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**LIFE EXPECTANCY, AGE STRUCTURE AND MORTALITY  
IN THE ROMAN PROVINCES RAETIA AND NORICUM. I<sup>st</sup> –  
III<sup>rd</sup> Centuries AD**

PhD Thesis Abstract

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Relatively young science, the demography of ancient times in general, and of ancient Rome in particular, has faced and still faces a number of challenges related to the research methodology, difficulties caused by epigraphic material, the main sources used in demographic studies. Initially reckoned as an auxiliary science of ancient history, ancient demography, defined as the scientific study of human populations, primarily with respect to their size, their structure and their development, has become established as a field of scientific research and also has developed significant progress especially over the last few decades, evidenced by a multitude of specialized studies and a diversification of research areas.

One of the first scientific studies devoted to the demography of Antiquity appears at the end of the nineteenth century, bearing the signature of the German historian K.J. Beloch - *Die Griechische-römischen Bevölkerung der Welt* (1886). In his study, the author deals with various issues, such as the comparative use of results concerning the age structure or the rounding age problem common in epigraphic sources. He encourages the scientific analysis of the sources, leaving aside the results attained through demographic analysis.

After Beloch, studies concerning the ancient populations entered in a phase of regression. They returned to the positivist interpretation of literary and epigraphic sources. By the 60s, this scientific direction remained untouched by new and interesting progress in historical demography of the recent past. A decisive moment in the development of ancient demography, as a field of scientific research, is illustrated by the emergence of K. Hopkins's study in 1966. Its importance lies not only in introducing the model life tables in ancient history surveys, but also in explicit recognition of the relationship between individuals in the past and age and sex structures of the population to which they belonged.

After 80s, the demographic study of Greco-Roman world experienced a revival, which was determined by the use of concepts, models and comparative data derived from the history of recent past population. This progress was not due to the discovery of significant amounts of new data but was made possible by new ways of addressing existing evidence. Integration of demography in Roman history was supported in part by T.G. Parkin's book, *Demography and Roman Society* (1992), which places the fertility, mortality and migration in the context of source materials that have survived from the Roman world (legal texts, the so-called Ulpianic life table: skeletal data from Roman provinces; the census data from Roman Egypt). This study contributed to the introduction of methods and materials useful for a possible marginal and technical expertise of Antiquity researchers, and stresses many of the shortcomings of demographic approaches conditioned by the use of legal sources, literary or otherwise in the understanding of birth, death or mobility. In 1994, B.W. Frier, along with R. S. Bagnall,

publish *The Demography of Roman Egypt*, where they categorizes and analyzes the census returns lists (comprising a sequence of household members, names and ages). It is the first study which brings in a comprehensive and systematic demographic investigation of an ancient population. They examine the age at birth, marriage and death using modern demographic methods and model life tables, and inform us about their impact on society, economy and culture.

In the previous decade, W. Scheidel was a key figure in ancient demography research. He edited a collection of essays *Debating Roman Demography* (2001), among which is advocating the use of demographic theories and methods in exploring population trends in the Roman world. Scheidel considers this approach as the most productive and rational way forward for the study of roman demography and population history.

Over the last few decades, ancient demography tried to find different ways to respond to questions related to lifetime or mortality of individuals from Antiquity. The present research deals with the analysis and description of the evolution of population from the Roman provinces between Alps and Danube, from a demographic perspective. For this purpose, they were chosen, for calculating and interpreting, three main demographic parameters: life expectancy, age structure and mortality. These parameters are calculated not only to obtain statistics. Much more important are the results, these framing the expression of a part of the society's image at a given moment.

The spatial framework is consisting of two western provinces of the Roman Empire: Raetia and Noricum, situated in the upper basin of the Danube. The period under discussion is chronologically framed between the first century and the end of the third century AD, when once arrived at the head of the Roman Empire, Diocletian undertake a comprehensive administrative reform, whereby Raetia is subdivided into two provinces called Raetia Prima and Raetia Secunda (belonging to the diocese of Italy), Noricum being also subdivided into Noricum Mediterraneum and Noricum Ripense (belonging to the diocese of Pannonia). The highest proportion of inscription discovered, from the entire ancient period are dated between 1st-3rd centuries A.D.

So far, both in Romanian and foreign scientific literature, the population dynamics issue in the roman provinces of Raetia and Noricum was not treated. In our country, the road to study the demography of Antiquity was opened by L. Mihailescu-Bîrliba, followed by V. Piftor, focusing their research on some Balkan-Danubian Roman provinces. In terms of demographics, the Danubian regions have been explored very little. Except the studies of J. Szilagyi, A. Mócsy, A. Paki, A. Ștefănescu, M. Balaci Crînguș and L. Mihailescu-Bîrliba, the

demography of these provinces remained unknown. The year 2004 represents a milestone in the research of Roman Antiquity demography from our country, by the appearance of demographic study of Roman province Dacia, closely followed by works investigating the demography of other Balkan-Danubian provinces of the Empire.

The reason for this approach is to add new data, obtained from the analysis of the two provinces, to the demographic picture of the Danubian provinces, started by some demographic studies on Pannonia Inferior and Pannonia Superior, Dacia, Moesia Inferior and Moesia Superior, and also to compare the results obtained for different times, and from different areas.

The occurrence of the systematic surveys of ancient source material that can be used by ancient historians for demographic purposes such as - tombstone inscriptions; mummy labels, census returns, and tax receipts from Roman Egypt; skeletons; ancient statistics as recorded in literary sources – made possible the identification and development of three methodological models which can be applied in the academic approaches of this kind of evidence.

The first model consists of the straightforwardly and positivist interpretation of numbers reported in ancient texts or derived from samples of documentary and osteological evidence, without reference to other models and without a comparative approach - a method of its own at the beginnings of the discipline, but still in use over the last few decades (K.J. Beloch; I. Kajanto in the 60s; R. Étienne, G. Fabre or P. Salmon during 50s – 80s; W. Suder and M. Sgarlata in the 90s).

The second model, advocated by K. Hopkins (*On the probable age structure of the Roman population*, Population Studies, 20, 1966, p. 245-264) in the 1960s and adopted more recently by several other historians, consists of rigorous rejection of all those data that cannot fully be trusted to provide reliable or representative results, and of potentially coincidental matches between such data and predictive models. This skeptical approach requires us to abandon attempts to derive vital statistics (such as mortality, fertility and sex ratios) directly from ancient sources, and to fall back on modern demographic models of age distribution and life expectancy which, whilst based on much more recent populations, are thought to provide a better approximation of conditions in antiquity than any sample of primary evidence.

The third model, set off by B.W. Frier (R.S. Bagnall, B.W. Frier, *The Demography of Roman Egypt*, 1994), is an intermediate methodological option, in relation to the other options described earlier and recognizes the superior value of modern models, but it simultaneously uses evidence from ancient sources that can be exploited.

In terms of methodology, in our analysis we tried to integrate the categories of sources relevant for historical reconstruction of the demography of the two provinces: the main sources being of epigraphical nature. Epigraphic documents have contributed enormously to the development of the demography of Greco-Roman world as a scientific field: statistical analysis of numerous inscriptions have generated new insights into mortality regimes, marriage practices and family structures in different areas of the Roman Empire.

Epitaphs designate one of the important categories of Latin and Greek inscriptions which survived until now. In its simplest form, an epitaph contains the name of the deceased. Most of them, however, contain information about the age of death, biographical details (social status, family relations, employment or public offices held), formulas for the characterization of the deceased or the expression of loss, ending with the name of dedicators. These, together, form a huge base of relevant information useful for population studies. Of the total number of inscriptions discovered in Noricum, we have identified a number of 651 funerary inscriptions with the age of death mentioned, representing a percentage of 20.60%. Regarding the epitaphs with specified age of death from Raetia, they are represented by a low percentage of 8.70% (90 funerary inscriptions).

For the analysis of epigraphic material, we outlined and created a database, including, where possible, information regarding the name of the deceased, the legal or socio-professional status held by the deceased, age, name of the dedicator, dating, and place of discovery and bibliographical source of the epitaphs. From the inscriptions available for the two provinces we have selected those inscriptions containing information on age and sex of the population, rejecting the data that cannot provide representative results. The inscriptions were collected from volumes of inscriptions published for the two provinces, such as *Antike Inschriften aus Jugoslawien, Heft 1: Noricum und Pannonia Superior*; *Corpus Inscriptionum Latinarum*; *Inscriptiones Baivariae romanae sive Inscriptiones Prov. Raetiae adiectis aliquot Noricis Italicisque*; *Inscriptionum Lapidarium Latinarum Provinciae Norici usque ad annum MCMLXXXIV repertarum indices*, and also *L'Année Épigraphique* magazine (years 1888-2009)). The documentary basis used, from funerary stones dating since the first three centuries of our era, allowed us the composition of two samples consisting of 115 individuals in Raetia (73 males, 40 females and two persons whose gender could not be determined) and 934 individuals in Noricum (555 males, 351 females and 28 persons whose gender could not be determined).

The three main demographic parameters were studied separately by gender, using quantitative, statistical, and mathematical methods, as well as modern models of demographic

structures. These models are considered to be comparable to those from Antiquity. We chose to apply the third methodological model set above, used previously by R.S. Bagnall and B.W. Frier in their work on the demography of Roman Egypt and by L. Mihailescu-Bîrliba in his studies and articles devoted to the provinces Dacia, Pannonia Inferior and Pannonia Superior and also by V. Piftor for two Moesias. Life expectancy, age structure and mortality characteristic to the two provinces were calculated on the basis of samples provided by inscriptions, separate on sex and age categories (category 0-1 years, 2-5 years and then 5 in 5 years) and modern life tables created by A.J. Coale and P. Demeny for modern populations. This model life tables rely upon a large number of accurate life tables from many historical populations, though the bulk of the evidence comes from Europe. The authors created four geographic sets (West, North, East and South); of these, Model West is the most generalized and has the broadest statistical foundation and also produces the most reliable results for populations with very high levels of mortality. The results thus obtained were interpreted and then compared with the life expectancy, age structure and mortality obtained for Roman Egypt and the Danubian provinces of the Roman Empire: Pannonia Inferior and Pannonia Superior, Dacia, Moesia Inferior and Moesia Superior. The principal sources for the study of the three main parameters for population in Raetia and Noricum come from the epigraphic records. It is therefore particularly important to keep in mind the methodological obstacles, determined by the application of modern demographic models on the information provided by the epigraphic documentation, which make the results of our analysis to be relative. They are as follows: social representativeness of the sample, age distribution of the population, *sex ratio*, origin place of the epitaphs, age rounding phenomenon.

A particular aspect on which we focused our attention is the age rounding problem. Inability to express the own age or the age of the family members and the approximation thereof by using a limited range of conventional digits, such as multiples of 5 or 10, designates a practice common in classical Antiquity, but that has been perpetuated including in the contemporary period. This demographic phenomenon has been in the attention of classical Antiquity historians starting with the end of the 19<sup>th</sup> century, with the articles of A.G. Harkness and W. Levison. More than half a century later, when the demographic studies on the Roman Era were resumed, age rounding came back to the researchers' attention: A. Mócsy, J. Szilagyi, R.P. Duncan-Jones and W. Scheidel. For the Danubian provinces, this phenomenon has been analyzed by L. Mihailescu-Bîrliba (as a single author or with V. Piftor and R.V. Cozma), V. Piftor and L. Pricop.

We used Whipple's Index to calculate age rounding. The formula is applied to a restricted age-range selected by the U.S. Census Bureau for studying excess representation figures in the U.S. Census of 1910. The range comprises 40 years stretching from 23 to 62 inclusive. Analysis is restricted to this age span in order to exclude children and juveniles, the precise ages of whom are likely to be remembered by their parents, as well as elderly people among whom an approximate and even increasingly symbolic expression of age becomes the norm. The interval is divided into four decades. The index-figures for rounding are calculated as follows. A separate percentile analysis has been made of the proportion of ages divisible by 5 in each of the four decades. We subtract 20 from the percentage obtain within a decade and we multiply the result by 1.25. Scheidel thought that Whipple's Index can afford to start with the data for age 10 without giving undue weight to the more accurate age records for juveniles because the cohort from 10-19 years is less fully represented than the cohorts from age 20 onwards. When evaluating census returns from Roman Egypt, in which the age from 60-69 years do not appear excessively imprecise, it seems reasonable to extend the overall age range to age 69. Therefore, for his calculations, he used an extend sample with ages ranging between 10 and 69. We applied for the analysis of age rounding process in Raetia and Noricum, the calculation method for Whipple's Index on 23-62 age span, used by Duncan-Jones, and also on 10-69 age interval proposed by Scheidel.

The paper is divided into five chapters, preceded by a list of abbreviations used in the text, seeking as much as possible to achieve a more complete picture of demographic structures in the upper basin of the Danube. The last part of the study is dedicated for final considerations, bibliography and appendices (presents in a tabulated form the dead persons commemorated in inscriptions from both provinces).

This present research completes the information about ancient demography presented by L. Mihailescu-Bîrliba for Roman Dacia and the two Pannonias, and of course, by V. Piftor for the population of the two Moesias, thus showing a comprehensive picture of the demographic structures of the Danubian provinces. Calculation of the main parameters in terms of demographic data provided by epigraphic sources is a novelty for the Upper Danube region. Precisely because of their limited number, funerary inscriptions with age of death in Raetia and Noricum retain a special significance, given the absence or scarcity of studies concerning the anthropological material discovered in necropolis, which could complete the demographic concerns. Currently, Roman epitaphs are the only reliable sources that can give us a picture, at least partially, on the demographic phenomena that have characterized population of Raetia and Noricum in the first three centuries of the Christian era.