

**ANTHROPOLOGICAL ANALYSIS OF THE SKELETAL SERIES
EXHUMED FROM THE NECROPOLIS OF
PIATRA NEAMȚ – DĂRMĂNEȘTI (XIVth – XVth CENTURIES)**

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This article represents a bioanthropological study of a small osteological series (32 skeletons) discovered in 2012 in the necropolis of Piatra Neamț – Dărmănești. According to the authors of diggings (Garvan Daniel, archaeologist, and his collaborators at Piatra Neamț Museum of History and Archaeology) the necropolis is dated between the XIVth and XVth centuries. The general and child mortality rates were analyzed, by gender and age, as well as the average lifespan by calculating the average age at death. We noticed a high mortality rate in childhood stage (0–14 years: 43.75%). If we add to it the teenage mortality rate (14–20 years: 6.25%), we can see that half of the studied population died before reaching adulthood. In the 20-x years interval, the highest mortality rate was recorded for mature people (30–60 years – 25%); the incidence of death among adults (20–30 years) and subjects over 60 years is much lower (15.63% and 9.38%, respectively). The average lifespan for the entire population under study (0–x years) is 25.63 years, the value recorded by gender, being of 44.17 years in men and 40.36 years in women. Anthropological analysis indicates, on the average, a population of over-middle height in males and middle height in females, with mesocranic skulls in males and brachyranic skulls in females, orthocranic and acrocranic (in the male series), respectively chamecranic and tapeinocranic (in the female series) skullcaps. The forehead is eurimetopic (in the male series) and metriometopic (in the female series), with averagely wide (in males) and wide (in females) occipitals. The face is, on the average, leptoprosopic and leptene in males, respectively mesoprosopic and mesene in females, with hypsiconch orbits and leptorrhine nose. Mandible robustness is moderate in both genders.

Keywords: necropolis, XIVth – XVth centuries, demographic indices, anthropological analysis.

1. INTRODUCTION

Initial archaeological research in Piatra Neamț – Dărmănești was conducted in 1957 by archaeologists A. Nițu, I. Zamoșteanu and M. Zamoșteanu. The archaeological site of Dărmănești is located within the built-up areas of Piatra Neamț, on the northern side of the town, at the crossroads between the 1st of December 1918 street and Dărmănești street. In the study of 1957, researchers

identified archaeological materials specific for the IInd – IIIrd centuries (ceramics, large pieces made of clay), but also some characteristic for the IIIrd – IVth centuries (a fibula). They also identified a medieval necropolis (XIVth – XVth centuries), located right over the Carpic settlement. Eight tombs were investigated. Based on a coin of Petru Musat and on various jewelry pieces, they could be

dated in the XIVth – XVth centuries [20]. In 1958, the research, conducted by a group composed of A. Nitu, C. Matasă, I. Zamosteanu and A. Buzilă, included 10 tombs, some of them double, the inventory reconfirming their chronological dating [16]. New diggings were conducted in 1968, with the main purpose of investigating the medieval necropolis. Seven more tombs were studied, one of them double [26].

In June 2012, archaeological excavations in the necropolis of Piatra Neamț – Dărmănești were resumed by the archaeologists at Piatra Neamț Museum of History and Archaeology (Daniel Garvan and collaborators), leading to the identification of 27 inhumation tombs – 22 of them individual and 5 double ones, containing 32 human skeletons (XIVth – XVth centuries) – very few of them including an inventory. The pits were not much bigger than the size of the skeleton they contained and some of them had rounded corners. We also noticed, mainly among the adult tombs, that the pits had a slightly scooped bottom and their size diminished towards the lower extremities. Compared to the present walking area, tomb holes have a depth ranging between 0.53 m and 0.93 m, based, to some extent, on the age of the deceased (adult tombs are usually the deepest). The skeletons are positioned on the west-east axis facing the sunrise; they were laid down on their back, according to the Christian ritual. Eventual deviations from the indicated axis were caused by the time of the year when the funerals took place. The osteological material exhumed in 2012 from the necropolis of Piatra Neamț – Dărmănești was entrusted to the researchers at the Anthropological Research Department, for the study on the anthropological structure defining a segment of the population of Piatra Neamț in the indicated period.

2. MATERIALS AND METHOD

The osteological series contains 32 skeletons (found in 27 inhumation tombs – 22 individual and 5 double) exhumed in 2012 from the medieval necropolis (XIVth – XVth centuries) of Piatra Neamț – Dărmănești. Among the 32 skeletons, 14 belonged to children (0-14 years), 2 belonged to adolescents (females), 5 to adults (2 males and 3 females), 8 to mature (5 males and 3 females) and only 3 belonged to senile people (2 males and 1 female).

There followed the analysis of each skeleton, according to the recently used methodology of anthropological research, therefore pointing out a series of conformational and morphological biometrical features that highlighted the general anthropological features of the population group inhumed in a particular area of the necropolis.

Determination of age at the time of death (20-x years for the segment) and of sex was done using the methods and techniques recommended by Brothwell, Bruzek, Mays, Schmitt, Walrath and collaborators, White and Folkens [7, 8, 17, 24, 30, 31].

For establishing the age at the time of death in the case of sub-adults, the eruption of the temporary and definitive dentition was analyzed according to the methodology established by Moores and collaborators, Schaefer and collaborators, Ubelaker [18, 22, 29], as well as the degree of ossification of the epiphysis of the long bones and their positioning in the corresponding age categories (Maresh, Scheuer and Black) [14, 23]. The anthropometric and conformational study of each skeleton has been completed with the techniques of Martin and Saller [15], for dimensional evaluation by the dimorphic scales of Alexeev and Debeț [2]. The waist has been calculated with the dimensional scales proposed by Bach, Breitingner, Manouvrier, Trotter and Glesser [3, 6, 13, 27].

The absolute and relative values resulted from direct measurement and calculation of the conformational indices has been positioned in the scales proposed by Olivier [21].

After establishing the sex and age for each skeleton, we proceeded to the demographical analysis of the population represented by the 32 skeletons, studying the mortality rates by age and by sex, and the average lifespan estimated by calculating life expectancy both at birth (0-x years) and at the age of 20 years (20-x years).

The average life expectancy at birth, associated with the average lifespan, provides the most accurate evaluation of the mortality level and it represents the average number of years a person is expected to live from the moment of birth up to the age limit [28]. Life expectancy at birth was determined using mortality tables [1]. Based on mortality according to age and sex, these tables represent significant demographic models in the evaluation of the probabilities of death (q_x) or survival (l_x). The mortality table features the life history of a population, which usually begins at birth and ends with the extinction of the last exponent [7].

The mortality tables include several mathematical indices associated with the number of deceases grouped on specific age intervals (half decades), based on which the life expectancy for the entire population (0-x years) and for the adult population (20-x years) was finally established:

– % dx = number of deceased subjects, on age intervals, and the associated percentage;

– l_x = number of survivors;

– q_x = death probability;

– L_x , T_x = mathematical calculations based on the previously mentioned indices;

– $e^{\circ}x$ = life expectancy.

The survival rate l_x , established for each age group, is defined as the probability that an individual from the intended group will be still alive at the beginning of the age group [9].

3. RESULTS AND DISCUSSION

3.1. DEMOGRAPHIC STRUCTURE

Paleodemographic studies provide important information about the ancient populations' style of life and help us to better understand the population dynamics during historic and prehistoric times [19]. Especially important in reconstructing the demographic features of past populations is the accurate determination of skeleton gender and age, based on the available methods. Based on the paleodemographic analysis of various human communities, we can estimate the number of people inhabiting a specific settlement and population density, the general and infantile mortality rate, distribution by gender and age, as well as life expectancy.

The cause of death in the case of children and teenagers is also an important parameter which allows us to estimate the general mortality rate and induces changes to other significant demographic parameters. Along historical periods characterized by a high child mortality rate, life expectancy at birth is greatly influenced by the mortality rate in the first years of life [12].

The osteological series (32 skeletons) exhumed from the necropolis of Piatra Neamț – Dărmănești, dating from the Middle Ages (XIVth – XVth centuries) is in a satisfying state of preservation and can be subjected to demographic study, in order to determine the distribution by gender and age categories (Table 1).

Table 1
Distribution according to age and sex of the specimens constituting the skeletal series of Piatra Neamț – Dărmănești (XIVth – XVth centuries)

Sex	Male		Female		Indeterminable		Total	
	N	%	N	%	N	%	N	%
Age (years)								
<i>Infans I</i> (0–7)	–	–	–	–	10	31.25	10	31.25
<i>Infans II</i> (7–14)	–	–	–	–	4	12.5	4	12.50
<i>Juvenis</i> (14–20)	–	–	2	6.25	–	–	2	6.25
<i>Adultus</i> (20–30)	2	6.25	3	9.38	–	–	5	15.63
<i>Maturus</i> (30–60)	5	15.63	3	9.38	–	–	8	25.00
<i>Senilis</i> (60–x)	2	6.25	1	3.13	–	–	3	9.38
Total	9	28.13	9	28.13	14	–	32	100

Child mortality rate (*infans I and II*) approaches 44%, the highest incidence being recorded for children aged 0–7 years (ca 31%). The incidence of death is considerably lower among teenagers (14–20 years), with only two cases recorded in the female series (ca 6%). By adding the teenage death rate and the infantile death rate, we obtain a mortality of approximately 50%, which indicates that half of the population buried in this necropolis died before reaching adulthood. The highest mortality rate in the 20–x years age interval was recorded among mature people (30–60 years – 25%); the incidence of death among adults (20–30 years), as well as among the subjects over 60 years is much lower (15.63% and 9.38%,

respectively). As to the distribution by gender in the 18–x years segment, represented by 18 subjects, we notice that the number of male skeletons is equal to the number of female skeletons (9 skeletons each).

Based on the distribution by age at death, we calculated life expectancy at birth both for the entire series subjected to study (0–x years) and for the subjects over the age of 20, separately for each gender which reflects the longevity of this population. Thus, life expectancy at birth for the entire sample (0–x years) is 25.63 years (Table 2), while by gender (20–x years for the segment), we recorded 24.17 years in men (Table 3) and approximately 4 years less in women – 20.36 years (Table 4). The average lifespan for the adult segment (subjects over the age of 20) is 44.17 years in males and 40.36 years in females.

Table 2
Mortality and life expectancy in the population exhumed from the necropolis of Piatra Neamț – Dărmănești (0–x years)

Age class	N(Dx)	%(dx)	Survivors (1x)	Probability of death (qx)	Life expectancy (e ⁰ x)
0–4	4	12.50	100.00	0.1250	25.63
5–9	6	18.75	87.50	0.2143	23.93
10–14	4	12.50	68.75	0.1818	24.77
15–19	2	6.25	56.25	0.1111	24.72
20–24	2	6.25	50.00	0.1250	22.50
25–29	3	9.38	43.75	0.2143	20.36
30–34	1	3.13	34.38	0.0909	20.23
35–39	0	0.00	31.25	0.0000	17.00
40–44	4	12.50	31.25	0.4000	12.00
45–49	1	3.13	18.75	0.1667	13.33
50–54	0	0.00	15.63	0.0000	10.50
55–59	2	6.25	15.63	0.4000	5.50
60–64	3	9.38	9.38	1.0000	2.50

Table 3
Mortality and life expectancy in the males exhumed from the necropolis of Piatra Neamț – Dărmănești (20–x years)

Age class	N(Dx)	%(dx)	Survivors (1x)	Probability of death (qx)	Lx	Tx	Life expectancy (e ⁰ x)
20–24	0	0.00	100.00	0.0000	500.00	2416.67	24.17
25–29	2	22.22	100.00	0.2222	444.44	1916.67	19.17
30–34	1	11.11	77.78	0.1429	361.11	1472.22	18.93
35–39	0	0.00	66.67	0.0000	333.33	1111.11	16.67
40–44	3	33.33	66.67	0.5000	250.00	777.78	11.67
45–49	0	0.00	33.33	0.0000	166.67	527.78	15.83
50–54	0	0.00	33.33	0.0000	166.67	361.11	10.83
55–59	1	11.11	33.33	0.3333	138.89	194.44	5.83
60–64	2	22.22	22.22	1.0000	55.56	55.56	2.50

Table 4
Mortality and life expectancy in the females exhumed from the necropolis
of Piatra Neamț – Dărmănești (20–x years)

Age class	N(Dx)	%(dx)	Survivors (1x)	Probability of death (qx)	Lx	Tx	Life expectancy (e ⁰ x)
20–24	2	28.57	100.00	0.2857	428.57	2035.71	20.36
25–29	1	14.29	71.43	0.2000	321.43	1607.14	22.50
30–34	0	0.00	57.14	0.0000	285.71	1285.71	22.50
35–39	0	0.00	57.14	0.0000	285.71	1000.00	17.50
40–44	1	14.29	57.14	0.2500	250.00	714.29	12.50
45–49	1	14.29	42.86	0.3333	178.57	464.29	10.83
50–54	0	0.00	28.57	0.0000	142.86	285.71	10.00
55–59	1	14.29	28.57	0.5000	107.14	142.86	5.00
60–64	1	14.29	14.29	1.0000	35.71	35.71	2.50

Compared to other populations inhabiting the Central Moldavian Plateau during the same period, the population buried in the necropolis of Piatra Neamț – Dărmănești has a relatively lower average lifespan than the series of Iași (25.63 years – Piatra Neamț – Dărmănești necropolis; 35.92 – Curtea Domnească [10]; 35.63 years – “Banu” Church [11] and 34.06 in “Sfântul Nicolae – Ciurchi” [25], but a higher lifespan than in the series of Brad – 22.80 years [4], and a nearly equal lifespan in the series of Siret – 25.80 years [5] (Fig. 1).

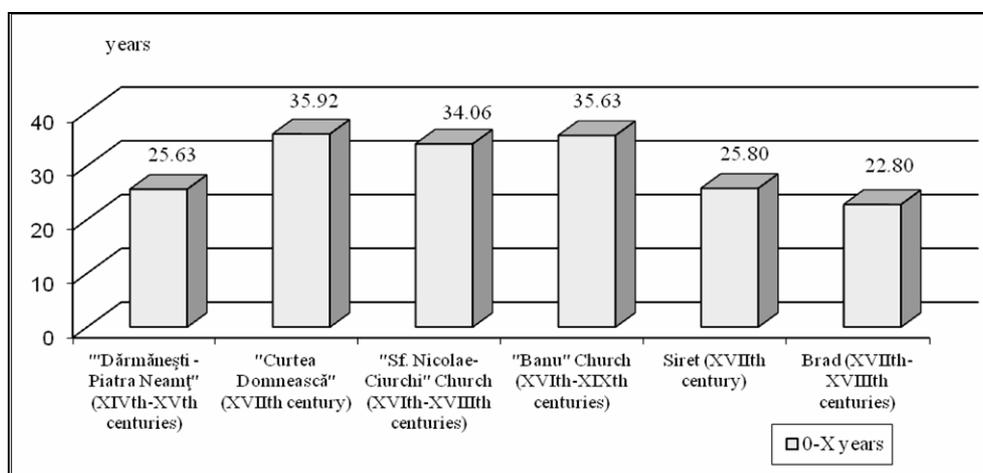


Fig. 1. Average lifespan for the investigated series compared to other synchronous series (0–x years).

3.2. ANTHROPOLOGICAL DESCRIPTION

The anthropological study was conducted on 18 skeletons which belonged to subjects aged 18–20 years. Table no. 5 presents the statistical values of the main absolute and relative cephalo-facial and stature dimensions.

Table 5
Statistic values of the main, absolute and relative, cephalo-facial and stature dimensions

Martin No.	Character	Male			Female		
		N	M	δ	N	M	δ
1	G-op	6	184.83	7.63	5	176.30	6.91
5	N-ba	2	102.50	0.71	2	95.25	3.18
8	Eu-eu	5	141.20	5.22	9	142.89	6.00
9	Ft-ft	7	100.07	6.90	6	92.83	2.07
10	Co-co	6	120.50	6.77	8	116.06	6.92
12	Ast-ast	4	110.75	4.52	6	118.33	11.51
17	Ba-b	2	141.00	1.41	2	123.00	0.71
20	Po-b	3	121.50	3.77	8	107.00	4.28
40	Ba-pr	2	92.50	2.83	–	–	–
44	Ek-ek	3	93.00	3.97	2	93.00	0.71
45	Zy-zy	2	128.50	2.12	3	131.17	13.29
48	N-pr	3	68.17	6.25	3	63.50	2.29
47	N-gn	3	113.17	9.93	3	108.00	1.73
50	Mf-mf	3	23.50	1.80	5	24.40	2.68
51	Mf-ek	3	37.67	3.06	5	37.80	1.52
52	Height of the orbit	3	32.50	2.29	5	33.20	3.40
54	Al-al	4	23.38	1.97	4	23.88	2.10
55	N-ns	3	52.00	2.78	3	52.83	8.40
62	Ol-st	4	46.00	4.38	4	41.75	2.02
63	Enm2-enm2	6	41.67	13.09	4	38.50	2.48
65	Kdl.-kdl.	6	122.25	6.41	5	119.40	4.10
66	Go-go	6	103.58	8.14	5	98.00	2.35
68	Depth of the mandible	6	75.25	3.84	6	67.92	3.47
69(1)	Height at g.m.level	9	33.83	3.01	9	27.00	4.70
69(3)	Thickness at g.m. level	9	13.22	1.42	9	10.78	1.00
8/1	Cranial index	4	75.04	4.13	5	80.14	4.27
17/1	Basio-bregmatic long. index	2	74.01	0.47	2	68.49	3.22
17/8	Basio-bregmatic transv. index	2	102.59	3.67	2	89.48	1.79
20/1	Porio-bregmatic long. index	3	68.12	9.37	5	61.66	3.07
20/8	Porio-bregmatic transv. index	3	90.63	6.91	8	74.91	3.53
9/10	Fronto-transversal index	5	83.15	5.24	6	70.02	31.12
9/8	Fronto-parietal index	5	71.22	2.37	6	66.27	2.52
12/8	Occipito-parietal index	4	78.20	3.83	6	84.16	7.72
47/45	Total facial index	2	92.45	4.00	2	86.30	5.65
48/45	Superior facial index	2	55.84	0.10	2	50.47	5.01
52/51	Orbitary index	3	86.50	6.91	5	87.96	9.61
54/55	Nasal index	3	44.13	6.17	3	45.38	3.13
45/8	Cranial-facial transv. index	2	93.47	0.86	3	91.90	8.60
9/45	Fronto-jugal index	2	74.87	4.54	3	70.60	5.07
69(3)/69(1)	Mandible robustness index	9	39.22	4.09	9	41.09	8.62
	Stature	9	167.34	4.76	8	155.38	5.88

a. The neurocranium

Neurocranium length (g-op), with higher variability in the male series (between very short and very long sizes), as opposed to the female series (between averagely long and long sizes) can be, defined as average for the former (184.83 mm – near the upper limit of the category) and large for the latter (176.30 mm – at the lower limit of the category) (Table 5).

Long skulls have the highest incidence in the male series (3 skulls), followed by the short, medium and very long categories, with 1 skull each. In the female series, we identified 3 averagely long skulls and 2 long skulls.

Skull width (eu-eu) falls under the averagely wide category (141.20 mm) in the male series and under the wide category (142.89 mm) in the female series, respectively.

As to individual variability, averagely wide (2 skulls), wide (4 skulls) and very wide skulls (3 skulls) dominate the entire female series, whereas, in the male series, low and average values (4 skulls) are more frequently encountered, since we recorded a single wide skeleton. In terms of shape, the male series is slightly mesocranic (cranial index: eu-eu/g-op = 75.04 u.i.), whereas the female series is brachycranial (80.14 u.i. – the lower limit of the category). The variation interval of the cranial indices is relatively narrow – ranging between dolichocephaly and brachycephaly. The female group contains 4 brachycranial skulls and 1 dolichocranic skull, whereas the male series has 2 dolichocranic skulls, 1 mesocranic and another one brachycranial.

Basion-bregma height (ba-b) indicates high dimensions (141.00 mm) in the male series and, short dimensions (123.00 mm) in the female series. This distribution on categories (ba-b) indicates 1 high skull and 1 very high skull in the male series and 2 short skulls in the female series. The height – length indices (longitudinal basion-bregma: ba-b/g-op) are, on the average, orthocranic in the male series (74.01 u.i.) and chamecranial in the female series (68.49 u.i.). Distribution of this index on categories indicates 2 orthocranic skulls in the male series, respectively 1 chamecranial skull and 1 orthocranic skull in the female series. Height – width indices (transversal basion-bregma: ba-b/eu-eu) are, on the average, high – acrocranial in the male series (102.59 u.i.) and low – tapeinocranic in the female series (89.49 u.i.). Analyzed individually, 2 male skulls are acrocranial and 2 female skulls are tapeinocranic.

Porion-bregma height (po-b), ranging between high and very high values in the male series, respectively between very low and average values in the female series, records a very tall mean in males (121.50 mm) and a very short mean in females (107.00 mm). While, in male skulls, the individual values fall under the tall (1 skull) and very tall (2 skulls) categories, in the female skulls the values range between the very short (1 skull), short (5 skulls) and average (2 skulls) categories. In relation to skullcap length the longitudinal porion-bregma indices (po-b/g-op) have hypsicranial (2 male skulls and 2 female skulls), orthocranic (1 male skull and

2 female skulls) and chamecranic (1 female skull) values. The average porio-bregmatic longitudinal index can be defined as hypsicranic in males (68.12 u.i.) and orthocranic in females (61.66 u.i.).

In relation to skullcap width the porio-bregmatic transversal indices (po-b/eu-eu) fall under the upper limit of the acrocranic category in the male group (90.63 u.i.), and under the lower limit of the tapeinocranic category respectively, in the female group (74.91 u.i.).

There are 8 tapeinocranic female skulls, 1 metriocranic male skull and 2 acrocranic male skulls. In the frontal area, metric features are defined by the two horizontal diameters: minimum (ft-ft) and maximum (co-co). Minimum frontal diameter (ft-ft) has a male mean situated at the upper limit of the high category and a female mean falling under the average category (100.07 mm, respectively 92.83 mm). Maximum frontal diameter means (co-co) fall under the average category in the male series (120.50 mm) and under the high category in the female series (116.06 mm). The fronto-parietal index (ft-ft/eu-eu) offers eurimetopic means in the male series (71.22 u.i.) and metriometopic means in the female series (66.27 u.i.). According to individual variability, sexual dimorphism is represented by the predominance of eurimetopic (wide) foreheads in male skulls (4 skulls), and metriometopic (averagely wide) foreheads in female skulls (3 skulls). The ratio between the minimum and maximum forehead width, expressed by the fronto-transversal index (ft-ft/co-co), indicates intermediate (oval) foreheads in the male series (83.15 u.i.) and spherical foreheads in the female series (70.02 u.i.). Index distribution in both genders is defined by intermediate foreheads (oval forehead – 3 men; 4 women) and spherical foreheads (2 men; 2 women). As regards the maximum occipital width (ast-ast), the mean absolute values indicate a wider occipital in the female series compared to the male series, falling under different categories on the dimorphic scale: very wide for the former (118.33 mm) and average for the latter (110.75 mm). The mean values for the occipito-parietal index (ast-ast/eu-eu) fall under the average category in males (78.20 u.i.) and under the wide category in females (84.16 u.i.). In both groups, distribution is based on the absence of narrow occipitals and presence of averagely wide (3 male and 1 female skulls), wide (1 male and 3 female skulls) and very wide occipitals (2 female skulls).

The neurocranial shape in *norma verticalis* and *norma occipitalis*, the frontal and occipital region characteristics represent useful morphological features in defining a specific anthropological type. The neurocranial shape in *norma verticalis* is mainly ovoid (6 male and 4 female skulls) and, in rare cases, spheroid (1 male and 3 female skulls). In *norma occipitalis*, the skull is mainly shaped as a “house” (6 male and 4 female skulls), or as a “bomb” (2 female skulls). Regarding the neurocranium posterior region, the male group shows 4 skulls with averagely curved occipital and 5 skulls with curved occipital. In the female group, averagely curved occipitals are encountered in 2 skulls, and curved shapes define 3 skulls. Development of the external occipital protuberance falls under degrees II, II→III and III→IV in both genders; the other degrees, I, I→II, have lower incidences.

Glabellar relief in both genders records only three of the six degrees – the IIIrd degree is the most frequently encountered (4 male and 3 female skulls), whereas the IInd and IVth degree have lower incidences. Supraorbital relief is poorly delineated: 5 female skulls – Ist degree; 5 male and 3 female skulls – degree I→II; 2 male skulls and 1 female skull – IInd degree.

b. The facial skull

Total facial height (n-gn) (the upper floor along with the mandible) returns mean values that fall under the low category in the male group (113.17 mm – the upper limit of the category) and under the average category in the female group (108.00 mm – the lower limit of the category). Individual dimension distribution points to the predominance of medium faces in both men and women (2 male and 3 female skulls); a single male skull falls under the low category.

Upper facial height (n-pr) records low means in both genders (68.17 mm – in the male series; 63.50 mm – in the female series), while individual variability has very low (1 skull) and average (2 skulls) values in males, respectively low (1 skull) and average (2 skulls) values in females.

Facial width (zy-zy), specified only in 5 skulls (2 men and 3 women), indicates a wide variability, ranging between narrow and very wide (1 skull in each category) in the female series; the 2 skulls in the male series fall under the narrow category. The 2 male skulls have a low mean value (128.50), whereas the 3 female skulls have a high mean value (131.17 mm).

According to the dimensional values, the total facial indices (n-gn/zy-zy) indicate high – mesoprosopic (1) and hyperleptoprosopic (1) skulls in the male series and low – euryprosopic (1) and high – leptoprosopic (1) skulls in the female series; the mean value is leptoprosopic (92.45 u.i.) in males, and mesoprosopic (86.30 u.i.) in females.

Using the superior facial index (n-pr/zy-zy), the skulls were classified as euryene (1) and mesene (1) in the female series, with a mean value situated at the lower limit of the mesene category (50.47 u.i.); as to the 2 male skulls, they can be defined as leptene (55.84 u.i. – the lower limit of the category).

Mean orbital height is lower in the male group, as opposed to the female group, being situated at different levels of the dimorphic scale: very low in the former (32.50 mm – the upper limit of the category) and average in the latter (33.20 mm – the lower limit of the category). Very low, low and average dimensions (1 skull for each category) are encountered in the male group, and low (2 skulls), medium, high and very high dimensions (1 skull for each category) are encountered in the female group. Orbital width (mf-ek) recorded relatively similar mean values in the two genders, situated at the limit between very narrow (the lower limit in males: 37.67 mm) and narrow (the lower limit in females: 37.80 mm). The dimensions have very low (very narrow – 2 male and 2 female skulls), low (narrow – 2 female skulls) and average (1 male and 1 female skull) values.

Orbitary indices (orbital height/ mf-ek) are, on the average, high – hypsiconch in both genders; however, the male mean is approximately 1.5 u.i., lower than the female mean, indicating a tendency towards lower orbits. High-hypsiconch orbital indices are prevalent in females (4 skulls), whereas male orbital indices are medium-mesoconch (2 skulls) and high-hypsiconch (1 skull).

The nose is averagely long (n-ns: 52.00 mm) and narrow (al-al: 23.38 mm) in males, long (52.83 mm) and averagely wide (23.88 mm) in females.

Nasal index is, on the average, leptorrhine in both genders, with close values (44.13 u.i. in the male series and 45.38 u.i. in the female series). Nasal indices distribution on categories is in line with the mean values, indicating leptorrhine (2 male and 2 female skulls) and mesorrhine (1 male skull and 1 female skull) shapes.

The cranial-facial transversal index (zy-zy/eu-eu) has a male mean of 93.47 u.i., situated at the lower limit of the medium category. In the female series, the mean value of the index is 91.90 u.i., falling under the cryptojugal category. The fronto-jugal index (ft-ft/zy-zy) has a male mean of 74.87 u.i., consequently a high index, and a female mean of 70.60 u.i., thus an average index.

The mandible is averagely wide (103.58 mm – the upper limit) and deep (75.25 mm) in the male series, respectively wide (98.00 mm – the lower limit) and shallow in the female series (67.92 mm). The mentonian hole height and thickness are, on the average, high in the male series (33.83 mm and 13.22 mm). The female series has an average height (27.00 mm) and low thickness (10.78 mm). Robustness indices have average values in both genders, but the female mean is ca 2 u.i. higher than the male mean (41.09 u.i. in women and 39.22 u.i. in men). The mentonian region in the male group is predominantly pyramidal (6 cases); the button shape is less frequently encountered (3 cases). In the female group, the button shape is predominant (8 cases) and there is a single case of pyramidal shape. Gonions are slightly turned outwards in the male group, whereas female mandibles do not show this tendency. Malar bones are most frequently moderately developed (5 men and 5 women), whereas wide (high) shapes are only encountered in 5 cases (3 men and 2 women). In terms of position, malar bones have mainly an intermediate position (4 men and 5 women), but frontalized (2 men and 1 woman) or temporalized (2 men and 1 woman) positions are also present. The development of the canine fossa has high variability, ranging between barely delineated fossae – Ist degree, to deep fossae – IVth degree (Ist degree – 2 women; IInd degree – 2 women; II→III – 3 men and 1 woman; III→IV – 3 men and 1 woman; IVth degree – 3 men).

The palate is mainly parabolic in shape both in the male and female series (5 men and 3 women); the hypsiloid shape is only encountered in three cases (2 men and 1 woman). Piriform aperture is anthropic in both genders (6 men and 5 women).

Stature has over-middle mean values in the male series (167.34 cm), and middle values in the female series (155.38 cm). From the mean stature distribution on categories, in the male series, the individual variability of the statures ranges

between the under-middle and high categories (under-middle: 2 cases; middle: 3 cases; over-middle: 3 cases; high: 1 case), whereas, in the female series, it ranges between the short and high categories (short: 1 case; under-middle: 3 cases; middle: 1 case; high: 3 cases).

4. CONCLUSIONS

Demographic analysis conducted upon the 32 skeletons (XIVth – XVth centuries) exhumed in 2012 from the necropolis of Dărmănești – Piatra Neamț indicates relatively high child mortality rate (0–14 years: ca. 43.75%), with the highest incidence recorded at the 0–7 years interval (31.25%). Thus, teenage death rate (6.25%) combined with child mortality rate (0–14 years), indicates a total mortality rate of approximately 50%, which shows that half of the population buried in this necropolis died before reaching adulthood. The incidence of death among adults (20–30 years) is close to 15–16%, whereas mature (30–60 years) death rate approaches 25%. Survival rate after the age of 60 recorded a mere value of 9.38%. As to death distribution by gender in the 18–x years segment represented by 18 subjects, we notice that the number of male skeletons equals the number of female skeletons (9 males and 9 females).

Life expectancy at birth for the entire population subjected to analysis (0–x years) is 25.63 years, whereas, in the 20–x years segment, it is of 24.17 years for men and of 20.36 years for women. Average lifespan, calculated for the adult segment (subjects past 20 years), is 44.17 years for men and 40.36 years for women.

From a biotypological point of view, the studied population is defined by a mesocranic cranial index in males and by a brachycephalic cranial index in females.

The porio-bregmatic longitudinal index is, on the average, orthocranic in the male group and chamecranic in the female group, whereas the porio-bregmatic transversal index is acrocranic in the male group and tapeinocranic in the female group. The fronto-parietal index, which represents the ratio between the minimum forehead width and neurocranial width, offers eurimetopic means in the male series and metriometopic means in the female series.

The occipital is averagely wide in males and wide in females, individual distribution occupying, in both groups, three of the five categories defining this feature (medium, wide and very wide).

Face is, on the average, leptoprosopic and leptene in males, respectively mesoprosopic and mesene in females, with hypsiconch orbits and a predominantly leptorrhine nose. Mandible robustness indices fall under the average category in both genders; however, the female mean is 2 u.i higher than the male mean. Mean stature is over-middle in the male series and middle in the female series.

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