

A Neolithic Child Burial from Ciemna Cave in Ojców National Park, Poland

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Abstract: This paper describes a newly discovered child burial found in course of a new research project in the main chamber of the Ciemna Cave. Anthropological investigation showed that the skeleton belongs to a fetus that died in the perinatal period. The body was buried in a shallow pit with no grave goods included. The radiocarbon date of the skeleton links it to the Neolithic settlement, most probably to the Baden Culture.

Keywords: Child burial, Neolithic, Baden Culture, Ciemna Cave

Introduction

The aim of this work is to elaborate on information previously mentioned about the Neolithic child burial (Ginter *et al.* 2015) that was found during a new research project carried out in the Ciemna Cave, Cracow district, since 2007 (Valde-Nowak *et al.* 2014). The Ciemna Cave is one of the most important Polish archaeological sites documenting human settlement in the southern part of the Cracow-Czestochowa Upland from the Middle Paleolithic to the Middle Ages. The site is located in Ojców National Park, on the left side of the Prądnik Stream Valley at Koronna Rock. The cave is cut from Upper Jurassic limestone rock. The present opening is situated 62m above the valley bottom, i.e. 372m above sea level. Ciemna Cave is one of the geologically oldest caves in the Ojców Upland (Madeyska 1977) and has one of the largest chambers of all the caves in the region (Gradziński *et al.* 2007). Ciemna Cave *sensu largo* is an extensive cave system which comprises: the main chamber (sector CK, acc. Valde-Nowak *et al.* 2014), a roofless part situated in front of the cave entrance (sector C acc. Krukowski 1939–1948), another roofless section called ‘Ogrójec’ (sector CO acc. Krukowski 1939–1948) and roofed sections: ‘Oborzysko Wielkie’ and ‘Tunnel’ (Fig. 1). Oborzysko Wielkie, Ogrójec and Tunnel used to form chambers that ran parallel to the hillside of the valley.

The site has been explored several times since the beginning of 20th century. Although the most quoted research there is focused on the Middle Palaeolithic settlement, the findings from the topmost Holocene layer were reported by many archaeologists. The most significant finds of the Holocene settlement were made

by Stefan J. Czarnowski (Czarnowski 1924), who explored almost all of the topmost sediments in ‘Ogrójec’ and ‘Tunel Wielki’. The materials of Czarnowski, those found by Stefan Krukowski, and the newest (obtained in the course of the present excavation) document a few subsequent phases of Holocene settlement in the cave system. The most numerous remains are linked to the Neolithic period (Żurowski 1931, 1933; Jażdżewski 1936; Kostrzewski 1939; Gardawski 1958; Kempisty 1970, 1973; Kulczycka-Leciejewiczowa 1970, 1979; Rook 1980; Godłowska *et al.* 1995; Valde-Nowak *et al.* 2014), although the artefacts which document the Roman Period (Mączyńska 1970; Woźniak 1970; 2006; Godłowski 1995) and the Middle Ages (Wojenka 2013) are also present. Additionally, a closely related Neolithic site was found above the Ciemna Cave (Lech and Partyka 2001a, 2001b).

The burial

The child burial was found in the main chamber of Ciemna Cave in 2014. This is an elongated, NE-oriented chamber (88m long, 23–10m wide, and about 8m high) which leads into a smaller, elongated SE-oriented chamber, and finally to a narrow NE-oriented, 60m long corridor (Gradziński *et al.* 2007). The burial was found in the south corner of the main chamber, close to the existing opening (c. 10m). As the filling of the pit did not differ from the Holocene layer, it was not documented until this layer was explored. At this level the pit was bipartite and had an irregular outline, c. 0.4m in diameter (Fig. 2). The skeleton was found in the bottom part. The body lay on its right side, in a fetal position, with the head directed to the west. As the cave sediment is composed of numerous boulders, the pit section was reconstructed by means of three-

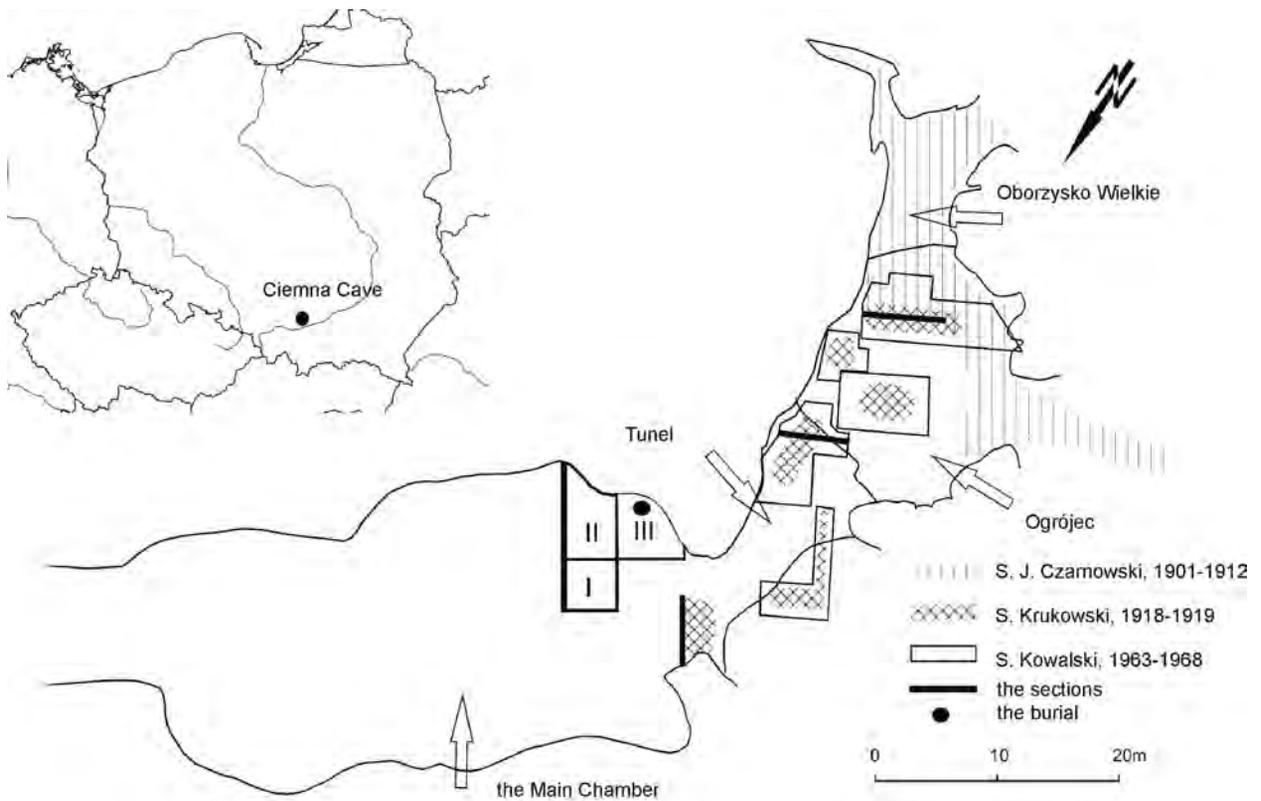


Fig. 1. Location and map of Ciemna Cave, Cracow dist. Drawn: D. Stefański.

dimensional measurements of the items documented from its filling (bones and potsherds). According to reconstruction, the feature was a shallow pit dug into the Holocene layer and partly into the Pleistocene bed (Fig. 3). The skeleton was covered with two visible levels of potsherds. The potsherds from the lower level are very fragmented and can be interpreted rather as an admixture rather than burial goods. These potsherds (c. 150 pieces) can be dated mostly to the Neolithic period and represent the Malice Culture – 3 pieces of vessel rims, and the Baden culture – a group of uncharacteristic fragments with specific treatment of the vessel surface. The upper level of potsherds constitutes a cultural palimpsest characteristic of the Holocene level in the main chamber.

The skeleton

Anthropological analysis of the skeleton was carried out according to methods developed for the study of prehistoric materials (Ubelaker 1989; White and Folkens 2005). Age at death was determined by the degree of bone ossification and the size of the various elements of the skeleton (Scheuer *et al.* 2000), as well as tooth development (AlQahtani *et al.* 2010). The length of the body was estimated by rib measurements using the multiple regression procedure recommended for use in fetus determination (Fazekas and Kósa 1978).

Most of the skull bones are preserved (Fig. 4). The frontal bones are connected by a frontal suture – only the left part is complete. The left parietal bone is complete; the right one is partly destroyed and reconstructed. The squamous part of the left temporal bone is complete, the right is partially damaged. The temporal bones are represented also by the left tympanic ring, fragments of the right one, the petrous part of the left temporal bone with the malleus and the incus; as well as the petrous part of the right temporal bone. The sphenoid bone is represented by both the greater wings and the corpus with the lesser wings. The occipital bone is represented by both lateral parts, a fragment of the squamous part, as well as the basilar part. The upper maxillae is represented by the orbital surfaces, the alveolar processes with buds of the primary teeth, and the palatine processes. The mandible is represented by the alveolar parts with buds of the primary teeth. The vertebral column is represented by the corpuses of the cervical, thoracic, lumbar and sacral vertebrae and the corresponding arches with articular processes. Additionally, a part of the second cervical vertebra (dens axis) was found. Ribs are present: I–XII from the right and I–VII from the left. The upper limb bones are represented by the complete right scapula and the partially preserved left one, the clavicle bones, diaphysis of humeri, ulnae, radii, complete metacarpals, and 5 phalanges. The

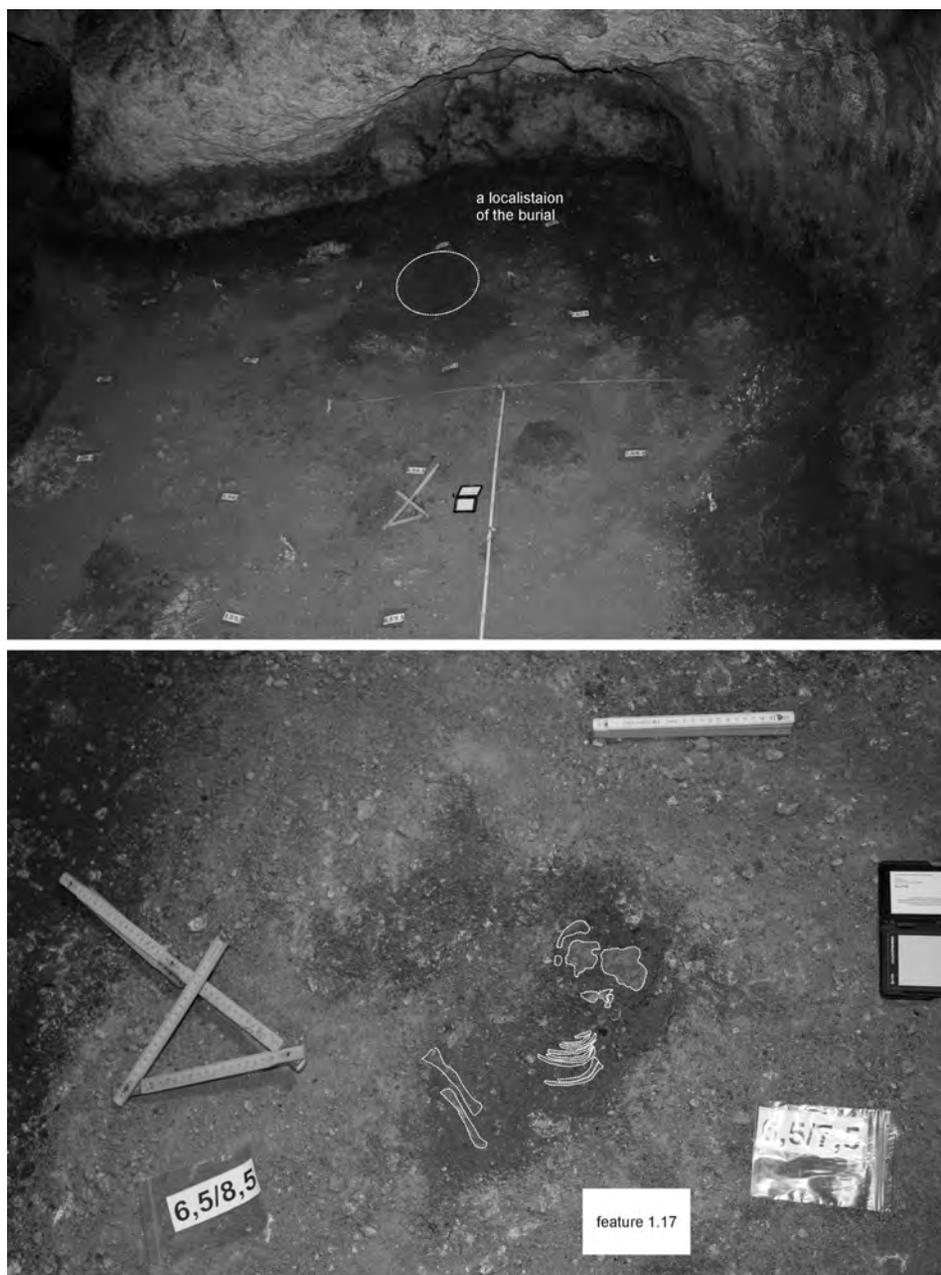


Fig. 2. 'Location of the skeleton'. Photo: D. Stefański.

lower limb bones are represented by pelvis bones: ilia, ischia and pubis. The long bones are represented by the left and right diaphysis of the femurs, the left tibia and the left fibula, and also the distal and proximal epiphysis of the right fibula. The bones of the foot are represented by the metatarsal bones (2x), the proximal and the intermediate phalanges (11x), and the distal phalanges (3x). A detailed overview of the remaining elements of the skeleton bones in accordance to field documentation is shown in Table 1.

The size of the bones and the degree of their morphological development allow a determination of the child's age at the time of death at around

the 40th week of fetal life (Tab. 1). The fetus was born dead, or death took place immediately after delivery. The length of the body, estimated by a rib measurement of 50.7cm, which places it between the 38th and 42nd week of pregnancy when compared to the contemporary population, with approximate crown-heel length between 46 to 54cm. According to Lionel Sharples Penrose (1961), the size of the fetus is only 38% determined by heredity, with the remaining percentage being determined by external factors (the most important being the socio-economic conditions of the mother's life). The natal parameters are indirect indicators of the nutritional status of the mother, her physical activity, lifestyle, as well as the impact of

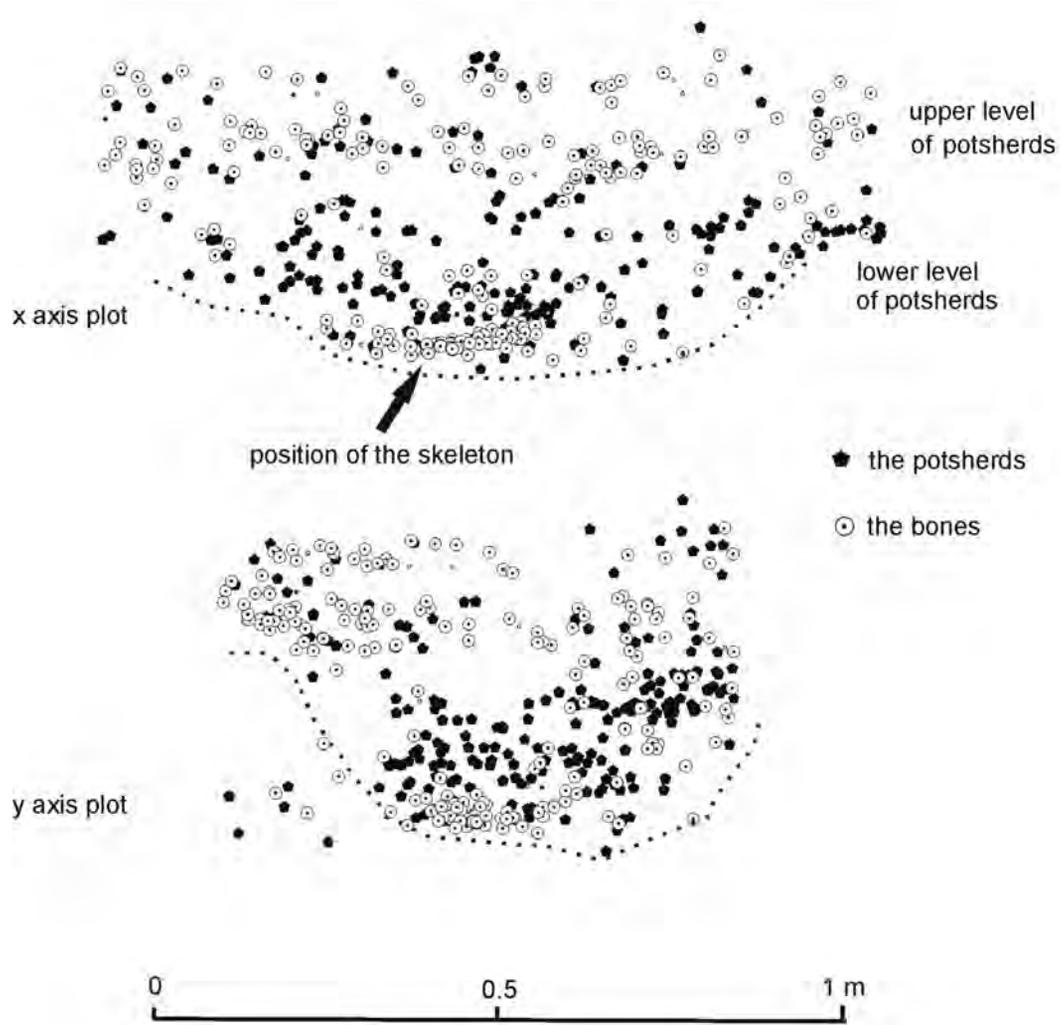


Fig. 3. Reconstruction of the burial. Drawn: D. Stefański.

Table 1: List of preserved bones and their measurements with comparisons to the contemporary population.

Inventory No.	Human remains	Comparative information (according to Fazekas and Kósa 1978)
23611	the left tibia (65mm length)	40th wk (65.2mm length)
	the left fibula (62mm length)	40th wk (62mm length)
23685	the left part of the frontal bone, frontal suture is visible (57mm length x 42mm width)	40th wk (54.8mm length)
23686	the left parietal bone (66mm length)	40th wk (65.7mm length)
23687	the left femur (72mm length, 20mm width at the distal epiphysis)	40th wk (74.4mm length; 19.9mm width at the distal epiphysis)
23688	the right femur (72mm length, 20mm width at the distal epiphysis)	40th wk (74.4mm length; 19.9mm width at the distal epiphysis)
23690	left rib - Co7 (63mm length)	
23691	left rib - Co6 (61mm length)	
23692	left rib - Co5 (61mm length)	
23693	left rib - Co4 (54mm length)	
23694	the left clavicle (42mm length)	38th wk (42.6mm length)

Inventory No.	Human remains	Comparative information (according to Fazekas and Kósa 1978)
23695	left rib – Co2 (39mm length)	
23696	left rib – Co3 (49mm length)	
23697	left rib – Co1 (23mm length)	
23698	fragment of the squamous part of the occipital bone	
23699	the left tympanic ring (12mm in diameter)	38th wk (12mm in diameter)
23700	fragment of the right rib, glued together with 23711	
23701	the metatarsal bones (2x), the proximal and the intermediate phalanges (11x), the distal phalanges (3x), fragments of the lumbar vertebrae: the corpuses (5x), arches with articular processes (3x)	
	the right ischium (19mm length x 12mm width)	40th wk (18.5mm length x 12.5mm width)
	the right (16mm length) and the left pubis bones (16mm length)	40th wk (16.6mm length)
23703	the right ilium (34 length x 30mm width)	40th wk (34.5mm length x 30.4mm width)
23709	the right radius (52mm length)	40th wk (51.8mm length)
23710	the corpuses of the thoracic vertebrae (8x), the distal and proximal diaphysis of the fibula	
23711	the right rib – Co5 (60mm length), glued together with 23700	
23712	the right rib – Co7 (63mm length)	
23713	the right rib (damaged) – Co6?	
23714	the left squamous part of the temporal bone (26mm length)	40th wk (25.4mm length)
23717	a fragment of the right parietal bone	
23718	a fragment of the right parietal bone	
23719	a fragment of the squamous part of the frontal bone, glued with 23722	
23720	a fragment of the squamous part of the occipital bone	
23721	the petrous part of the left temporal bone (38mm length x 17mm width), the malleus, the incus	40th wk (38.1mm length); 38th wk (17mm width); 36th wk (16.1mm width)
23722	a fragment of the squamous part of the frontal bone with the orbital surfaces, glued with 23719	
23723	a fragment of the squamous part of the occipital bone	
23724	the left ischium (19mm length x 12mm width)	40th wk (18.5mm length x 12.5mm width)
23725	a fragment of the squamous part of the occipital bone	
23726	the arch of the vertebrae, the metacarpal bones (3x), the phalanges (3x)	
23727	a fragment of the right parietal bone, the squamous part of the temporal bone	
23728	fragments of the arches and the processes of the vertebrae (4x)	
23729	fragments of the arches and the processes of the vertebrae (6x)	
23730	a fragment of the squamous part of the occipital bone	
23732	the left maxilla with the buds of central incisors	
23733	the left greater wing of the sphenoid bone	
23734	the petrous part of the right temporal bone (38mm length x 16mm width)	40th wk (38.1mm length); 38th wk (17mm width); 36th wk (16.1mm width)
23735	the corpus and the lesser wings of the sphenoid bone	

Inventory No.	Human remains	Comparative information (according to Fazekas and Kósa 1978)
23736	the right greater wing of the sphenoid bone	
23737	the corpuses (3x), the arches and the articular processes of the vertebrae (3x)	
23738	the corpuses (1x), the arches and the articular processes of the vertebrae (6x)	
23740	the left part of the mandible with the primary teeth buds	
23742	the right maxilla with the primary teeth buds	
23743	the right part of the mandible with the primary teeth buds	
23744	the right rib, damaged – Co10?	
23745	the right rib, damaged – Co9?	
23746	the right rib – Co8 (59mm length)	
23747	the right rib, damaged – (Co4 53mm?)	
23748	the right rib, damaged	
23749	the right ulna (60mm length)	40th wk (59.3mm length)
23750	the right clavicle (42mm length)	38th wk (42.6mm length)
23751	the right lateral part of the occipital bone (26mm length x 15mm width)	40th wk (26.5mm length, 14mm width)
23752	the basilar part the occipital bone (11mm length x 14mm width)	
23754	the left lateral part of the occipital bone (25mm length x 15mm width), the phalanx, fragments of the arches and articular processes of the cervical vertebrae (12x)	40th wk (26.5mm length x 14mm width)
23757	tiny fragments of the skull, the right and the left part of the orbital surfaces of the maxilla, a fragment of the left scapula, a fragments of the right tympanic ring	
23758	small fragments of the skull, a damaged fragment of the left scapula, a dens of the a part (dens axis) of the second cervical vertebra, the corpuses (7) and the arches (12x) of the vertebrae, the metacarpal bones (7x), the phalanx bone, the left ribs (4x) – Co8 (61mm length), Co9 (58mm length), Co10 (51mm length), damaged – Co11	
	the left humerus (62mm length, 16mm width at the distal epiphysis)	40th wk (64.9mm length, 16.8mm width at the distal epiphysis)
	the left ulna (60mm length)	40th wk (59.3mm length)
	the left ilium (34mm length x 29mm width)	40th wk (34.5mm length); 38th wk (28.5mm width)
	the left radius (53mm length)	40th wk (51.8mm length)
23759	the right rib – Co-1 (23mm length)	
23760	the right rib, broken – Co2	
23761	the right rib – Co3 (51mm length)	
23762	the right humerus (65mm length, 17mm width at the distal epiphysis)	38th wk (61.3mm length, 15.7mm width at the distal epiphysis)
23764	the right scapula: (30mm length x 27mm width, the ridge – 30mm length)	38th wk (33.1mm length x 26.8mm width length, the ridge – 29.1mm)
	the corpuses (3x) and the arch with the process of the vertebrae, a fragment of the rib	

external climatic factors on her body (Gawlikowska-Sroka *et al.* 2007). In temperate climates, autumn is the most favourable and has a positive effect on the pregnancy (Litwiejko-Pietryńczak 1996). On the basis of measurements and estimated body length of the fetus, it can be assumed that pregnancy proceeded well, and the death occurred in the perinatal period.

Radiocarbon determination

Thanks to the National Science Centre grant (2013/11/D/HS3/01877) which aims to research the phenomenon

of human presence in the caves of the Cracow-Czestochowa Upland, the skeleton was subjected to radiocarbon dating. The collagen was gathered from a vertebra process. The radiocarbon data (Poz-67071, 4385 ± 35 BP, 2.6% N, 8.8% C, 2.5% coll) confirms the Neolithic date of the burial (Fig. 4) and links it with the Baden Culture, whose settlement in Lesser Poland has been precisely framed by a series of radiocarbon determinations (Zastawny 2015a). According to this outcome, the burial can be synchronized with the late classic phase of the Baden Culture which persisted there between 3100 and 2900 BC (Zastawny 2015b).

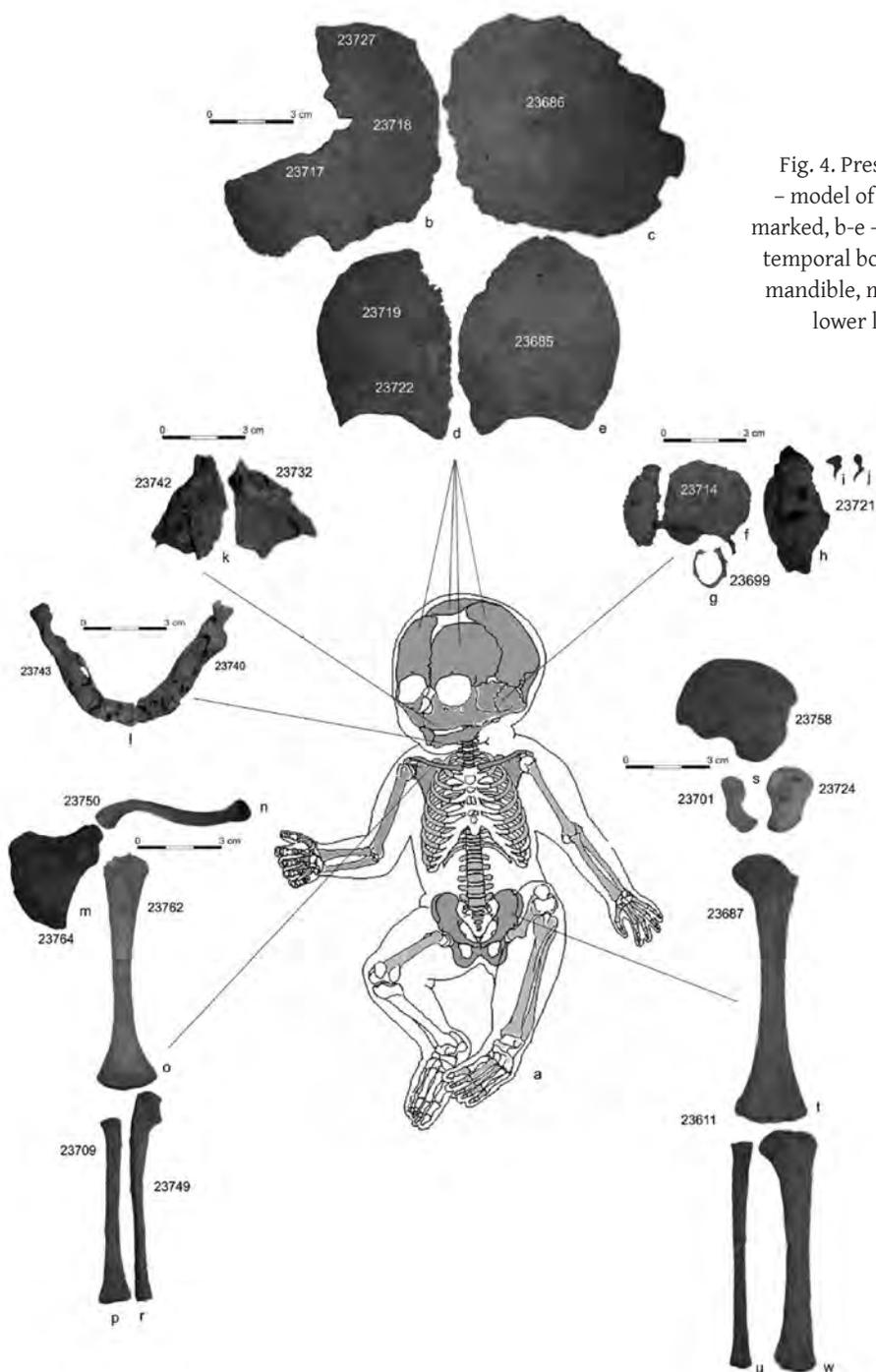


Fig. 4. Preserved bones of the skeleton: a – model of skeleton with preserved bones marked, b-e – bones of the skull vault, f-j – left temporal bone, k – left and right maxilla, l – mandible, m-r – right upper limb, s-w – left lower limb. Photo: A. Szczepanek.

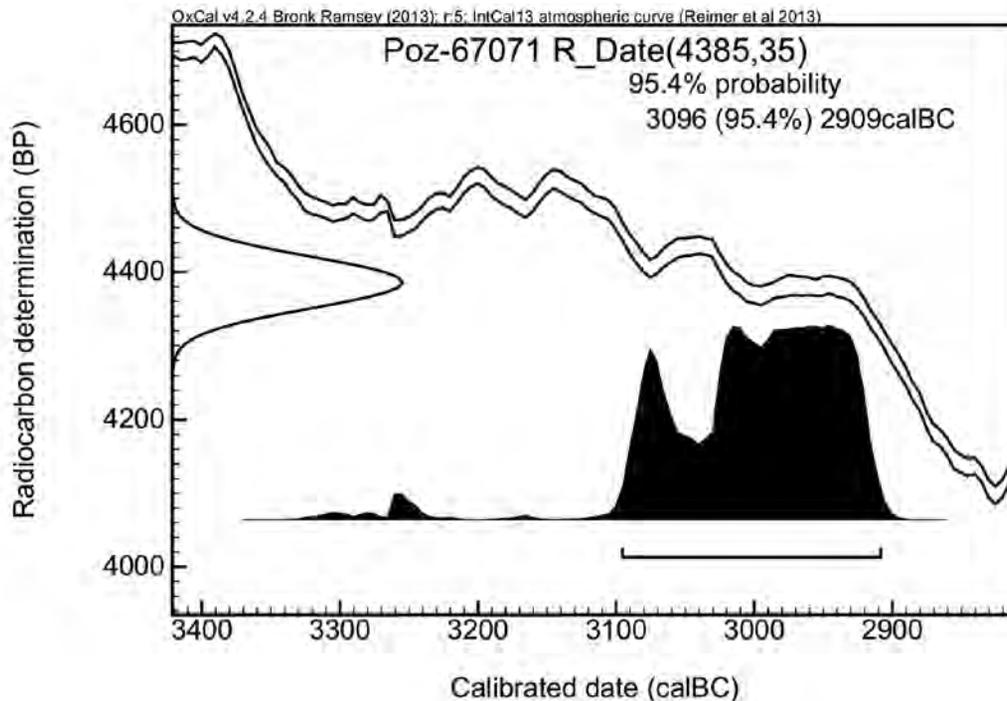


Fig. 5. Calibration of the radiocarbon date. Graphic: D. Stefański.

Conclusion

The findings of human remains acquired during this new research proves the funeral role of the Ciemna Cave, as yet documented only by series of ambiguous human remains reported by Czarnowski from Oborzysko Wielkie (Czarnowski 1924). The presented child burial, although lacking in grave goods, can be conclusively linked with the Neolithic settlement, thanks to radiocarbon dating, and precisely to the Baden Culture. It is not clear whether the feature was a deliberate grave or if the body was buried in a settlement pit. In this last case it is also not known whether the fetus was respected and treated with care, or if it did not receive the general funeral practice proper for a recognised member of the community. The Baden Culture funeral practice in Lesser Poland (both graves and burials in settlement pits) have been documented: Zesławice site 21, Cracow district; Pleszów site 17, Cracow district (Godłowska 1978); Zagórze site 1, Wadowice district (Valde-Nowak 2008), and in all cases the corpses were handled carefully and grave goods were offered (Zastawny 2012). As none of the above-mentioned burials relate to a child, there is no certainty that the body of the fetus in the Ciemna Cave was a deliberate grave, buried with a conscious funeral act. However, since the body was oriented towards the west and because of the fetal position of the corpse (both signs which seem to point to the Baden Culture) the above hypothesis seems to be reliable. Although the

position of children in society could have differed across prehistory, deliberate children's graves have been previously documented since the upper Paleolithic period (Einwogerer *et al.* 2008)

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