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The Medieval Cemetery outside the Eastern Gate of Gamizgrad (*Felix Romuliana*): A Paleodemographic Interpretation

Abstract: The medieval cemetery was archaeologically investigated between 1981 and 1992. It consisted of 91 graves containing 95 anthropologically identified skeletons. Further anthropological analysis has established 31 reliably or highly likely adult males, 31 reliably or highly likely adult females, 3 poorly preserved and therefore unsexed adult skeletons, and 30 children, most of whom died within the first ten years after birth. From the paleodemographic viewpoint, this would be the necropolis of a single medieval community showing a dearth of children of all age groups, which may be interpreted in several ways, ranging from reduced procreation to inadequate archaeological excavation.

Keywords: anthropology, archaeology, paleodemography, historical demography, sexes, age groups, individual age, population size, hypothetical settlement size

Even in its first issue, the oldest anthropological journal, *Bulletin de la Société d'Anthropologie* published in Paris since 1860, brought demographic contributions and anthropological papers containing demographic data. Indeed, demography and anthropology have been going hand in hand ever since they became established through their societies, journals and university departments. This combination is not surprising, given that at first the main emphasis of anthropology was on the biology of human populations, looked at both diachronically and synchronically, and that demography is defined as a broad study of population.[1] In their further development, the quantitative demographic and the qualitative anthropological aspects became increasingly integrated. Anthropological issues are combined with statistical data about past populations or population groups as well as with qualitative effects of demographic processes. They are examined and interpreted theoretically and empirically during the research process itself. This may be illustrated by abundant examples, one of which will be the subject of this paper: the medieval cemetery outside the eastern gate of Gamzigrad, which in fact is one of the earliest models in domestic practice of how any archaeologically explored cemetery should be analyzed.

It should be added that paleodemography is the study of ancient populations which addresses issues such as the size and structure of a population in the past. It looks at a particular micro- or macro-region, but most

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[1] I. Schwidetzky-Rösing, "Demographie und Anthropologie", *Bundesinstitut für Bevölerungforschung* 26 (1982), 7–15.

of all, at a particular necropolis. It supplies information about the size of the settlement associated with a given necropolis, about average life spans and mortality frequencies, about the ratio of males and females and their relation to the number of children, about social or marital patterns, about migrations. Briefly, paleodemographic studies are based on human osteological material which should be excavated jointly by anthropologists and archaeologists in order to reconstruct the biological basis, as well as the social background and structure of ancient populations.[2]

The prefix paleo in the term paleodemography is used to indicate that the study is concerned with human osteological material from different periods of the past, that is that it seeks to infer about prehistoric, protohistoric and historical populations (usually up to the sixteenth century) from their preserved and excavated skeletal remains.[3]

Every paleodemographic analysis is based on the data obtained by anthropological methods. To be exact, the data pertain to the sex and biological age of every individual skeleton from an archaeological site. As for the medieval necropolis outside the eastern gate of Gamzigrad, the sex and age of the skeletons were established according to the criteria European anthropologists agreed upon at Szarospátak, Hungary, as early as 1978. The criteria were formulated and published in the form of a manual by D. Ferembach, I. Schwidetzky and M. Stloukal in 1980.[4]

Of course, apart from sex and age assessment for each of the 95 skeletons found in 91 graves, a full anthropological processing was carried out, which means all available osteometric measurements of the skulls and post-

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[2] G. Ascadi and J. Nemeskeri, *History of Human Life Span and Mortality* (Budapest: Akademiai Kiado, 1970).

[3] At the University of Belgrade and in Serbia in general demography is much more institutionalized than physical anthropology. Since 2000, the Department of Demography of the School of Geography in Belgrade offers a programme of basic studies in demography, and at the Institute of Social Sciences operates Demographic Research Centre. Within that framework, historical demography covers the period between the sixteenth century (from the earliest records, namely the Ottoman defters) and the modern age, while paleodemography is only partially covered through anthropological courses. At the School of Philosophy, the Department of Sociology teaches social demography as a separate subject, and the Department of Archaeology covers paleodemography insomuch as it offers courses in physical and social anthropology.

[4] D. Ferenbach, I. Schwidetzky and M. Stloukal, "Recommendations for age and sex diagnoses of skeletons", *Journal of Human Evolution* 9 (1980), 517–549.

cranial skeletons,[5] hereditary markers,[6] paleopathological changes on the preserved bones and teeth[7] etc. The obtained paleodemographic results are shown in Table 1.

Grave	Sex	Age
1	child	*ca* 4
2	unidentified	up to 60
3	female	up to 23
4	male	up to 50
5	male	*ca* 50
6	child	0–1
7	child	early months
8	child	*ca* 2
9	male	up to 40
10	female	up to 45
11	unidentified	adult
12	child	6–8
13	female	up to 30
14	child	0–1
15	male	up to 45
16	female	adult
17	female	up to 40
18	female	up to 60
19	child	up to 8
20	child	early years
21	male	up to 40
22	child	up to 5
23	male	up to 21
24	male	up to 50
25	child	8–10
26	male	up to 45
27	male	up to 45
28	male	up to 45
29	male	up to 50
30	male	up to 40
31	female	up to 30
32	female	up to 30
33	male	up to 40
34	male	up to 40
35	child	*ca* 8
36	female	over 50
37	male	up to 50
38	male	up to 40
39	male	up to 50
40	female (probably)	adult
41	male	up to 30
42	child	up to 6
43	male	up to 45
44	male	up to 40
45	female	up to 40
46	male	up to 40
47	child	up to 4
48	child	4–6
49	female	up to 21
50	male	up to 50
51	male	up to 30
52	female	up to 35
53	male	up to 40

[5] R. Martin and K. Saller, *Lehrbuch der Anthropologie* I (Stuttgart: Gustav Fischer Verlag, 1957).

[6] A. C. Berry and R. J. Berry, "Epigenetic variation in the human cranium", *Journal of Anatomy* 101 (1967), 361–379; G. Hauser and G. F. de Stefano, *Epigenetic variants of the human skull* (Stuttgart: Nägele und Obermiller, 1989).

[7] A. Lovrinčević and Ž. Mikić, *Atlas of osteopathological changes of the historical Yugoslav populations* (Sarajevo: Svjetlost, 1989).

Grave	Sex	Age
54	child	up to 6
55	female	adult
56	female	up to 60
57	female	up to 30
58	male	up to 45
59	child	0–1
60	female	up to 30
61	female	adult
62	female	up to 30
63	adult and child in early months	
64	adult male and child in early years	
65	female	up to 40
66	male	up to 40
67	female	up to 35
68	female	up to 40 and neonate
69	female	up to 45
70	child	up to 2
71	child	8–10
72	female	over 40 and child up to 12
73	male	up to 40
74	child (male)	15–19
75	child	up to 12
76 +76 /1	probably adult female + child in early years	
77	child	early months
78	female	up to 60
79	female	up to 35
80	child	up to 15
81	child	12–15
82	child	0–1
83	male (probably)	adult
84	male (probably)	adult
85	female (probably)	adult
86	male (probably)	adult
87	female	adult
88	child	0–1
89	female (probably)	adult
90	female	adult

A remark to be made about Table 1 concerns grave numbering. Namely, in the excavator's plan of the necropolis, which was published posthumously in 2000,[8] Grave 76 occurs twice in two different places about ten metres apart. In order not to disturb the numbering established during the

[8] S. Jovanović, "Romulijana — srednjovekovna nekropola ispred istočne kapije", *Razvitak* 203–204 (2000), 106; the text was prepared for publication by Dj. Janković, M. Sladić, M. Ružić and V. Manojlović-Nikolić.

excavations (between 1981 and 1992),[9] we have resolved the problem by marking the two graves as 76 and 76/1. Thus the total number of excavated graves becomes 91, of which four are double: No 63 (a woman and a child), No 64 (a man and a child), No 68 (a woman and a child), and No 72 (a woman and a child). As can be seen from Table 1, paleodemographic analysis has encompassed 95 individual skeletons from 91 medieval graves.

Given the state of preservation of the skeletons, that is that Table 1 gives a significant amount of bounding data, especially concerning the individual biological age, our paleodemographic calculation of average life spans (specified according to sex and age) will rely on maximum bounding values. As for sex, the obtained results have already been given: of 95 skeletons, 31 belong to each of the two sexes, excluding 3 poorly preserved adult skeletons which could not be assigned to any sex group. The remaining 30 skeletons belong to children, and the age of most is within the first decade of life.

Statistical analysis of the data contained in Table 1 has produced the following results: the average life span for males was about 42, and for females about 40, which means that for some reason women were biologically more compromised than men. The average life span of children was slightly over 5 years. Or, in other words, the average life span of the whole medieval community was nearly 30. The average life span of adults, namely of those who survived the critical first decade of life, was about 41. This does not mean that there were no individuals whose age at death belonged to the *senilis* age group (over 50/55), which is at least 5 individuals, predominantly female (Nos 18, 36, 56 and 78).

The question is how to interpret the obtained paleodemographic results. These results are: assuming that the necropolis is fully or largely explored archaeologically, and that it forms a single burial ground despite the configuration of the terrain, the medieval population group consists of 31 males, 31 females, 3 unsexed adults, and 30 children, which is an obvious deficit. The average life span was below 30, the highest mortality rate was in the first decade of life (in 27 cases, or about 28 percent of the whole group).

If we accept the assumptions about the degree of investigation and about the necropolis as being a single burial area as "the situation on the ground", our interpretation can go in only two directions: if the situation is the result of inadequate archaeological excavation, we do not consider ourselves competent for interpretation. The assumption about a reduced

[9] Excavations were directed by S. Jovanović, curator of the National Museum at Knjaževac, while the Gamzigrad Project was directed by Prof. Dragoslav Srejović. The team was numerous and comprised archaeologists and archaeology students.

biological reproduction seems more likely, as shown by elementary statistics giving one third to adult males, females and children each (31 : 31 : 30). This detail will be additionally looked at later.

Further, paleodemographic methods make it possible to calculate a cross-section of a population, which is the number of group members at a given point in time, as well as the size of the settlement with which a necropolis was associated,[10] if it has not been established by using archaeological methods.[11] This cross-section of the population is calculated by using the formula P = D × E/T + K; D being the number of burials (or skeletons), E being average life span (in this case 30), T standing for the length of use of the necropolis (in this case, about one century). To the value of this fraction is then added a constant coefficient (K), which is usually 10 percent (of the obtained value). It should include various dropouts from the group, ranging from marital combinations and various disappearances to possible archaeological blunders (shallow burials, erosions etc.). In some cases this coefficient can rise to a maximum of 20 percent. In our case, with the coefficient K = 10%, the average number of coexisting individuals is 31. On the other hand, if the coefficient is increased to its maximum of 20 percent, the coexistence rises to 34 members of the medieval population group.

Given the average life span of about 30, the deficit in children and the mortality rate of women much before the end of their reproductive period, no more than three generations could coexist regardless of combinations. This would mean, then, that this community needed 10 to 12 houses, apart from economic buildings (depending of the type of their economy). Given that Gamzigrad at the time abounded in building material or even in suitable dwellings, their accommodation only required a small area of the intramural zone. Of course, the inference is at odds with the chronologically synchronous necropolises (or a necropolis) within the walls. The question posed by S. Jovanović[12] as to the exact period of the eleventh century and the circumstances under which the two necropolises at Gamzigrad were formed, "one in front of the eastern gate, the other within the walls", can

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[10] J. Nemeskeri, "Contributions à la reconstruction de la population de Veszprém, Xe et XIe siècles", *Ann. Nat. Mus. Nat. Hung.* n. s. 8 (1957), 367–435.

[11] There is some discrepancy concerning the number and location of cemeteries and settlements at Gamzigrad in the 10th–11th centuries between D. Srejović, Dj. Janković, A. Lalović, V. Jović, *Gamzigrad — kasnoantički carski dvorac*, Exhibition Catalogue (Belgrade: SANU, 1983) and Jovanović, "Romulijana". In addition to this necropolis, the author of this contribution has anthropologically processed the intramural one excavated between 1974 and 1980, as well as the intramural one abutting to the southern wall excavated in 1984.

[12] Jovanović, "Romulijana", 119.

now be answered. If the two are simultaneous with each other, then there were two small communities which used different burial grounds and different zones of Gamzigrad and therefore should not be defined as connected by kinship ties. Their morphological characteristics can be the object of further anthropological analysis.

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