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Converting Private Buildings into Public Monuments: Sites of Transformation and Reuse

Les chantiers de transformation de bâtiments privés en monuments publics : lieux de transformation et réemploi

This article examines the processes of transforming private buildings into public monuments in Antiquity through a focus on the archaeological and economic aspects of construction sites. Three main approaches are identified concerning pre-existing structures: total preservation, partial preservation, and demolition. The concept of 'deconstruction', defined as selective dismantling aimed at reusing materials, distinguishes itself from 'demolition', which involves complete destruction without any intent of reuse. Through specific examples, such as the Baths of Mithras of *Ostia* and the Pseudo-Sanctuary of Cybele of *Lugdunum*, this article explores the methodologies applied during site preparation and the economic impacts related to material management. This study, which also analyses the reuse of materials and the logistical challenges associated with debris removal, contributes to a better understanding of construction dynamics in Antiquity and the economic and logistical issues associated with the transformation of urban spaces.

Keywords: archaeology of construction, deconstruction, demolition, material reuse, Baths of Mithras, Pseudo-Sanctuary of Cybele.

Cet article examine les processus de transformation de bâtiments privés en monuments publics dans l'Antiquité, en mettant l'accent sur les aspects archéologiques et économiques des chantiers de construction. Trois approches principales sont identifiées pour les structures préexistantes: conservation totale, conservation partielle ou démolition. La notion de "déconstruction", définie comme un démantèlement sélectif visant la réutilisation des matériaux, est distinguée de la "démolition", qui implique une destruction complète sans intention de réemploi. À travers des exemples concrets, tels que les thermes de Mithra à Ostie et le pseudo-sanctuaire de Cybèle à *Lugdunum*, l'article explore les méthodologies appliquées lors de la préparation des sites et les impacts économiques liés à la gestion des matériaux. La réutilisation des matériaux, ainsi que les défis logistiques associés à l'évacuation des déchets, sont analysés. Cette étude contribue à une meilleure compréhension des dynamiques de construction dans l'Antiquité et des enjeux économiques et logistiques associés à la transformation des espaces urbains.

Mots-clés : archéologie de la construction, déconstruction, démolition, réutilisation des matériaux, thermes de Mithra, pseudo-sanctuaire de Cybèle.

Introduction

The archaeology of construction is a recent discipline that emerged at the beginning of the 21st century following research conducted on the *Porta Romana* water tower in *Ostia*. These studies, led by E. Bukowiecki *et al.* (2008), not only established the scope of this discipline but also its methodological foundations This line of research over the last two decades can be followed, fundamentally, through the volumes published in the *Anejos de Archivo Español de Arqueología* series (*e.g*. Camporeale *et al.* 2008; Camporeale *et al.* 2010; Camporeale *et al.* 2012; Bonetto *et al.* 2014; Camporeale *et al.* 2016). These, in turn, bring together the contributions of many other international scientific meetings, which have brought together a large group of specialists in questions related to the architecture, construction, economy and logistics of building works. Among the researchers trained in this context, S. Camporeale has become one of the main figures in this field (Camporeale 2011; 2018).

The archaeology of construction studies the organization, production, and management of a construction site (Dessales 2017: 75-94; Pizzo 2009: 31-45). This discipline is therefore not only interested in the architecture and decorations of buildings but in the entire operational chain of their erection. This chain consists of seven successive stages:

1. The Initial Project: This first stage concerns the conception of the project by sponsors or architects. It includes determining the place of the building in urban planning, taking into account the topographical position, the immediate environment, and the available space (Barresi 2003: esp. 20-83). This also involves developing models such as mock-ups and tracings of architectural elements in situ. It is important to note that initial projects are not always respected during the execution of monuments, as shown by the example of the *forum* of Nîmes (Célié *et al*. 1994: 389-392), where modifications were made during construction.
2. Site Preparation: This stage includes managing existing developments on the site chosen for construction. In an urban context, this may require the leveling of ruins. The question of the fate of materials from this demolition is crucial: reuse of rubble, modification of architectural blocks, sale of decorations, etc. Site preparation may also involve topographical transformations, such as leveling, adding fill, or excavating the substrate (Giuliani 2006: 161-180).
3. Infrastructure Development: This stage concerns the work necessary for the proper functioning of the building, particularly those related to roads and hydraulics. It also includes the installation of storage spaces or galleries, such as the cryptoporticoes present under many *fora*.
4. Production of Materials: This stage concerns the extraction and exploitation of construction materials. Studies in this field help us understand the modes of extraction and the origin of materials (Wilson 2012).
5. Transformation of Materials: Once brought to the site, the materials are cut and assembled to be integrated into the building.
6. Construction of the Structure: This stage concerns the realization of walls, foundations, and elevations. The archaeology of construction carefully details these parts to establish typologies and understand the techniques and design gestures, such as the use of scaffolding and lifting machines.
7. Finishing of the Building: This final stage focuses on decorative elements and coatings used. The study of these elements allows us not only to address the ornamental aspect but also to restore the architecture of the structures.

The archaeology of construction offers a unique perspective for understanding the dynamics of archaeological sites, particularly during the transformation of private buildings into public monuments (Boucard 2020). This study focuses on the processes of transformation and reuse of existing structures, a frequent but often neglected phenomenon during the High Roman Empire. The urban space, constantly evolving, was marked by cycles of destruction, construction, and reconstruction, reflecting a society in perpetual motion.

In this context, we explore the dynamics of the transformation of private buildings into public monuments through the analysis of construction sites, defining an operational chain that integrates the potential for reuse of materials and structures. Archaeological examples, such as the *Mithraeum* in *Ostia* and the sector of the pseudo-sanctuary of Cybele in *Lugdunum*, illustrate these processes and provide new answers about the progress of construction sites. This approach allows us to explore in depth the methods of deconstruction, demolition, and partial conservation of buildings, as well as the economic and logistical implications of these practices in Roman antiquity.

Deconstruction/ Demolition/ Conservation of Pre-existing Buildings

Once the land is acquired, the first step of the construction site consists of preparing the land, a

crucial phase, especially when it is already occupied by existing constructions. In this context, a precise methodology is put in place, and the study of archaeological remains plays a key role in determining the treatment of private buildings present on the site. Three main options are available: total conservation of the building, partial conservation, or complete leveling. These choices imply distinct operational chains for the preparation of space, requiring differentiation between deconstruction sites and destruction sites. The techniques and implementations vary depending on the type of site as well as the materials used in private buildings, highlighting the importance of a methodical and adapted approach for each situation.

Deconstruction

The term deconstruction is recent, appearing only in 2004 in the Larousse dictionary. It is defined as: 'selective dismantling of technical installations or certain elements of a construction, in order to valorize waste and reduce landfilling'. Although the term is anachronistic, its meaning is transposable to many ancient examples. While it is currently linked to ecological problems, in Roman times it was mainly the economic aspects that were highlighted. In their article on deconstruction in contemporary France, L. Mongeard and V. Veschambre regretted that the term was not more widely used, as it is often replaced by demolition or destruction (Mongeard and Vescahmbre 2016: 1-6). However, the practices are indeed different. However, recycling cannot always be demonstrated, which complicates the situation. In any case, deconstruction is very rarely mentioned. This term was mainly used and popularized to qualify Roman construction practices by S. Barker in the early 2000s (Barker 2010: 127-128), who defined it and highlighted its relevance for the Republican and Imperial periods. Indeed, it is only in recent years that the study of deconstruction and reuse in the Roman Empire has been undertaken (Barker 2018: 43). As S. Barker did for the city of Rome (Barker 2018: 44-49), the economic aspects of deconstruction must be considered. Among these factors, the time and cost of deconstruction play a major role in shaping the transformation process. The frequent reuse of components also greatly affects the site's overall economy. Together, these aspects influence the dynamics of the deconstruction and construction phases. In such cases, one can refer to the integration of the new building into the existing structure.

Deconstruction is the action of removing certain elements that make up a building. This selective dismantling implies that a certain number of elements are preserved. Thus, deconstruction goes hand in hand with partial conservation of the previous building. It is the opposite of construction. This work requires meticulousness on the part of the deconstructors to avoid damaging the different components, in order to reuse or recycle them in new constructions. A distinction is made between these terms as they do not refer to the same practice. Reuse refers to the use of an element in its existing state, unlike recycling, which involves transforming the material (Duckworth and Wilson 2020; Acero 2021). The materials can be recovered on the site itself or on others. This induces techniques specific to dismantling and the use of tools in this context.

The deconstruction site might have been managed by the same people as the construction site and generally could have involved the same trades. Deconstruction is precision work to avoid damaging the building materials. This is especially true for brick structures (Bukowiecki *et al.* 2021), as this material is more fragile than stone structures. An inscription mentions a guild of demolition experts, called the *collegium subrutorum*: *TI. CLAVDIVS CLEMENS FECIT T. NAEVIVS DIADVMEN CVR. COL SUBRUTOR CULTOR SILVANI P.S.R.* (*CIL* VI, 940). This reveals the existence of specialists in the deconstruction of buildings. But it could be demolishers, the word meaning people who tear down a wall. This is the only testimony of such an association, and it does not allow us to know if these *subrutores* are demolishers or deconstructors. Although other guilds of this type must have existed, it must be imagined that most buildings were deconstructed by the contractor and the workers who also carried out the erection work of the new structure. The work of clearing decorations, such as painted plasters, was probably entrusted to less experienced personnel, often not recovered, as we will see. On the other hand, the deconstruction of a brick wall had to be delegated to an individual with skills in this field.

Demolition/ Destruction

The term demolition/ destruction has been used since antiquity, notably in three forms: *dirutum*, *destructum*, and *labefactum* (Davoine 2015: 190). Although it is generally used to characterize violent and natural causes, such as earthquakes, it is sometimes attributable to human actions (Dessales 2022). Greek writings use similar terms. This is what a passage from Strabo (5.3.7) highlights:

> […] and it is because of this concourse of blessings that the city, although it has grown to such an extent, holds out in the way it does, not only in respect to food, but also in respect to timber and stones for the building of houses, which goes on unceasingly in consequence of the collapses and fires and repea-

> ted sales (these last, too, going on unceasingly); and indeed the sales are intentional collapses, as it were, since the purchasers keep on tearing down the houses and build new ones, one after another, to suit their wishes (Jones 1906).

The passage from Strabo demonstrates a phenomenon of intentional destruction carried out by the entrepreneurs of Rome to build new buildings. However, is it only demolitions proper or deconstructions? As we have seen, the concept of deconstruction is recent and was not used during antiquity. It is therefore possible that the actions revealed by Strabo are as much deconstruction as demolition.

The term destruction has long been part of the archaeologist's vocabulary. It designates both natural demolitions and voluntary ones, which have led to the ruin of constructions. It has been used as much in cases of proper destruction as in cases of deconstruction, hence the interest in distinguishing these two concepts here. Larousse defines destruction, synonymous with demolition, as the 'action of tearing down a building or an architectural ensemble realized according to a determined plan'. This should therefore be understood as the complete leveling of previous constructions. A more complete presentation is given by J.-Ph. Carrié:

> il semble que les bâtiments concernés [il s'agit ici de villas] aient fait l'objet d'un démontage méticuleux avec parfois une récupération des matériaux. Ce genre de remaniement planifié, qu'on peut appeler chantier de démolition complète, pour souligner son caractère organisé et non violent, ainsi que sa large portée, suppose le démontage systématique des structures en place, ou leur arasement méthodique (Carrié 2017: 162-163).

These two definitions refer to destructions wanted and carried out by men: they are therefore programmed and organized. Thus, one or more people wanted to make a clean sweep of the past by leveling the constructions in place. Although the buildings are to disappear completely, the materials may have been recovered and recycled for new uses. In this case, as for deconstruction, meticulous work was carried out to avoid damaging the different elements. We must not forget natural demolitions. They can be the consequences of an earthquake, a fire, a flood, etc. In ancient sources, they appear as the frequent cause of destructions (*Strabo* 5,3,7).

Total Conservation

Conservation is the action of maintaining free from any alteration, in the same state or in good condition. Therefore, the total conservation of a building implies that it is kept as is, although it can be incorporated into a new ensemble. Regarding our study theme, this means that the private building is intact and does not undergo modifications to its structures, although it can be restored. In studying the transformation sites from private monuments to public ones, total conservation is a very rare case, which we will not examine further.

Partial Conservation of Private Buildings

Operating chain

The partial conservation of ancient buildings is a common practice, mainly for domestic installations. Two main cases arise: either the public building reoccupies the entire former dwelling, or it covers only a part, often retaining the domestic use in the unoccupied part. A good example of these partial transformation/ demolition practices at *Baelo Claudia* is also discussed in this dossier (Rodríguez Gutiérrez *et al*. 2023; Rodríguez Gutiérrez 2025). Some of these modifications are the work of the owners of the *domus*, wishing to give part of their domain to erect a public building there.

Whether it is the reoccupation of the building in its entirety or only a part, deconstruction work is necessary to rehabilitate the building and transform it into a public monument. In the case of partial conservation, some structures are kept and others cleared. Studying this partial conservation of the construction thus amounts to examining the deconstruction site. The operational chain of these works can be defined in five main stages: the initial project, the treatment of the decor, the removal of the covering system, the dismantling of certain walls, and the management of the site's materials.

The initial project is dictated by several constraints, such as the sponsor, the topography, the area of the land, and the nature of the existing constructions. These points must be studied and examined by the architects during a partial conservation of the previous developments. This implies a reuse of certain structures and/or the existing building. Unlike a realization *ex nihilo*, the architect thus has a more demanding specification. The first step is to draw the plan of the present remains. This survey had to be simple diagrams showing the main elements, especially the elevations. The architect also had to analyze the solidity of the structures to know which elements could be reused. From these elements, the architect had to draw the plan of the public monument, taking into account the elements to be kept and those to be removed. This drawn plan is called *ichnographia* by Vitruvius (*Vitr.*,1,2,2: *Ichnographia est circini regulaeque modice contines usus, e qua capiuntur formarum in solis are-*

arum descriptiones). It is a small plan drawn with geometric tools, such as the ruler and the compass. This sketch was an integral part of the training of ancient architects (Frézouls 1985: 220-221).

The operational chain of the architect's work is not known for antiquity since no text addresses the stages of a rehabilitation site. Later periods, notably the modern era, are better documented and allow for comparisons. Several works carried out in Rome during the 16th century illustrate this concept. One notable example is the project for the Orsini Palace designed by B. Peruzzi within the ancient Baths of Agrippa. Although the project was never completed, the architect's plan has been preserved and shows how the palace was designed to adapt to and utilize the existing Roman structures. The perimeter boundaries of the palace were intended to exactly match those of the bath complex. Inside the palace, some rooms were designed to follow the boundaries of the pre-existing ones. In this way, the ancient structures were fully integrated into the new design (Gloton 1962: 720-721). Ancient architects must have made a survey of the existing structures before drawing the plan of the public monument. Finally, the choice of partial conservation of the previous buildings in the new public work has a significant impact from the initial project. This affects, in particular, the activity of the architect who must study the structures, make a survey, and design the plan of the building. It is only after this preparatory work that the deconstruction site proper is launched. The analysis of the structures ensures their solidity. The fundamental principles of the architect's discipline are announced by Vitruvius. These are utility, solidity, and beauty (Davidotis 2007: 19). Thus, in the case of the conservation of elements, their stability had to be guaranteed. When robustness was no longer ensured, either the element could be removed, or it could be consolidated.

The treatment of decorations in ancient buildings, notably the removal of floors and wall coa-tings, was a meticulous operation aimed at not damaging the materials and underlying structures. The removed materials could be recycled for other uses, leaving the buildings without their original adornments. A unique and representative example of these practices, which even seem to illustrate the existence of long-term storage of such materials, are the decorative elements reused in the Arch of Constantine in the Roman Forum (Domingo *et al.* 2020). Roman floors were varied, composed of materials such as mosaic, bricks, marble, and concrete. Tile concrete floors and mosaic floors were often left in place, while brick and marble coverings were generally removed (Fant *et al.* 2013). Mosaics, consisting of tesserae embedded in preparation layers, could be dismantled either tessera by tessera or in entire slabs. Wall coverings included painted plasters, marble slabs, and mosaics. Painted plasters were removed with all their layers using simple instruments. Stucco decorations, applied to walls and ceilings, could be detached and reused.

Regarding roof structures, the work had to follow the reverse order of a construction site. The roofs of Roman dwellings, built with durable materials, were mainly composed of tiles (Adam 1989: 231-232). These rested on a framework made of perishable materials, such as wooden beams. During the deconstruction process, meticulous care was required to remove the tiles from the upper structure (Previato 2021). Scaffolding had to be installed to access the roofs. The tiles had to be removed following a precise operational chain. The *imbrices* and *tegulae* were glued to the framework with mortar to ensure their hold. The tiles had to be removed using percussion tools operated by striking, thus allowing to hit the joints and extract the tiles. Once the tiles and mortar were removed, the framework was bare. The work had to be done first on the non-load-bearing elements and then on the main beams. These elements had to be removed one by one.

Once the building was cleared of its covering, work on the elevations could begin. There are two different treatments for the walls. Some walls are preserved because they align with the new plan, while others are deconstructed because they do not. Regarding the latter, we will mainly study here the cases of walls made of bricks and stone since the partially conserved private buildings are all built in durable materials. However, we must distinguish the elevations made in large blocks from those in small blocks, as the deconstruction techniques will be different.

To deconstruct an elevation in small blocks, whether made of stone or brick, the first step was to set up scaffolding. These could be mobile or embedded (Ginouvès and Martin 1985: 116-118). Once the scaffolding was in place, the deconstruction of the elevations proper could begin. This work is done from the highest course to the lowest. As with construction, deconstruction had to be done course by course. The tools used to separate the rubble include chisels, wedges, and points, manipulated with strikers.

Unlike the deconstruction of elevations in small blocks, that of walls in large blocks does not involve setting up scaffolding. As with their construction, the different blocks were extracted using lifting machines. The goat, ancestor of the crane, is a machine composed of upright legs. The pulley systems were connected to hooking devices that lifted the blocks. Once the lifting system was

set up, the deconstruction work with the dismantling of the elevation blocks could begin.

A key issue in deconstruction is determining the fate of dismantled elements. The materials had to be evacuated as the deconstruction work progressed. The architectural terracotta that was dismantled was transported to a specific location (Barker 2010: 130). This storage area could be on the construction site itself, especially if the materials were to be recovered in the new work. The components that were to be reused had to be kept on the site or in the immediate vicinity. On the site, storage spaces therefore had to exist. They could be simple areas where the elements were sorted to determine their function. But they could also be real workshops in which the materials were transformed.

In addition to these materials that were to be recycled on the site, a certain number of elements, useless to the new project, had to be evacuated from the site. Archaeology shows that these elements could be stored in other places to then be resold and recovered in new constructions. In Pompeii, near the pomerial road, an open-air storage space was discovered, containing tiles, ceramics, pavements, and painted plasters of the first three Pompeian styles (Dessales 2011: 59). These materials, probably from the destructions caused by the earthquake of 62, were stored there, although their exact fate remains unknown. An inscription (*CIL* IV, 7124) mentions the sale of these tiles and other construction elements, suggesting that these second-hand materials could be reused in new constructions. This indicates a phenomenon of reuse, although these materials may have been used for other buildings than those constructed on the same land. The management of deconstruction sites therefore had to include the transport of materials to the storage sites, requiring convoys involving human and animal activities.

Example: Mithras Baths

For the construction of the baths (Poccardi 2006: 43-52), the entire insula was not used. Only the northern part accommodates the new project, while the southern part was transformed into a shop. Although interesting on several levels, these aspects fall outside the scope of this study, as they are not directly related to the public monument. The site underwent no modification for the construction of the baths. However, the preexisting masonry was adapted to the new structure, either by preserving or deconstructing the elevations. These baths were built entirely using architectural terracotta (fig. 1,B). The previous private building, on the other hand, was constructed in mixed reticulated work with paneling (fig. 1,A).

Figure 1. Construction techniques observed in the Baths of Mithras, *Lugdunum* (J. Boucard).

Treatment of Previous Remains

The remains of the previous *domus* concern only elevations. Thus, during the construction of the baths, only elements that could be integrated into the new project were preserved, while others were dismantled. The layout of the baths follows the same orientation as the private building. Moreover, it retains the same western and northern boundaries. This is confirmed by the presence of fragments of *reticulatum* walls reused in the perimeter walls of the bath complex. The western wall was not entirely preserved, but only certain sections (fig. 2 and fig. 3). This is explained by the adaptation to the new project. First, in room 2,

two openings were created to the west, which explains why the previous elevation was deconstructed at that point (Mar 1990: 34). Rooms 5 and 6, which are heated rooms, have walls with *tubuli*. It was therefore essential in these spaces to redo the walls to match the new functions. The eastern exterior wall was largely demolished. Only a remnant remains in the eastern wall of room I. However, its presence is confirmed by several other wall sections, such as the northern wall of room M and the two east-west oriented walls in the eastern part of area J. This wall was destroyed to create the space necessary for a portico and to install stairs leading to the upper floors from the outside. Other elevations were preserved, those of rooms I, K, L, and M, as well as three remnants in area J. The *reticulatum* is only visible in the lower parts, with the upper parts consisting solely of architectural terracotta. Thus, some walls were dismantled because they did not fit the new construction project. The preserved elevations were still treated, particularly those reused in the hydraulic system. They were coated with a thick layer of hydraulic concrete to suit the space's new function.

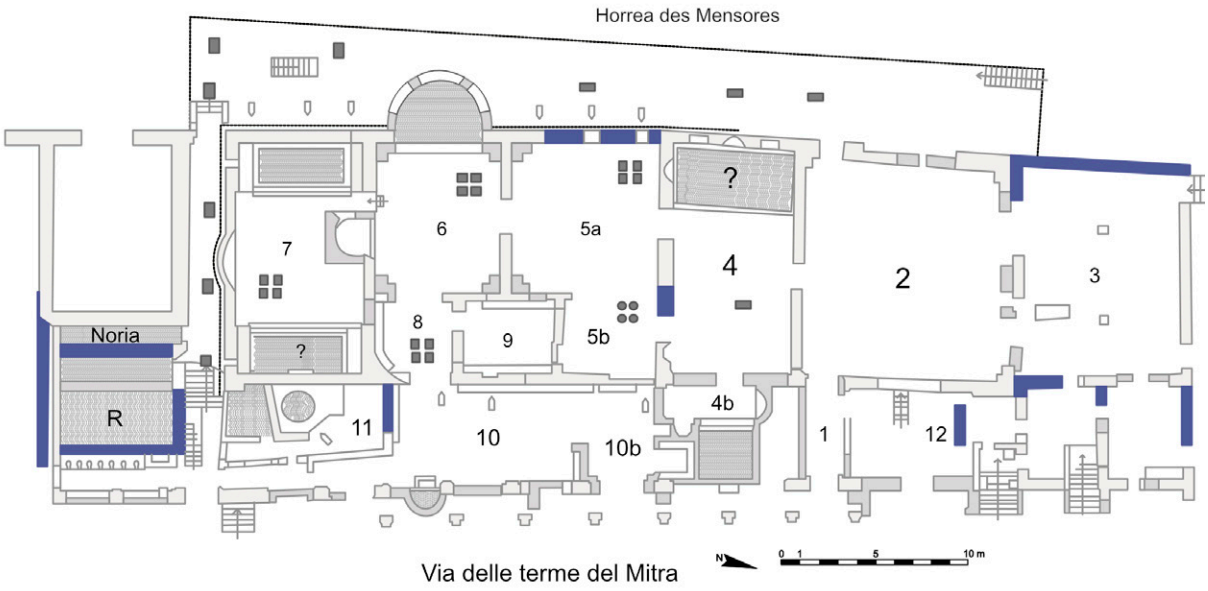

Figure 2. Plan of elevations in mixed reticulated masonry with panels, *Lugdunum* (J. Boucard).

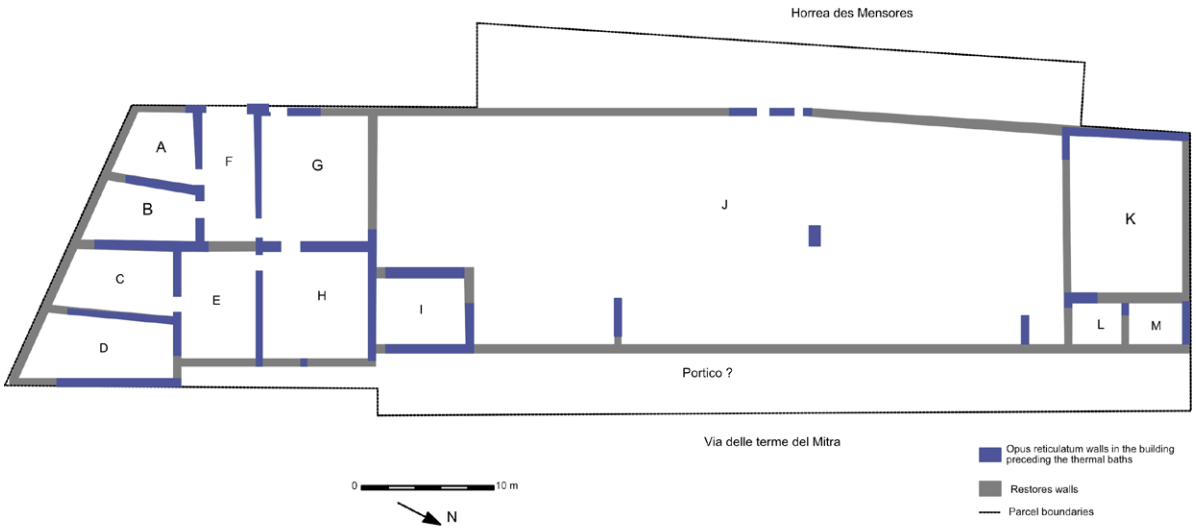

Figure 3. Reconstruction of the plan of the private building on the Mithras Baths block, *Lugdunum* (J. Boucard).

The Question of Reusing Construction Material

Some earlier walls were preserved, but many were dismantled. This raises the question of reusing the material from these dismantled structures, especially the bricks from the panels and the *reticulatum*.

The elevations of the habitat used bricks in the panels surrounding the *reticulatum*. These bricks come in various colors; some are yellow, others orange, and others red. This indicates the use of different clays and likely different sources of supply. Measurements were taken on the bricks from this phase. These bricks are from phase 1, as they are associated with the *reticulatum*. The graph shows that the length of the bricks varies between 17 and 19 cm (fig. 4). However, most have a length between 22 and 27 cm. The former would be resized *bessales*, and the latter cut *sesquipedales*. The average length of the bricks is 23.9 cm. The height of these architectural terracotta varies between 2.5 and 4.5 cm, with an average of 3.5 cm.

A similar study was conducted on the bricks from Phase 2 on the western wall (western face, exterior) of Room 7. The bricks here also show a variety of colors and clays. The graph also shows a variety in lengths, although 20% of the architectural terracotta has a length of about 23 cm (fig. 5). The average length is 22.5 cm. The height is more uniform, with 50% of the bricks being 4 cm high. The average height is 3.9 cm.

These graphs first demonstrate a variety in the sizes of bricks used. Coupled with the fact that several types of clay were employed, this reveals that the bricks came from different batches. Thus, there was no single module in use. The comparison between the two graphs, with peaks in length between 23 and 24 cm and more or less comparable average heights, could suggest that the bricks from the earlier structure were reused in the baths. The slight differences between all the graphs might also support this notion. Based on these graphs, the reuse seems likely. However, it is impossible to confirm this on the bricks without conducting chemical analyses to definitively prove the reuse. Indeed, the modules of architec-

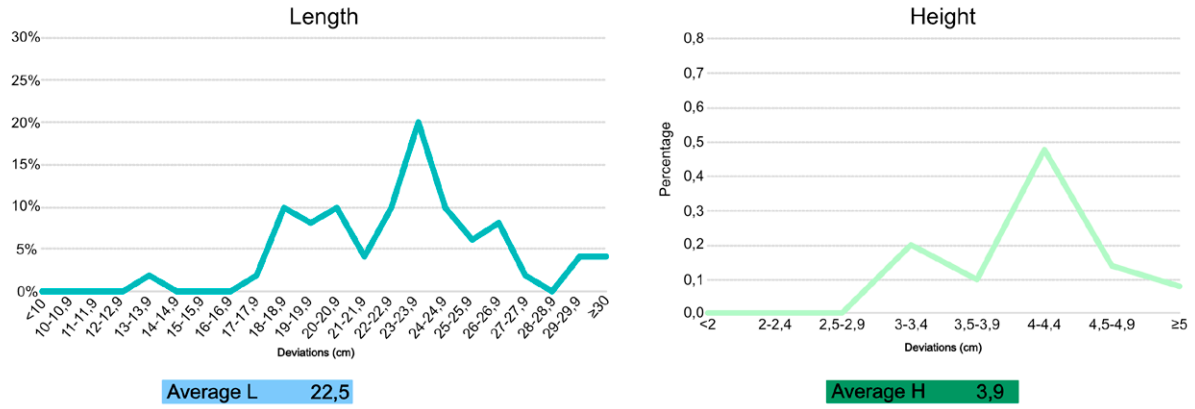

Figure 4. Chart of materials used in phase 1 prior to the baths, *Lugdunum* (J. Boucard).

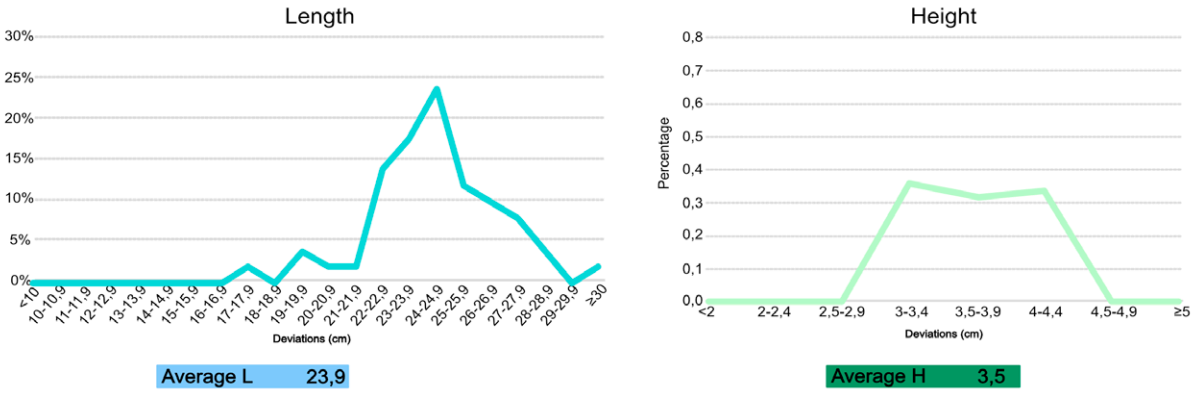

Figure 5. Chart of materials used during the construction of the baths, *Lugdunum* (J. Boucard).

tural terracotta were often the same in buildings in *Ostia* during the first two centuries of our era. Since the earlier private building was constructed with a mixed *reticulatum* and panel technique, the number of bricks potentially reusable in the baths, which were built in brick, was less than what was needed for the new project. Other terracotta materials had to be used to create the new elevations.

The other material used in the elevations of the earlier structure was the *reticulatum* stone blocks. No evidence on the site indicates their recycling. Therefore, they were not reused during the construction of the baths. Yet, these materials must have been numerous, as they made up a large part of the previous elevations. This raises the question of what happened to them during the construction of the baths. They must have been removed from the site. This has an impact on the construction project. They could have been transported elsewhere at the builder's expense, or they could have been sold, generating income for the builder. In any case, their disposal must be considered within the economic framework of the construction site.

Leveling of Private Constructions

Operational Chain and Definition

Numerous archaeological examples illustrate the fact that private developments were leveled to build the public monument. There is no impact on the project, as the installations will be demolished and the land can be reshaped. Thus, the project of the public work is modeled on an *ex nihilo* planning, even if the operation of preparing the area is more significant. Even if a total leveling of the remains was carried out, the preparation of the land could have begun either by setting up a demolition site or a deconstruction site. In the first case, the construction materials of the demolished buildings were not reused, even if they could have been used in the embankments to raise the levels. In the second case, the deconstruction site follows the model of the one described previously, without selection of the elements but by dismantling all the structures.

Whether for constructions in perishable materials or for buildings in durable materials, the destruction can be of natural cause, notably attributable to fires. In these cases, the rubble of the demolished buildings had to be treated. We must also imagine a destruction carried out by the builders on certain buildings. This is particularly probable when the materials are not reused in the new work, but in raising the ground level. Since the materials are not recycled in the new work, it is possible to imagine here a violent demolition, a more economical practice. The result of these practices is the presence of significant rubble. These had to be spread out, in the case of leveling the land, or evacuated to make way for the new work.

To be able to conserve the materials, a meticulous deconstruction site could also have been set up, similar to the one described previously.

The excavation of a monumental building in *Augustobona*, in Gaul, provides information on the destruction site (Driard *et al*. 2014: 25-37). During the Antonine period, a collective complex, probably a peri-urban sanctuary, was established on Augustan domestic installations. Although related to our subject, it is not this transformation that interests us here, but the dismantling of the public monument. It was partially dismantled in the 2nd and 3rd centuries, notably the north wing. The process was demonstrated by the archaeological remains. It was the covering that was removed first. The partitions had to be removed next, before the load-bearing walls could be taken down. Then, the foundations were deconstructed. The remains were leveled to the ground level. Later, the area was flattened. This work allowed the courtyard to be enlarged. As for the fate of the deconstructed materials, they could have been reused in other constructions or cleared to a different location. In the 4th and 5th centuries, the building was abandoned. The archaeological excavations carried out on the east gallery demonstrated the stages of the destruction site. The work first focused on dismantling the decor. Small remains of painted plasters were discovered on the floor of the gallery, as well as a few marble elements that were part of the wall decor. The marble used was diverse: some local rocks, the rest imported from different parts of the empire. These elements were identified in the immediate vicinity of the gallery, in the demolition levels. Next to the gallery, combustion structures were uncovered. Associated with these, calcined limestone stones were discovered. At this location, a lime kiln workshop for transforming the elements was therefore installed. After dismantling the decorations, the walls were deconstructed. Then the foundations. The foundation trenches were filled with earth, and coins from the 5th century were discovered there. The foundation blocks were therefore recovered. During this deconstruction site, the north area, formerly occupied by the north gallery, was used as workshops. These were devoted to metallurgical work. Hearths and pits filled with charcoal were discovered there. On the ground,

numerous slag and traces of metals were identified. These workshops are dated, by the coins and the material discovered, to the same period as the deconstruction site of the east wing. They were therefore installed to work the metal from the dismantling of the public monument. Thus, the lead and copper elements of the building were melted down to be reused. The site was not rebuilt immediately afterward.

The deconstruction site will have a significant impact on the economy of the site, particularly on working time and expenses. But stages 4 and 5 of the archaeology of construction, relating to the construction materials of a construction site, can also be positively impacted. Thus, the reuse of elements induces a lesser transport of new materials. On the other hand, the repercussion of violent destruction will be less important on the site since the demolition is done more quickly. If there is violent destruction, there is no longer a need to transport embankment materials since they are on site.

Example: Pseudo Sanctuary of Cybele

Treatment of the Previous Remains

The public monument construction project took into account the terrain as it was (Desbat 1998: 238-247). The plan of the two phases shows that the public monument does not exactly follow the same orientation as the previous dwelling (fig. 6). Thus, the walls are slightly misaligned (fig. 7).

The foundations of the earlier building were made of stone blocks, while the elevations were made of adobe bricks. The foundations and floor levels were preserved. The previous elevations were completely destroyed. Only traces of these adobe bricks were found during the excavations, in the shops that were filled with the same material, and outside the building. Part of this demolition probably also served to fill the foundation caissons in the western part of the public monument. However, given the large size of the previous dwelling, not all the material from the demolished elevations was used in the new building. This provides significant information about the construction process. The first step was to demolish the adobe brick elevations. The second logical step was to clear the area of the demolition debris. This impacts the construction project in terms of time, the number of workdays required, and the money spent. The location where the demolished bricks were taken is unknown. It is likely that the demolition debris was reused in other constructions. The places where the remains of adobe bricks were found showed that the walls had been destroyed. Thus, it does not seem that any special care was taken in dismantling the elevations.

The builders decided to preserve the stone foundations and the floor levels. It is from these levels that they built the foundations of the public monument. Two approaches are identifiable. In the first case, the public foundations rest directly on the previous structures; in the second, the foundations break through the earlier structures. In the latter case, the previous elements act as support for the new building. This difference in treatment must be related to the desired stability of the building.

Some foundations were reused. Given the difference in orientation between the private building and the public structure, this concerns only remnants of walls. However, this is evident in the western wall of space a5, which incorporates the western wall of the private space 1g. Similarly, the public wall between b10 and b9 rests on the back wall of the shops from the earlier dwelling.

The Question of Reusing Construction Material

The issue of reusing construction material is very difficult to address on this site. At first glance, it seems that no such practice was employed. Since the stone blocks used in both phases of the buildings do not have a specific module, it is impossible to confirm the reuse of these elements. However, it cannot be ruled out either. It is possible that some stone blocks were recycled. Where the western wall cuts through the earlier wall, the latter is partially destroyed. It seems logical to imagine that the demolition debris was reused in the new walls of the public building.

Regarding the bricks, measurements were taken on the jamb shops for the private building and on a wall on the public monument. The graphs are quite comparable, showing the use of bricks around 30 cm in length and approximately 6.5 cm in height in both phases. However, in this specific case, the similarity in brick modules is not enough to demonstrate reuse. Since the two buildings were constructed about twenty years apart, they likely used bricks made in *Lugdunum*, whose modules probably did not change during this period. Moreover, since bricks were only used in the jambs of the private shops, they could not provide enough useful material for the new structure. Thus, the construction site of the public building likely used new bricks with a module comparable to those used in the so-called *Praetorium* of Agrippa.

Figure 6. Surveys of the walls in the pseudo-sanctuary sector of Cybele, *Lugdunum* (J. Boucard).

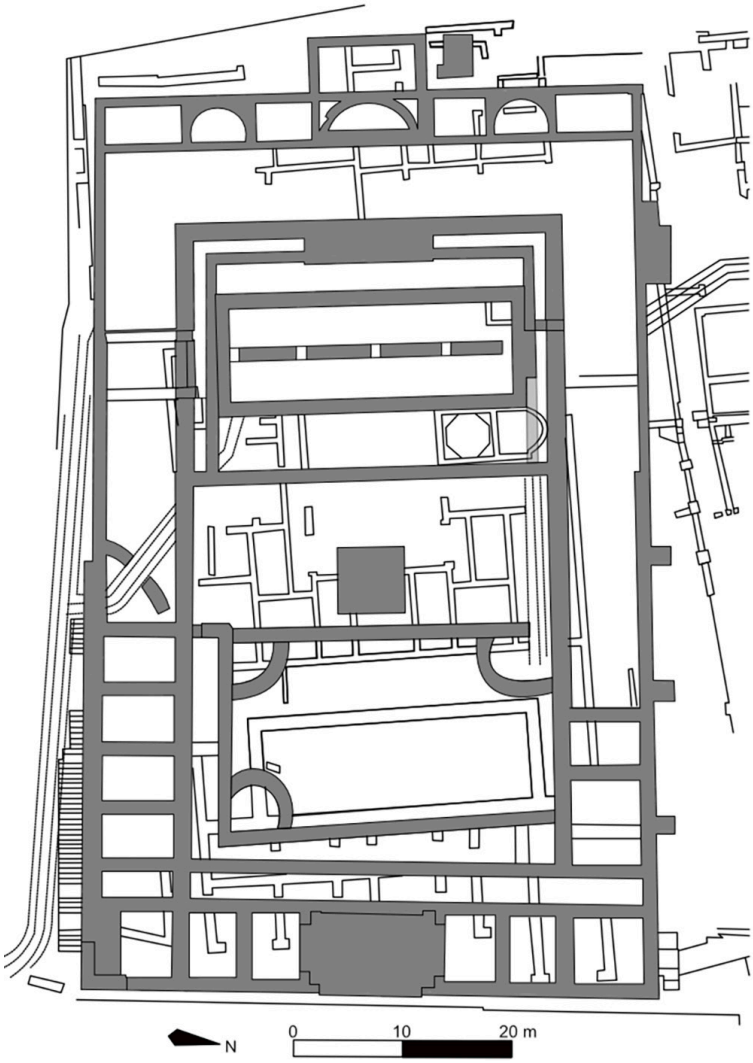

Figure 7. Plan of the Pseudo Sanctuary of Cybele, *Lugdunum* (J. Boucard).

Conclusions

The study of the processes of transformation of private buildings into public monuments in antiquity reveals complex dynamics and varied methodologies. Archaeological examples, such as the Mithras Baths in *Ostia* and the pseudo-sanctuary of Cybele in *Lugdunum*, illustrate the different approaches adopted for the preparation of sites and the management of materials. The distinction between deconstruction and demolition highlights the economic and logistical practices of the time, emphasizing the importance of reusing materials and existing structures.

The partial conservation of ancient buildings, although common, requires meticulous planning and a thorough analysis of pre-existing structures. Architects in antiquity had to not only design plans adapted to topographical constraints and the needs of sponsors but also evaluate the solidity of elements to be conserved or reused. This approach has a significant impact on the economy of the site, influencing working time, costs, and the logistics of materials.

Examples of deconstruction and demolition show that materials could either be reused on-site or transported to other sites for recycling or sale. Deconstruction sites, in particular, required rigorous waste management and meticulous planning to maximize the reuse of materials, thereby reducing construction costs and efforts.

This study leads to a better understanding of construction dynamics in antiquity, highlighting the economic and logistical challenges associated with the transformation of urban spaces. The practices of deconstruction and reuse of materials, although often neglected, play a crucial role in the evolution of cities and public monuments, reflecting a society in perpetual motion and constant adaptation.

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