Fig. 18 (a sinistra). Scafati, villa in via Spinelli, proprietà D’Amore. Panoramica (su concessione della Soprintendenza Archeologica della Campania).

Fig. 19 (a destra). Scafati, Villa in Via Panaroti, proprietà Mercenier. Panoramica (su concessione della Soprintendenza Archeologica della Campania).

Roma, in primis il Lazio e la Campania, sia soprattutto nel meridione italico, nelle aree soggette all’influenza magnogreca. Allo stato attuale delle nostre conoscenze, si sembra di poter concordare con quanto sostenuto da Mario Torelli, secondo il quale, a partire dal III sec. a.C., in seguito ai profondi cambiamenti provocati dall’espansione imperialistica romana, si giunge all’adozione di modelli iridivi, nei quali vengono fusi insieme il tipo della casa ad atrio, forma di autorappresentazione tradizionale delle elites romano-italiche, e modelli architettonici e decorativi tipici del mondo greco ellenistico.

Un vero e proprio cambiamento nella pianimetria generale delle ville viene introdotto solo più tardi, a seguito del consolidarsi della presenza romana nella piana del Sarno e con il progressivo intensificarsi dello sfruttamento agricolo del territorio. Le piantine delle nuove villae rusticae risentono di quel processo di razionalizzazione degli spazi che porta a privilegiare l’

area di lavoro rispetto all’ambiente domestico. La pianta di queste nuove edifici appare ora allungata, e al centro è sempre presente la corte, sulla quale si affacciano innanzitutto gli ambienti produttivi (turrariae e cellae vinariae) e quelli domestici (cucinae e apotheca). Gli ambienti residenziali, invece, con la sola eccezione dei triclini, significativamente disposti accanto o di fronte ai turrariae, trovano posto ai piani superiori.

Tale modello, che potremmo definire già pienamente ‘colonnelliano’, resta invariato sino alla tragica eruzione del 79 d.C.

\[\text{\textsuperscript{86} Torelli 2012, pp. 25-27.}\]

Oplontis: The Ancient Landscape, the Structures, and Their Relationship with the Resources of the Vesuvian Region

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The complex originally called Villa B (“of Lucius Crassus Tertius”) located in present day Torre Annunziata, Italy, was not a villa but rather a kind of emporium focused on the handling of wine and perhaps other agricultural products (fig. 1). If Villa A, located on a high cliff 300 meters to the west, was, at the time of the eruption, an abandoned seaside estate filled with the ghosts of an army of slaves and hordes of elegant guests, Oplontis B was very much alive. Its proximity to the sea, its unusual architecture, and its abundant artifacts and organic remains have much to tell about those human beings who lived and died there and the commodities they handled. Following the initial excavation of the site by the Soprintendenza Archeologica di Pompeii (1974-1991), the Oplontis Project has, since 2012, conducted a series of explorations, including geoprospection, conventional trenches beneath the CE 79 levels, analysis of the organic remains, and study of the old finds. This paper presents our findings to date in order to frame Oplontis B in relation to the Vesuvian territory as well as the commercialization of its regional agricultural products.

I. The Ancient Landscape

In order to reconstruct the geoarchaeological landscape and the ancient coastline in relation to the ancient structures the project employed a variety of techniques including direct methods of investigation, such as coring and stratigraphic excavations, as well as indirect methods, including geo-radar and Electro Resistivity Tomography (ERT). The results are starting to frame the various production and logistical networks that connected Oplontis B with the countryside. Like most of the Campanian area, Oplontis exhibits a superimposition of tephra and paleosols often reworked by human beings. Cultivated fields, prevalently of grains, characterize the area starting at least with the Late Neolithic Age. Some of the deepest and oldest layers recovered at the center of the great courtyard of Oplontis B, revealed flow marks on at least six tephra layers belonging to repeated prehistoric eruptions of Vesuvius. The earliest of these can be associated with a thin ash fall of the Avellino pumice or Plinian eruption of 1700 BCE (fig. 2).

Two events radically changed the ancient topography: the earthquake of February 10, 62 CE, and a series of unusually devastating pyroclastic flows—both surges and lahars—that accompanied the last phases of the eruption of 79 CE. The crossties in this reconstruction of the ancient coastline represent the foundations of other pre-eruption buildings, some of them seaside villas, to the west of Villa A and Oplontis B (fig. 3). The path of the principal pyroclastic flows followed a deep valley to the west of Villa A that drained the north flank of the volcano. The masses of volcanic material that these flows deposited extended the ancient coastline by almost a kilometer. A series of cores in the area of the former pasta factory (the “ex-mulino”) revealed that Villa A stood on a steep cliff at least 14 meters above the ancient sea level (fig. 4). The southward view that this luxurious villa commanded was extraordinary, including, to the east, the rocky islets, or faraglioni, of Rovigliano and the...
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Fig. 1 (above). Oplontis Villa B, plan (J. Galloway).

Fig. 2 (on the right). Oplontis Villa B, trench OPB 1, section (G. Di Maio).

Fig. 3. Reconstruction of the ancient coastline with Oplontis Villa A (8) and Villa B (15) (G. Di Maio).

Fig. 4. Oplontis Villa A, reconstruction of sea façade (T. Liddell).

port of Pompeii at the mouth of the Sarno River. The high limestone bastions of the Lattari mountains formed the backdrop of a panorama that extended all the way to Sorrento, with a view beyond to the island of Capri. To the west, the view extended upon the promontory of Capo Oncino, the coastline of the Phlegraean Fields and Mount Epomeo on Ischia. A series of cores revealed the presence of buildings that probably belonged to a small marina where small boats could moor and visitors could access the villa from the sea. The earthquake of 62 CE caused a disastrous subsidence that affected many of these buildings in a manner perhaps beyond repair before the eruption of 79 CE.

The scenic position of Villa A, with its great gardens and grand living spaces, its lavish use of water, and its ample areas for slaves, provides a stark contrast with Oplontis B, a center dedicated above all to the packaging and trade of the famous wines produced in the Vesuvian area. Although the original excavators called it Villa B, the complex, situated about 300 meters to the east of Villa A, was not a villa at all, nor was it a *villa rustica*. Despite their spatial proximity, the differences between these two complexes underscore their clearly distinct functions and social organization.
just a few hundred feet to the south of Oplontis B. Given the commercial nature of the complex, there must have been some sort of port nearby.

Unfortunately, modern apartment buildings cover the area. Scholars have proposed many more warehouses with small ports such as Oplontis B, interconnected toward the port of Pompeii at the mouth of the Sarno to the east. The agglomeration of buildings and streets, or better the "insula" of Oplontis B, then, must be a part of the settlement of Oplontis represented on the Tabula Peutingeriana, a twelfth-century copy of a fourth-century Roman itinerary that constitutes the only mention of the ancient name "Oplontis" (fig. 6). It is perhaps without coincidence that the Tabula accurately records the distances in miles from the archaeological site of Oplontis to Herculaneum, Pompeii, and Stabiae.

The standing remains suggest that Oplontis B was part of a larger settlement. At the center of the complex is a large building surrounding a two-story quadruporitus or peristyle. The ground floor spaces were dedicated to commercial activities and to storage (see plan, fig. 1). The north part of the upper floor was also used for storage, whereas the southern part of the upper floor, closer to the sea, was largely residential and included a bath complex. In this area excavators found marble revetments and Fourth Style wall painting of fairly good quality that the Oplontis Project is currently studying. To the north of the courtyard building, located on a secondary street running east-west, there are several simple two-story houses. Excavations have only touched the top of several other buildings to the north and west of the site. These structures do not seem to have a direct connection with the central courtyard; they could be the remains of further residential quarters.

2. EXCAVATIONS OF THE OPLONTIS PROJECT, 2012-2017

The excavations at Oplontis B, directed by Ivo van der Graaff in collaboration with Paul Wilkinson and the Kent Archaeological Field School, have focused upon cleaning and recording the standing structures as well as investigating their long-term development. Preliminary results indicate a complex series of at least three main construction and rebuilding events subdivided into five phases or minor interventions dating between the middle of the second century BCE up to the moment of the eruption (see fig. 1). During the first phase of the site engineers built much of the courtyard including the two-story colonnade. Our team recorded the remains of two cisterns heads located on the north side of the peristyle. They must have supplied water for the earliest phase of the complex. During the 2014 season two units on the south side of the site studied the remains of a third cistern some 30 meters long, 2.5 meters high and 1.5 meters wide. It is unclear whether it operated together with the other two cisterns on the north side of complex. To the north and south of the

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1 See Mario Grimaldi, Luciana Jacobelli in this volume.

2 See also Di Maio 2014a and 2014b.

3 Van der Graaff et al. 2020.
court yard, our excavations have recovered a series of foundation walls belonging to this and following phases. Their exact function remains unclear and they remain under study. In a second phase, dating roughly to the time of Augustus, the complex received running water by means of an aqueduct. A series of channels uncovered throughout the complex run in a north-south direction to follow the natural slope of the ancient terrain. The addition of this network must have radically altered the nature of the courtyard complex in ways that we are just beginning to understand. The buildings on the north side of the site are roughly contemporary to this phase. Here workers carefully demolished earlier buildings to make way for a series of small shops with upper living quarters that lined a street. Each of these had running water, including a private latrine. Toward the end of the phase these shops were converted fully into living quarters, perhaps as a result of the new development of the site after the earthquake of 62 CE.

The effects of the earthquake must have devastated the site, bringing about its third major phase of development. The roughly two meters of ground subsidence probably rendered the cistern recovered on the south side of the site useless since at this low level it would have been in direct contact with salt water. As a result workers would redevelop the area by building the barrel-vaulted storage spaces that now line the southern side of the complex. The rapid reconstruction and reorganization of the complex after the earthquake suggests that it had ample access to a water supply. At Pompeii, after the damage to the Augustan aqueduct caused by the same earthquake, there were efforts to relaunch all of the old water-supply systems, like wells and cisterns. In a similar fashion, emergency remedies were adopted at Oplontis B where engineers brought in water from sources located above on the slopes of Vesuvius. Thanks to the exploitation of new water sources, Oplontis B was still full of life and commercial activity at the moment of the eruption, unlike its neighbor, Villa A. In the southeast corner of the courtyard our team recovered an amphora-washing station, complete with a network of functioning water channels (fig. 7).

3. New Studies of the Amphorae and Other Ceramic Finds

The large number of Dressel 2/4 amphorae, the presence of large quantities of organic materials, including a ton of pomegranate skins and hay, and, sadly, the more than 50 human skeletons found inside the peristyle building indicate how Oplontis B was thriving at the time of the eruption. The project has conducted new studies on the amphorae under the leadership of Jennifer Muslin. The first priority was to quantify and analyze the thousands of unstudied amphora fragments stored in Oplontis B. By using the Minimum Number of Vessels Represented technique, our team counted a total number of 1,431 amphorae, with the Central Italian Dressel 2/4 forms accounting for roughly 90% of the vessels. In addition to these vessels principally used for wine transport, were the globular, small-necked Citeroise 1, 2 and 4 and the flat-bottomed Gauloise 5 from Frejus in southern France. A few examples of the pear-shaped Dressel 8 produced on the Bay of Cadiz and used to transport fish sauce were also present.

Adèle Lagi De Caro’s reports from the excavation of the amphorae record that the four sides of the great courtyard were filled with amphorae. Her photographs and drawings record that they were stacked vertically upside down, with the spike of one amphora inserted into the neck of the one above it. One group of these amphorae was left in situ in the northwest corner of the courtyard. The presumption is that workers stacked the amphora in this manner so that they could dry after being washed and then pitched and refilled. Other discoveries relating to the commercial activities of Oplontis B were 8 marble weights used to measure the filled amphorae and a small ceramic inkwell containing red pigment, probably used to paint the labels (tituli picti) on the shoulders and necks of the amphorae when they were ready for shipping. Some of the tituli recorded at Oplontis B indicated the contents, others the person to whom the amphora was to be delivered, and still others the names of the merchants who distributed the filled amphorae overseas. Occasionally the names of both the contents and addressee occur.

In addition to the locally produced wine and Dressel 2/4 amphorae, the Oplontis B assemblage contains several other Vesuvian area ceramic products. Two plain terra sigillata platters bearing the in planta pedis stamp of Successus (SUCCESSUSS), which was common at most of the Pompeian household’s production of this and other types of tableware that graced the cupboards of as many as 60% of all Pompeian households in the last decade before Vesuvius eruped, were found in room 30, along with another similarly shaped plate with the fragmentary in planta pedis stamp H.M.[...1 known to have been produced in a Futeoli workshop. The owners of Oplontis B were also consumers of Vesuvian ceramic building material; Italian excavators found several stamped tegulae hailing from the Pompeian workshop of Lucius Eumachus, father of the famous pistoness Eumachia, and his freedman Lucius Eumachius Eros in room 17 that were used to roof the building.

3.1. Organic residues analysis of amphorae

In addition to quantifying and cataloging the amphorae, the project has undertaken the study of the contents of a small sample of amphorae. The analysis of the organic residues found in eleven Dressel 2/4 amphorae were conducted by Alexandra Pecchi of the Archaeological and Archaeometric research team of the University of Barcelona (ERAAUB). Analysis of the visible residues indicated the presence of pitch obtained directly from wood of the species Pinusvara. Pitch was a product

6. For the last category as represented on the Citeroise 1 and 2 amphorae at Oplontis, see MARRASONE-NERBAT 1996, pp. 143-145. 
8. Inv. p. 160. 
9. PECCHI et alii 2017. The study of the content of amphorae is part of the activities of the contract SYC 2013-13369, the project HAR2017-84242‐R supported by the Spanish MINECO and the ERAAUB Consolidated group (2017-3GR1043), funded by the Comissariat per a Universitats i Recerca del DIUE of the Generalitat de Catalunya.
much used in the Roman period; it was applied to the interiors of the amphorae to make them impermeable. Adele Lagi De Caro, as the original excavator of Oplontis B, recorded finding two small stoves built in stone on the south side of the courtyard. These stoves would have heated the pitch; two small bronze vessels found next to one of them contained residues of the substance.

As for the residues preserved in the ceramic matrix, they identified wine markers in all the studied amphorae, confirming the hypothesis on the use of this typology for wine storage and transport. The analyses did not find any trace of oil or fish products, such as the fish sauce known as *garum* (fig. 8). The fact that most of the amphorae were likely found upside down, suggesting that they were waiting to be filled and that they all showed residues of wine (unpregnated in a previous use of the vessels) points out the fact that the amphorae were very likely re-used more than once to ship the same product: wine. Two of the amphorae studied for residue analysis were sealed with cork; at least one of them had a tap hole on its side to empty its contents. The presence of wine in the clay matrix of this amphora further confirms its re-use.13

The continued amphora project will coordinate analysis of residues with two other methods. The project has conducted a fabric analysis on the clay used to make the amphorae. A comparison of the ceramic fabric or matrix with those found in excavations of ceramic workshops will enable us to ascertain their origins.

### 3.2. Wine production and transport

Given the abundance of Dressel 2/4 amphorae at Oplontis B and the evidence of our preliminary sampling, Michael Thomas has investigated the mechanisms of wine production and transport.14 Ancient literary sources, including Martial and Pliny the Elder, indicate that some Vesuvian wines were held in high regard.15 Seals and *tiulti picti* found as far afield as Carthage indicate that Vesuvian wines were widely exported. Columella and Pliny the Elder, both writing in the first century CE, provide detailed information about the winemaking process. The hundreds of amphorae stacked upside down around the courtyard of Oplontis B suggest that they were waiting to be filled or refilled. Considering, as seems likely, the date of the eruption of 79 in late October, rather than the canonical Plinian date of 24 August, the new vintage must have been on its way.16 Cato the Elder17 tells us that fermentation took thirty days to complete, although that time could vary depending on ambient temperatures.

Villa Regina, located approximately two kilometers from Oplontis B, may have been a source for the wine traded at Oplontis B. The Villa Regina was a true *villa rustic* with spaces for grape crushing, pressing, and fermentation (fig. 9). Excavators found 18 sealed *doliba* with wine residue inside, indicating that at the time of the eruption the harvest had already taken place. Although the wine could have been kept on the premises for storage and aging, no amphorae were found at the Villa Regina, making it likely that the owners were making wine to sell wholesale.

To move large amounts of liquid in antiquity over land, Romans typically used a *culenus*, a leather bladder made from tanned animal skins mounted on an ox cart.18 A *culenus* could hold the equivalent of twenty amphorae (about 520 liters). It is quite possible that the wine from Villa Regina was sent to Oplontis B for bottling and shipping. At the eastern end of the courtyard at Oplontis B there is significant wear on the stone column-guards, where the space between the columns is extra wide to accommodate cart traffic. Once inside the courtyard, carts were probably backed up to the spaces between the columns on the long north and south sides. The curbs between the columns preserve cart wheel ruts, suggesting that the carts were parked there to offload the wine directly from the *culeni* into amphorae.

The continued analysis of the plant remains recovered during the first excavations at Oplontis B will offer further clues concerning the goods it handled. More than 27 plant species have already been identified.19 For instance, a pile of carbonized *cereus* could have been used as fodder for the animals that pulled the carts. The ton of carbonized pomegranates recovered in one of the barrel-vaulted rooms to the south of the courtyard building suggests either that they were for sale and export or that they were used to extract tannins used to tan the animal hides to fabricate or repair *culeni*.

The fact that excavations to date have found no wine presses or dolia suggests that Oplontis B did not produce wine. Rather its owner bought it from producers such as the Villa Regina wholesale and was responsible for bottling and shipping it. The seal of Lucius Crassius Tertius found on the upper floor of the courtyard building probably belonged to the manager or proprietor of Oplontis B (fig. 10). On the back of the seal there is the representation of a sort of amphora, suggesting that he was involved in wine commerce. Excavators also found many industrial and household items. Particularly interesting for connecting Oplontis B with commerce were the discovery of an elaborately decorated strongbox signed by three Greek artisans. All Roman warehouses were required to have a strongbox to hold the proceeds of the commercial activities carried on at the site.

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14 An interesting exception to our hypothesis that the Dressel 2/4 amphorae were used and re-used for wine transport is the Dressel 2/4 amphora with the following inscription painted in black on its shoulder: *Liquamen / Optimum / [SM]aa [Name]*, indicating that it contained not wine but *garum* and was addressed to a certain Sextus Aecius Doroteus. (ibid., fig. 40). However, these amphorae were not subjected to organic residue analysis.
15 *Tertius* 2015.
16 *Tertius* 2015, p. 44; *PLIN. NH* 3.60; *NH* 14.8
17 Stepan 2006.
19 See drawing of *culen* painting from the Caupona on the Street of Mercury: *PPP IV*, p. 1009, fig. 23.
4. NEW STUDY OF HUMAN REMAINS

In addition to its function as a commercial hub and its associated settlement, Oplontis B is perhaps best known for the discovery of human skeletons of men, women, and children under the collapsed barrel vault of room 10. Their recovery between 1978 and 1983 caused a sensation—mainly because of the large horde of coins and jewelry accompanying some individuals. Kristina Killgrove has begun a new study of the skeletons in collaboration with Nicola Terrenato and the Oplontis Project. Preliminary results indicate that some victims were likely biologically related, given the high frequency of less common genetic features such as shovel-shaped incisors and persistent metopic suture. DNA analysis to be carried out on samples of tooth roots and bone may be able to verify this hypothesis. At least two of the women were in the final terms of their pregnancies, as bones from two fetuses with a gestational age of 36-40 weeks were recovered. Although Killgrove has found that the majority of the individuals enjoyed good skeletal health at the time of their death, with few to no examples of common pathologies such as porotic hyperostosis and periostitis, the dental health varied significantly from one individual to the next, with many skeletons showing missing or deteriorating teeth. In two young adolescents, analysis revealed severe hypoplastic defects in the dental enamel, indicative of a prolonged period of illness or starvation. Further pathogen DNA analysis will attempt to investigate the disease load of the entire population, and analysis of the matrix found beneath each skeleton will be analyzed for pathogens or parasites. Additionally, stable carbon and nitrogen isotope analysis of the bones of the victims should be able to determine each individual’s diet in the final years of his or her life.

Further research associated with the skeletons is revising our understanding of the mechanisms that destroyed the complex during the eruption. Excavators recovered more than 50 individuals, surrounded only by ash and perhaps mud—but not by pumice—and trapped under the vault of room 10 (fig. 11). A similar collapse of the vaulted ceiling occurred in the adjacent space 41. Di Maio’s analysis of the strata sealed below the vault suggest that it collapsed on these layers of fine ash and black sand deposited above the original pavement. This sequence suggests that the first effect of the eruption was a strong earthquake that pushed seawater into the room during the first ash fall, an event accompanied soon thereafter by the immediate collapse of the vault. The pumice fall that covered the entire site occurred only after this first event.

This brief overview of the work of the Oplontis Project at site B indicates its rich potential for shedding light on ancient commercial production and the circulation of agricultural goods, especially wine in the Vesuvian region and the Mediterranean. The research shows how Oplontis B hosted a much larger wine-bottling operation than originally posited. Analysis of the buildings and their functions for handling and storing wine, as well as the residential areas, will provide a window into Roman life at the time of the eruption. The excavations beneath the 79 CE levels are revealing the evolution of the buildings stretching back into the Samnite era. The study of the skeletons helps populate this space with individuals who had, it seems, ties of kinship. The picture that emerges is one of long term commercial development along familial ties which we are only beginning to understand.
