

## Recent Excavations and Mapping Technology at the Villa del Vergigno, Tuscany

The Villa del Virgigno is an ancient Roman villa built originally in the first century BCE and occupied through the fifth century CE. In 2013 and 2014, an American Field School in cooperation with the Sistema Museale di Montelupo Fiorentino and Cooperativa Ichnos have excavated a non-residential area of the Villa to understand the nature and extent of agricultural and ceramic production at the site. This paper presents an overview of undergraduate work from these two field seasons and a summary of the methods employed for producing Geographic Information Systems digital maps of the excavated areas.

The excavations have focused on a series of walls appearing through the topsoil adjacent to the main habitation area, which appear to be a series of structures built on top of one another through three centuries of occupation. We believe this to be a three-sided open faced structure used as a kitchen or as part of ceramic production at the site. One of the unique features of this site is the number of pottery kilns that have been found. There were at least four separate pottery kilns already discovered and in 2013 we revealed a possible fifth. This is a surprisingly large number of kilns for a residential villa. Moreover, at least one kiln appears to have been for the production of Lamboglia 2 wine amphora, a type previously thought to have been produced only along the Adriatic Sea (Lindhagan 2009; Peacock and Williams 1986).

We also discovered many metal artifacts and artifacts associated with metal production including coins (datable to the third and fourth centuries CE), slag, iron nails, bronze bracelets, bronze pins, and a bronze ornament in the shape of a bull's head. All of these finds appear to be from the last phase of occupation at the Villa, suggesting prosperity and high levels of production in the rural areas of Northern Etruria during the Roman period. It is important to understand the geographical significance of the site which sits on the confluence of two rivers,

River Vergigno and River Pesa, that feed into the Arno. This location gives the Villa the ability to export inland as well as west to Pisa and the Tyrrhenian Sea. Rural villas such as this one were important contributors to the Mediterranean economy. A better understanding of such sites can only lead to a better understanding of the production and distribution of wealth both regionally and throughout the Roman world.

Using Geographical Information System (GIS) mapping, the Villa del Vergigno Project fostered strong use of all available technology. The mapping project was not without difficulty, but in the end, with the tools available and time and effort poured into it, work at this site continues to maintain a strong technological presence using some of the best electronic mapping tools available to archaeologists.

The site was mapped using Quantum GIS (QGIS), an open-source, Python based mapping program comparable to Esri's ArcGIS. The reasoning behind using this mapping software was based in the use and testing of a new QGIS plug-in called PyArchInit which assists in building the information behind all of the electronic maps, detailing information including objects found in stratigraphic units, how certain units were associated with other units, and even the composition of the soil found in units. We obtain special data via a total station, a mapping apparatus that uses laser remote sensing and a separate prism to enhance, digital maps. This device allows just two people to map areas in a quarter of the time it takes to hand draw field maps. The kiln discovered in 2013, mentioned above, is strongest example of this mapping technique, when over a dozen stratigraphic units were mapped in less than a day, using only GIS and the total station.

Using these technologies, a complete record of both seasons' efforts are available in just a few short minutes. With PyArchInit, the new QGIS plug-in, the Villa del Vergigno not only

has a complete record of all information associated with stratigraphic units, but also has spatial data associated with all of those records, making analysis on the dig site far more easy and detailed. The total station offered the project a brand new way of creating spatial data, drastically decreasing the amount of time it takes to develop a map, allowing for more time to be spent digging. The Villa del Vergigno Project continues to support the use of new technology in all fields of archaeology, especially in electronic mapping, and aims to enhance those technologies more with every season.

### Bibliography

- Lindhagen, A. 2009. "The transport amphoras Lamboglia 2 and Dressel 6A: a central Dalmatian origin?" *Journal of Roman Archaeology* 22: 83-108.
- Peacock, D.P.S. and D.F. Williams. 1986. *Amphorae and the Roman economy: an introductory guide*. Longman: London.