



The use of lime in funerary/burial practice by Past Populations has long been recorded, and its intended use has been attributed both to the acceleration of decomposition and to its sanitary proprieties. Recent studies (Shotsmans, 2012; Schultz et al., 2006), have deepened our knowledge. Nowadays, it is used worldwide, mostly as a sanitary measure (as advised by the World Health Organization and Red Cross and Red Crescent,) due to its antiseptic properties, while it has been widely replaced by Alkalines for the decomposition of remains. Lime is usually used hydrated or quicklime and can be applied directly in contact with the body, mixed in the grave's soil or even dusted on shrouds and coffins.

In Portugal, there are some examples of the use of lime **directly over the body** and **mixed within the soil**. For the first case, it has been reported on a mass grave from the 1786 shipwreck at Peniche (Blot, 1994) where the bodies were buried, in different stages of decomposition, continuously, as they were recovered. It has also been noted on individual burials such as at the Convent of Espírito Santo, where it was applied inside the casket, forming a block. The use of lime mixed with soil has been observed at the Churches of Misericórdia de Almada, and Church of Espírito Santo. The addition of lime was also required on public cemeteries (created and regulated by a 1835 decree) not only to accelerate decomposition but mainly as a sanitary measure to prevent "nefarious vapours" that could emanate from cadaver decomposition (Queiroz, 1998:269).

The Convent of Santa Maria da Consolação

Figures 1 and 2: Superior view of the excavated cloister and crypt; map of Porto with the convent.

The convent of Saint Eloi, also known as Convent of Santa Maria da Consolação, belonged to the order of Saint John Evangelist, also called in Portugal as Padres (fathers/priests) Lóios or of the hábito azul (blue habit). It was situated in downtown Porto in an area commonly known as the Cardosas Block. The convent was erected in 1490 and was shut down 1834, when all religious orders were expelled from Portugal. In 2009 the area was excavated.

A sample consisting of 66 individuals, both adults (N=45) and sub-adults (N=21) was studied for a Master dissertation.

The purpose of this work is to register if lime had been used in the past and if so, whether it was related to several aspects of the burials, such as, sex, age at death, presence of pathologies, type of burial (re-burial on smaller spaces; on the soil or placed on a crypt).

RESULTS AND DISCUSSION

It was possible to observe a powdered white substance, consistent with the description of lime (Coma, 1991), on a total of 22 individuals. 6 of them show evidence of pathological conditions. 16 were recovered from ossuary/reduction context found near burials, and included both adults and non-adults. Additionally, 6 individuals were exhumed *in situ* burials. Of these burials, 5 were located in a small crypt (3 non-adults and 2 adults), and 2 in individual graves in the cloister (both adults). The pathologies observed in these individuals include deposition of woven bone and swelling, including a case of osteomyelitis. Since most burials were of adult males and children, and many cases corresponded to secondary depositions, relation with sex was possible to confirm.

It was possible to note that:

† Not all cases with pathological condition had evidence of lime;

† It was not possible to detect any relation with demographic profile of the individuals;

† The majority of cases with evidence of lime were recovered from the crypt besides two graves in the cloister;

† A slight difference of the colour of the bone and in preservation of the osteological material was noticed: the human remains with lime had a more greyish white shade and were slightly more fragmented;

Figure 3: Osteological remains from the crypt; Figure 4: Remains from cloister grave 21.

We consulted the results of other anthropological studies of convents with similar chronology – burial of both clergy and laymen benefactors – as the Convent of Lóios in Arraiolos (Forte, 2006; Ventura, 2004; Ramos, 2004; Tavares, 2003); Convento de Vilar de Frades (Assis, 2002; Tavares, 2001), and of other orders such as the convents of Convento do Carmo (Benisse, 2005); Igreja da Misericórdia de Almada (Neto, 2005) Igreja de Santiago (Gonçalves, 2004); igreja de S. Pedro (Furtado, 2007); Capela de Nossa Senhora da Vitória (Marques, 2007); Igreja Matriz de São Julião (Pinto, 2012); Hospital da Venerável Ordem de S. Francisco (Domingues, 2013); Colégio de Santo Antão-o-Novo (Godinho, 2008) and the Cemitério Oculto da Sé Velha de Coimbra (Teixeira, 2007).

Although most had evidence of a strong re-utilization of the graves with a frequent reburial, and many included individuals with signs of pathology, there is little evidence of lime. However, in the Convent of São Francisco it was observed white colouring on several remains (Gaspar, 2013) where the author has considered lime in a differential diagnosis with exposure to fire, since the area had suffered a fire. In the Church of Santiago (Gonçalves, 2004) although there is a mention of some remains with white colouring, pertaining to a adult female individual with a case of *Spina Bifida*, lime was not considered, possibly due to the texture it presented, since it was more fluid, but no further explanation is given.

FINAL REMARKS

Further studies are needed, specially the comparison between different archaeological sites, to access the differences and similarities in the use of lime.

The use of lime is usually but a footnote on reports, which adds to the difficulty of finding accurate descriptions that allow for deeper comparisons.

In the case of Santa Maria da Consolação, the substance observed is similar to the description of powdered lime as well as its apparent effect on the osteological remains. Despite lime being known to be used in burials in public spaces or in containers without direct contact with the soil, such as crypts, chemical testing would enable a definite conclusion, although it would not be possible to distinguish quicklime from hydrated lime, since the former will eventually turn into the latter.

In the case of Portugal, the legal obligation to include an anthropology specialist whenever there are human remains and that their preliminary study is included in a report, adds to the potential of the study of archaeological human remains not only for this subject but for funerary practice in general.

Bibliography

- Barbosa, J. 2008. Quarteirão das Cardosas, Relatório Preliminar, Documento Estratégico, Porto.
- Benisse, V. 2005. Retrato da Lisboa moderna: estudo paleobiológico de uma amostra da população exumada do Convento do Carmo (séc. XVI-XVIII). Coimbra: Universidade de Coimbra-Faculdade de Ciências e Tecnologia.
- Domingos, A. 2004. Monsaraz revisitado: contribuição para o estudo antropológico do material exumado na Igreja de Santiago. Trabalho de Investigação em licenciatura, Universidade de Coimbra-Faculdade de Ciências e Tecnologia, Coimbra.
- Domingos, G. 2013. Violaceus ossa In Franciscanis Ordinibus: estudo bioantropológico de uma amostra osteológica associada ao Hospital da Venerável Ordem de S. Francisco, Porto, Século XVIII. Dissertação de Mestrado, Universidade de Coimbra-Faculdade de Ciências e Tecnologia, Coimbra.
- Forte, T. 2006. Um olhar para o passado: interpretação paleoantropológica das amostras esqueléticas exumadas do Claustro do convento dos Lóios em Arraiolos. Trabalho de Investigação em licenciatura, Universidade de Coimbra-Faculdade de Ciências e Tecnologia, Coimbra.
- Freitas, E. 1947. O Convento Novo de Santa Maria da Consolação (Padres Lóios). Documentos e Memórias para a História do Porto. Publicações da Câmara Municipal do Porto, Gabinete de História da Cidade.
- Furtado, M. 2007. Leiria medieval: estudo paleobiológico de uma série osteológica proveniente da necrópole da igreja de S. Pedro (Leiria) Trabalho de Investigação em licenciatura, Universidade de Coimbra-Faculdade de Ciências e Tecnologia, Coimbra.
- Godinho, R. 2008. Vestígios de um império passado: a necrópole do Colégio de Santo Antão-o-Novo e a Lisboa dos séculos XVI-XVIII. Coimbra: Universidade de Coimbra-Faculdade de Ciências e Tecnologia. Dissertação de Mestrado.
- Gonçalves, G. 2004. A vida no registo da morte: contribuição para o estudo do espólio osteológico exumado da igreja de Santiago de Monsaraz. Dissertação de licenciatura, Universidade de Coimbra-Faculdade de Ciências e Tecnologia, Coimbra.
- Ferreira, M. T. 2012. Para lá da morte: estudo tafonómico da decomposição cadavérica e da degradação óssea e implicações na estimativa do intervalo pós-morte. Tese de doutoramento. Universidade de Coimbra.
- Marques, R. 2007. Capela de Nossa Senhora da Vitória: paleobiologia de uma série osteológica humana proveniente do Porto do Mos, Batalha. Dissertação de Mestrado, Universidade de Coimbra-Faculdade de Ciências e Tecnologia, Coimbra.
- Micozzi, M. 1991. Postmortem Change in Human Remains and Animal Remains. A systematic Approach. Charles Thomas Publisher, Ilencos.
- Neto, F. 2005. Estudo paleobiológico da necrópole da Igreja da Misericórdia de Almada (séculos XVI-XVIII). Tese de Mestrado Coimbra: Universidade de Coimbra-Faculdade de Ciências e Tecnologia.
- Pinto, R. 2012. Memórias Figueirense: estudo paleoantropológico de um ossário exumado da Igreja Matriz de São Julião da Figueira da Foz. Dissertação de Mestrado, Universidade de Coimbra-Faculdade de Ciências e Tecnologia, Coimbra.
- Teixeira, C. 2007. Estudo antropológico do cemitério oculto da Sé Velha de Coimbra. Dissertação de Mestrado, Universidade de Coimbra-Faculdade de Ciências e Tecnologia, Coimbra.
- International Red Cross and Red Crescent Society. [Acedido em 20 de Março de 2011]. <http://procurement.firc.org/catalogue/detail.aspx?volume=1&groupcodes=114&familycode=114008&categorycode=IME&productcode=WCHPLIME02>
- World Health Organization <http://www.who.int/en/>



PEst-OE/SADG/UI0283/2013



ACKNOWLEDGEMENTS:
CIAS and Nathalie Ferreira-Antunes.