



TOMB REUSE AT YASIELEH: A BYZANTINE SITE IN NORTHERN JORDAN

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ABSTRACT

Tomb 35 at the Byzantine site of Yasielah was analyzed to extract data on the social persona of the buried individuals, skeletal biology and paleopathology. Seventeen human ribs were sampled from tomb 35 at Yasielah for establishing a relative dating using the concentration of Fluorine in bones. Cyberscan PH 2500 ion selective electrode was used to measure the concentration of Fluorine after certain bone preparations. The results show two main groups indicating two chronological interments with a very high standard deviation among groups but more homogenous results within groups. The study also concludes that the tomb is not a family tomb but probably of the general public.

KEYWORDS: Byzantine, Tomb, Reuse, Fluorine, and Dating.

INTRODUCTION

Most of the Byzantine sites in Jordan witnessed tomb reuse (Cheyney 1995; Abu Dalu 1995; Waheeb 1995; Al-Shorman 2003; Rose *et al.* 2004; Rose and El-Najjar 2004). Tomb reuse is defined as the repeated use of a tomb, where previous interments were moved to one side or piled away from

the most recent interments (Middleton *et al.* 1998). A tomb reuse could be misinterpreted as a secondary burial (Autry 1973) but the post interment disturbances caused by tomb reuse usually left one or several segments in the correct anatomical positions (Romano 1974). In the case of a secondary burial, the body was removed

from its original burial after skeletonization is complete, which means that the excavator unearths remains in a disarticulated state (White and Folkens 1991, 272).

One of the Byzantine sites that witnessed extensive tomb reuse is Yasielah in the north of Jordan (Khrais 1998; Al-Shorman 2004). Yasielah is the crossroad between southern Syria, Jordan, and Palestine, where occupation took place during the Hellenistic, Roman, Byzantine, and Islamic periods. The fertile agricultural landscape surrounding the site (Al-Muheisen 1989) and the water distribution systems (Al-Muheisen and El-Najjar 1994; Al-Shukairat 2000) indicate rural and agricultural prosperity during the Byzantine period. The site has many unique architectural features, such as the 6th century AD churches (Al-Muheisen 1992), the wine presses (Melhem 1992; Al-Khouseh 2000), and the cemeteries (Khrais 1997; Anderson 2000).

One of the multiple tombs at Yasielah is "Tomb 35", which revealed 30 individuals. One of the problem that the tomb possesses is the unknown time of interments; it is unknown if the deceased were interred during a short period of time, and thus implying a family tomb, or interred during a longer period. Moreover, if it was not a family tomb, who probably would be buried there?

In the absence of an absolute dating method, the method of choice to assign a relative dating to the skeletons would be using Fluorine relative dating technique (Parker *et al.* 1974). This technique has been proved reliable in archaeological studies since the 19th century (Middelton 1844). The applicability of this technique was later demonstrated by the studies of Wiener *et al.* (1950), Singer and Armstrong (1968) Callaghan (1986) Ezzo (1992) and Johnson (1997). Fluorine dating was tested

against known dated samples and proved its validity (Hady 1982; Schurr 1989). It is currently used to develop a relative chronology for bones (Haddy and Hanson 1982) offering a temporal resolution capable of distinguishing between features separated as little as 20 years (Schurr and Gregory 2002). This study establishes a relative dating technique for the recovered skeletons at tomb 35 at Yasielah and considers the biology and demography of the recovered skeletons.

MATERIALS AND METHODS

The sample represents 17 right first ribs and thus excluding the possibility of having two samples from the same individual. The nature of the sample did not permit adding more ribs, where no other right first ribs could be found. Other bone types were excluded to avoid the varied porosities and densities of compact bone. It is known that the movement of Fluorine across the compact bone is influenced by its density and porosity (Haddy and Hanson 1982). All sub adult bones were also excluded because they accumulate more Fluorine (Underwood 1977).

The method of sample preparation and analysis is present in the work of Singer and Armstrong (1968), Parker *et al.*, (1974) and Schurr (1989). The ribs were first cleaned with deionized water to remove adhering soil, then were dried at 70° C for 24 hours and ground to a fine powder using an agate mortar and pestle. About 50mg of the powdered bone were dissolved in 60micro liter of 1.5 M perchloric acid (HClO₄) and the solution was then diluted with 120micro liter of deionized water and 120micro liter of TISAB II buffer solution. Each sample was prepared separately and the Fluorine content was measured using the tip of the ion selective electrode (Cyberscan PH 2500) after calibration with

4 different standard Fluorine concentrations. The ion selective electrode was rinsed with deionized water and dried after each measurement. The 10 measurements of Fluorine content from a single bone fragment produced a standard deviation of 0.02 revealing a very good reproducibility of the ion selective electrode.

RESULTS AND DISCUSSION

The tomb is the only unrobed tomb at the site; an articulated skeleton was found in the upper loci and thus excluding the possibility of robbing and/or a secondary burial. The bedrock of the tomb has two sunken graves. The very high number of buried individuals in this tomb is well beyond its capacity as its size and the shape indicate. The recovered grave goods (all are Byzantine) are classified into two categories; personal items like body ornaments (bronze bracelets, rings and earrings) and household items like pottery (pots and oil lamps).

The quality of the grave goods are not valued compared to other grave goods from other funeral sites in the region and also not varied, which means that the buried individuals were probably of low social persona (cf. Saxe 1970). The construction of this tomb, as being small and bizarre in shape, required a minimum amount of energy expenditure, which also reflects the lower social persona of the deceased (cf. Tainter 1975).

The demographic analysis of the tomb revealed individuals of both sexes and deferent ages but showed an absence of sub-adults and children. Most of these individuals were suffering osteoarthritis and osteophytosis as marks of hard labor. No other pathological lesions were detected.

The average Fluorine concentration of the 17 samples is 1.27%. The standard

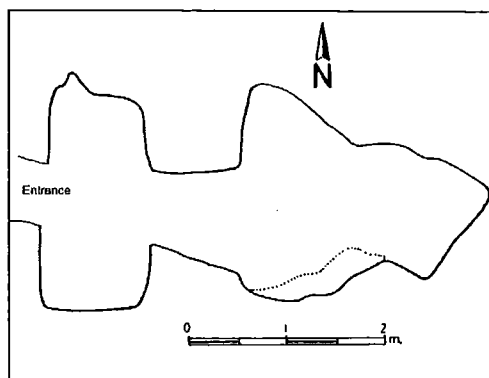


Fig. 1: Top plan of tomb 35 at Yasieleh.

deviation is very high (2.36) indicating that the buried individuals were chronologically apart from each others. So interments did not happen over a short period of time.

The results are chronologically arranged in two groups (fig. 2). The first group has 15 individuals with a standard deviation of 0.3 and a standard error of 0.08, which statistically means that their mean is close

Sample no.	Group	Fluorine %	
18	1	0.01	
16	1	0.02	
19	1	0.13	
20	1		Group 1 statistics
13	1	0.15	Average: 35%
15	1	0.22	Standard Deviation: 0.32
14	1	0.25	Standard Error: 0.08
17	1	0.30	Number: 15
11	1	0.31	
6	1	0.31	Group 2 statistics
5	1	0.36	Average: 8.2
7	1	0.46	Standard Deviation: 0.89
12	1	0.60	Standard Error: 0.63
10	1	0.72	Number: 2
9	1	1.27	
7	2	7.57	
8	2	8.83	
Average			
Standard Deviation		2.63	

Table 1: The results of Fluorine at tomb 35 in Yasieleh.

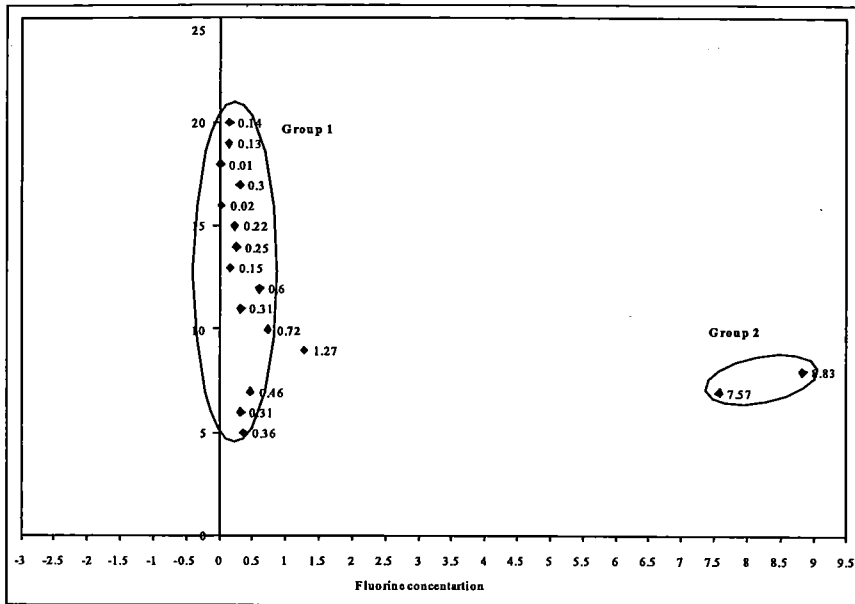


Fig. 2: Fluorine dating results.

to the population parameter. In other words the individuals in group 1 were buried during a relatively short period. The second group has only two individuals with an average of 8.2%. The second group is older than the first group because it has the higher concentration of Fluorine. The difference between the concentration of Fluorine between the two groups is about 7.85% and does not necessarily imply that group 2 is thousands of years older than group 1 simply because the rate of Fluorine deposition inside the bones is not stable over time; does not follow a certain algorithm or a mathematical function but depends on the site-specific environmental factors (Schurr and Gregory 2002); these factors include temperature, soil pH, ground water content, and soil fluorine content (Hagen 1973). As far as the recovered grave goods were all Byzantine, interments happened during the Byzantine period but over a very long period.

The multiple interments in such an enormous number is a clear indication of a

stratified society, where the poor had a limited access and power in the surrounding spatial organization. Tomb reuse at the archaeological site of Yasielch was manifested in almost every multiple tomb. Such a conspicuous phenomena might have not only been attributed to the social dimensions of the society then, but also might have been triggered by other political and economic factors as well, which we may refer to as instable.

Reusing tombs is a major component in one's society burial practices. It seems that this funeral custom is only practiced under stressful situations, like for example, political and economic instability, where tomb 35 at Yasielch is not the only case. The unique tomb of Yajuz near Amman has also witnessed extensive tomb reuse toward the end of the Byzantine period triggered by the change in social organization. Yajuz, which witnessed social stratification during the Early Byzantine period, had a weakened power of the institution that maintained such stratification (Al-Shorman 2003).

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