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ABSTRACT

The recent discovery of the site of the Roman villa of Noheda and its outstanding mosaics has entailed a considerable boost for research on the Roman world and, especially, for the understanding of the palaces and large rural complexes of Late Antiquity. Hence, during the excavation process, in addition to the application of the appropriate archaeological methodology, the latest available research and analysis techniques have been used to document these archaeological remains in as much detail as possible. This approach is based on the understanding that only through a meticulous analysis of the data to be collected from the large number of structures and artefacts buried in the stratigraphic sequence can information be properly decoded. The present paper thus aims to provide a concise overview of how technological advances, such as georadar, 3D scanning, laser scanning, photogrammetry, etc., have been combined to achieve optimal results.

KEYWORDS

Drone, Georadar, Mosaics, Palace, Photogrammetry, Roman Villa, Three-Dimensional Scanning, Triclinium

INTRODUCTION

The present paper aims to explain how some of the most innovative documentation techniques have been applied in the research currently being undertaken at the Roman villa of Noheda. These techniques are being used to develop a detailed and comprehensive record of all the data obtained during the excavation process, understood as the only means of rigorously portraying all the unearthed information. The data obtained will facilitate the reconstruction not only of the building, but also its environment and setting, a fundamental means of analysing the site.

In recent decades, archaeological methodologies and excavation techniques have gradually been refined and standardised. At Noheda, all the latest developments have been implemented, not least by replacing the obsolete archaeological method of opening small reticular grids with open-area excavations. This makes it possible to document the entire stratigraphic sequence without artificial interruptions.

In keeping with the decision to use the latest methodological trends and archaeological excavation techniques at the site, it was decided to apply some of the most ground-breaking technological advances...
in order to collect rigorous data. This, in turn, enabled the creation of an exceptional database that will make it possible to continue using and taking advantage of new technologies for the museumisation and dissemination of information in relation to the site. To this end, some of the methods available today have been coupled with the new technologies for 3D digitisation applicable to the recording of digital cultural heritage (Pavlidis et al., 2007).

As the following pages will show, the scientific staff that has conducted the research at Noheda has especially sought to stay up to date on the latest technological developments. This has made Noheda a pioneering site in Spain with regard to the implementation of the latest technological advances in the field of archaeology.

To date, many researchers have shown interest in the digital representation of cultural heritage (Agosto & Bornaz, 2017). One of the digital technologies associated with greater dissemination and development of information is 3D models, which have been increasingly used in the representation of cultural heritage in recent decades (Ioannakis et al., 2017). These models are particularly used in so-called archaeology of architecture, as well as in topography (Brusaporci, 2015).

These models are made from high-precision georeferenced 3D scans that are easy and quick to perform. These data sets are called point clouds. The scans not only provide information on the position, but also the colour data associated with each point, rendering the 3D models obtained through the use of advanced point-based representation algorithms both accurate and realistic (Mures et al., 2016). Many methods and technologies have been developed due to the difficulty of digitising certain objects or structures. However, all of them aim to enable successful digital recording so that the models can be presented, archived, or commercially exploited (Pavlidis et al., 2007).

Following an analysis of the different, more modern, non-intrusive graphic documentation systems (Ortiz and del Pino, 2013, pp. 91, 93), two main techniques were chosen: photogrammetry and laser scanning. The former was used on the site’s entire surface and in each stratigraphic unit of interest. It was chosen mainly for its relatively low cost and speed. The latter was used only in the digitisation of the figurative mosaic found at the site.

This paper arises from the need to contribute to the comprehensive study of the site. Although, to date, the figurative mosaic has been the site’s most salient feature (Valero, 2010, p. 6; 2013a pp. 312-327; 2014b pp. 54-60; 2015a; 2016b pp. 10-12), it is understood that the research of the enclave should be approached comprehensively. Thus, whilst the mosaic piece should not be ignored, it should be given the same importance afforded to the rest of the elements that make up the villa. In this regard, research has been carried out to analyse the architecture of various rooms, the chronology of the complex, and the evolution of the construction phases (Valero, 2014a, pp. 523-526). Likewise, an analysis of the ornamental elements of the complex’s pars urbana has been undertaken (Valero, Gutiérrez, & Rodá, 2015, pp. 362-367), as has a study of the rural complex’s water sources (Mejías, Martínez, Goicocheea, & Valero, 2013, pp. 4-15; Martínez, Mejías, Goicocheea, & Valero, 2014, pp. 1-2). The initial results of the prevention and conservation plans carried out on the mosaic have also been reported (Valero, Merelló, Fernández, & García-Diego, 2014, pp. 1667-1673). Finally, an analysis of the territory that would have constituted the estate’s fundus has been undertaken (Valero, 2017b, pp. 68-72), revealing signs of intense human activity in the area (Valero, 2013b, pp. 227-232).

THE SITE: THE ROMAN VILLA OF NOHEDA

The Roman villa of Noheda has long been known (Santa María 1897, pp. 13-14; Coello 1897, p. 21; Larrañaga 1966, p. 438; Abascal 1982, p. 68; Palomero, 1987, p. 169). It is located in the central area of the Iberian Peninsula, 17 kilometres north of the city of Cuenca. It is a mere 500 metres northeast of the place it is named for and is part of the municipality of Villar de Domingo García. Figure 1 shows the location of the Noheda site.

The archaeological complex was listed as a Site of Cultural Interest in 2012, mainly because of the mosaics discovered there. Although, the signs of anthropic activity at the site do not date only to
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