

Chapter 4

Scientific Datasets in Archaeological Research Through Pottery Dating and Provenance Cases

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ABSTRACT

Recent trends in archaeological research dictate the incorporation of various analytical methods for dating, chemical/mineralogical characterization, morphological description, etc. of various excavation findings and landscapes to support and corroborate the archaeologists' observations. Each method, when used individually, provides a different feedback, but once single studies are combined, the information produced can significantly contribute to the solution of the archaeological puzzle. Thus, numerous scientific data and metadata are produced creating large and complex scientific datasets. The use of common terminology and definitions to describe these data along with the establishment of a formal standardized structure any cultural heritage information could be mapped to would assure the credibility and durability of such scientific datasets. The chapter provides an overview of the types and formats of the scientific data/metadata produced in the archaeological research through the detailed presentation of the common practices used in pottery dating and provenance studies.

INTRODUCTION

Archaeology aims towards the understanding of humankind. A further objective is the re-creation of the material culture, the reconstruction of the cultural past and the understanding of the lifeways of the people through the material remains of past societies. The above can considerably contribute to the better knowledge of the social, political, economic and cultural structure and evolution of ancient societies as well as their interactions within sites or regions (e.g. Rice, 1987; Tite, 2008).

In this endeavour the recent years, archaeology interacts increasingly with natural sciences and informatics to take advantage of the possibilities they offer and reduce the subjective element involved in the traditional approaches. The combined information from the various scientific disciplines allows the investigation of theories and interpretations that shed light on the human past and environment.

Numerous “components” of the archaeological research, such as Dating, Provenance and Dietary studies are leaning heavily on natural sciences and involve the use of advanced scientific methods applied on the archaeological finds. The information extracted from the materials using such methods produce a plethora of scientific data and metadata, which do not serve only as tools for answering individual archaeological questions, but also create large scientific reference datasets that allow the complete scientific documentation of the artifacts, environment and living beings of the past.

These datasets include data of various formats and types, while their metadata (e.g. experimental method, date of measurement etc) are essential for their evaluation and constructive use, especially when comparisons are attempted.

The present work provides an overview of the specifications of the scientific data and metadata produced in the archaeological research and their importance from a scientific point of view are discussed below, while a minimal simplified structure for such datasets is also proposed as a guideline towards standardization based mainly on best practices and procedures followed in scientific laboratories. The above is accomplished through the detailed presentation of the common practices in pottery dating and provenance studies, which can be considered as the most representative example of scientific data production in the archaeological research due to the large number of methods that can be involved and the variety of the obtained data.

APPROACHES IN THE ARCHAEOLOGICAL RESEARCH

Traditionally, the study of ancient artifacts was mainly focused on meticulous macroscopic observations by the archaeologists. Conclusions would be derived from their typology, decoration, iconography and chronology, based exclusively on stylistic considerations and aesthetic evaluation of the artifacts as well as their use, role and function. The above could also be complemented in some cases by available historic archive studies. In addition, evaluation of their characteristics would also shed light on the places (e.g. Attics or Corinthian pottery in ancient Greece) and the techniques of production (black-figure), the distribution, the trade routes, the organization and the contacts of the societies they created and exchange them.

In the late ‘50s, the term of Archaeometry was first introduced by Prof. C.F.C. Hawkes to refer to the use of methods and techniques coming from the natural sciences (physics, chemistry, mathematics, geology, geophysics, biology) and their application to archaeology as well as to art objects in order to provide solutions for specific questions and problems (Harding, 1994). The term today is expanded to include the computer technologies and their contribution to the study of the Cultural Heritage and is

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