

Archaeological, archaeomagnetic and thermoluminescence investigation of a baked clay kiln excavated at Chieri, northern Italy: contribution to the rescue of our cultural heritage

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ABSTRACT

Combining different dating techniques is fundamental to constrain the ages of archaeological findings, mainly when direct evidences for their chronological context are not available. This paper presents the results of a combined archaeological, archaeomagnetic and thermoluminescence study of a kiln discovered during a rescue excavation at Chieri, northern Italy. The archaeological site is quite complex mainly due to the interposition of different stratigraphic levels that span from Roman times to present day. The studied kiln belongs to the post-medieval stratigraphic level but the lack of datable diagnostic objects strongly limits the possibility of its accurate dating only by means of archaeological evidences. Archaeomagnetic study was performed on 26 baked clay samples, isolating stable characteristic remanent magnetizations. The statistic comparison of the averaged direction with reference secular variation curves suggests two possible dating intervals. Independent dating from thermoluminescence study of 2 samples is consistent with the second time interval proposed by archaeomagnetism, suggesting that the kiln was abandoned at the beginning of the 17th century. The successful combination of the two independent laboratory techniques provides accurate dating of archaeological baked clays and can be used as routine for future archaeological investigations of rescue excavations.

1. Introduction

During last decades, the number and the variability of scientific laboratory techniques applied for the investigation of archaeological finds have been significantly increased and nowadays the natural sciences offer valu-

able and well-established tools for better understanding the traces of our past. This process is particularly important in the cases where the findings do not include ceramics or other date diagnostic objects. Obtaining as much information as possible, including precise dating of an archaeological site, is even more significant nowadays, since the rapid expansion of new constructions inevitably involves the destruction of archaeological structures in urban areas, often even unearthed, causing the loss of important knowledge about the past. In the case of such excavations, usually called rescue excavations, scientific techniques such as archaeomagnetic and thermoluminescence dating can offer information about the last firing of baked clay material and contribute to the chronological reconstruction of the studied archaeological sites [Liritzis and Thomas 1980, Becker et al. 1994, Schnepf et al. 2003, Tema et al. 2013]. Such information is very important for the evaluation of our cultural heritage and better understanding of our past.

Archaeomagnetic and thermoluminescence (TL) dating present the advantage that both can be applied to the same materials (e.g. kilns, bricks, pottery) and date the same event (last heating of the material). Archaeomagnetism is based on the fact that baked clay archaeological artefacts contain magnetic particles that, when heated and cooled in the presence of the Earth's magnetic field, acquire a thermal remanent magnetiza-