

## АСПЕКТИ НА СЪДЕБНАТА АРХЕОЛОГИЯ

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**Резюме:** Статията разглежда аспектите на съдебната археология. Читателят се запознава с дефинирането на различните термини, които са необходими за задълбочено проучване на поставения въпрос. Термини като: археология, съдебна археология, полева археология и антропология се определят в статията. Три различни археологични техники се разглеждат детайлно, като се набляга на техния произход, нужното оборудване и адаптациите, през които те преминават, когато са поставени в контекста на съдебната археология. Дискусията в тази статия е фокусирана както върху връзката между дисциплините - съдебна археология и съдебна антропология, така и върху възможността да се комбинират двете специалности в професионалната кариера на един и същ специалист.

**Ключови думи:** археология, съдебна археология, антропология, съдебна антропология

## ASPECTS OF FORENSIC ARCHAEOLOGY

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**Abstract:** This paper explores the aspects of Forensic Archaeology. The reader is familiarized with the definitions of terms needed for the thorough exploration of the question. Terms such as archaeology, forensic, forensic archaeology, and field archaeology have been considered. Furthermore, three archaeological techniques are explored in detail, with focus on their origins, equipment and adaptations, when introduced in a forensic context. A discussion on the relationship between the disciplines of forensic archaeology and anthropology is also provided preceding the assessment of the limitations of combining the two disciplines in one person's career.

**Key Words:** archaeology, forensic archaeology, anthropology, forensic anthropology

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### Definition of Archaeology

In our modern era the definition of the term archaeology can prove to be as complex as the discipline itself. The precise meaning of the word is arguably either incorrect or in most instances not covering all the aspects of the curriculum.

Archaeology as a word derives from Greek ἀρχαῖος “ancient”; and λογία, “to speak” or “the study of the past”. In the Oxford wordpower dictionary the term is defined as a study of human history based on buried parts of material culture (Steel 2000). In the Concise version of this dictionary archaeology is explained as the study of human history and prehistory through excavation processes of the material culture (2001), however both descriptions focus on the retrieval and analysis of buried remains. This excludes a significant portion of archaeological techniques and methodologies such as pre and post excavation activities.

These inaccuracies outline the reasons why archaeology cannot be defined in a single sentence, rather than explored in its complexity. The concept of archaeology originated together with history and philosophy in ancient Greece as a result of the development of human civilization and thought, used only to establish a chronological extension of history (Malina et al. 1990, Taylor 1991). Throughout the Middle Ages archaeology was perceived as the “beginning of something” (Malina et al., 1990). Today it is comprehended as a science examining the past on the basis of material culture, maintaining the pace in which science develops and changes (Trigger 2006, Smith 2008). In the last decades the character of the discipline shifted from discovering the past to organizing it in time and space, dictated by “dating techniques, taxonomies, classifications, taphonomy and faunal analysis, multivariate analyses, regional surveys, and detailed regional chronologies” (Maschner and Chippindale 2005). As a term it has undergone changes, developments, growth in order to meet contemporary needs and the maturation of the discipline itself (Darvill 2003). All these lead to the definition of archaeology being the study of mankind as a fusion of physical activities on the field and intellectual pursuit in the laboratory (Renfrew and Bahn 2012, Fagan 1992).

Archaeology has inarguably undergone a number of developments through the course of time, developments that lead to the implication of the discipline in a variety of different contexts, one of which is forensics.

### Definition of Forensic

The word “forensic” derives from “forum” meaning “public” in Latin (Houck 2007). The term “forensic” can be as simply explained as “suitable in a court of law” (Brenner 2004). In literature the term “forensics” may prove to be encountered quite often (Margot 2011). A word used, to bring a group of science based disciplines

(chemistry, biology, physics etc.) that contribute to the criminal justice system (Roux, Crispino and Ribaux 2012). Nevertheless, as a result of the media's constant influence on the society's views and understandings, the term "forensic" is used to outline importance, glamour and the implication of science, which is inarguably incorrect (Hunter and Cox 2005). The other term that derives from "forensic" is "forensic science", a term that is concerned with the occupation that clarifies the science related inquiries in a court of law (Houck 2007).

### **Definition of Forensic Archaeology**

The definition of the term "forensic archaeology" proves to be another problematic area of study. It is argued to be the application of archaeological methods in the recovery of human remains and the interpretation of their spatial associations (Brenner 2004). However, this definition does not include the legal aspects of the discipline. Hanson (2004) better the definitions by introducing its legal use, as well as providing more detailed information on the set of archaeological skills that the applied in the forensic aspect of archaeology. He argues that it involves the location and assessment of sites and excavation, recording and recovery of human remains, forensic evidence and landscape (Croft and Pye 2004, Heron 2007).

Hunter argues that it is not simply the introduction of archaeological techniques into a forensic context, but also the transmission of archaeological theory and underlying principles (Hunter and Cox 2005). In a more narrowed view, where forensic archaeology is referred to as a process of recovery, the discipline is defined as the first steps of pathological assessment and the determination of identify (Ferlini 2007). In the same paper, forensic archaeology is the tool of expertise that provides the investigators with the very early forms of evidence.

The Oxford concise dictionary of archaeology perhaps provides the most accurate definition of the term: "An expanding branch of archeological investigation in which the methods and approaches of archaeology are applied to legal problems and in connection with the work of courts of law. Most commonly this involves the reconstruction of a chronology and sequence of events from deposits found within and around graves and burial sites of homicide cases and investigations into violation of human rights" (Darvill 2008).

In all instances, as far as the definition of forensic archaeology is concerned, and despite the fact that some are more accurate and/or broader than others, the estimation of the involvement of archaeological skills is prevalent. In the next chapter of this paper the skills of the professional field archaeologist will be examined, the applications of which will be discussed in further chapters in regards of their forensic use.

### **Definition of Field Archaeology, Skillset Examination**

The term field archaeology can be misleading when it comes to its definition. The term may refer to the pre-field as well as the post-field elements of the discipline (Drewett 2011). Although, it consists of the words "field" and "archaeology", fieldwork is not the only sphere that a professional is engaged with (Renfrew and Bahn 2012). An archaeologist, including an academic, may well never be introduced to any fieldwork (Drewett 2011). On the other hand, some authors argue that it is essential to all archaeologists, on and off the field, to have as much field experience as

possible (Carver 2012). The production of the definition for the term field archaeologist requires an examination of all skills and elements incorporated in the discipline. Field archaeology is to be revealed as a process that starts before going to the actual site and ends indoors or in a laboratory confinement.

The process of archaeology is about asking questions (Renfrew and Bahn 2012, Trigger 2006, Hodder 1999). The starting point of any archaeological project is to answer the question “why”, also referred to as “formulation”, in relation to the choice of site (Fagan 1992, Renfrew and Bah 2012, Brown 1987, Drewett 2011, Atkinson 1946). With this question the start of a project design is commenced. Archaeologists have to make decisions on how to fit their project into wider agendas, assess any legal restrictions as well as inquire permission from landowners (Drewett 2011, Renfrew and Bahn 2012, Fagan 1992). The next step is the establishment all previous archaeological work on the site and area, as it is critical to obtain all information due to the destructive nature of modern archaeology (Drewett 2011, Roskams 2001). The project has to have clear aims and objectives, with a high degree of flexibility and liability to change (Renfrew and Bahn 2012). The aims and objectives determine the methodology that is a combination of techniques which may prove to be inapplicable thus resulting in the need abandon or change them (Drewett 2011). The development of an archaeological field project reveals an overwhelming amount of work that is produced off the field.

The collection and recording of evidence consists of both on and off field activities (Renfrew and Bahn 2012). Pre-excavation strategies include : aerial photography and aerial surveying for identifying archaeology based on crop marks, “field walking” – the collection of surface material to identify activities, sampling-production of grids for recording location of artifacts or features, production of test pits-when surface collection is inapplicable, geophysical surveying as part of ground-based remote sensing – requiring the technical skills to operate with GPR, Magnetometer etc., chemical surveying – establishing changes in soil to trace human activity and occupation (Renfrew and Bahn 2012, Fagan 1992, Roskams 2001, Drewett 2011, Brown 1987). All the pre-excavation strategies require a skill on their own including the operation of machinery and tools.

Excavation has a central role in archaeology as it produces the most reliable evidence for researchers. Its straightforward requirements in terms of skills are the ability to use tools such as spades, shovels, mattocks, towels etc. The excavation of a site follows a well-established sequence from the removal of the topsoil and setting up the site grid to the finds retrieval and recording (Roskams 2001, Drewett 2011). One of the most valued skills of the field archaeologist is the ability to record stratigraphic sequences applicable in relative dating techniques (Shott 1987). Gridding, developed by General Pitt-Rivers in the 19<sup>th</sup> AD, allows the archaeologist to trace and relate layers across the site. The pre-excavation and excavation are the smaller portions of work that is needed for the completion of a project (Drewett 2011). The post-excavation process-finds analysis, interpretation and processing, followed by publication, is the most extensive section of the field archaeologist work.

The inclusive number of skills that a field archaeologist requires is not the focus of this paper, nevertheless the outline of the different types of work that a professional is involved in reveals the colourful nature of archaeology disproving any statements of the archaeologist solely a fieldworker. With the development of the discipline some of these skills and elements have been introduced to a forensic context aiding the investigation of crime scenes, provided the needed adjustments and adaptations.

### **Discussion of Archaeological Techniques in a Forensic Context**

This chapter will introduce three archaeological techniques and their application into a forensic context. The first technique to be explored is stratigraphy as a relative dating method.

Relative dating in archaeology produces a time sequence of events, not a specific date (Pollard and Brothwell 2011, Renfrew and Bahn 2012). The different techniques in relative dating including stratigraphy comprise of typology, seriation, environmental sequences etc.

Absolute dating in archaeology can be produced by a variety of objects and techniques. With the use of material such as coins, pottery, trees and rootlets as well as techniques involving C14, thermo luminescence, electron spin resonance, obsidian hydration etc. Absolute dating provides a numerical date of an activity or event; nevertheless it may be inaccurate or imprecise in many instances (Chapple 2008, Filippo et al., Gianmarco, Hellstrom 2012, Maschner and Chippinale 2005).

Through time archaeology has adopted and developed techniques from closely related sciences such as geology. The first works on stratigraphic sequences had been produced by German geologist Johannes Walter in his work on facies correlation in the late 19<sup>th</sup> century (Gischler 2011). Geologists have recognized the process of stratification, and that each layer is laid down on top of another, thus establishing the law of superposition. This is the concept that lower levels precede those on top in relation to time (Gischler 2011, Renfrew and Bahn 2012, Pollard and Brothwell 2001). In an archaeological perspective, the same law applies, however the implications focused on deposits rather than the layers and cuts. Archaeologists have the opportunity to use this relative dating method in order to establish a time sequence. In the occurrence of two objects from the same depositional layer an absolute date can apply for both, even if one of them is not liable to absolute dating.

The combination of the two techniques and stratigraphy can produce a framework in which the archaeologists can focus their research. For example if a coin is deposited in a particular layer ( a coin is usually used for absolute dating) it carries an issue date, this date in return can be used for the establishment of a terminus post quem – the deposit cannot be earlier than the date on the coin, however it can be later. Terminus ante quem relates to the manufacturing of objects and absolute dating, most likely pottery. If there is available information about the type of pottery and the date when it used to be produced, this provides a date of a deposit that all earlier events must predate (Maschner and Chippindale 2005).

In a forensic context all these techniques can be used during the investigation of a crime scene without applying any changes and adaptations. The burial of bodies can be established as contemporaneous or not based on stratigraphy (Blau and Ubelaker 2008).

Cases in which a simple assessment of the sequence of events through stratigraphic analysis have saved the police a lot of money by stopping further unneeded investigation (Hunter and Cox, 2005). The second archaeological technique to be evaluated in a forensic context is geophysical survey.

Geophysical prospection introduces a valuable and non-destructive approach contributing to the search and location of archaeological features and objects below the ground. Archaeological investigation assumes that variations in the soil and the occurrence of deposited objects can be stimulated through alterations in physical property (Pollard and Brothwell 2001). There is a variety of different geophysical

techniques of which the physical properties can relate to acoustic pulses traveling faster or slower through the soil or the electric conductivity of a current can be measured. The emphasis is on the anomalies that occur when these techniques are used.

There are many types of geophysical surveys applied in archaeology. The most frequently used are: GPR (ground penetrating radar), Electrical resistivity and magnetometry (David, Linford and Linford 2008, Luciana, Perez-Perez et al.2012). The application of magnetometry surveying will be looked into from a forensic perspective.

Magnetometry is a highly technique especially for areas with high topsoil magnetic susceptibility, areas with lower susceptibility should also be surveyed with a magnetometer to prove correlations between archaeology and the changes in reading of this geophysical instrument (David et al.2008). The technique relies on the manifestation of the earth's magnetic field that provides a platform onto which any changes can be detected and assessed. The development of the planet have resulted in the occurrence of iron elements in the topsoil the disturbance and mixture of which can be races by using this technique (Clark 1996). Introduced into a forensic archaeology context, this geophysical technique can prove to be great use to crime scene investigators. As the human body does not possess high magnetic susceptibility the detection of human remains can prove to be quite difficult. On the other hand as pointed above the mixture of top soil and sub soil as a result from grave digging may as well be detected by magnetometer. A variety of ferrous objects associated with the buried victim will cause anomalies in the readings of the magnetometer thus indicating the forensic specialists an area of focus. The magnetometer is a geological tool; therefore it undergoes changes in its adjustment for archaeological use. In a forensic use the readings should be taken more frequently the height for the bottom sensor needs to be about 35cm above remains, the same for both archaeological and forensic use (Cheetham 2005). A variety of case studies can be found in Hunter and Cox 2005, and Pollard and Brothwell 2001.

The third archaeological technique to be introduced from a forensic perspective is excavation. As already mentioned in previous chapters excavation is a technique in archaeology that produces the most reliable and unbiased evidence. The destructive and unrepeatability nature of this technique is unarguable does not change when introduced to forensic archaeology. On the other hand there is a variety of features that do. An example for the different realities of the archaeological and forensic site is the equipment availability. It is regarded as common sense in the archaeological world that trowels, spades, shovels, wheelbarrows etc. are to be provided (Hunter and Cox 2005). In the world of forensic investigation the site managers, perhaps sometimes not expecting the need for archaeological excavations do not provide them resulting in slowing down whole operation. An archaeologist, who is involved in excavation, carries the knowledge of the common, health and safety considerations in relation to footwear and clothing. In the world of forensics the archaeologist is introduced, due to issues of contamination, to disposable forensic over-suits to minimize fibre transfer (Hunter and Cox 2005). The process of actual excavation of a forensic site is quite similar to an archaeological, provided the significant time constraints. After the location of the desired area, top-soil removal and careful digging through narrow trenching is commenced. Before any digging is instigated, however the whole site is recorded through photography that is similar to archaeological surveying but its uses are substantially different. The archaeologist on a forensic site is not solely in charge of the excavation. Unlike an archaeological site

the decisions on breadth and depth of a trench rests on the site manager (Hunter and Cox 2005). The forensic archaeologist is neither a researcher nor site manager a supervisor that can be both heard and ignored. Nevertheless, excavation using archaeological techniques is a valued skill that produces evidence to be used in the court of law, present in many forensic cases (Blau and Ubelaker 2008). In the case of encountering human remains the archaeologist is not permitted to make decisions on his own, rather than the pathologist or the SIO (Dupras 2011)

### **Forensic Archaeology and Forensic Anthropology (Osteology) Discussion**

Forensic Archaeology and Forensic Anthropology are two disciplines the skillset of which is both applicable in a crime scene investigating context. The forensic archaeologist has been examined in the previous chapter to be involved in the excavation and other field work related activities. The forensic anthropologist also referred to as forensic osteologist is the professional involved in the interpretation of skeletal remains (Killam 2004). The definition of forensic anthropology provided by Komar 2008 is the application of the science of physical anthropology to the legal process, in close relation to the identification of skeletal remains. The skills of the forensic anthropologist include the determination of age, sex, stature as well as detection of post and ante mortem traumas (Killam 2004, Dupras 2011). The forensic anthropologist however, does not receive any field training that an archaeologist possesses such as recovery of skeletal material (Cox and Mays 2000, Killam 2004). Therefore the disciplines share a distinct separation (Dupras 2011).

The investigation of a crime scene collates a significant number of disciplines including detectives, SIOs, police officers, forensic archaeologists, anthropologists, pathologists etc. Every specialist has received training and education to do a specific task, in relation to the skills he/she obtained in the course of the training. A person can obtain both the profession of a forensic anthropologist and archaeologist, however the depth of knowledge and experience that the person possess is likely to not initially meet the precision required for the investigation of a crime.

### **Conclusion**

Forensic archaeology is a discipline that brings together most archaeological resources to meet the contemporary needs of solving crime. The use of excavation, dating and various sorts of surveying adapted to the forensic context reveals the flexibility and use of archaeology as a discipline. Unarguably, forensic anthropology is another step in the process of crime investigating. Facing the time constraints, authority limitations, adaptations and adjustments the forensic archaeologist remains the surveyor, locator and provider of forensic evidence, abilities that have proved their crucial importance to the criminal justice system.

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