

## The Liceo Project: Field work at proprietà Lolli and Colleoni, Villa Adriana, 2011-2012

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*This article is a preliminary publication of the results of the excavations and research at proprietà Lolli and Colleoni 2011-2012, Villa Adriana, known as the Liceo area and often considered as a part of Hadrian's Villa. The Liceo Project, which is the framework of this fieldwork, aims to document the archaeological remains and the topography of the area through digital documentation, archaeological excavation and prospection and understand its relation to the Imperial villa. The project has two core objects of study, the so-called Villa of the Lolli Paolini with its ambulatorium and a recently excavated structure (Building A) that can be interpreted as a smaller villa with baths. The so-called Villa of the Lolli Paolini has an enigmatic ambulatorium which originally gave the name to the area, Liceo. Building A was discovered in 2004, and the excavations carried out by the project have shown that the excavated structure had a basin. Water supply was abundant here: a cistern may have been connected with a large aqueduct of probable Hadrianic date which passes nearby. In addition, the end of a late Republican aqueduct, hewn out of the tufa rock, was discovered beneath Building A. The building had at least four different building phases: the first can be dated to the early Augustan period and the last to the Hadrianic period. In addition, the basin seems to have been reused in late Antiquity as a lime kiln. The spina-wall of the ambulatorium of the so-called Villa Lolli Paolini was cleaned of vegetation, and it became apparent that a double water channel was attached to the south side of it, continuing all the way to its double exedra in the west. The fact that the Hadrianic aqueduct mentioned above, which presumably lead water into Hadrian's Villa, seems to begin behind the western exedra of the ambulatorium, raises interesting questions regarding where this water came from.*

### Background

The author together with Marina Prusac Lindhagen (Museum of Cultural History, University of Oslo) supervised in May 2004 a limited excavation which regarded a presumed water-related building in the Lolli property south of Villa Adriana, near Tivoli (figs. 1-2). This short excavation was part of the Danish project *Water for the emperor*, led by Jørgen Hansen and financed by the Carlsberg Foundation. The short excavation revealed the remains of what was presumed to be a smaller villa with baths situated in the area to the south of Hadrian's Villa. This area has been regarded by many scholars as the southernmost part of the Imperial villa (figs 1-2)<sup>1</sup>. For convenience, the edifice will henceforth be called "Building A". The construction consisted in vaulted substructures with a basin and several rooms with mosaic and *cocciopesto* floors (figs. 3-6). The remains uncovered were at this first stage supposed to have at least two phases, one Augustan/early imperial and one probably of Hadrianic date. The structure was interpreted as being part of a bath building, judging by its basin lined with water-proof concrete. Since the area has been so little studied and contains so many buildings which have never been properly documented or studied, a project to study this area on a contextual and broad scale under the name *The Liceo Project* was born. The main aims of the project are:

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<sup>1</sup> LIGORIO *Descrizione*; CONTINI 1668; PIRANESI 1781; MARI 1991; SALZA PRINA RICOTTI 2001.



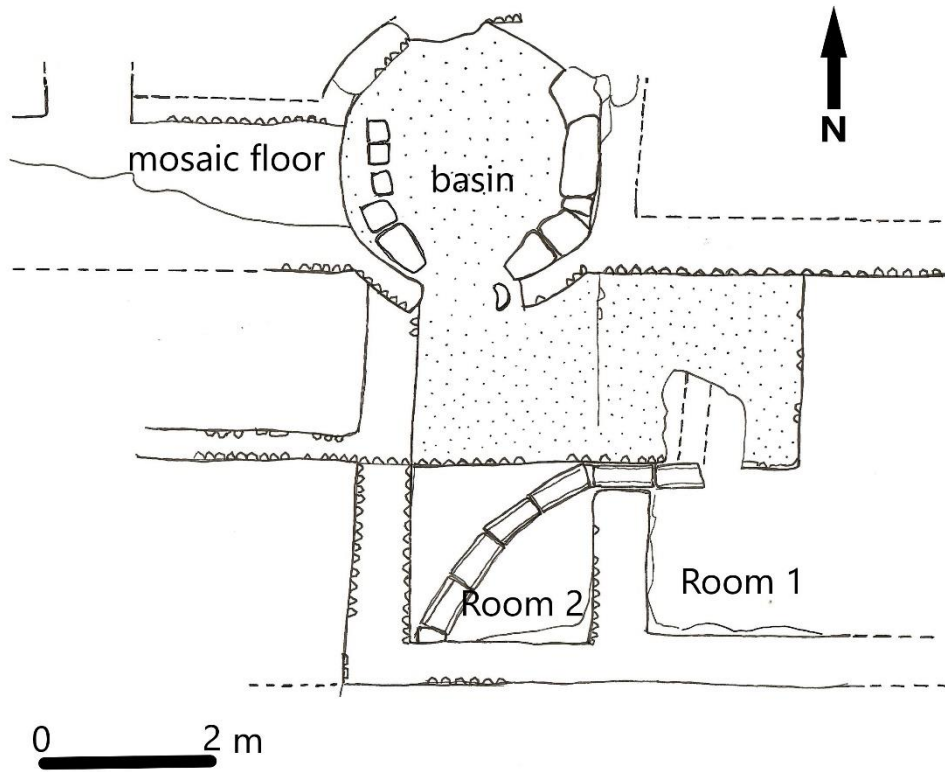


Fig. 3. Plan of Building A as it appeared after excavation in 2011.

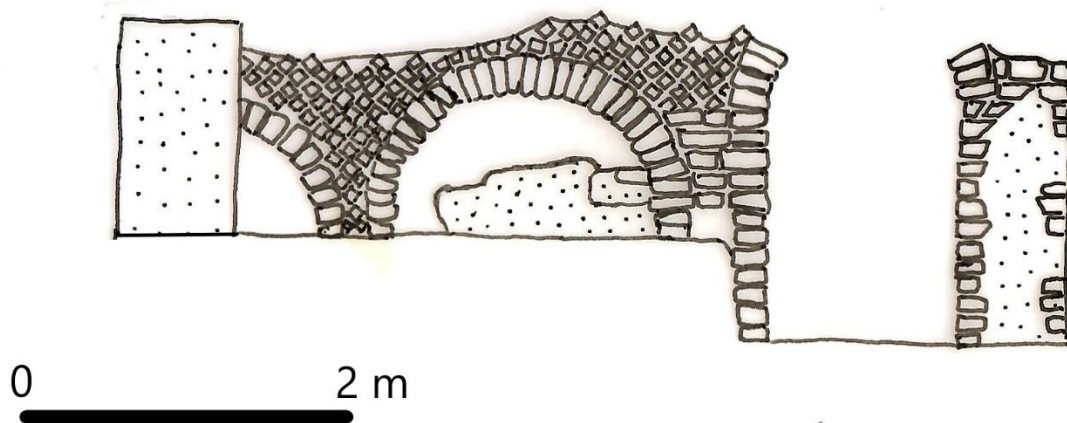


Fig. 4. Section of the lower storey of Building A as it appeared after excavation in 2011.



1. to understand the chronology and function of the buildings
2. to document the buildings and create a GIS-based map of the area
3. to understand the relation of the area with the Imperial villa

In October-November 2011, an excavation with the Norwegian Institute in Rome as its main financier in collaboration with the Department of Archaeology and ancient culture at Stockholm University and the Museum of Cultural History, University of Oslo, took place on the Lolli property<sup>2</sup>. The purpose of the excavation was to investigate further Building A, which was discovered in 2004, and to better understand its building phases, function and relationship with the surrounding structures.

A subsequent field season in September 2012 concentrated on field survey and the cleaning of structures from vegetation. This latter activity turned out to be of great value for several reasons. First and foremost it showed the very bad condition of the buildings and the threat posed not only by human activity but above all from the very thick vegetation which slowly is destroying the ancient walls. The main priorities were:

1. To clean the area surrounding the excavation area from vegetation in order to get a clearer impression of the topography and possible extant building remains above ground.
2. To clean part of the so-called spina wall of the *ambulatorium* in order to get a more detailed impression of it and its function as well as assessing its state of preservation.



*Fig. 5. Overview of excavation of Building A as it appeared after excavation in 2011, view from the south-east.*

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<sup>2</sup> Our warmest thanks to the landlord, Emanuele Lolli di Lusignano for his kind support and assistance.





Fig. 6. Overview of excavation of Building A as it appeared after excavation in 2011, view from the south.

### General topography

Building A stands on the southernmost extremity of the vast tufa plateau on which lies Hadrian's villa further to the north. The nearest structure of the imperial villa is the *Odeum* or *South Theatre*, situated approximately 400 m. to the north (fig. 2). Immediately behind and partly overlying the excavated structure is a rubble wall marking the border between the Lolli and Colleoni properties. The property of the latter family begins north of the slope and comprises the southern end of the plateau between the Lolli and Bulgarini properties, today an open field with olive trees.

Building A is situated within a very interesting archaeological context. A few meters to the east passes a low aqueduct running north-south (fig. 1)<sup>3</sup>. It seems to begin just some 60 meters to the south, behind the so-called *ambulatorium* of the Villa of the Lolli Paolini<sup>4</sup>. For the first 60 meters it is attached to a large terrace wall on the east side. The latter supports the western side of the terrace of this villa and constitutes its western limit (figs. 1-2)<sup>5</sup>.

### The surroundings of Building A

The aqueduct which passes immediately to the east of Building A follows the terrace wall described earlier until it reaches the Colleoni ground after a junction with another terrace wall, orientated east-west, that constitutes the northern limit of the so-called Villa dei Lolli Paolini. The aqueduct continues well preserved some 40 meters north of the excavated structure, where at least one arch is preserved, slightly below ground level (figs. 1; 7). Here, the entire façade is built in the same type of *opus reticulatum*. Walking some 30 meters north on the plateau from the excavated area, a very overgrown Roman cistern can be found, close to the aqueduct (fig. 8). This was first documented by

<sup>3</sup> MARI 1991: 230, fig. 365.

<sup>4</sup> MARI 1991: 231. See below.

<sup>5</sup> MARI 1991: 230-232, no. 152.





*Fig. 7. Cleaned arch of aqueduct north of cistern in proprietà Colleoni, with palmette incised on key-stone (2012).*



*Fig. 8. Cleaned entrance to cistern in proprietà Colleoni viewed from the south (2012).*

Piranesi in his map of Villa Adriana (fig. 9)<sup>6</sup>. It is built in concrete and fragments of travertine and has an opening towards the south. There is little doubt that it must have served Building A, and it is natural to think that it has a connection with the aqueduct. With the aid of test-pits it was possible to exclude that the villa continued to the north and north-west of the cistern, since only sterile soil and tufa rock was encountered here. This means that the Building A would have been confined to the southern end of the plateau, measuring roughly 45 x 40 meters. Judging by its size,

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<sup>6</sup> PIRANESI 1781.





Fig. 9. Detail of the area from the map by Piranesi 1781.

it seems hardly probable that the building was an independent villa. At Tibur, the villas are very large, and the larger ones, like the neighbouring Villa of the Lolli Paolini (see below), measured around one or one and a half hectares.

When viewing the plateau from below, in the valley to the west, a few remains of an *opus mixtum* wall are visible, founded directly on the tufa rock. Interestingly, Piranesi in his map of Hadrian's Villa has in this very place marked remaining walls of a building, which were thus still standing in the middle of the eighteenth century (fig. 9)<sup>7</sup>. From the excavated remains and these indications, there could be little doubt that the plateau hides the remains of a building complex.

In order to better understand the topography of the plateau, the area to the west of the excavation and beneath the plateau, on its western side, was cleaned of vegetation. This work yielded interesting results. Completely hidden by the nearly impenetrable vegetation was the opening of a late Republican aqueduct in the tufa hill-side (fig. 10)<sup>8</sup>. It has a vaulted roof and measures approximately 1.60 meters in height and 50 cm in width. It continues roughly 2 meters into the plateau towards the east, and seems to turn at a right angle towards the north. The aqueduct is

<sup>7</sup> The text on the Piranesi map referring to no. 14 and these structures reads: "Muri rovinate nel poggio più basso" (Ruined walls on the lowest hillock). This description would fit best with the substructures found below the plateau, on a small hill above the valley.

<sup>8</sup> It has never been recorded on any of the maps over Villa Adriana.



blocked by masses of soil which seem to have poured out from the interior. The height of the tunnel increases after the right-angle turn. In the process of cleaning the area in front, a number of walls became visible beneath the aqueduct opening, creating three rooms, following the steep slope. These walls are clearly the substructures of a number of rooms of the villa, which extended above on the same level as the plateau. Around the northern side of the aqueduct opening, the remains of a vault in concrete and tufa stones are still attached to the rock, which would once have supported the upper storey. It would seem that the aqueduct was contemporary with these structures.

From the opening, two walls lead downwards, following the slope and creating a kind of pathway, c. 1.2-1.5 m. broad (fig. 11). It is difficult to understand this "pathway" without the aqueduct, and it seems that it constituted a continuation of it. Interestingly, the concrete in all these substructures is identical to the purplish concrete with reddish inclusions of the first phase of Building A identified in the excavations. They and probably also the aqueduct should therefore be dated to either the very end of the late Republic or the early Augustan period.



*Fig. 10. Exit of late Republican aqueduct with remains of concrete vault viewed from the west, probably for outflow of water.*



*Fig. 11. Opening in the hill-side of late Republican aqueduct and below walls for outlet of water, viewed from the west.*



Regarding the function of the aqueduct, it is impossible at this stage to say anything certain, since it has not been possible to study it closer due to the danger of collapse of the remains of the vault above the entrance. However, two identical openings of the same shape and size are found in the western arm of the Grande Trapezio. It is clear that the latter cut off and destroyed this tunnel when it was built<sup>9</sup>. It seems thus highly probable that our aqueduct was part of the same system of water supply, and that the branch discovered at Building A led overflow water out into the valley. The “causeway” formed by the parallel walls and following the steep slope outside the opening looks like an obvious way of channeling the water exiting the aqueduct.

### *Building A*

The excavation of the Building A in 2011 concentrated mainly on the southern rooms in front of the facade of the structure, on the cleaning and complete uncovering of the basin and on trying to gauge the extension of the structure to the east (figs. 5-6). In the excavation of both Room 1 (to the east) and 2 (west), the same thick stratum of silty, light brown, soil came up with plenty of finds of fragmented table ware, cooking ware, painted wall plaster, glass, roof-tiles and animal bones. It became clear that this stratum had entered the rooms from the vaults through a colluviation or collapse of structures further to the north, and were filled almost to the top by an identical layer of soil. It thus is clear that the finds from this layer derive from the tufa plateau immediately to the north, behind the excavated structure. The structure is no doubt merely the southern end of a larger building situated on the plateau.

Around one meter to the east of the excavated structure, a trial trench was excavated in N-S direction, parallel to the structure and measuring 4 x 1 meters. This was done in order to trace the south wall of Room 2 further east and to understand the situation to the east of the structure. The southern wall continued further eastwards, suggesting a continuation of Room 2, with the wall to the north as a northern limit.

Just as in Rooms 1 and 2, the same colluvial layer was present here, with large amounts of finds such as fragments of concrete, painted wall plaster, roof tiles, pottery, lamps etc.

### *Phase 1*

The central structure was the earliest phase of the complex with the original basin built in reddish-purple concrete, and a façade in *opus reticulatum* (figs. 3-6). Judging by the construction technique and the finds it can probably be dated to the Augustan era, in the last decades of the 1<sup>st</sup> century BC. The structure consists of a façade in *reticulatum* with three vaults on different levels (figs. 3-6); the easternmost is on the highest level, and then the two following vaults are found on a gradually lower level. This is due to the terrain that still today slopes significantly not only towards the south, but also towards the west. The easternmost vault would have had a room in front of it (Room 2), its eastern limit is still unknown. The walls of this room probably functioned partly as a substructure for a second storey. In the lowest level of this room, were found a Dressel 1 amphora of the 1st century BC (fig. 12), and a fragment of a black-gloss bowl with three palmette stamps, possibly predating the Augustan age. The identical type of



Fig. 12. Neck of Dressel 1A amphora from floor level in Room 2. C. 1st century BC.

<sup>9</sup> Köhler 2008: 421-30.

reddish-purple concrete suggests that the room was built at the same time as the vaulted structure. The foundation level of the vault and that of the walls of the room is also the same. Thus, the core structure in *opus reticulatum* had at least one room, probably more, in front of it, functioning as substructures for a second storey, but possibly also for the storage of goods.



Fig. 13. Building A, basin with two rows of stone blocks on the inside, possibly from a medieval reuse. Note the white colour deriving from the reuse as a lime kiln.

Crowning this core structure at the centre was a basin, covered with water-proof *opus signinum* (figs. 3, 5-6; 13). The basin itself has had at least two phases. In the first phase, it would not have been circular, but rather D-shaped, with the straight side towards the east, which runs parallel to the wall running N-S which delimits the basin from the eastern wing. This wall was constructed in a reddish-purple concrete, and is clearly part of the original structure. This original concrete structure can also be traced beneath the later semicircular structure in *opus mixtum* (figs. 3, 5-6). A room immediately south-west of the basin, on a lower level and above the westernmost vault, is also part of this earliest layout, as well as a corridor to the west of the basin. This corridor has a quite well-preserved mosaic floor with white and some black tesserae and sparse pieces of marble *crustae* of different types set in it. Pavonazzetto, Luna marble, Giallo antico and Verde antico could be identified (fig. 14). The floor is of a type common in the late Republican period<sup>10</sup>. The floor is part of a narrow corridor which turns ninety degrees and continues north at the western end of a later *opus mixtum* wall, more or less on the level of the tufa plateau. Thus, the level of the mosaic floor should indicate the floor level of the building on the plateau. On the eastern side of the basin, only the concrete foundation of the floor is preserved, whereas the floor itself has presumably been obliterated by the modern rubble wall which delimits the Lolli and Colleoni properties.

<sup>10</sup> GHEDINI, RINALDI, VINCENTI 2010: 53, fig. 2.





*Fig. 14. Building A, mosaic floor with crustae of marble to the west of the basin. Probably late Republican.*



## Finds

The finds belonging to this first phase include Dressel 1 amphorae (wine, Campania), Dressel 1A (wine, central Italy, locally produced?) (fig. 12). Two fragments of volute lamps date to the late 1st century BC and early 1st century AD. A few finds of black gloss were made, but it is impossible to tell at this stage whether they belong to a yet undiscovered, late Republican, phase of the building, or if they belong to the very beginning of the Augustan phase. Two cups, both with three palmette stamps in the center within a circle of rouletting, were found at the lowest level of Room 2. They are probably of central Italian production and can be dated to between the 2<sup>nd</sup> and first half of the 1<sup>st</sup> century BC<sup>11</sup>. The terra sigillata material is quite varied and seems to begin in the early Augustan period.

## Phase 2

In a second phase, Room 2 was reconstructed on top of the old remains of the pre-existing room, as was probably also Room 1 to the west. The western wall of Room 1 closes the westernmost vault and shows that by now this vault was not used for communication. The upper part of the walls of Room 1 have at least two phases, since the interior walls were refurbished: on the east side, the rather coarse wall was clad with *opus reticulatum*, whereas the southern wall which was initially in *opus reticulatum* has on the inside been covered with a rough concrete surface. A test trench and a test pit indicated a continuation of the southern wall as far as five meters to the east of the excavation, very close to the aqueduct. The fact that the structure extended some 8 meters to the west from the basin, suggests a combined length of the structure's façade at least 20 meters long. The walls are thicker than the earlier ones, suggesting that at this time a heavier second storey was built above. Evidence for this comes from two almost intact floors, one with a mosaic pavement, the other in *cocciopesto*, which were retrieved broken in two after having fallen down from the upper storey (figs. 3, 5-6). The second phase of Rooms 1 and 2 must be dated to sometime before the closing of the vaults at the back, to the north, by a wall in bluish concrete. This can be deduced from the masses of soil with finds which must have entered the rooms prior to the closing of the vaults, since they cover the interior walls of the rooms to a height of c. 80 cm. The date of construction of the second phase of Rooms 1 and 2 is probably pre-Hadrianic, somewhere in the 1st century AD.

## Finds

Almost all finds from the thermal building derive from soil which, presumably by natural forces such as a colluviation or an earthquake, was pressed through the vaults. The intact layer in the vault of Room 1 shows very clearly how building debris, roof tiles, architectonic friezes and other material has poured out from the vault. The material found inside the vaults and the rooms date to between the 1st century BC and the first half of the 2nd century AD, but the inundation of soil through the vaults must have taken place prior to the construction of the rear wall of Phase 3. We have explicit testimony from Pliny the younger about a catastrophic flood of the Anio (Aniene), which can be dated to between AD 98-108<sup>12</sup>. The Roccabruna valley is connected to the Aniene, and could well have been flooded. As a consequence, the late Republican aqueduct which exists in the Roccabruna valley beneath Building A may have been filled with water and the entire building flooded.

There are a number of forms of terra sigillata, many small cups, less fragments of thin wall ware, quite numerous fragments of lamps, mostly fat lamps and late Vogelkopf lamps, but also a Factory lamp and some volute lamps (fig. 15). A number of amphora fragments include Dressel 2/4 (wine, central Italy), Spello amphora (wine, central Italy), Dressel 20 and Haltern 70 (oil and wine respectively, Hispania Baetica) Gauloise 4/Pelichet 47 (wine, southern Gaul), Tripolitana 2/3 (olive oil, Libya). To these finds of amphorae can be added those from the 2004 campaign (Dressel 1, Dressel 2/4, Gauloise 4, Pelichet 46 (fish sauce, Hispania Baetica), Africana 1 (oil, Tunisia). All these amphora types except two can be dated to between the 1<sup>st</sup> century BC and the 2<sup>nd</sup> century AD. Many lamp fragments were found, mostly dating to between the Flavian and Hadrianic periods (7 fat lamps of type Loeschcke VIII and one Factory lamp) (fig. 15). One fragment has the stamp ...CCESSI, referable to the producer Successus

<sup>11</sup> For a parallel dated to the 1<sup>st</sup> century BC, see MARI 1983: 194-195, fig. 317, 1. Other parallels: *ibid* 212, figs. 350-351; 234, fig. 392.

<sup>12</sup> Pliny *Epist.* 8.17; ALDRETE 2007.





Fig. 15. Lamp fragments from the 2011 campaign, dating to between the 1<sup>st</sup> c. AD and AD 140.

(SVCESSI), who produced lamps of this type in central Italy c. 90-140 AD<sup>13</sup>. This picture corroborates that of the 2004 campaign, in which also most lamps were fat lamps of the late 1st-mid-2nd century AD. The only factory lamp found, has a stamp where unfortunately most of the letters are missing: S.....NI (most probably, since the producers of this type always have the name in the genitive form) or IN....S (fig. 15). Two Vogelkopf lamps of the late type date from the late 1st to the mid- 2nd centuries AD. One fragment of the same type, with ducks' heads, seems to be part of the earlier production of the first half of the 1st century AD. Several fragments of terra sigillata can be dated to the 1st and early 2nd centuries AD. The fragments stem mostly from small cups and large platters, some of which with rouletting, one with a fraction of a stamp in *planta pedis*. A small cup also had a *planta pedis* stamp, but also here only a fraction was preserved, reading COR[...]. One of the vessels that can be easily dated is a bowl type Conspectus 34.1 with a rosette on the rim (late Tiberian-Flavian) (fig 16). A few fragments of African Red Slip can also be mentioned, above all the Hayes 8A type, dating to the late 1st-early 2nd century AD. The many fragments of painted wall plaster give a good idea of how the rooms of Building A on the plateau were decorated. The many different types of motives and colours (among the more common colours are white, red, pink, light blue, black, red with white stripes, white with green stripes) show that they have been washed randomly from the rooms of the upper plateau, and hardly any pieces join. Judging by the other finds and the dating of the stratum of fallen soil, they can be dated to between the second half of the 1st century BC and c. 120 AD. One fragment deserves particular mention, a vegetal motif on black background (fig. 17). The fragments of wall plaster with motives excavated in 2004 and 2011 have almost exclusively floral or vegetation decoration.

<sup>13</sup> BAILEY 1980: Q1279.



*Fig. 16. Fragment of terra sigillata bowl with rosette. Flavian, c. AD 69-96.*



*Fig. 17. Fragment of painted wall plaster with floral motif on black background. Late 1st c. BC-1st c. AD.*





Fig. 18. Stucco frieze in Ionian style. Mid- 1<sup>st</sup> century BC-early 2<sup>nd</sup> century AD.

### Glass

Several finds of glass were made, although mostly very fragmented. A couple of complete miniature vessels for cosmetics or oil, and a fragment of a window glass can be mentioned.

Window glass began to be used in the Augustan period. Another interesting find is a twisted glass rod, which originally was used for blending cosmetics and had a disc at each end. Apparently, judging from finds from the Nordic excavations at the villa by the lake of Nemi, such glass rods were reused as decoration in *nymphaea* after the discs at the end had been broken away<sup>14</sup>.

### Marble and stone

Several fragments of marble, deriving mostly from wall- or roof decorations, were encountered. Among the fragments a part of a large bowl in a pinkish conglomerate, an architectonic profile in a purple marble, and a slab in greenish marble with grooves can be mentioned.

### Stucco friezes

Two stucco friezes were found in the destruction layer inside the vault of Room 1. One is of the Ionian type with egg- and dart decoration (fig. 18), the other has lotus buds.

<sup>14</sup> POULSEN 2010: 363-364, nos 79-81, especially no. 81, fig. 222.

### Phase 3

In this phase, a long wall in *opus reticulatum* and bluish grey concrete was constructed. It passes E-W cutting the original structure in two, in this way closing the subterranean vaulted passages towards the north. The wall continues further east and west than the original structure (figs 5-6). Its limits in the east and west respectively are not known, but it is probable that it continued as far west as the mosaic floor above it, i.e. about 8 metres west of the basin, and it is probable that it extended the same length to the east of the basin. The southwestern, curving, part of the basin at the front is part of the same back-wall, and thus the layout of the basin seems to have been altered in this phase. The wall was clearly built after the vaulted structure and the flooding of the vaults, since it closes them at the rear. A hole in the concrete structure behind the rear wall makes it possible to see how the vaulted passage continues to the north, suggesting that it communicated with subterranean spaces to the north of the excavated complex. The rear wall was coarsely built with tufa stones and concrete; the part behind the vaults was obviously not supposed to be seen. This makes sense, since the rooms would now not have served any function other than as substructures for the upper storey, and at least Room 1 did not have any entrance. The construction of the back-wall most probably was the first rebuilding phase after the inundation of the vaults since such a safety measure must have been prioritized. The structure in *opus mixtum*, behind it and on a higher level, is probably datable to the Hadrianic period, since an intense building activity in the area in this period is to be expected. The construction of the back-wall should presumably be dated between c. 90 AD to the first third of the 2nd century AD.

A water conduit was encountered at a high level in Room 1 (figs. 19-20); it would have been constructed after the latest construction phase of the rooms, cutting through the northern part of the eastern wall of Room 1 (figs. 3, 5-6), and built above the silty layer of debris where the latest finds date to not earlier than c. 90 AD. Although the water conduit cannot be traced east of Room 1, it is probable that a hole in the wall with bluish concrete inside the partly ruined vault, lined on each side with dressed stone blocks, shows where the water conduit once had its course. The most obvious hypothesis is that it led water from the basin and maybe other water installations out from the building, passing through the vault, Room 1 and out through the exterior wall, outside which it ends.<sup>15</sup> The water outlet through the back-wall closing the vaults clearly seems to have been there from the moment it was constructed, and thus the water conduit in Room 1 probably dates to the same period. This means that the basin was still in use in the late 1st/ early 2<sup>nd</sup> century AD.



Fig. 19. View from above of the water channel in Room 1 in Building A, towards north.

<sup>15</sup> This also must be the ending of the entire building, since the water conduit must have ended outdoors, which is suggested by the gradual conclusion of the N-S wall of the room (fig. 13).





Fig. 20. View from above of exit of the same water channel, towards south.

#### Phase 4

The wall-structure to the west of and behind the basin, forming an exedra, is constructed in *opus mixtum* and can with great probability be dated to Hadrianic times (figs 3-6). A brick stamp found occasionally when cleaning the site from vegetation, close to the rubble wall separating the Lolli and Colleoni properties, reinforces this hypothesis. It is from the *figlinae* of the consul M. Annius Verus and dates to AD 123, thus in the early period of construction of Hadrian's Villa (fig. 21). Another sporadic find of a fragmented brick-stamp found inside the above-mentioned rubble-wall with the letters ...I[GL?] . ANN... may be another brick-stamp by M. Annius Verus. If so, it only confirms that there was a Hadrianic building phase. The concrete of this phase is white with brownish inclusions, and the surface sometimes takes a rather brownish colour. The wall comprises what was originally an apse behind the rounded basin. It is clear that it was partly destroyed by later reuse of the basin in Phase 5. The apse with the basin would have been centrally placed in the complex with one wing or corridor on each side.



Fig. 21. Fragment of brick with stamp: SALAR[I] ANNI VERI.

#### Finds

Since the vast majority of finds belong to the destruction layer connected with Phase 2, only few finds, all random, can with certainty be connected with Phases 3 and 4. There are only two finds which with certainty postdate this latest building phase, both amphora fragments: a Libyan Tripolitana 2/3 and a Tunisian Africana 1 which both date to the late 2<sup>nd</sup>-3<sup>rd</sup> centuries and are the only finds which with certainty can be assigned a post-Hadrianic date. A circular brick stamp (almost illegible, with the letters ...S .

OP D, an abbreviation for OPVS DOLIARVM) also might suggest a Hadrianic building phase; the circular stamps are very common in Trajanic-Hadrianic times.

#### *Phase 5: reuse*

It is probable that the basin was re-used in late Antiquity or early Medieval times as a lime-kiln. The floor of the basin was at the time of discovery covered with a thick layer of lime, as was the lower part of the apse-shaped structure of phase 4. The whole excavated complex has a whitish surface colour which is not the natural colour of the stones and concrete used. This, as well as isolated hard lime deposits found on some parts of the walls is additional evidence of a reuse of the structure as a lime kiln. In addition there are clear signs of firing at a high temperature especially in the foremost part of the basin, where it seems that part of the curved wall which once would have limited the basin to the south must have been destroyed. The stone blocks lining the curving eastern and western walls of the basin were clearly not part of the Roman basin, but added later and thus would be part of the lime-kiln structure. To this phase we can probably place the rebuilding of the apse; in two places the apse has been broken and mended with coarse bricks in a coarse manner. It would seem that by the time the apse was rebuilt, parts of the apse were already ruined and were mended in order to get a functioning kiln with intact walls.

#### *The “Liceo” and the so-called Villa of the Lolli Paolini*

This area has gone under this name as far back as the mid- 16<sup>th</sup> century, when the Neapolitanian architect Pirro Ligorio visited it<sup>16</sup>. It refers to the passage regarding Hadrian’s villa in *Historia Augusta*<sup>17</sup>, according to which Hadrian had named many of the buildings in his villa after famous buildings in ancient Greece. According to the same source, one area/building was called the *Lyceum* after the philosophical school of Aristoteles in classical Athens. It was the remains of the large portico with a double exedra in its western end which clearly gave Ligorio the association that this might be the Lyceum, since the portico (or in Greek, stoa) was intimately connected with the peripatetic philosophers of ancient Athens. Several scholars have made comparisons between the Liceo portico and the “Pecile” in the northern extremity of Hadrian’s Villa<sup>18</sup>. The *Pecile* is a so-called *ambulatorium* with a double portico divided by a spina wall in *opus mixtum* of exactly the same type as our portico, but built on a larger scale and with a single exedra at each end. *Ambulatoria* were not uncommon in larger Roman villa gardens and used for taking promenades – in summer in the shade, in winter sheltered from rain and wind.

The remains of the villa were accurately described by Z. Mari in *Forma Italiae* in 1991 (fig. 1)<sup>19</sup>. The entire area supposed to belong to this villa measures c. 15,400 m<sup>2</sup> and would have been among the larger around Tibur. It is delimited to the north and west by large terrace walls and the land is divided in two or even three broad terraces running in east-west direction. The position of the villa on a separate terrace, limited by terrace walls and topographically clearly divided from the tufa plateau, makes it uncertain whether Building A described above belonged to this villa (fig. 1).

The core area of the villa is superseded by a building which can be traced back to the 15<sup>th</sup> century and was then known as *Rocca Ferrata*. This building was built above a well-preserved vaulted chamber of imperial date in *opus reticulatum*. It was later known as “Casetta delle vasche” and is since the early 20<sup>th</sup> century used as a rural “casale” by the Lolli family. The name Ferrata comes from the iron-rich spring a few meters east of the house which has been indicated by all visitors beginning with Ligorio and certainly also existed in Roman times. A few meters to the west, E. Salza Prina Ricotti discovered in the 1960-70’s remains of a row of *cubicula* with walls painted in yellow with motifs of wild animals and birds and a mosaic floor with large tesserae<sup>20</sup>. According to her, the decorations were identical to those from the “alloggi” by the *Canopus*. Not far south of the house, remains of a large cistern were indi-

<sup>16</sup> LIGORIO, *Descrittione*, Barb. Lat. 5219, ff. 139v-141 v.

<sup>17</sup> *HA Hadr.* 26.5.

<sup>18</sup> For example MacDonald and Pinto, who regard the function of the Liceo portico as an *ambulatorium* as self-evident (MACDONALD, PINTO 2006: 79).

<sup>19</sup> MARI 1991.

<sup>20</sup> Only one of the small rooms was excavated completely, all were covered and are not visible at present (MARI 1991, 234, n. 665).



cated and described by Piranesi, in those days still containing water<sup>21</sup>. To the north of the house, a number of structures such as wells and basins clearly indicate that the villa included a large and quite luxurious bath complex<sup>22</sup>.

Another detailed map of the archaeological remains in the Liceo area was compiled by E. Salza Prina Ricotti in the 1970's, published in 2001<sup>23</sup>. Unfortunately, it is completely unreliable regarding distances and orientation. Whereas the Liceo portico, the great terrace wall with *contrafforti* and the length of the Casale Ferrata in reality are all orientated E-W, on the map they are orientated NE-SW. Even more problematic is that the distance from the exedra to the Casale Ferrata which in reality is c. 210 meters, on the detailed map is c. 400 meters!<sup>24</sup> In addition, the scale meter of Salza Prina Ricotti's general plan of Hadrian's Villa is puzzling: when looking closer, it shows two different scales!<sup>25</sup> An interesting detail of her map is the supposed continuation of the south-western branch of the huge subterranean service tunnel system, the *Grande Trapezio*, all the way to the northern terrace-wall of the villa (fig. 2)<sup>26</sup>. Unfortunately, the only indication that the *Grande Trapezio* arrived here was that two *oculi* of the tunnel supposedly were identified here, but they were immediately reinterred, and were never documented<sup>27</sup>. Therefore, it is impossible to evaluate this information. If it is true, it would be a very strong argument in favour of the Liceo area being a part of the imperial villa.

Ligorio visited the Liceo area after the so-called *Inferi*, and there is no doubt from his description that he regarded it as a part of the imperial villa domain. He correctly identified the remains of Roman baths with *praefurnium* and basins around the Rocca Ferrata building, near the *ambulatorium*. He is the first to describe the remains of the portico, which he estimates as being c. 400 Italian feet long, with two exedras at each end. Depending on what kind of foot Ligorio used (in Italy at this time, the measure was about 30 cm), the wall of the portico would according to him have been c. 120 m. long<sup>28</sup>. At one end of the portico, which must be the eastern part, he describes remains of "vari alberghi", some of them with heating of the floor through hypocausts. Most probably, these rooms are identical to the ones mentioned by Salza Prina Ricotti, with painted walls with motifs of birds and wild animals.

Francesco Contini was the first to produce a plan of Hadrian's Villa in 1668 (but the field work had begun already in 1634) and included also the Liceo area in it. He estimated the whole portico (including exedras) to be c. 134 m. long, and c. 6 m. wide<sup>29</sup>. On the map, the two western exedras are drawn with filled lines, whereas the eastern ones are more lightly drawn. This is probably an indication that the eastern exedras were not visible but rather reconstructed according to Ligorio's description. The Baroque era had a strong urge for symmetry and regularity, and it is typical of Contini's map that it reconstructs and hypothesizes, sometimes without evidence<sup>30</sup>.

Piranesi's mapping of the portico more than a century later, is similar to that of Contini, but is different in some details (fig. 9). Piranesi did not make any distinction between the exedras and showed them as if all four existed. Moreover, he indicated columns in the portico, 28 on each side. Since there are today no remains of the exedras to the east, there is no evidence to judge whether the map reflects what Piranesi actually saw, or if he merely supposed the exedras as being probable, following the description of Ligorio. It should be pointed out that Piranesi, just as Contini, was not merely documenting the ruins present, but no doubt used also his imagination in the reconstruction of them when evidence was lacking<sup>31</sup>.

When A. Penna came to the Liceo area in 1833, only some fifty years after the publication of Piranesi's map, the eastern exedras, if they ever had existed, were clearly not there anymore, and much of the eastern part of the spina wall was in bad shape and not visible (marked with "fratto" on the map)<sup>32</sup>. His map, which is regarded as very correct and probably the most realistic one of the pre-20<sup>th</sup> century maps of Hadrian's Villa<sup>33</sup>, only shows features which were visible in his days: only part of the spina wall and the two western exedras are indicated here. Just as in

<sup>21</sup> PIRANESI 1781; MARI 1991: 234, n. 664.

<sup>22</sup> MARI 1991: 233-235.

<sup>23</sup> SALZA PRINA RICOTTI 2001.

<sup>24</sup> SALZA PRINA RICOTTI 2001: 68, fig. 13.

<sup>25</sup> SALZA PRINA RICOTTI 2001: general plan.

<sup>26</sup> SALZA PRINA RICOTTI 2001: general plan; 68, fig. 13.

<sup>27</sup> SALZA PRINA RICOTTI 2001: 79; MARI 1991: 236, n. 674.

<sup>28</sup> According to Mari, 118 m. (MARI 1991: 236, n. 672).

<sup>29</sup> The measures given by Contini are 600 and 28 *palmi* respectively. The *palmi* unit of measure differed greatly between different Italian regions. I follow Mari's suggestion that a *palmi* of 22.3 cm. was used by Contini (MARI 1991: 236, n. 672).

<sup>30</sup> SGALAMBRO 2010: 164.

<sup>31</sup> SGALAMBRO 2010: 167.

<sup>32</sup> PENNA 1832.

<sup>33</sup> SGALAMBRO 2010: 168-169.



Fig. 22. Drawing of the remains of the Liceo ambulatorium by A. Penna 1833. *Viaggio pittorico della Villa Adriana*, vol. 4, tav. 118.

Contini's map there are no traces of columns. This can only be interpreted in two different ways: either the columns and exedras had been destroyed in the course of the relatively short period of time between Piranesi and Penna, or Piranesi would have invented at least some, or even a great part of the architectural outline, drawing on the description by Ligorio and Contini. This seems, in fact, probable, since both Contini and Piranesi with its perfect structures clearly reconstructed parts of the buildings<sup>34</sup>. In fact, although not ruling out the comparison with the *Pecile* and a function as *ambulatorium*, Z. Mari suggests an alternative interpretation: a single portico facing to the north or a simple terrace-wall with a tower ("belvedere") at its western end<sup>35</sup>. A drawing made by Penna of the western end of the spina wall shows both the western exedras (fig. 22). The southwestern one was already then ruined and preserved only to a height of some meter, but is evidence that it really existed.

There is not much help from the slightly later drawings by Luigi Canina in his *Antichi edifizii dei contorni di Roma* (fig. 23)<sup>36</sup>. One drawing shows the supposed state of the ruins in his days, but there are a number of errors. The western end of the spina wall is here preserved to a considerable height, whereas in Penna's drawing which is c. 20 years earlier, the last 10 meters of the wall are preserved only to a height of about 1 meter. This means that Canina was not very diligent with the details, but rather cared more for the artistic impression. His little interest in the topographic details is also shown by how he depicts the ruins of the remaining exedra. Behind it are several meters of plain ground on the drawing, whereas in reality the ground slopes steeply here: the aqueduct is found several me-

<sup>34</sup> SGALAMBRO 2010: 168-169.

<sup>35</sup> MARI 1991: 236.

<sup>36</sup> CANINA 1856.



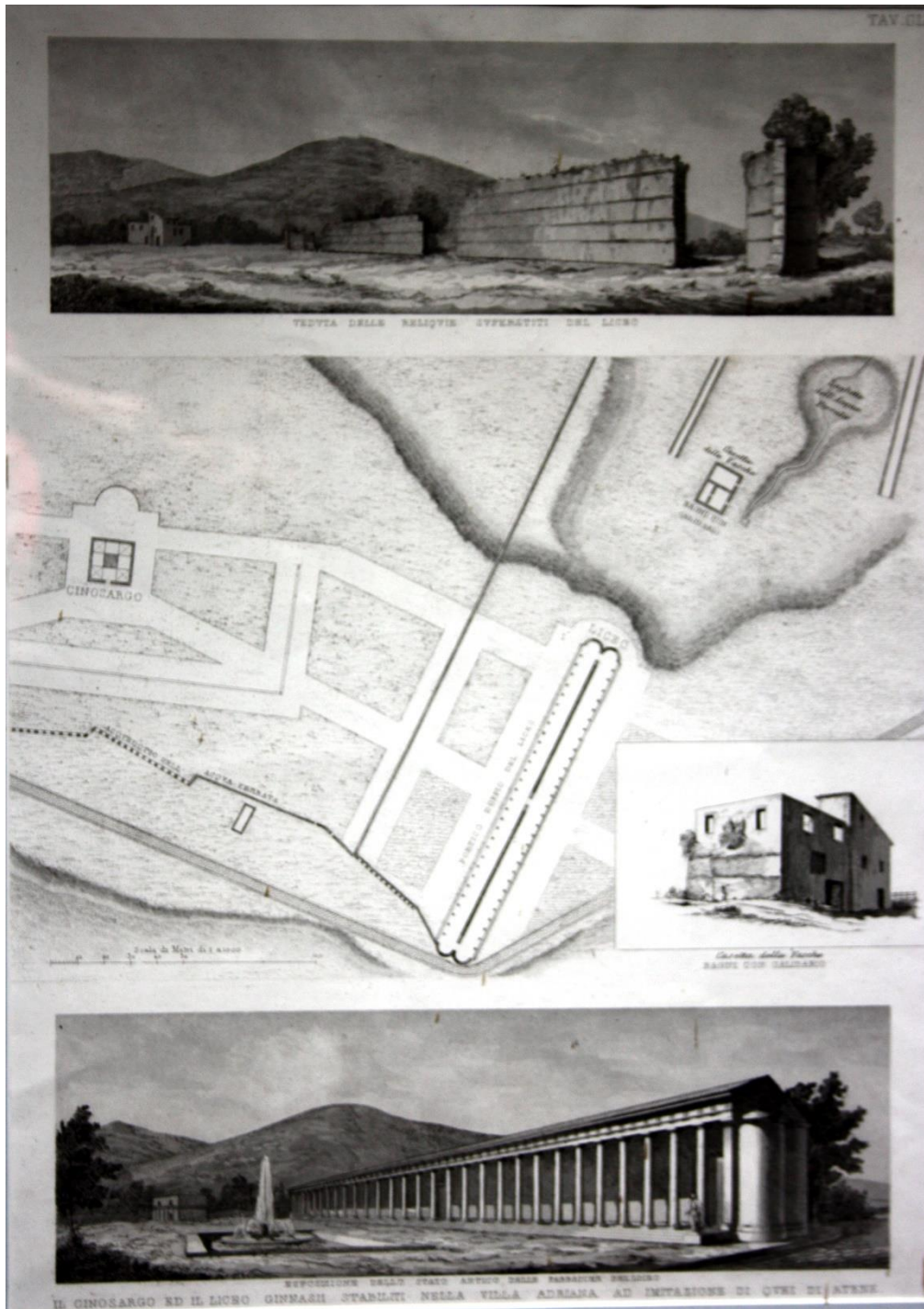


Fig. 23. Drawing and reconstruction of the Liceo ambulatorium by L. Canina 1851. Courtesy E. Lolli di Lusignano.

ters below, immediately behind the exedra. Another detail is the wide opening in the wall. It is depicted on both Contini's and Piranesi's maps, but not on Penna's. From our inspection of the wall, there is no opening to be seen, although due to lack of time it was not possible to study the wall in detail in its central parts because of the thick and bushy vegetation. We hope to be able to clean large part of the wall in the coming campaign and consequently be able to resolve the question.

Today, the only immediately visible part of the Liceo portico is the surviving north-western exedra built in *opus mixtum*, preserved to almost 6 meters height (fig. 24). The remains of the spina wall are completely overgrown with



*Fig. 24. Ambulatorium, the north-western exedra of the double portico (2015).*

bushes, trees and vegetation. The distance from the outer wall of the exedra, which would be the beginning of the supposed colonnade, to the northern façade of the spina wall is 6.6 meters. The wall can be followed from about 7.5 meters east of the center of the exedra for about 135 meters. It is, however, possible that the wall continues a little bit further, underground. On the maps of Contini and Piranesi, the entire portico measures c. 146 meters. This means that from the eastern extremity of the spina wall that has been uncovered so far, there would be only four meters left to the end of the exedra. Given that the depth of the north-western exedra is c. 7 metres, this means that the drawing of the eastern exedras by Contini and Piranesi must be wrong, or that the exedras were simply reconstructed from the description by Ligorio. In fact, the total distance from the exedra until the end of the spina wall is more or less the same as the distance given for the entire portico by Contini (c. 134 m.). There are no signs of the eastern exedras above ground today.

Zaccaria Mari<sup>37</sup> noted in passing that the spina wall might have had a second function as a terrace wall, since the terrain on the southern side is on a level nearly 1 meter higher than the northern side. A small test pit dug at the

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<sup>37</sup> MARI 1991: 236.



eastern extremity of the spina wall made it evident that this difference in level did not exist in antiquity; the floor level was clearly on the same level on both sides of the spina wall.

The finds of fragments of roof-tiles scattered on the ground along the spina wall suggests a roof covered with roof-tiles. The base of the spina wall is on both sides supported by a socket hewn out of the tufa rock, but there is hardly any sign of a floor-level where the socket ends. It is evident that nearly all of the floor has been spoliated. The floor would probably have been in *opus sectile* using white marble, serpentino and conglomerate stone. The thoroughness of the spoliation apart from that of the valuable marbles is not surprising, since we know that a kiln for burning lime was built inside the ruins of Building A in the Roccabruna valley just beneath.

The date of the portico can be quite confidently put to the Hadrianic period. E. Salza Prina Ricotti reports the find of three brick stamps on the ground, dating to AD 122/123<sup>38</sup>. Interestingly, this is exactly the same date as that of the brick stamp found at Building A. There is no doubt that the villa was at its height in this period, suggested also by the frequent surface pottery, and such a large building project is difficult to imagine outside the context of the imperial villa. The building technique is, as mentioned above, also very similar to the *Pecile*, and the large buildings in *opus mixtum* in the area generally suggest a Hadrianic date. Indeed, it is questionable if the so-called Villa dei Lolli Paolini was an independent villa at all. All extant structures belong to the Hadrianic period and may well have been part of the Imperial villa.



Fig. 25. Ambulatorium, view from the north-west of trait of spina wall of the Liceo portico after cleaning in 2012.

The cleaning of a shorter stretch of the spina wall gave very interesting results (fig. 25). A covered canal is attached to its southern side. The structure, which measures c. 85-90 cm in width is covered by a small vault with a facing in *opus reticulatum* (fig. 26). It was possible for us to clean a part where this vault had collapsed completely and thus obtain a section through the canal. Here it is possible to see how the vault is connected with the spina wall. The vault is in section divided in two by a c. 30 cm broad wall in concrete mixed with tufa blocks (fig. 27). The depth

<sup>38</sup> SALZA PRINA RICOTTI 2001: 320.





Fig. 27. Ambulatorium, section of the divided vaulted canal and spina wall from the south. The wall furthest towards north is the spina wall.

Fig. 26. Ambulatorium, view towards the west of vaulted canal in opus reticulatum attached to spina wall.

of the two channels was about 30 cm here, but seems to be considerably deeper, since they are filled with soil. Two small framed openings in the canal vault were registered, only 7 x 3 cm wide, clearly part of the original structure, c. 5 meters distant from each other. It is the intention of the project to clean the entire spina wall, partly in order to follow this vaulted structure, which is of great interest. None of all the visitors and scholars who have described the Liceo portico, beginning in the 16<sup>th</sup> century, discovered this vaulted channel, probably because the southern part of the wall never was cleaned from vegetation and studied properly. Knowing that the villa was very rich in water, with the Ferrata source, and several basins, wells and cisterns recorded, it is a fascinating thought that the canal might be the missing link between the spring and the aqueduct below the western exedra. It is of course at this stage far too early to pose any hypothesis. However, it is an interesting fact that the vaulted canal was an integral part of the western part of the Liceo portico and that the aqueduct to the west seems to begin immediately west of the end of the portico/exedra. It has earlier been suggested that the Acqua Ferrata spring fed the aqueduct, although without the presentation of any evidence<sup>39</sup>.

Regarding the function of the area, Salza Prina Ricotti has suggested that the villa was used as a retreat for Hadrian's distinguished guests with luxurious baths and accommodation and has hypothesized that the villa was used as a "hunting pavilion"<sup>40</sup>. There are obviously no archaeological remains which point in this direction, but it is rather the topographic position which is of importance in this context. MacDonald also suggests that the area to the south of "the southern ruins" belonged to the emperor and was used by him as hunting ground<sup>41</sup>. Several ancient sources mention Hadrian's passion for hunting and that he loved walking, riding and keeping in shape<sup>42</sup>. The many bath-related buildings in our area are interesting in this context. After all, what could be more natural than to clean up and relax in the baths after a hunting party? The only possible reason why the emperor could have chosen to integrate the Liceo area into the imperial estate must have been exactly the isolation and the situation in a relatively

<sup>39</sup> SALZA PRINA RICOTTI 1972; MARI 1991: 233, n. 661.

<sup>40</sup> SALZA PRINA RICOTTI 2001: 317. This suggestion has been argued also by MARI (MARI 2010: 39).

<sup>41</sup> MACDONALD, PINTO 2006: 217.

<sup>42</sup> HA, Hadr. 26.2.



uninhabited area. Given the emperor's well-documented interest for hunting and exercise, the area would have presented an ideal environment in which he could indulge in these activities.

### Summary

Summing up, it could be concluded from the results of the field-work in 2004, 2011 and 2012 that the excavated Building A was a small villa with baths. It seems that the building had finely decorated rooms, and that eating and drinking was an important activity. The building was in use at least from the end of the late Republic to the Hadrianic period, and presumably continued its existence at least throughout the 2<sup>nd</sup> century. Its building history can so far be divided into four, possibly five, main phases:

1. The core building was built on a slope, with a basin with surrounding rooms supported by three vaults on different levels due to the sloping terrain (reddish purple concrete). There was at least one room, probably several, in front of the vaulted *reticulatum* façade, which functioned as substructure for an upper storey, possibly also for storage. On the western side of the plateau, remains of substructures in the same type of concrete suggest that the building extended outside the plateau here. Judging from the general building technique and the indications from the finds of the life-time of the building this first phase can be dated to the middle of the 1<sup>st</sup> century BC.

2. A second phase consists in the rebuilding of the rooms in front of the vaults. New, thicker, walls in *reticulatum* were built on top of the old ones (whitish concrete). The increased thickness of the walls probably also indicates a rebuilding of the upper floor. This must have taken place either in the Augustan age or somewhere in the 1<sup>st</sup> century AD, but probably not later than the end of the 1<sup>st</sup> century AD. This phase is concluded by evidence for a flood, possible to date between c. 90-140 AD. It is probable that the flooding can be connected with that of the Aniene c. AD 98-108.

3. The third phase is characterized by the closing of the vaults at the back by a wall in *reticulatum* which extends much further to the east and west than the original structure (bluish grey concrete). It must have been a consequence of the flooding in which huge masses of soil and debris from the plateau above pressed out through the subterranean tunnels and vaults into the rooms in front of them. In this phase, alterations were made to the basin. A water conduit was constructed through Room 1, above the layer of soil and debris. This conduit probably led out the water from the basin through the eastern vault and Room 1. This phase can be fairly certainly dated to post-90 AD and the Trajanic period, with the earliest possible date of the latest finds from the layer of debris in the vaults and rooms as a *datum post quem*.

4. The fourth phase seems to be chronologically close to the third one. It is characterized by the wall to the west of the basin which partly continues behind it in a small exedra or apse, built in *opus mixtum*. It must be posterior to the wall in bluish grey concrete, since the structure and its floor partly are supported by it. The brick-stamp of M. Annius Verus together with the other finds suggest an early Hadrianic date of this phase (around AD 123).

5. The fifth phase is probably one of reuse. It concerns only the basin and its apse; the former was lined on its interior eastern and western sides with stone blocks and mortar. The traces in front of the basin of damages due to a very high temperature as well as the thick stratum of calcite on the floor of the basin and on its back wall suggest that it was used as a lime kiln. Such lime kilns were in use primarily in the Middle Ages, and the area around Hadrian's Villa would obviously have been an excellent area for this activity due to the innumerable marble statues available there.

Regarding the so-called Liceo ambulatorium, interesting results were obtained with very little intervention and use of time. The existence of a hitherto unknown covered canal integrated into the "spina-wall" of the portico was discovered. It is probable that the wall also functioned as a terrace wall. In any case, it is probably wise to question the interpretations of the building by Ligorio, Contini, Piranesi and others as a double portico with double exedras at both ends. It seems that this interpretation was based to a great extent on architectural comparisons, especially with the so-called *Pecile*, rather than from the existing remains. Consequently, the character and function of the building have to be reinterpreted. It is to be hoped that the project in the coming years will be able to provide enough evidence to reconstruct the building and understand its purpose and function.

What is striking so far is the ubiquitous connection with water of the buildings discussed here. Apart from the channels found attached to the spina wall of the Liceo, there is also the late Republican aqueduct discovered underneath Building A. Any connection between the water source Acqua Ferrata, the water canal in the Liceo and the

many water installations present in the area of the villa on the one hand, and the aqueduct on the other, is as yet only speculation. There is, however, no doubt that this area still conceals many surprises. It probably holds important keys to both the past of the entire area of Hadrian's Villa prior to the building of the emperor's estate and if or how the Liceo area was integrated into it, and for what purpose. In May 2015 a field campaign was conducted in which the architectonic structures and the topography were documented with GIS. This documentation will not only lead to a thorough mapping of the area (finally!) but hopefully also begin to solve many of the questions which our research has begun to raise.

## REFERENCES

- ALDRETE G.S., 2007, *Floods of the Tiber in ancient Rome*, Baltimore.
- BAILEY D.M., 1980, *A catalogue of the lamps in the British Museum 2. Lamps made in Italy*, London.
- CANINA L., 1856, *Antichi Edifizj dei contorni di Roma*, vols. V-VI, Rome.
- CONTINI F., 1668, *Hadriani Caesaris immanem in agro tiburtino villam*, Rome.
- GHEDINI F., RINALDI F. & V. VINCENTI, 2010, "Apparati musivi a Villa Adriana", in *Villa Adriana. Una storia mai finita. Novità e prospettive della ricerca*, ed. M. Sapelli Ragni, Milan: 50-56.
- KÖHLER J., 2008, "Wasserwirtschaftliche Einrichtungen im Grossen Trapez der Villa Hadriana. Bericht über die Forschungen 2005/2006" in *Die Wasserkultur der Villa Hadriana. Ergebnisse der Kampagnen 2003-2006 des DFG-Projekts FA.406/2*, ed. H. Fahlbusch, 397-434, Siegburg.
- LIGORIO, P., *Descrittione della superba et magnificentissima Villa Hadriana* (Barb. Lat. 4342, f. 48 r.; Barb. Lat., 5219 f. 137 v.), unpublished manuscript.
- MACDONALD W.L., PINTO J.A., 2006, *Villa Adriana. La costruzione e il mito da Adriano a Louis I Kahn*, Milan.
- MARI Z., 1983, *Forma Italiae 3*, Rome.
- MARI Z., 1991, *Forma Italiae 4. Tibur*, Rome.
- MARI Z., 2010, "Villa Adriana: il sito, le vie di accesso e i percorsi sotterranei", in *Villa Adriana. Una storia mai finita. Novità e prospettive della ricerca*, ed. M. Sapelli Ragni, Milan: 34-41.
- PENNA A., 1833, *Viaggio pittorico della Villa Adriana*, vol. 2, Rome.
- PIRANESI G.B., 1781, *Pianta delle fabbriche esistenti nella Villa Adriana*, Rome.
- POULSEN B., 2010, "Pottery and glass", in *A Roman villa by Lake Nemi. The finds*, eds. M. Moltesen & B. Poulsen, Rome: 35-411.
- SALZA PRINA RICOTTI E., 1972, "Criptoportici e Gallerie sotterranee di Villa Adriana nella loro tipologia e nelle loro funzioni", in *Les Cryptoportiques dans l'architecture romaine*, Colloque Rome 1972, Rome 1973: 219-259.
- SALZA PRINA RICOTTI E., 2001, *Villa Adriana. Il sogno di un' imperatore*, Rome.
- SGALAMBRO S., 2010, "Catalogo", in *Villa Adriana. Una storia mai finita. Novità e prospettive della ricerca*, ed. M. Sapelli Ragni, Milan: 164-169.