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INTRODUCTION

Children in the past. Palaeoauxology, demographic anomalies, taphonomy and mortuary practices

Children's growth is a traditional marker of the general population health and development. This descriptive inferential approach has been developed by scientists focussing on living children, in the study of auxology, and has been adopted by researchers reconstructing the biology of past populations. In this case the data set involves juvenile skeletal samples and the studies can be considered as palaeoauxology, a term that we suggested first (Tillier 1995). However it is important to articulate the essential differences between the goals that can be realised by auxological and palaeoauxological studies.

Studies of growth in archaeological samples cannot be conducted with the same approaches as those that aim to describe living samples and consequently the interpretation of the growth status of skeletal remains is different. The primary challenge posed by skeletal samples is that they are, by necessity, only cross-sectional samples. In the case of skeletal juveniles, the human remains provide data only at one point in time during the skeletal development of the individuals.

Skeletal juveniles reflect only a specific point in the time course trajectory of individuals' development. A priori there is a difference between the skeletal maturation state of juveniles and their actual chronological age on one hand, and their skeletal status vis-à-vis their own growth trajectory. The potential errors inherent in palaeoauxological approaches are evident as data collected on living subjects clarify that growth is not a static state, but a process which can only be documented through time sequential, longitudinal studies. Data gathered from human skeletal remains seem to be irrelevant to reconstruct a model of growth rate, as growth itself is not simply linear in nature, but characterised by alternating growth episodes and stasis intervals (Lampl et al. 1992) that are impossible to reconstruct from the specimens characterising archaeological samples. Obviously future studies in palaeoauxology can benefit from further collaboration with researchers focussing on auxology, and from an appreciation of the distinctive problems confronting a palaeoauxological data set.

In the last two decades skeletal biologists have attempted, however, to improve methods of analysing immature skeletons (e.g. Johnston, Zimmer 1989, Saunders, Katzenberg 1992, Molleson, Cox, Whaldrone 1993, Saunders, Hoppa 1993). The impact of methodological advancements in the analyses of human osteology and odontology has contributed to a better approach in growth studies and a better knowledge of the biology of past populations.

It appears clear now that age at death estimation of non-adult individuals from past populations must be based on genuine reference data, i.e. children of known age and sex. Since Lewis and Garn (1960), the use of

the dental age estimation is recommended as being the most accurate method to evaluate chronological age in immature individuals. Several important studies of tooth formation age predictions of subadult skeletal samples have recently increased the documentation of population differences in dental development (Saunders 1992, Tompkins 1996 among others).

The possibility of using tooth enamel microstructures has received much attention as an approach to the precise estimation of age at death. However, this approach is the subject of considerable debate at the moment as the variability in these structures that has been documented raises questions regarding the proposed accuracy of dental microstructures as age indicators (e.g. Warshawsky, Bai, Nanci 1984, Mann, Monge, Lampl 1993).

In the lack of dental criteria, innovative approaches have been proposed, such as studies focussing on the accuracy of ageing techniques applied to the skeletons of neonates and infants (e.g. Fazekas, Kosa 1978, Scheuer, Musgrave, Evans 1980, Sellier, Tillier, Bruzek 1997). These approaches evaluated the reliability of different methods and might provide new insights in the future.

Perinatal mortality is an important factor in reconstructing the health status of past populations. Two most useful topics of research for improving growth-related studies on infant skeletal samples are concerned. Indeed, skeletal biologists still fail to determine from the skeletal remains themselves whether the individual was a premature baby, a stillborn or a baby who had died a few days after birth. This is also a crucial point when we address the question of the status of the infant in the prehistoric society from the analysis of the archaeological data set and specifically from the interpretation of the funerary practices. Apart from the difficulties regarding the accurate age estimation at death, in the discussion surrounding interpretation of infant mortality, is also the problem of sex determination of subadult skeletons from the morphometric skeletal data (e.g. Saunders 1992, Molleson, Cox, Whaldrone 1993, Schutkowski 1993, Majo, Tillier, Bruzek 1995).

Excavations carried out in different archaeological sites have demonstrated the antiquity of mortuary practices devoted to infants who had been stillborn or had died shortly after birth. Age-related changes of such practices within the infant age group, as well as their diversity in spatial distribution, in location within sites, cemeteries or other contexts were documented (e.g. Dedet, Duday, Tillier 1991, Molleson 1993, Duday, Laubenheimer, Tillier 1995, Sellier 1995, Murail 1996, Ulrich-Boesler 1997).

Although a meticulous excavation provides accurate information in order to reconstruct the infant burying mode, it appears rather difficult to establish from the field work (in the lack of written archives, i.e. surviving documents or records) the evidence for the practice of infanticide (e.g. Dedet *et al.* 1991, Molleson 1995).

The representativeness of the archaeological immature skeletal samples vis-à-vis the biological population in which they had lived is a major question that palaeoanthropologists and archaeologists together have to resolve. With respect to palaeodemographic studies, the evaluation of childhood mortality, the reconstruction of age at death profiles in past populations, in the absence of documents, should be carefully conducted (Konigsberg, Frankenberg 1992, Saunders, Herring 1995, Castex, Sellier, Houët 1995, among others).

Finally over the past few years discoveries in Middle and Upper Palaeolithic sites, located in Europe and Southwestern Asia (e.g. Akazawa, Aoki, Bar Yosef, Eds. 1998, Duarte *et al.* 1999) have refocused attention on the significance of studies devoted to juvenile human remains of prehistoric samples. Ontogenetic studies are integrated into the ongoing debate on the origins of Modern Humans and their evolutionary relationship to other *Homo sapiens* fossil samples, such as the Neanderthals. However, methodological biases can be introduced in palaeoanthropological studies of prehistoric samples as the individual variation in growth and maturation processes is more difficult to document and to evaluate from the fossil record itself (Tillier 1995).

Research applied to fossil children has included analyses of the pattern of skeletal development and maturation, various facets of comparative studies that aim to establish general processes of growth that have characterised extinct members of the *Homo sapiens* species (e.g. Minugh-Purvis 1988, Coqueugniot 1998, Tillier 1999).

This volume provides the presentation of a diversity of topics covering growth and ontogenetic studies, palaeodemographic analyses, taphonomic aspects and examination of funerary practices applied to sub-adult individuals. The discussion of methodological aspects prevails to the presentation of newer technologies.

Thanks are due to the colleagues who all shared the common interest in the study of subadult skeletal samples and friendly accepted to contribute to this volume. Their contributions evince some aspects of the progress in studies of past human population biology and will provide information for further discussion and additional researches. Indeed, interdisciplinary work between parallel disciplines, i.e. auxology, palaeoanthropology

and archaeology can only enhance our understanding of the juvenile specimens who represent one aspect of life in past times.

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