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Palaeodemographic and anthropological study of the Old Slavonic population of the South Outer Precincts of the ringwall Pohansko near Břeclav in the 8th–10th centuries A.D.

BŘECLAV – POHANSKO: SOUTH OUTER PRECINCTS. ANTHROPOLOGICAL STUDY

ABSTRACT: Palaeodemography and physical condition of the Old Slavonic population of the 8th–10th centuries A.D. have been studied at the burial ground Břeclav – Pohansko: "South Outer Precincts" (South Moravia, Czech Republic). Morphometric features on the skull and the postcranial skeleton have been analysed in 183 heavily damaged human skeletons.

KEY WORDS: Old Slavonic population – Palaeodemography – Cranial and postcranial traits – Morphometric analysis

INTRODUCTION

The ringwall Pohansko near Břeclav is one of the Old Slavonic localities in south Moravia. According to preserved archaeological finds it had reached its cultural and economic climax in the former half of the 9th century AD. In that period, a magnate court was established in its centre, with a stone church and graveyard inside, protected by a wall. Inside the protected ringwall, as well as outside it, smaller living aggregations were formed. The South Outer Precincts belong among the outer ones (Kalousek 1971, Dostál 1975).

The South Outer Precincts were inhabited in the 8th–10th centuries A.D. The area was discovered in the early 1960s and thoroughly excavated in the years 1975–1979 within the framework of the so-called rescue research. Jana Vignatiová, member of the Department of Archaeology, Faculty of Arts, Masaryk University, has discovered there three major living aggregations and attributed them working denominations settlement I, II and III (Vignatiová 1992). So far none of the archaeologists was able to provide a definitive answer to the question of the function of the South Outer Precincts within the complex of Pohansko habitation area. According to Vignatiová it might have been

a settlement of soldiers who lived there with their families and servants (Vignatiová 1992).

The present study is a mere section of the research project Břeclav – Pohansko. It is devoted to the palaeodemography of the South Outer Precincts and to the study of physical condition of its inhabitants. Any deeper comparison with the extensive skeleton material from other Great-Moravian settlements, such as Mikulčice, Josefov, Libice and others, was made impossible due to the very poor state of preservation of the South Outer Precincts skeletons, out of which only a very limited population sample could be examined, irrelevant from the statistical point of view and not suited to any statistical evaluation.

MATERIAL AND METHODS

During archaeological research, 199 skeleton burials were uncovered in the South Outer Precincts, out of which only 183 human skeletons were extracted. Many of the skeletons were in bad condition, others were heavily damaged, or even smashed, due to careless ground removal during the rescue research. The selected skull measurements, as well

as currently used measurements in the study of postcranial skeleton, have been made by standard procedures (Martin-Saller 1928, Olivier 1969, Martin, Knußmann 1988), the sex has been defined by features of the pelvis (Novotný 1971, 1979, 1986), talus (Novotný, Malinovský 1985) and skull (Novotný, Iscan 1991), also by the features of the femur (Santos 1991) and of the mandible (Pötsch-Schneider, Endris, Schmidt 1985); body height has been calculated according to Sjøvold's discrimination equations (Sjøvold 1990); the age of adults has been assessed according to Lovejoy's scheme of teeth abrasion (White 1991), and also according to the evolution scheme of the *facies symphysis ossis pubis*, proposed by McKern and Steward (Martin, Knußmann 1988), and finally according to Vallois' scheme of skull sutures ossification, as adapted by Rösing (Martin, Knußmann 1988). The age of children

has been assessed according to Ubelaker's schemes of teething and, where it was possible, also according to the degree of epiphyseal closure (Martin, Knußmann 1988).

RESULTS AND DISCUSSION

Sex and age of studied individuals

The studied material consisted of 183 incomplete skeletons, out of which 27 were male and 37 were female; 85 skeletons belonged to children, and in 34 adult skeletons the sex could not be defined.

The age of studied individuals, for males and females separately, is given in *Table 1* and in graphic form in *Figure 1*.

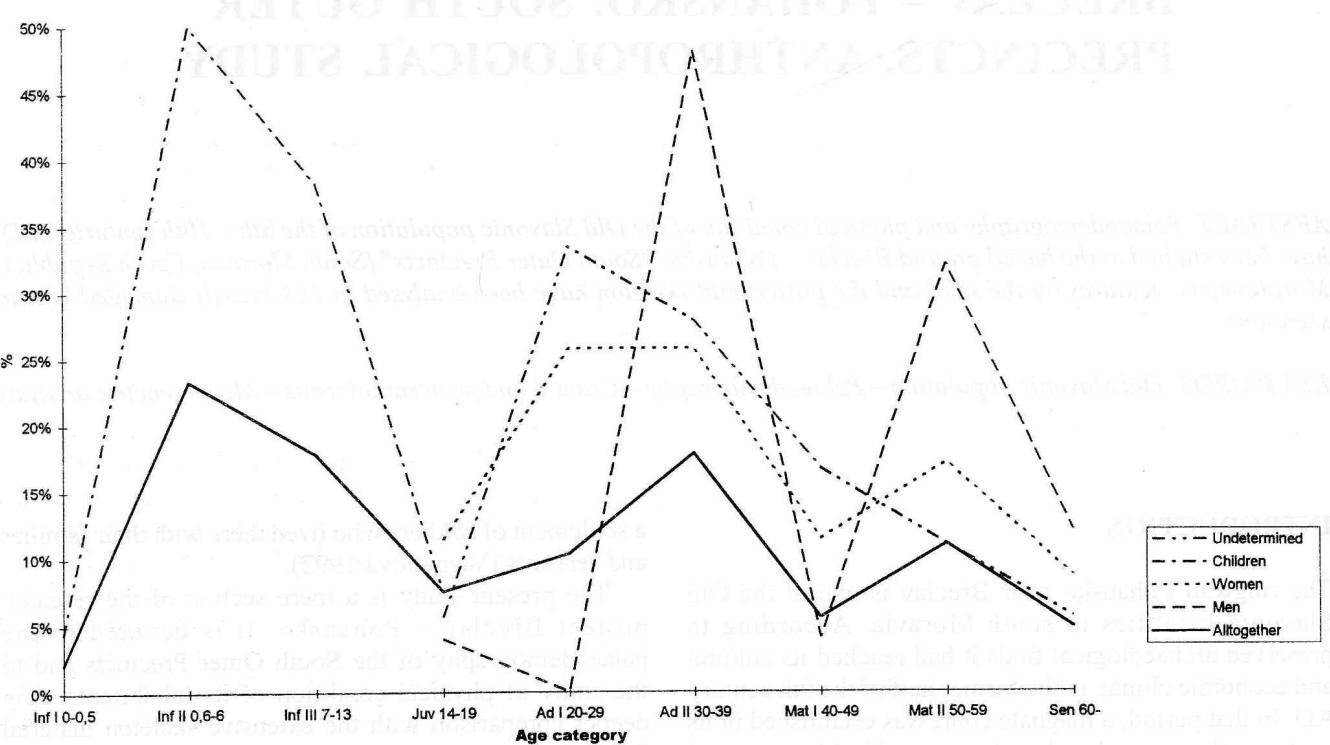


FIGURE 1. Age distribution (in %) at Pohansko – South Outer Precincts.

TABLE 1. Age distribution at Pohansko – South Outer Precincts.

Age category	Children N (%)	Males N (%)	Females N (%)	Undetermined N (%)	Alltogether N (%)
Infans I (0 – 0.5 years)	3 (4.4%)				3 (2.1%)
Infans II (0.6 – 6 years)	34 (50%)				34 (23.3%)
Infans III (7 – 13 years)	26 (38.2%)				26 (17.8%)
Juvenis (14 – 19 years)	5 (7.4%)	1 (4%)	4 (11.4%)	1 (5.6%)	11 (7.5%)
Adultus I (20 – 29 years)			9 (25.7%)	6 (33.4%)	15 (10.3%)
Adultus II (30 – 39 years)	12 (48%)		9 (25.7%)	5 (27.8%)	26 (17.8%)
Maturus I (40 – 49 years)	1 (4%)		4 (11.4%)	3 (16.7%)	8 (5.5%)
Maturus II (50 – 59 years)	8 (32%)		6 (17.1%)	2 (11.2%)	16 (11%)
Senilis (60 – and more years)	3 (12%)		3 (8.6%)	1 (5.6%)	7 (4.8%)
Σ	68 (100%)	25 (100%)	35 (100%)	18 (100%)	146 (100%)

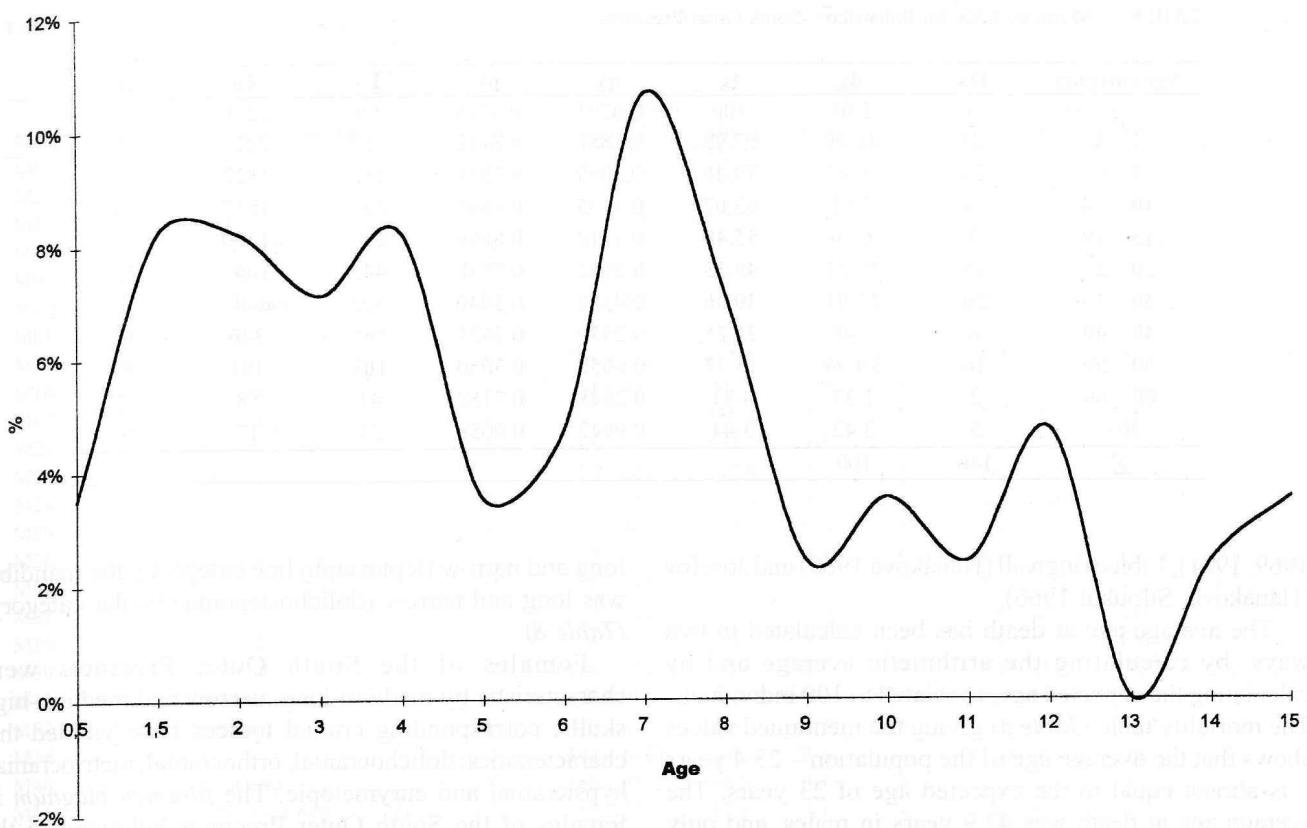


FIGURE 2. Age distribution in Children (in %) at Pohansko – South Outer Precincts.

TABLE 2. Age distribution in children (in %) at Pohansko – South Outer Precincts.

Age	N (%)
0	3 (3.5%)
1	7 (8.2%)
2	7 (8.2%)
3	6 (7.1%)
4	7 (8.2%)
5	3 (3.5%)
6	4 (4.7%)
7	9 (10.6%)
8	6 (7.1%)
9	2 (2.4%)
10	3 (3.5%)
11	2 (2.4%)
12	4 (4.7%)
13	1 (1.4%)
14	2 (2.4%)
15	3 (3.5%)
Σ	68 (100%)

According to our expectations, most of the inhabitants of the South Outer Precincts died as children, i.e. between the age of 0.6 and 13 years (*infans II – infans III*) then followed adults in the age categories of 30–39 years and 50–59 years. Children mortality is given in *Figure 2* (graph) and in *Table 2* (numbers). Both show that most of the children died at the age of 7–8 years, which is quite unusual for Old Slavonic burial grounds – with one exception. This exception is the burial ground "Valy III" at Mikulčice, where the same phenomenon was observed by Stloukal (1969). The second wave of mortality is obvious between 1.5 and 4 years of age.

The age structure of males and females is also shown in *Figure 1*, with numbers stated in *Table 1*. The data provide clear evidence that the studied males most often died in two decades: 30–39 years (48%) and 50–59 years (32%). The females died younger. More than half of them died at the age of 20–39 years of life. The mortality rate of adult individuals, in whom the age could not be identified, rather followed the course of mortality rate in females than that in males (*Figure 1*). These data lead to the conclusion that mortality in men was closer to the lower age limit than usual in Old Slavonic populations, where the highest mortality in males occurred between 40–49 years, while female mortality at the South Outer Precincts did not differ from that in neighbouring populations, as it was analysed at the burial grounds of Mikulčice (Stloukal 1964, 1967,

TABLE 3. Mortality table for Pohansko – South Outer Precincts.

Age category	Dx	dx	Ix	qx	px	Lx	Tx	ex
0	3	2.05	100	0.0205	0.9795	99	2276	23
1–4	27	18.49	97.95	0.1888	0.8112	355	2177	22
5–9	24	16.44	79.46	0.2069	0.7931	285	1822	23
10–14	11	7.53	63.02	0.1195	0.8805	237	1537	24
15–19	9	6.16	55.49	0.1110	0.8890	210	1300	23
20–29	15	10.27	49.33	0.2082	0.7918	442	1090	22
30–39	26	17.81	39.06	0.4560	0.5440	302	648	17
40–49	8	5.48	21.25	0.2579	0.7421	185	346	16
50–59	16	10.96	15.77	0.6950	0.3050	103	161	10
60–69	2	1.37	4.81	0.2848	0.7152	41	58	12
70–	5	3.42	3.44	0.9942	0.0058	17	17	5
Σ	146	100						

1969, 1981), Libice ringwall (Hanáková 1969) and Josefov (Hanáková, Stloukal 1966).

The average age at death has been calculated in two ways: by calculating the arithmetic average and by calculating the expected age, as related to 100 individuals. The mortality table (Table 3) giving the mentioned values shows that the average age of the population – 23.4 years – is almost equal to the expected age of 23 years. The average age at death was 42.9 years in males, and only 37.5 years in females. The five-year difference to the detriment of females was observed in other Old Slavonic burial grounds as well; archaeologists and anthropologists believe that it reflects the risks of childbirth and after-childbirth (Stloukal 1964, 1967, 1969, 1981).

The average age in children was established to 6.1 years; our figure corresponds with Stloukal's data from Mikulčice (Stloukal 1964, 1967).

Morphometric characteristics of the skull and postcranial skeleton

As the skeleton material from the South Outer Precincts was heavily damaged, only selected measurements could be performed in only 18 male and 17 female skulls, and not always completely. The situation was rather similar with the measurements of the postcranial skeleton. The small amount of analysed individuals does not allow any objective evaluation of the physical condition of the South Outer Precincts inhabitants to be made; it only allows a rough survey to be done. The average values are as follows: Tables 4–7.

Males of the South Outer Precincts had a long, narrow and medium-high skull; according to corresponding indices they appeared to be dolichocranial, orthocranial,

hypsicranial and eurytopic, with a narrow *foramen magnum* and the cranial capacity in the category of euencephalic. Their face was medium-high, the upper face was low and narrow; according to the facial indices the males were hyperleptoprosopic and leptene. As to the orbits dimensions the males were distinctly mesoconch, and chamaerhine as to the nose dimensions. Their palate was

long and narrow (leptostaphyline category), the mandible was long and narrow (dolichostenomandibular category) (Table 8).

Females of the South Outer Precincts were characteristic by medium-long, narrow and medium-high skulls; corresponding cranial indices have yielded this characteristics: dolichocranial, orthocranial, metriocranial, hypsicranial and eurytopic. The *foramen magnum* in females of the South Outer Precincts belonged to the category of medium-large, the cranial capacity was in the category of euencephalic. The face of females was narrow and low, also the upper face was low, facial indices have attested obvious euryprosopy and meseny. The orbits were medium-high (mesoconch), the nose was narrow (leptorrhine), the palate was short and wide (brachystaphyline), the mandible was short and narrow (dolichostenomandibular) (Table 8).

Of the postcranial skeleton, the clavicle, scapula, long bones of the upper and lower extremities and the *os sacrum* were analysed. This is how the postcranial skeleton appeared, again in average values: Males of the South Outer Precincts had a strong clavicle, a long scapula, a medium-robust humerus of oval shape in the middle part (eurybrachy), according to the humero-radial index the radius appeared to be medium-long, the body of the ulna was medium-flat (euroleny), the *os sacrum* was long and narrow (dolichohiery), the femur was of robust stature, the *linea aspera* were only slightly developed in most of the cases, the body in the upper part of the diaphysis was flat (platymery), the tibia was rather slim and long, and in the cross-cut it appeared to be, according to the cnemic index values, mesocnemic (Table 9).

The females of the South Outer Precincts differed in the postcranial skeleton from males especially in smaller absolute dimensions of long bones and in some proportions reflecting pronounced sexual dimorphism. It was especially the case of the *os sacrum* which was short and wide (platyhie), then the absence of pilaster at the femur and in consequence prevailing hyperplatymery; finally, characteristic eurycnemy has been observed on the tibia (Table 9).

TABLE 4. Statistical characteristic of cranial metrical traits from Pohansko – South Outer Precincts.

Measure No. (Martin, Knußmann 1988)	Males				Females			
	N	Min. – Max.	Mean	S.D.	N	Min. – Max.	Mean	S.D.
M1 – Maximum cranial length	9	183 – 197	190.6	5.6	7	166 – 188	176.4	7.4
M2 – Glabello – inion length	8	156 – 193	179.5	10.2	7	159 – 184	167.6	8.3
M5 – Basion – nasion length	2	100 – 106	103.0	3.0	6	95 – 110	99.5	5.2
M8 – Maximum cranial breadth	8	134 – 153	141.4	5.7	7	126 – 141	131.9	4.7
M9 – Least frontal breadth	8	90 – 104	97.5	4.2	7	89 – 97	91.9	2.6
M10 – Maximum frontal breadth	7	114 – 126	120.7	3.5	5	107 – 115	111.0	2.8
M11 – Biauricular breadth	8	105 – 134	123.1	9.5	5	111 – 119	115.6	2.9
M12 – Biasterionic breadth	10	105 – 120	112.1	5.2	7	100 – 108	105.0	2.6
M16 – Breadth of the foramen magnum	1	31 – 31	31.0	0.0	5	28 – 32	30.2	1.3
M17 – Basion – bregma height	2	135 – 137	136.0	1.0	7	123 – 136	128.4	4.6
M20 – Auriculo – bregmatic height	9	116 – 127	122.1	3.5	7	108 – 117	113.3	2.7
M23 – Horizontal circumference	7	518 – 556	537.4	14.1	6	485 – 519	501.8	11.1
M24 – Transverse arc	7	317 – 350	335.4	10.1	7	291 – 310	302.7	5.5
M25 – Total longitudinal arc	6	370 – 407	389.5	13.8	5	339 – 375	358.2	13.7
M26 – Frontal longitudinal arc	10	122 – 140	132.8	5.5	6	107 – 132	122.8	7.8
M27 – Parietal longitudinal arc	11	116 – 145	130.6	9.3	7	106 – 131	122.7	8.2
M28 – Occipital sagittal arc	7	110 – 144	126.4	10.4	6	98 – 125	114.0	9.2
M29 – Frontal sagittal chord	10	108 – 121	114.7	3.9	6	102 – 112	106.5	3.3
M30 – Parietal sagittal chord	11	110 – 131	118.6	6.6	7	98 – 116	108.7	5.2
M32 – Nasion – metopion angle	6	79 – 91	84.3	4.0	4	87 – 94	89.8	2.7
M32(1a) – Nasion – bregma angle	6	45 – 65	51.0	6.7	4	39 – 53	48.5	5.6
M38 – Cranial capacity	2	1380 – 1420	1400.0	20.0	2	1150 – 1240	1195.0	45.0
M40 – Basion – prostion length	2	86 – 87	86.5	0.5	4	85 – 94	89.8	3.3
M41 – Ektokonchion – porion length	dx	65 – 72	67.6	2.4	4	62 – 64	63.3	0.8
	sin	65 – 73	69.8	3.1	4	61 – 65	63.3	1.5
M42 – Gnathion – basion length	2	102 – 110	106.0	4.0	5	94 – 112	101.4	6.3
M43 – Outer biorbital breadth	7	99 – 109	105.4	3.3	5	97 – 109	102.4	3.9
M43(1) – Inner biorbital breadth	7	93 – 103	99.3	3.1	5	96 – 96	94.8	1.2
M44 – Biorbital breadth ek – ek	4	91 – 101	96.8	3.8	5	90 – 103	96.2	4.7
M44(1) – Nasomalar arc	4	109 – 120	113.0	4.2	4	105 – 114	109.5	3.6
M45 – Bizygomatic breadth	1	124 – 124	124.0	0.0	2	122 – 124	123.0	1.0
M46 – Bimaxillary breadth	3	86 – 95	90.0	3.7	5	84 – 95	89.2	3.7
M47 – Total facial height	4	109 – 130	120.0	8.1	4	102 – 109	105.0	2.8
M48 – Upper facial height	6	54 – 74	65.0	6.1	4	57 – 65	61.0	3.5
M50 – Anterior interorbital breadth	5	19 – 25	21.8	2.1	3	18 – 20	19.3	0.9
M51 – Orbital breadth	dx	39 – 43	41.0	1.8	4	39 – 44	41.0	1.9
	sin	41 – 44	42.3	1.3	4	38 – 41	40.3	1.3
M52 – Orbital height	dx	31 – 35	33.0	1.7	5	29 – 35	32.0	2.0
	sin	28 – 34	31.4	2.2	5	28 – 34	31.4	2.8
M54 – Nasal breadth	5	22 – 28	25.8	2.0	4	20 – 30	24.0	3.7
M55 – Nasal height	6	45 – 56	50.7	3.4	4	45 – 53	48.5	3.2
M57 – Least nasal breadth	4	9 – 13	10.8	1.8	3	9 – 12	11.0	1.4
M57a – Simotic subtense	5	4 – 14	8.2	3.5	3	3 – 7	5.0	1.6
M60 – External palatal length	6	43 – 59	48.0	5.1	3	43 – 49	45.0	2.8
M61 – External palatal breadth	6	56 – 69	60.8	4.1	5	59 – 63	60.8	1.5
M62 – Internal palatal length	4	43 – 50	46.8	2.9	5	39 – 48	43.8	3.1
M63 – Internal palatal breadth	8	33 – 49	38.8	5.0	5	39 – 41	40.0	0.9
M64 – Palatal height	7	9 – 26	15.0	5.3	6	8 – 12	10.3	1.4
M65 – Bicondylar breadth	6	117 – 127	121.7	3.3	8	100 – 124	112.3	8.0
M66 – Bigomial breadth	10	78 – 109	97.0	8.4	14	83 – 110		

TABLE 5. Statistical characteristic of cranial indices from Pohansko – South Outer Precincts.

Index (Martin, Knußmann 1988)	N	Males			Females			S.D.	
		Min. – Max.	Mean	S.D.	N	Min. – Max.	Mean		
I1 M8/M1 Cranial index	6	69.1 – 77.6	72.7	2.7	7	69.1 – 83.4	74.9	4.7	
I2 M17/M1 – Vertical index	2	73.8 – 74.9	74.4	0.6	7	66.5 – 80.5	72.9	4.3	
I3 M17/M8 – Transversal vertical index	2	95.1 – 101.5	98.3	3.2	7	91.1 – 103.1	97.5	3.9	
I12 M9/M10 – Transversal frontal index	6	78.8 – 82.5	80.4	1.4	5	80.5 – 85.0	83.0	1.9	
I13 M9/M8 – Transversal fronto-parietal index	6	66.7 – 75.4	70.1	2.8	7	63.1 – 73.2	69.8	3.6	
I33 M16/M7 – Foramen magnum index	1	81.6 – 81.6	81.6	0.0	5	79.5 – 84.9	82.6	2.0	
I38 M47/M45 – Total facial index	1	104.8 – 104.8	104.8	0.0	2	83.6 – 85.5	84.6	1.0	
I39 M48/M45 – Superior facial index	1	59.7 – 59.7	59.7	0.0	2	47.5 – 52.4	50.0	2.5	
I39 (1) M48/M46 – Malar facial index	2	60.7 – 67.4	64.1	3.4	4	66.7 – 73.0	69.5	2.4	
I42 M52/M51 – Orbital index	dx	5	72.1 – 89.7	80.7	6.6	4	70.7 – 82.5	76.4	4.8
	sin	4	68.2 – 82.9	76.5	5.3	4	68.3 – 82.9	77.0	6.3
I47 M44(1)/M44 – Nasomalar index	4	112.1 – 119.8	116.9	3.0	4	110.7 – 116.7	113.3	2.3	
I48 M54/M55 – Nasal index	5	39.3 – 60.0	51.0	6.8	3	43.5 – 53.3	46.9	4.5	
I54 M61/M60 – Palatoalveolar index	4	100.0 – 131.9	122.6	13.1	3	126.5 – 139.5	134.4	5.7	
I58 M63/M62 – Palatal index	4	76.0 – 85.2	79.5	3.6	3	81.3 – 92.9	87.8	4.8	
I59 M64/M63 – Palatal height index	6	21.4 – 53.1	38.2	10.9	5	19.5 – 30.8	25.5	3.9	
I62 M68/M65 – Mandibular index	6	54.0 – 63.1	59.9	3.5	8	54.5 – 76.2	63.4	6.7	

Body height

According to Martin's classification, the males were above medium-high (169.3 cm); the span of individual values varied between 154.3 and 180.8 cm. Also the females were above medium-high (157.4 cm), with individual values varying between 154.9 and 166.7 cm. Sexual difference to the benefit of males was of 11.9 cm (*Table 6*). By their body height the inhabitants of the South Outer Precincts did not differ from the range given in the literature for the Old Slavonic population in this territory. The average body height in Old Slavonic males varied between 166.3 cm in males from Josefov (Hanáková, Stloukal 1966) and 170.6 cm in males from Mikulčice – 11th church (Stloukal 1981). Old Slavonic females reached an average height from 154 cm at Josefov (Hanáková, Stloukal 1966) to 160.7 cm at Mikulčice – Klášteřisko (Stloukal, Hanáková 1985).

females), hypsicrania, hyperleptoprosopy (euryprosopy in females), lepteny (meseny in females), and mesoconchy; chamaerrhiny (leptorrhiny in females), the body was above medium-high, and the same was observed, with only some slight exceptions, also in inhabitants of other Old Slavonic burial grounds.

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CONCLUSIONS

27 males and 37 females were identified and analysed at the burial ground of Břeclav – Pohansko South Outer Precincts; in 34 adult skeletons the sex could not be identified, 85 skeletons belonged to children.

The average age at death was of 42.9 years in males, and only 37.5 years in females. The males died most often aged between 30–39 years, the females between 20–39 years. The average age in children was of 6.1 years, while the largest amount of children died at the age of 7–8 years, and then at the age of 1.5–4 years.

The following complex of physical features was characteristic of the Old Slavonic population at the South Outer Precincts: dolichocranial, orthocranial (metriocranial in

TABLE 6. Statistical characteristic of postcranial metrical traits from Pohansko – South Outer Precincts.

Measure No. (Martin, Knußmann 1988)	N	Males				Females			
		Clavicula	Scapula	Humerus	Ulna	Radius	Os sacrum		
M1 – Maximal length	dx	4	50 – 146	118.3	39.6	9	43 – 136	120.7	27.7
	sin	7	52 – 156	119.7	40.7	10	40 – 142	124.2	28.7
M6 – Circumference of midshaft	dx	19	35 – 49	41.3	3.9	20	29 – 42	35.7	3.4
	sin	18	34 – 47	41.2	3.3	24	28 – 47	35.5	3.7
M1 – Scapular height	dx					1	160 – 160	160.0	0.0
	sin								
M2 – Scapular breadth	dx	1	111 – 111	111.0	0.0	3	94 – 99	96.3	2.1
	sin								
M2a – Maximum breadth	dx	1	114 – 114	114.0	0.0	3	98 – 104	101.0	2.5
	sin								
M12 – Glenoid height	dx	8	39 – 49	40.8	3.2	9	30 – 37	34.3	2.5
	sin	7	36 – 42	40.4	2.0	9	30 – 38	33.8	2.7
M13 – Glenoid breadth	dx	9	23 – 31	27.6	2.8	7	21 – 27	23.3	2.3
	sin	6	26 – 29	28.0	1.0	9	21 – 25	22.9	1.1
M14 – Depth of glenoid fossa	dx	7	2 – 6	4.1	1.1	9	2 – 5	3.7	0.9
	sin	7	2 – 6	4.4	1.4	9	2 – 6	3.2	1.3
M1 – Maximum length	dx	9	307 – 355	332.9	14.7	12	279 – 317	301.5	11.2
	sin	11	302 – 354	325.1	15.0	14	276 – 312	298.6	9.7
M2 – Total length	dx	7	304 – 352	328.9	15.4	6	276 – 310	295.0	13.8
	sin	11	299 – 351	321.9	14.9	14	272 – 309	294.9	9.8
M4 – Breadth of the distal epiphysis	dx	13	55 – 70	62.5	4.6	11	51 – 57	55.4	1.7
	sin	9	57 – 68	61.8	4.0	15	50 – 58	53.9	2.3
M5 – Maximum diameter mid-shaft	dx	23	20 – 27	23.8	1.9	25	16 – 24	20.4	2.0
	sin	24	19 – 27	22.4	2.0	26	16 – 22	20.1	1.5
M6 – Minimum diameter mid-shaft	dx	23	17 – 22	19.6	1.5	25	14 – 22	16.7	1.9
	sin	24	16 – 24	19.9	2.1	26	13 – 20	16.5	1.8
M7 – Least circumference of the shaft	dx	22	61 – 77	69.4	5.0	25	50 – 65	59.6	3.6
	sin	24	60 – 80	67.5	5.4	26	49 – 66	59.6	3.7
M8 – Circumference of the head	dx	2	150 – 159	154.5	4.5	7	123 – 135	130.3	3.9
	sin	3	140 – 158	148.7	7.4	6	123 – 132	129.3	3.0
M9 – Transverse head diameter	dx	4	45 – 51	47.3	2.5	8	39 – 43	40.8	1.6
	sin	4	43 – 52	46.8	3.3	9	38 – 43	40.4	1.8
M10 – Longitudinal head diameter	dx	4	49 – 50	49.5	0.5	9	38 – 43	40.6	2.0
	sin	4	43 – 50	46.3	2.6	8	37 – 43	39.8	1.6
M1 – Maximum length	dx	10	243 – 296	272.9	13.5	7	236 – 257	247.7	6.0
	sin	7	257 – 296	278.9	12.5	8	220 – 257	240.1	11.9
M2 – Physiological length	dx	11	211 – 269	243.5	15.8	8	206 – 220	214.8	4.1
	sin	10	211 – 259	237.9	14.1	11	190 – 235	212.5	12.6
M3 – Least circumference	dx	16	35 – 47	41.8	3.1	18	26 – 40	35.3	3.0
	sin	13	31 – 50	40.9	4.1	20	24 – 42	35.0	3.6
M11 – Dorso – ventral shaft diameter	dx	22	11 – 19	13.8	1.8	22	10 – 17	11.6	1.8
	sin	21	11 – 18	14.1	1.9	21	10 – 18	11.2	1.7
M12 – Transverse shaft diameter	dx	22	15 – 20	17.0	1.5	22	10 – 17	13.9	1.4
	sin	21	13 – 20	17.1	1.9	21	10 – 16	14.0	1.4
M13 – Transverse diameter	dx	15	19 – 28	23.2	2.3	16	15 – 22	18.2	1.8
	sin	15	19 – 27	22.5	2.5	22</			

TABLE 6. Statistical characteristic of postcranial metrical traits from Pohansko – South Outer Precincts (cont.).

Measure No. (Martin, Knußmann 1988)	N	Males				Females			
		Femur		Mean	S.D.	N	Min. – Max.	Mean	S.D.
M1 – Maximum length	dx 16	400 – 497	456.4	22.3	22	383 – 441	411.3	15.6	
	sin 14	418 – 506	464.3	19.2	21	369 – 440	410.8	16.0	
M2 – Physiological length	dx 16	399 – 495	454.2	21.9	22	382 – 437	408.2	15.4	
	sin 14	416 – 506	461.6	19.6	20	367 – 433	407.9	15.7	
M6 – Anterior-posterior diameter of the mid-shaft	dx 24	22 – 32	28.5	2.4	29	21 – 27	24.3	1.8	
	sin 22	23 – 32	28.3	2.4	25	20 – 28	24.6	2.2	
M7 – Medio-lateral diameter of the mid-shaft	dx 23	26 – 33	28.8	1.8	30	20 – 31	26.0	2.4	
	sin 22	25 – 34	29.2	2.1	25	21 – 31	26.2	2.3	
M8 – Circumference of the mid-shaft	dx 23	80 – 101	92.0	4.9	29	67 – 96	82.3	6.3	
	sin 22	82 – 103	93.0	5.8	25	68 – 92	81.8	6.1	
M9 – Subtrochanteric transverse diameter	dx 24	28 – 39	33.3	2.8	31	24 – 37	31.0	2.6	
	sin 23	28 – 39	33.1	2.7	30	24 – 36	30.4	2.4	
M10 – Subtrochanteric anterior-posterior diameter	dx 24	22 – 32	26.3	2.6	31	18 – 27	22.0	1.8	
	sin 23	22 – 31	26.3	2.3	30	20 – 26	22.4	1.5	
M15 – Vertical diameter of the neck	dx 17	29 – 39	33.7	2.6	26	25 – 35	29.1	2.2	
	sin 17	31 – 39	34.9	2.3	23	25 – 34	29.0	2.1	
M16 – Sagittal diameter of the neck	dx 18	22 – 31	26.9	2.3	27	19 – 28	23.1	2.2	
	sin 18	24 – 32	27.9	2.7	23	19 – 28	22.7	2.1	
M17 – Circumference of the neck	dx 17	87 – 115	101.4	6.8	24	75 – 103	88.5	6.0	
	sin 17	94 – 116	105.5	6.5	22	75 – 103	88.1	6.6	
M18 – Medio-lateral head diameter	dx 11	44 – 55	48.5	2.8	14	39 – 46	41.8	2.2	
	sin 14	44 – 55	48.3	2.7	17	38 – 46	42.1	2.5	
M19 – Transverse head diameter	dx 12	44 – 54	47.9	2.6	14	39 – 46	41.4	1.9	
	sin 15	43 – 54	47.8	2.6	17	39 – 46	41.4	2.1	
M20 – Head circumference	dx 7	140 – 173	154.0	10.6	11	112 – 147	132.1	9.5	
	sin 11	137 – 178	152.4	11.0	12	116 – 152	134.8	9.9	
M21 – Bicondylar width	dx 9	74 – 87	79.9	3.5	9	70 – 75	72.7	1.5	
	sin 7	77 – 90	81.4	4.0	9	64 – 75	71.0	3.1	
M22 – Anterior-posterior diameter of the lateral condyle	dx 12	56 – 67	61.3	3.1	16	50 – 61	55.1	3.2	
	sin 13	55 – 70	61.5	4.0	12	48 – 64	54.9	4.2	
Tibia									
M1 – Total length	dx 10	345 – 428	380.8	20.7	16	311 – 375	340.8	16.6	
	sin 13	347 – 431	387.9	18.3	17	310 – 373	344.0	17.4	
M1b – Maximum condylo-malleolar length	dx 9	337 – 419	372.8	21.1	16	304 – 370	334.2	17.0	
	sin 13	338 – 422	379.1	18.2	17	303 – 367	338.4	16.9	
M3 – Proximal epiphyseal breadth	dx 3	73 – 76	75.0	1.4	9	62 – 70	67.1	2.4	
	sin 4	73 – 82	76.8	3.3	8	66 – 69	67.4	0.9	
M6 – Transverse diameter of the distal epiphysis	dx 8	46 – 55	50.8	2.5	12	38 – 48	43.5	2.9	
	sin 12	47 – 61	52.8	3.8	15	42 – 52	47.1	3.2	
M8a – Anterior-posterior diameter at nutrient foramen	dx 23	30 – 41	34.7	2.5	26	26 – 36	30.3	2.4	
	sin 20	30 – 43	35.6	3.6	24	27 – 35	30.4	2.0	
M9a – Medio-lateral diameter at nutrient foramen	dx 23	19 – 28	24.2	2.3	26	19 – 26	21.3	1.7	
	sin 20	21 – 28	24.1	2.0	23	17 – 23	20.6	1.4	
M10a – Circumference at nutrient foramen	dx 22	76 – 111	94.6	8.1	26	74 – 94	84.4	5.5	
	sin 20	73 – 112	96.2	9.4	22	74 – 93	83.3	4.8	
M10b – Minimum circumference of the shaft	dx 19	65 – 98	78.2	7.9	23	64 – 79	70.0	4.1	
	sin 19	66 – 92	78.6	7.3	24	62 – 76	70.2	4.4	
Fibula									
M1 – Maximum length	dx 1	375 – 375	375.0	0.0	3	311 – 340	329.7	13.2	
	sin 2	335 – 378	356.5	21.5	5	311 – 340	330.6	10.6	
M2 – Maximum diameter of the mid-shaft	dx 13	13 – 18	15.6	1.6	14	11 – 18	14.5	1.8	
	sin 12	12 – 18	14.7	1.6	17	10 – 17	13.6	1.6	
M3 – Minimum diameter of the mid-shaft	dx 13	10 – 16	13.1	1.5	14	10 – 13	11.1	1.0	
	sin 12	10 – 16	12.5	1.4	17	8 – 18	11.4	2.0	
M4a – Minimum circumference	dx 10	33 – 47	40.7	3.8	11	32 – 42	37.0	3.1	
	sin 7	35 – 46	40.3	3.5	13	27 – 42	35.0	3.9	
Stature height (Sjøvold 1990)	24	154.3 – 180.8	169.3	5.8	30	145.9 – 166.7	157.4	4.8	

TABLE 7. Statistical characteristic of postcranial indices from Pohansko – South Outer Precincts.

Index (Martin, Knußmann 1988)	N	Males				Females			
		Clavicula		Mean	S.D.	N	Min. – Max.	Mean	S.D.
M6/M1 Robusticity index	dx 4	25.9 – 82.0	41.8	2.3	8	24.4 – 95.3	36.3	22.4	
	sin 7	26.3 – 76.9	42.0	21.1	9	23.3 – 100.0	35.3	23.1	
Scapula									
M2/M1 – Scapular index	dx 1	61.9 – 61.9	61.9	0.0					
M13/M12 – Glenoid index	dx 8	60.0 – 76.9	69.2	5.7	7	56.8 – 75.0	67.8	5.7	
	sin 5	65.0 – 70.3	67.7	2.1	9	59.5 – 75.0	68.1	5.2	
Humerus									
M7/M1 – Robusticity index	dx 8	18.7 – 22.5	20.8	1.1	11	17.4 – 21.9	20.0	1.2	
	sin 11	19.3 – 23.6	20.6	1.3	13	17.2 – 22.3	20.2	1.2	
M6/M5 – Diaphyseal index	dx 23	68.0 – 95.7	82.7	6.0	24	65.2 – 100.0	81.7	9.7	
	sin 24	76.2 – 100.0	88.7	6.1	25	63.3 – 95.0	81.7	8.6	
Radius									
M5/M4 – Diaphyseal index	dx 19	55.6 – 82.4	72.0	6.7	20	60.0 – 100.0	70.7	8.4	

TABLE 8. Distribution of cranial metrical traits and cranial indices (in categories) from Pohansko – South Outer Precincts.

Maximum cranial length M1				Maximum cranial breadth M8			
	Males (N) %	Females (N) %		Males (N) %	Females (N) %		
very long			very narrow	(3) 37.5%	(4) 57.1%		
long	(5) 55.6%	(2) 28.6%	narrow	(4) 50%	(3) 42.9%		
medium	(4) 44.4%	(2) 28.6%	medium	(1) 12.5%			
short		(3) 42.9%	broad				
mean	long	medium	mean	narrow	very narrow		
Basion - bregma height M17				Bzygomatic breadth M45			
	Males (N) %	Females (N) %		Males (N) %	Females (N) %		
low			narrow	(1) 100%	(2) 100%		
medium	(2) 100%	(5) 71.4%	medium				
high		(2) 28.6%	broad				
mean	medium	medium	very broad				
Total facial height M47				Upper facial height M48			
	Males (N) %	Females (N) %		Males (N) %	Females (N) %		
very high	(1) 25%		very high				
high			high				
medium	(1) 25%	(1) 25%	medium	(2) 33.3%	(2) 50%		
low	(2) 50%	(3) 75%	low	(4) 66.6%	(2) 50%		
mean	medium	low	mean	low	low		
Cranial index M1/M8				Vertical index M17/M1			
	Males (N) %	Females (N) %		Males (N) %	Females (N) %		
ultradolichocranial			chamaecranial				
hyperdolichocranial	(1) 16.7%	(1) 14.2%	orthocranial	(2) 100%	(1) 100%		
dolichocranial	(4) 66.6%	(4) 57.2%	hypsicranial				
mesocranial	(1) 16.7%		mean	orthocranial	orthocranial		
brachycranial		(2) 28.6%					
hyperbrachycranial							
ultrabrachycranial							
mean	dolichocran.	dolichocran.					
Transverso-vertical index M17/M8				Transversal frontoparietal index M9/M8			
	Males (N) %	Females (N) %		Males (N) %	Females (N) %		
tapeinocranial			stenometopic		(1) 14.3%		
metriocranial	(1) 50%	(2) 28.6%	metriometopic	(2) 33.3%	(1) 14.3%		
acrocranial	(1) 50%	(4) 57.2%	eurymetopic	(4) 66.7%	(5) 71.4%		
mean	acrocranial		mean	eurymetopic	eurymetopic		
Foramen magnum index M16/M17				Total facial index M47/M45			
	Males (N) %	Females (N) %		Males (N) %	Females (N) %		
narrow	(1) 100%	(2) 40%	hypereuryprosopic				
medium		(3) 60%	euryprosopic		(1) 50%		
broad			mesoprosopic		(1) 50%		
mean	narrow	narrow	leptoprosopic				

TABLE 8. Distribution of cranial metrical traits and cranial indices (in categories) from Pohansko – South Outer Precincts (cont.).

Superior facial index M48/M45				Malar facial index M48/M46			
	Males (N) %	Females (N) %		Males (N) %	Females (N) %		
hypereuryene				hyperchamaeprosopic		(1) 50%	
euryene				chamaeprosopic		(1) 50%	(4) 100%
mesene				leptoprosopic			
leptene		(1) 100%		hyperleptoprosopic			
hyperleptene				mean			
mean	leptene			hyperchamaeprosop. chamaeprosopic			
Nasomalar index M44/M44(1)				Nasal index M54/M55			
	Males (N) %	Females (N) %		Males (N) %	Females (N) %		
platopic				leptorrhine		(1) 20%	(2) 66.7%
mesopic				mesorrhine		(1) 20%	
prosopic		(4) 100%		chamaerrhine		(2) 50%	(1) 33.3%
mean	prosopic			hyperchamaerrhine		(1) 20%	chamaerrhine
				mean			leptorrhine
Palatoalveolar index M61/M60				Palatal index M63/M62			
	Males (N) %	Females (N) %		Males (N) %	Females (N) %		
dolichouranic				leptostaphyline		(2) 50%	
mesouranic				mesostaphyline		(1) 25%	(1) 33.3%
brachyuranic		(3) 75%		brachystaphyline		(1) 25%	(2) 66.7%
mean	brachyuranic			mean			leptostaphyline
Palatal height index M64/M63				Cranial capacity M38			
	Males (N) %	Females (N) %		Males (N) %	Females (N) %		
chamaestaphyline				oligencephalic		(1) 50%	
orthostaphyline	(1) 16.7%	(4) 80%		euencephalic		(2) 100%	(1) 50%
hypsistaphyline	(3) 50%	(1) 20%		aristencephalic			
mean	orthostaphyline	chamaestaphyline		mean			euencephalic
Mandibular index M68/M65				Mandibular index M68/M65			
	Males (N) %	Females (N) %		Males (N) %	Females (N) %		
dolichostenomandibular				oligencephalic			
mesomandibular				euencephalic			
brachyeurymandibular				aristencephalic			
mean	dolichostenomandibular	dolichostenomandibular		mean			
Total facial angle M72				Cranial capacity M38			
	Males (N) %	Females (N) %		Males (N) %	Females (N) %		
hyperprognath				oligencephalic			
prognath				euencephalic			
mesognath				aristencephalic			
orthognath				mean			
hyperorthognath				euencephalic			
mean	orthognath	mesognath		euencephalic			
Orbital index M52/M51				Orbital index M52/M51			
	Males (N) %	Females (N) %		Males (N) %	Females (N) %		
chamaeconch				dx (N) %	sin (N) %		
mesoconch	(2) 40%	(1) 25%		(2) 50%	(2) 50%		
hypsiconch	(1) 20%	(3) 75%		(2) 50%	(2) 50%		
mean	mesoconch	mesoconch		mesoconch	mesoconch		

TABLE 9. Distribution of postcranial indices (in categories) from Pohansko – South Outer Precincts.

Thickness index of clavica M6/M1							
	Males		Females				
	dx (N)	%	sin (N)	%	dx (N)	sin (N)	%
slight					(2) 33.3%	(1) 11.1%	
medium					(4) 100%	(7) 100%	
thick					(6) 66.7%	(8) 88.9%	
medium	thick		thick		thick	thick	
Diaphyseal index of humerus M6/M5							
	Males		Females				
	dx (N)	%	sin (N)	%	dx (N)	sin (N)	%
platybrachial					(1) 4.3%	(9) 37.5%	
euhydrachial					(22) 95.7%	(24) 100%	
mean	euhydrachial		euhydrachial		(15) 62.5%	(18) 72%	
Platelenic index of ulna M13/M14							
	Males		Females				
	dx (N)	%	sin (N)	%	dx (N)	sin (N)	%
platelenic					(1) 6.7%	(1) 7.1%	(3) 15.8%
eurolenic					(8) 53.3%	(11) 84.6%	(12) 63.2%
hypereurolenic					(6) 40%	(2) 14.4%	(1) 7.1%
mean	eurolenic		eurolenic		eurolenic	eurolenic	eurolenic
Breadth index of os sacrum M5/M2							
	Males		Females				
	(N)	%	(N)	%			
dolichohieric			(5) 83.3%		(1) 16.7%		
hypoplatyheric					(1) 16.7%		
platyheric			(1) 16.7%		(4) 66.6%		
mean	dolichohieric		platyheric		platyheric		
Pilastri index of femur M6/M7							
	Males		Females				
	dx (N)	%	sin (N)	%	dx (N)	sin (N)	%
no pilaster			(9) 39.1%		(14) 63.7%	(21) 75%	(16) 55.2%
weak			(12) 52.2%		(5) 22.7%	(6) 21.4%	(7) 29.2%
medium			(2) 8.7%		(3) 13.6%	(1) 3.6%	(1) 4.2%
strong							
mean	weak		weak		no pilaster	no pilaster	
Platymeric index of femur M10/M9							
	Males		Females				
	dx (N)	%	sin (N)	%	dx (N)	sin (N)	%
hyperplatymeric	(8) 33.3%		(6) 27.3%		(22) 73.3%	(16) 55.2%	
platymeric	(10) 41.7%		(10) 45.5%		(7) 23.3%	(9) 30%	
euromeric	(5) 20.8%		(5) 22.7%		(1) 3.4%	(4) 13.8%	
stenomeric	(1) 4.2%		(1) 4.5%				
mean	platymeric		platymeric		hyperplatymeric	hyperplatymeric	
Cnemic index of tibia M9a/M8a							
	Males		Females				
	dx (N)	%	sin (N)	%	dx (N)	sin (N)	%
hyperplatycnemic							
platycnemic	(7) 30.4%		(8) 40%		(7) 28%	(7) 31.8%	
mesocnemic	(6) 26.1%		(5) 25%		(3) 12%	(5) 22.7%	
euycnemic	(10) 43.5%		(7) 35%		(15) 60%	(10) 45.5%	
mean	mesocnemic		mesocnemic		euycnemic	mesocnemic	

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