

GEOARCHAEOLOGIC METHODS APPLIED TO PREVENTIVE ARCHAEOLOGY. A NEW PERSPECTIVE FOR ARCHAEOLOGISTS AND QUATERNARY SCIENTISTS

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ABSTRACT: Cremaschi M. & Pizzi C., *Geoarchaeologic methods applied to Preventive Archaeology. A new perspective for archaeologists and Quaternary scientists.* (IT ISSN 0349-3356, 2011)

The applications of Geoarchaeology in the frame of the Preventive Archaeology are discussed on the basis of the Public Contracts Code (Legislative Decree no. 163/2006) and of some case studies in different archaeological contexts.

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Viene discusso il ruolo della Geoarcheologia nelle operazioni di Archeologia Preventiva sulla base del Codice dei Contratti Pubblici (D.Lgs. 163/2006, art. 95: Verifica Preventiva dell'Interesse Archeologico in sede di progetto preliminare) e mediante l'illustrazione di alcuni casi di studio da contesti archeologici diversi.

Key words: Geoarchaeology, Preventive Archaeology, cultural heritage.

Parole chiave: Geoarcheologia, Archeologia Preventiva, beni culturali.

Within the upper geological layers of the continents is enclosed evidence of two million years of human activity, in the form of archaeological sites. These include a wide range of evidence, from the city of Pompeii, perfectly preserving structures and materials connected to daily life, (thanks to the dramatic eruption of Vesuvius that buried it rapidly), to the bivouac of Palaeolithic hunters, testified to by a few scattered stone tools within a soil. But also buried soils with traces of wood clearance and ploughing, or tested flint nodules in a chert outcrop, and any other evidence recording the impact of human activity on the territory (Fig. 1), are to be considered archaeological sites.

All together, these objects form an invaluable archive to understand how humanity has developed over time, adapting the subsistence strategies to the changing environment. The archaeological sites are also an important part of the historical memory of nations, and are widely used in cultural activities and in educational performances; in this sense they constitute a significant opportunity for economic activities and a wealthy source of profit. Most of the developed countries have implemented protection policies of the archaeological heritage - and laws that support them - as its preservation often conflicts with the requirements of land management (for building, motorway and railway construction, agriculture, etc.). Specific procedures are to be considered to mitigate the damage that could ensue from uncontrolled intervention (LIVERANI *et al.*, 2000; ANAG *et al.*, 2002; BERNABÒ BREA & VALONI, 2009; INRAP, 2009).

In Italy (MALNATI, 2005), these procedures have been recently elaborated in the Public Contracts

Code (Legislative Decree no. 163/2006), which contains the rules on so-called Preventive Archaeology (Article 95: Verification of Preventive Archaeological interest in the preliminary draft). This includes a stage of preliminary documentation and subsequent test-operations. Availing themselves of working professionals, the leaders of the management projects estimate, already in the planning phase, the so-called "archaeological risk", enabling both contractors and the Archaeological Heritage Service (Soprintendenza per i Beni Archeologici) to assess the chance of discovering, in the working areas, archaeological evidence subject to protection, and to evaluate the possibility of removing it, and the time and cost of removal (MALNATI, 2005). The law determines who is allowed to achieve these objectives: the Departments of Archaeology of the University and the professionals possessing specific qualifications in the field of Archaeology (PhD and/or post doc in Archaeology). No mention is made of geoarchaeologists (CREMASCHI, 2010), the archaeologists who have a study career in Geology or Natural Sciences, although the law provides for operations such as geomorphological mapping, core drilling, geophysical and "geochemical" survey, which definitely require specific knowledge in earth sciences (CREMASCHI, 2000). Furthermore, geoarchaeologists in recent decades have found a place in many professional companies that deal with archaeological excavations, and often have duties and responsibilities of leadership.

Geoarchaeology provides the main operational tools and methodology to optimize the scientific practice that regards Preventive Archaeology. To

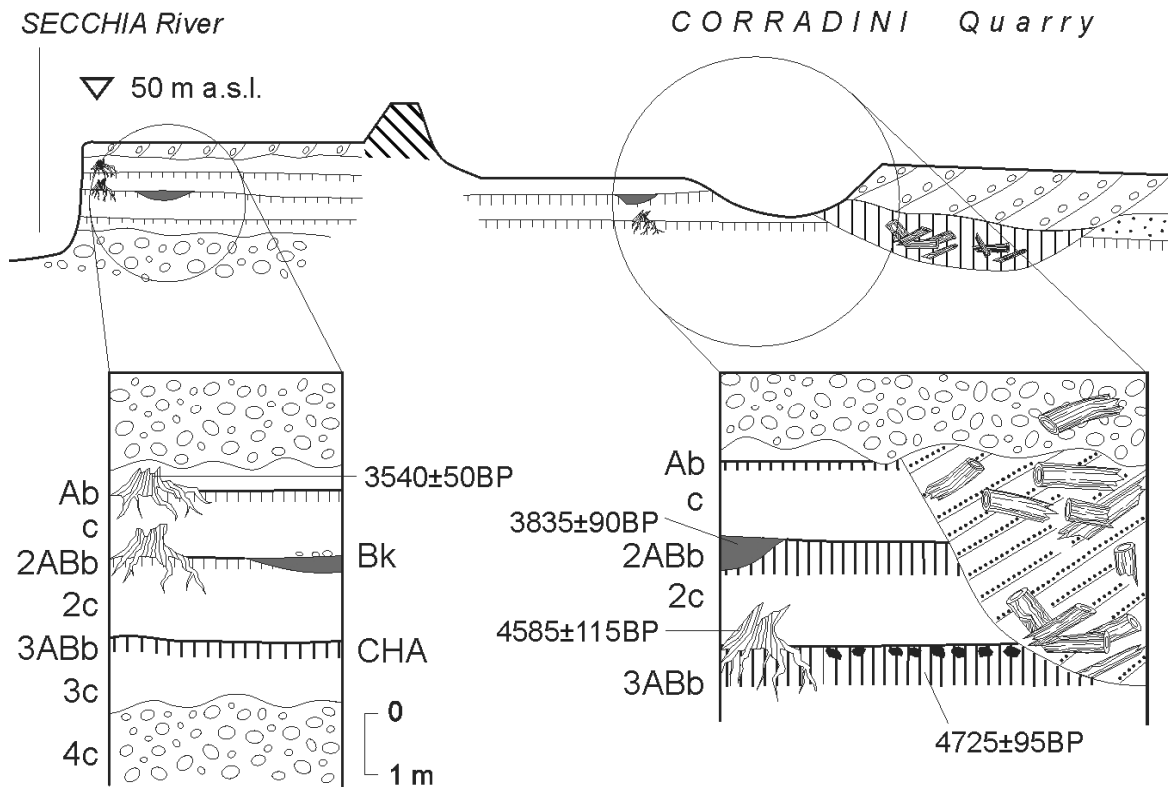


Fig. 1, Buried soils, and associated archaeological sites, record the impact of human activity on the territory. The case of buried soils in the central Po Plain (Rubiera, RE).

I suoli sepolti, e i siti archeologici ad essi associati, conservano evidenze dell'impatto umano sul territorio. È il caso, ad esempio, dei suoli sepolti nelle alluvioni della pianura padana centrale (Rubiera, RE).



Fig. 2, Geoarchaeologists at work: coring the Bronze age site of Qatna in Central Syria (left) and performing a geophysical survey (right) in the central Po Plain (Terramara S. Rosa, RE).

Geoarcheologi al lavoro: perforazioni presso il sito archeologico dell'età del Bronzo di Qatna, nella Siria centrale (a sinistra) e durante una campagna di rilevazioni geofisiche (a destra) nella pianura Padana centrale (Terramare di S. Rosa, RE).

be perceived, understood and protected, archaeological sites must be studied and surveyed through an earth-science approach as, at any scale, the material traces of human activities, once produced and abandoned by their authors, become a part of the Earth system (CREMASCHI, 2010); and thus, as any object on the surface of the planet, they are exposed to the processes of erosion, transport and weathering.

Geomorphologic surveying, together with remote sensing, allows detection of geomorphologic processes that have acted in the past (among them those induced by human activity; CREMASCHI, 2000). It permits us to reconstruct the archaeological landscape, distinguishing the suitability of the different landscape segments for conservation of the archaeological evidence. Coring, pedological and sedimentological analysis, and geophysical survey, are the most effective tools for operating at the margins and inside of the archaeological sites (Fig. 2), to estimate their extent, shape, consistency and degree of preservation, all without the need for extensive excavations (some cases of study are provided by surveys concerning arid zones, core drilling in urban areas, reconstruction using DTM and geophysical survey of terramare). Consequently, this increases the efficiency of Preventive Archaeology operations, while optimizing the time employed and lowering the costs. There is now extensive agreement among Soprintendenze Archeologiche and many archaeologists

involved in the archaeological heritage protection on the need to complete the existing law, giving the right Geoarchaeology and its operators their proper place. It is useful for the scientific community of Earth Sciences to take up this issue. For scientific reasons, but also because the Preventive Archaeology requiring geoarchaeological knowledge, constitutes a significant professional opportunity for young graduates in the sciences.

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