part of the grave has been destroyed. At the depth of the burial, ca 90-100 cm above the present ground surface, the feature was almost oval in shape. The skeleton of a man at the age of *maturus/senilis* was positioned in the central part of the grave. The body was placed on its back, with the head and legs turned to the right, along the N-S axis. Two holes could be seen in the cranium, the result of trepanation, clearly performed at a distance of time (Sochacki 1964, 317-318). Behind the man's back and below his feet burial goods consisting of an amphora, a beaker, a stone battle axe, a flint axe, a bone chisel, a flake tool and three flint flakes were found (Sochacki 1964)². In order to determine the

absolute chronology, skeletal bones were used, and the date was **4150±80 BP (Ki-7948)**, or 2880-2600 BC (Fig. 4).

4. Samborzec, Sandomierz district, „Niwa Dworska” site

The site is located on the south facing slope of a hill, which forms a part of the so-called „Vistula scarp”, or a steep slope of a loess-covered upland, bordering on the wide Vistula river valley to the E.

The slope falls gently towards the valley of the Gorzyczanka river, which surrounds the site to the S and SW. The four graves of CWC were found in 1965 in the course of the excavations conducted on this multi-cultural site by Barbara Burchard, Jadwiga Kamińska and Anna Kulczycka-Leciejewiczowa (Kamińska, Kulczycka-Leciejewiczowa 1970; Włodarczak 1999). During the excavations probably the eastern fringe of a more extensive CWC cemetery was determined. The finds are kept in the Cracow Branch of the Institute of Archaeology and Ethnology of the Polish Academy of Sciences.

Grave n° 21

The shape and fill of the feature indicate that it was probably a niche grave. The burial of a man at the age of *senilis* was found at a depth of *ca* 80 cm above the present ground surface. The body was

² The above-mentioned flint tool and the three flint flakes were not included in the publication of the materials by Z. Sochacki (1964). They are kept in the Nowa Huta Branch of the Archaeological Museum in Kraków. According to the field documentation, they were found at the same level as the burial.

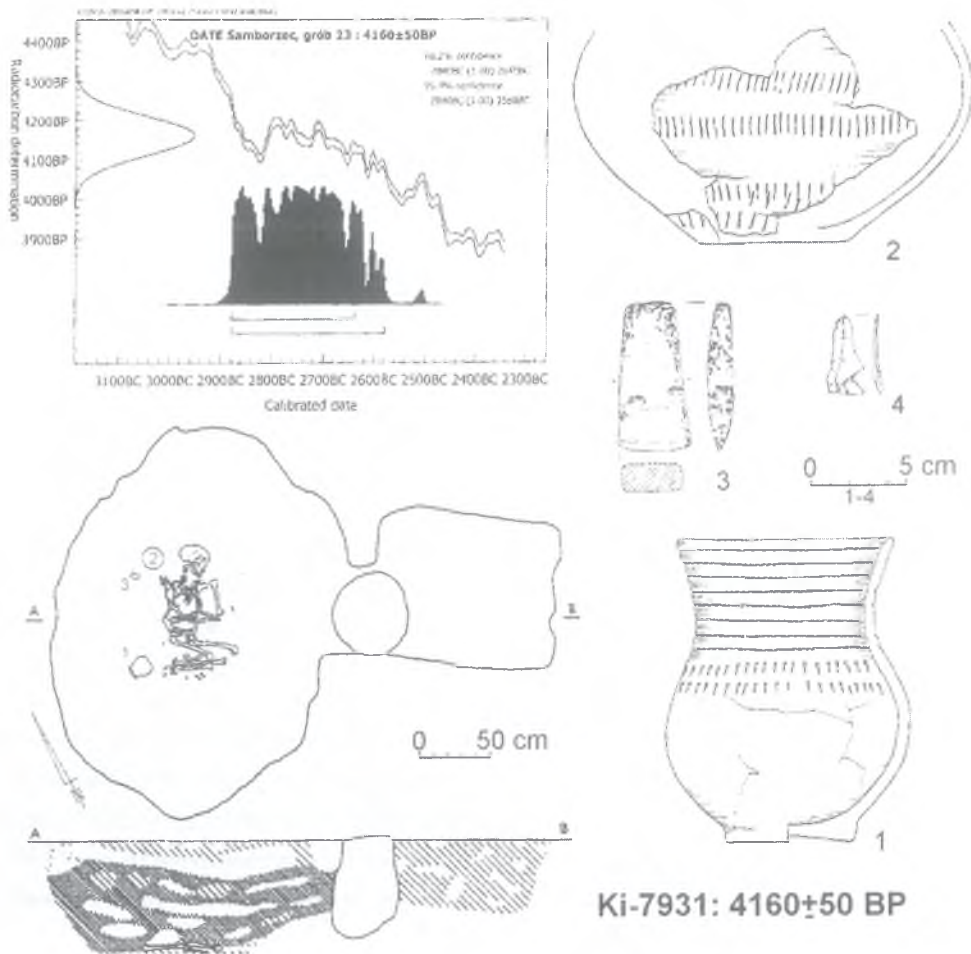


Fig. 6. Samborzec, Sandomierz district. Grave n° 23.

positioned in the eastern part of the feature, in a contracted position, on its back, with the head and legs turned to the left. The orientation was on the NE-SW axis. At the feet of the man two amphorae, and slightly above the head - a bone awl were found (Włodarczak 1999, 122-124). The absolute chronology was conducted on the skeletal bones, and was established as **4080±50 BP (Ki-7930)**, or 2860-2810, 2700-2560, 2530-2490 BC (Fig. 5).

Grave n° 23

It was a feature of a well-preserved niche construction. The entrance pit, which was rectangular in horizontal projection, was connected by a narrow

passage, blocked with a stone slab, with an oval niche. At the bottom of the niche, at the depth of *ca* 110 cm from the present ground surface, a burial of a woman at the age of *maturus* was found. It was placed in a contracted position, on its back, with the head and legs to the left. The body was oriented along the NE-SW axis. To the W of the skeleton a beaker, sherds of a large amphora, a flint axe and a flint splinter flake were found (Kamieńska, Kulczycka-Leciejewiczowa 1970, 234; Włodarczak 1999, 125-126). The chronology of the grave, determined on the basis of radiocarbon dating of the skeletal bones, is **4160±50 BP (Ki-7931)**, or 2880-2640 BC (Fig. 6).

DISCUSSION

The above-presented datings of the absolute chronology fall within the previously determined chronological boundaries of the development of the CWC in south-eastern Poland (2900/2800-2200 BC; Włodarczak 2001). Yet, these datings not always correspond to the previous results, based on typological and chronological analyses. It is, therefore, necessary to discuss the problem of chronology, and also to conduct more analyses of the absolute datings of further assemblages. The dates that have already been determined will also help to ascertain the chronological relations between CWC sites in the Little Poland (*Małopolska*) and the Upper Silesia (*Górny Śląsk*).

In the light of the typological analyses, the graves from Kietrz (grave n° 2711) and Koniusza (grave n° 14) are dated to phase II in the development of the CWC (according to Piotr Włodarczak 2000), which chronologically corresponds to the „Middle-European horizon” (according to Jan Machnik 1979, 342-366). Most likely, those features were covered by barrows. It is also worth drawing attention to the fact that the bodies were oriented on the N-S axis (with the heads to the S), which was characteristic for local CWC groups in south-eastern Poland (particularly for the Kraków-Sandomierz group). Thus, it may be concluded that the two graves belong to the phase when local CWC groups were forming. There is another argument to

support this hypothesis - a stone battle axe of Ślęża type found in the grave in Koniusza. The „borderline” chronological position of graves with such finds was discussed by Andrzej Kempisty (1978, 372-377). The battle axes of Ślęża type have been found in graves that had features linking them both with the older and younger phases in the development of the CWC on the Little Poland Upland. The best example of such a „syncretic” assemblage is the inventory from the grave n° 4 in Kolosy, Kazimierza Wielka district (Kempisty 1978, 372-374). Grave n° 2711 from Kietrz also falls within this category. The older elements are an amphora, whose decorative motifs link it with vessels of the „Pan-European horizon” (though it is not a typical example of a Thuringian amphora) and a battle axe, whose analogies can be found in the short and solid variants of battle axes of Ślęża type (second variant according to Jan Machnik - 1979, 360). Apart from the above-mentioned orientation of the burial, another feature linking the grave in Kietrz with the younger phases of the CWC development is the richness and diversity of its burial goods. The best analogies of its inventory can be found in Phase I and II in the development of the CWC in the neighbouring territories of Little Poland (Włodarczak 2000).

As far as the chronology of the graves from Kietrz and Koniusza is concerned (between *ca* 2600

and 2500 BC), the graves are a little younger than the previous typological and chronological analyses would indicate. It corresponds to the older phase of a large CWC cemetery in Żerniki Górne, Busko Zdrój district (Włodarczak 1998; Kempisty, Włodarczak 2000). However, in Żerniki Górne, no close typological links with the finds from the graves in Kietrz and Koniusza have been found. Assuming polygenetism in the CWC development and the possibility that some of the „older” elements continued to appear in the „younger” phases, such a situation is possible. However, further studies are needed in order to find better evidence for it.

There are three radiocarbon datings from the cemetery in Koniusza. Grave n° 2, dated to *ca* 2650-2500 BC, was dug into the barrow mound. Under the central part of the mound, there was grave n° 1, which was older than grave n° 2 and grave n° 14, which was found in a different part of the site (Tunia 1979, 47-49). The chronological relation between graves n° 2 and 14 is difficult to determine. Both of the two features were undoubtedly older than grave n° 3, dated to *ca* 2470-2350 BC (Budziszewski, Tunia 2000, 104), which was dug into the barrow mound raised above grave n° 1. It is interesting that a clearly marked difference in absolute chronology is reflected in a different construction of the niche structures of graves n°s 2 and 3. The oval niche of grave n° 3 has numerous analogies in dozens of other sites of the Kraków-Sandomierz group of the CWC. On the other hand, the rectangular niche of grave n° 2 is unique in the territory of Little Poland. Analysing the layout of the barrow (Tunia 1979, 50, 51, fig. 2), we may suspect that while building the niche of feature n° 2, they were trying to align it in accordance with the orientation of the central grave (grave n° 1 - which was also rectangular). Therefore it is possible that graves n° 1 and 2 were built in relatively short period of time, and we may conclude that grave n° 1 (the oldest on the site) was built *ca* 2650-2600 BC (dating it to the middle of 26th century BC is less likely to be correct). The age of this grave corresponds to the oldest graves in Żerniki Górne, and also - approximately - to the dating of the central grave in barrow II in Miernów, Pińczów district (Ki-5833: 4105±35 BP, K-1837: 3960±100 BP; Włodarczak 1998, 39). The younger phase of the

cemetery in Żerniki Górne (ŻG III according to Andrzej Kempisty and Piotr Włodarczak 2000) corresponds to the age of grave n° 3 in Koniusza. It is also the younger (though, not declining) period in the development of the Kraków-Sandomierz group of the CWC.

The CWC grave n° 7 in Kraków-Ześlawice was the first one dated by means of the radiocarbon method found on the lower Dłubnia river. Its age (2880-2600 BC) is surprisingly early. It is suspected that the concentration of graves on the lower Dłubnia originated after the disappearance of the settlement of the Ześlawice-Pleszów group of the Baden Culture (Machnik 1966, 129, 130 ff). This turning point should be dated to *ca* 2650-2600 BC (Włodarczak 2000). On the basis of the ¹⁴C dating, the age of grave n° 7 should most likely be estimated at *ca* 2600 BC. That date can be synchronised with the older phases (ŻG I and ŻG II) of the cemetery in Żerniki Górne.

It is very important to ascertain the absolute chronology of two features at the cemetery in Samborzec on the Sandomierz Upland (*Wyżyna Sandomierska*). It is not clear there what the chronological relation between the CWC and the Złota culture cemeteries is. The age of the latter, mostly based on the data from the cemeteries in Złota (Krzak 1989, Ścibior 1993, 319) should be determined as *ca* 3050/2900-2600/2550 BC. The dating of grave n° 23 in Samborzec is very interesting. Owing to the typological characteristics of the artifacts and the elements of the burial ritual it was included in the oldest phase of the Kraków-Sandomierz group of the CWC (*cf* Włodarczak 1999, 126-134). Its age (2880-2640 BC) indicates that the oldest features of the Kraków-Sandomierz group were contemporary with the younger period of the functioning of the Złota culture cemeteries. This observation is confirmed by the stylistic features of the pottery belonging to the oldest finds of a local group of the CWC on the Little Poland Upland. It is difficult to ascertain the absolute chronology of grave n° 21 in Samborzec due to the character of the calibration curve. The ascertained age falls within the range of about 400 years (2860-2490 BC). The stylistic characteristics of the pottery would indicate the younger part of that long period, i.e. the years after 2600 BC. In that case the

feature would be contemporary with the older phase of the development of the cemetery in Żerniki Górne. Radiocarbon datings of the features in Samborzec prove that the cemetery there is clearly older than grave n° 15 (76) at the nearby site in Złota („Grodzisko II”), dated to 2340-2200 BC (GrN-9146: 3825±35; Machnik, Ścibior 1991, 50). It is possible therefore, that the cemeteries at the sites „Nad Wawrem” and „Grodzisko II” appeared in the late phase in the development of the Kraków-Sandomierz group of the CWC - in contrast to the cemetery in Samborzec. However, it needs to be confirmed by further radiocarbon dating.

The observations presented above show that there are reasons for radiocarbon dating of as many

CWC graves in south-eastern Poland as possible in order to determine their absolute chronology. In spite of the fact that the accuracy of the dating is limited – due to a lack of precision of radiocarbon method – they can be taken as an excellent point of departure for dealing with many prehistoric problems.

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