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Heritage in fragments: On spolia and other forms of preservation of architectural fragments through reuse

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This paper elaborates on the reuse of architectural fragments in new constructions as a strategy for the conservation of cultural heritage. The ancient practice of spolia is used as a frame of reference to analyze contemporary reflections and examples. The introduction reflects on the tension between the practice of spolia and heritage conservation. Next, a review of relevant literature is presented, including sources from different disciplinary backgrounds, like heritage conservation, architectural history, architectural theory, and interior architecture. Furthermore, two precedent-setting studies are investigated: the decomposition of the interiors of the Generale Bank in Brussels (Belgium) by Rotor and the reuse of its fragments in new projects, and the Lin'an History Museum in Hangzhou, China by Amateur Architecture Studio. The following research questions steered the investigations: (1) what is the origin of the spolia? (2) how are the spolia reintegrated into a new building? (3) is the heritage embedded in the spoliated fragment transferred to or appropriated by the new host? A final reflection highlights gaps in the literature study and proposes directions for future research.

Keywords*:* spolia; fragment; material reuse; adaptive reuse; circular building; conservation theory

Introduction

Problem statement: Spoliation versus conservation

The reuse of fragments of older buildings in new constructions is probably as old as the building practice. As transportation and crafting of materials were expensive and time-consuming, it was easier and cheaper to reuse materials from demolished or unused buildings in the immediate surrounding. During the Late Antique period, a more conscious and ambitious form of reuse of architectural fragments appeared, which was not merely pragmatic but also served aesthetic and ideological purposes. This form of reuse is referred to as *spolia*. One of the first paradigmatic cases is the Arch of Emperor

Constantine, with integrated fragments of arches of his predecessors. Other examples include early Christian basilicas such as the Lateran and St. Peters, which incorporated columns and capitals from earlier, pagan buildings. The reused marbles usually became available through demolition conducted in the context of urban renovation or following a disaster or dilapidation. Materials were either transported directly from the demolition site to the construction site or were stored in a depot.[1] Enormous imperial marble yards included elements that were prefabricated in workshops right after being taken from the quarry and fragments too that came from demolition sites.[2]

Increasing demands for spolia caused a tension between demolition out of necessity—because of instability or to clear a site for new construction—and demolition to provide materials for new constructions. Already, in the late 4th century, emperors Arcadius and Honorius put a law in force to prohibit illegal demolitions and allowed spoliation only by explicit approval of the emperor. In 458 AD, emperor Majorian broadened existing laws, putting even more strict regulations on the demolition and spoliation of ancient monuments. In particular, the reuse of materials from public buildings in private construction works was denounced. Instead, if a public monument was beyond repair, its spolia had to be reused in a public context, accessible to the city's residents, to preserve 'public elegance'. Hence, these legal matters illustrate the relation between spoliation and conservation and can be seen as a form of heritage preservation *avant-le-lettre.*[3]

Although the concept of spolia is strongly linked to late antique buildings in Rome, it was continuously practiced throughout the Middle Ages and the Renaissance period. While in late antiquity, the marble supply in Rome seemed 'eternal', the stocks decreased during the Middle Ages. Especially during the 12th and 13th centuries, supplies were insufficient to meet the demands of the times.[4] On the one hand, this

shortage was caused by the stoppage of (foreign) supplies that had existed during the heyday of the Roman empire.[5] On the other hand, demand for building materials increased due to large-scale repairs of urban infrastructures such as bridges and fortifications by the popes. Ancient materials were used to execute the works, not only ornamental marble elements and columns but also less precious stones and bricks, roof tiles, and even strictly decorative elements such as mosaics. In this process of urban transformation, buildings that could not be adapted to modern uses "*could be treated as quarries and torn apart in order to reuse their building materials*."[4] These large-scale public works, combined with increasing private construction works and heightened export of marble fragments to other regions such as France, Germany, and England, led to unregulated or even 'illegal' spoliation of standing ruins and the excavation or 'mining' of ancient sites.[4, 6]

It is clear that the use of spolia has always held an ambiguous relationship with the notion of heritage conservation. On the one hand, spoliation can be seen as a violent act of destruction that reduces a monument from the past to mere building material. On the other hand, the reuse of older elements, the appropriation of their iconographic meaning, and the revival of the craft and techniques to handle these materials have been described as acts of preservation of heritage to appropriate or strengthen identity.

The practice of material reuse disappeared from the dominant architectural discourse and practice in the modern period due to the interest at the time in new building materials and techniques and because production and transportation of materials became cheaper and more manageable. However, in the last decades of the period, architects showed interest once again in using reclaimed materials for new buildings. Early examples include Dimitri Pikionis' path to the Acropolis, constructed with debris from demolished neoclassical buildings in Athens; a series of houses by

Rudolf Olgiati in the Swiss Alps that integrated wooden doors, window frames, and other elements from earlier, vernacular buildings; or projects that were in the context of post-war reconstruction such as Godfried Böhm's chapel of Madonna in the Ruins, which integrated fragments of the old Kolumba church that had been almost completely destroyed by bombing. More recent examples include the oeuvre of Pritzker Prize winner Weng Shu, who in many projects used debris from demolished vernacular buildings, or the Brussels-based Rotor, specialized in design with reused materials and the organization of reclaimed-material flows. This trend can be read in the context of increasing ecological concern and a more conscious approach to the use of natural resources. It can also be seen as a means to create new buildings with a stronger link to the local identity and history of the place. Some architects have even described their effort to work with reclaimed materials from historic sites in their new constructions as an act of heritage preservation.[7,8]

Objectives and research questions

This article elaborates on contemporary forms of 'spolia'—the reuse of architectural fragments in new buildings—as a means of heritage conservation. The first part of the paper presents a review of scholarly literature that discusses the use of older fragments in new architectural compositions, approaching the topic from different disciplinary backgrounds, including architectural history, architectural theory, interior architecture, and heritage conservation. The second part of the paper focuses more specifically on the relationship between material reuse and heritage conservation through the study of two case studies: the decomposition of the interiors of the Generale Bank in Brussels (Belgium) by Rotor (2014–2015) and the reuse of its fragments in new projects, and the Lin'an History Museum in Hangzhou, China by Amateur Architecture Studio (2020). The following research questions steer the investigations:

- What is the origin of the spolia?
- How are the spolia reintegrated into a new building?
- Is the heritage embedded in the spoliated fragment transferred to or appropriated by the new host?

Literature Study

Scope of the literature study

The origin of the Latin term spolia refers to 'spoils of war' and the Roman tradition to display confiscated statues and bronzes taken as war trophies in the victor's city as a symbol of triumph. In the 16th century, the term was adopted to refer to marble fragments taken from older buildings, mostly ruins, and integrated into a new architectural composition.[1] In that period, the interest in spolia architecture increased, and it became a subject in the art historical discourse. However, the interest in spolia at the time was limited to the relation between the fragment and its original context as a material witness of the heritage of antiquity. There was no interest in the aesthetic or iconographic connection between the spolia and its new setting, as the use of spolia was seen as a form of artistic decline due to the lack of available materials or decline of craftsmanship.[9] In 1901, Alois Riegl[10] was one of the first scholars to study in the art and architecture of the Late Antique period as recognizes its genuine aesthetic expression as innovative. However, thorough studies of the practice of spolia from antiquity up to the Renaissance have only emerged since the 1980s, including research of various scopes such as that of the origin and distribution of spolia, the meaning of the spolia in their new settings, and the legal measures that regulate the dismantling, trade, and use of spolia. The literature review presented in this article, however, does not

cover this historical research on pre-modern uses of spolia,[11, 12] but instead focuses on the reuse of architectural fragments in modern buildings.

The field of architectural theory also includes a significant body of theory on the fragment as a motive in architectural design.[13-15] However, as these investigations consider the fragment as a conceptual model, rather than dealing with physical fragments of older buildings in new construction, a review of this body of theory is beyond the scope of this paper. The relocation of an entire building, to an open, air museum or an alternative location in the immediate surrounding of the original location, has been occasionally applied as a conservation strategy when a site had to be cleared for redevelopment.[16] As the architectural composition of the heritage object in such circumstances is not reduced to a fragment but is instead treated as an integer whole, a review of literature on this subject is also beyond the scope of this paper.

The literature study that follows spans sources from different disciplinary backgrounds, including heritage conservation,[17, 24] architectural history,[11, 18-20] architectural theory, [21-23] and interior architecture.[24]

Table 1 presents an overview of the relevant sources, including for each source:

- the "definition" of spolia that the author uses. Some sources do not use the term spolia but discuss relevant insights and are, therefore, included in the overview.
- the "type of reuse," which may vary between (1) the reuse of the fragment in a new architectural ensemble at a location that is different from its origin, (2) the reuse of a fragment in situ, when a new building is constructed at the site where the fragment was found, and (3) the adaptive reuse of an entire building, or a large part of a building (e.g., a façade or ruin).
- the "purpose of reuse" that is considered by the author, which includes (1) ecological, (2) economic, (3) aesthetical, and (4) ideological considerations—

including the transfer of narratives or meanings—along with (5) conservation of an aspect of cultural heritage.

Source	Definition of spolia	Character of the new context			Purpose of reuse				
		new location	in situ	adaptive reuse of a building	ecological	economical	aesthetical	ideological	conservational
Wharton, 2011	*art-historical term for the recycling of architectural fragments*	x					x	x	
Meier, 2011	*[no definition is cited in the text]*	x	x	x		x	x		
Meier, 2021	intentionally and visibly reused building elements; a sector of the broad field of material reuse in architecture that is usually associated with special design and/or meaning intentions	x	x	x	x	x	x	x	x
Brooker & Stone, 2011	*the recycling of existing architectural elements by incorporating them into new buildings*	x	x	x		x	x	x	
Frangipane, 2015	*construction materials and elements that originate from the dismantling of existing buildings, thereby destroying their original contextual value, and transforming them into parts of a new artefact*	x	x	x	x	x	x	x	
Kalakoski & Huuhk, 2018	*the goal-oriented reuse of observably old building parts in architecture*	x			x	x	x	x	x
Huuhka & Vestergaard, 2020	*architectural reuse of components, typically medieval reuse of Greco-Roman marbles*				x				x
Woods, 1990	*[does not use the term spolia]*	x	x				x	x	x
Lowenthal, 1989	*[does not use the term spolia]*								x
Arlotta, 2020	*[does not use the term spolia]*	*x*			x				x

Table 1: Overview of literature study

Reuse of architectural fragments as a design strategy

A first significant contribution is made by Brilliant and Kinney, two leading experts on the historical study of spolia, in the form of an edited volume, *Reuse Value: Spolia and Appropriation in Art and Architecture from Constantine to Sherrie Levine.*[11] The book results from a colloquium on the apparent parallels between the use of spolia in pre-modern art and architecture and the postmodern theories and practices in these fields. Two articles explicitly include a reflection on the use of fragments in contemporary architecture. Wharton[18] discusses the example of the Tribune Tower in Chicago, built in

the 1930s as a modern steel-frame high-rise building with a neo-gothic shell, studded with nearly 150 pieces of other buildings, among which are the Great Pyramid of Giza and the Parthenon, accompanied by more recent buildings such as the Sydney Opera House. Hans-Rudolf Meiers' contribution discusses the topic in a broader sense. He asserts that since the 1980–90s, spolia in the form of reuse of fragments of existing buildings has become a theme once again for practicing architects. Though modern architects themselves often framed such design decisions within an economic or ecological motive, Meier argues that implicit aesthetic reasons are equally important. Building on a postmodern architectural discourse, he proposes that the use of fragments of traditional buildings in modern constructions was a reaction to the generic tropes of modernism. On the one hand, the spolia served as a new form of ornament but without having to develop a new decorative vocabulary. On the other hand, the use of fragments of older buildings aimed to create an architecture that was more firmly rooted in the locality of the place.[19] In a research monograph on the topic (published in German only), Meier further develops this topic, presenting an extensive historical overview of the evolution of the practice of spolia and including numerous contemporary examples.[10] The notion of spolia in his book is interpreted very broadly and is looked at from different angles, including ecology, iconography, aesthetics, etc. Although Meier touches upon various aspects related to heritage conservation, he does not fully develop a picture of the tension between heritage conservation and the reuse of architectural fragments.

Parallel to Meier, Brooker and Stone[25] and Woods[21] have also recognized the reuse of architectural fragments as a valuable design strategy. Brooker and Stone describe three types of implementation of ‘spolia’ in contemporary interior architecture. The first type uses spolia as ‘ready-mades,' meaning interiors composed as a collage of

different objects that are often not used as intended or designed but which instead serve a different purpose in their new context, e.g., road signs used as interior decoration or industrial sinks used to separate rooms. The second type uses spolia to create 'persistent meaning' in the form of old fragments that are integrated into a new entity to create a meaningful link with the past, e.g., the reuse of older materials to make a new building fit within a historical context. The third type, 'continuity and performance,' uses spolia to enhance the narrative of the host building. Woods[19] does not use the term spolia but does reflect on designing new buildings with preserved fragments. He argues that as an increasing number of fragments of the historic fabric is being preserved for the sake of heritage conservation, designing with fragments will become increasingly important in the architectural practice. His conclusion is somehow different from Meier's or Brooker and Stone's as he concludes, based on a series of examples, that it is challenging to preserve the meaning of the fragment while at the same time designing a meaningful new ensemble.

Reuse of architectural fragments as a means of heritage conservation

Several authors have framed the reuse of architectural fragments as a form of sustainable design.[11, 20, 22-24] Huuhka and Vestergaard[22] elaborate on the relationship between the circular economy and heritage conservation. They state that both disciplines are concerned with extending the lifetime of existing buildings and building materials. They believe that the principles of the circular economy hold great potential for innovation in architectural conservation, especially for heritage that is not legally protected as a monument. As they do not give any concrete examples of what types of interventions or methodologies this would entail, this is primarily a theoretical reflection. Elsewhere, Huuhka and Kalakoski[23] assert that spolia in contemporary architecture has great potential to enrich architectural creation and can open new

pathways to heritage conservation. They illustrate their work with examples from Finland in which wooden elements from older buildings are reused. Although their argumentation is based on a solid theoretical underpinning, the examples that illustrate the argument are less convincing. Arlotta[24] starts from the same hypothesis that the reuse of materials can contribute to the historic preservation. She argues that although material reuse, deconstruction of buildings, and the second-hand market do not fit into the existing heritage systems, its practices hold great potential for the development of the discipline. Her writing is largely theoretical but she convincingly draws on Wang Shu's discourse related to his design for the Ningbo History Museum.

On a more conceptual level, David Lowenthal[17] has argued in his paper *Material preservation and its alternatives* that the preservation of fragments rather than material buildings *in toto* offers more flexible and creative possibilities for dealing with history and memory. Where preservation of 'the whole' is static and its observation passive, he argues that fragments join the past more dynamically with the present and require more imaginative observation. Moreover, Lowenthal believes that working with fragments is more open to preserving a different type of cultural heritage, focusing on processes (e.g., craftsmanship of construction) and rituals, rather than on material substance. As a historical frame of reference, Lowenthal does not refer to the ancient practice of spolia but relates his work instead to Chinese traditions for dealing with history and memory.

Precedent Studies

The reuse of the fragments of the Generale Bank in Brussels, a project by Rotor

Origin of the spolia

The headquarters of the Generale Bank in Brussels (currently PNB Paribas Fortis) was

constructed in 1968–1971 by the architect Hugo Van Kuyck (1902–1975). The interiors of the public areas of the bank were designed by renowned interior designers at the time: Jules Wabbes (1919–1974) and Christophe Gevers (1928–2007). Although it was one of the finest examples of late-modernist concrete architecture in the historical center of Brussels, it was not protected as a monument. The decision of the bank to replace the building with a new office tower generated a debate on the value of the building. Although this could not prevent its demolition, on the initiative of Docomomo Belgium, a project was launched to 'save' the valuable interiors by means of decomposition.

The Brussels-based design company Rotor organized the process of decomposition and distribution of the fragments. First, an inventory of the interior elements was conducted, on the basis of which a selection was made of elements that were suitable for reuse. The decomposed elements included furniture, granite tiles, suspended ceiling elements, lighting fixtures, doors, door handles, railings, coat hangers, and signage—many of the pieces were custom designed by Wabbes or Gevers.[7]

Integration of the spolia in a new setting

Because the project was initiated by Docomomo and was presented as a measure to safeguard some of the country's finest and best-preserved interiors of post-war office buildings, a protocol was set up by Rotor and BNP Paribas Fortis to organize the distribution of the fragments.[26] The first two steps of the protocol were aimed at the preservation of fragments as objects to be exhibited. First, the bank selected some pieces of furniture and fragments to be included in an exhibition on the history of the bank.[27] Second, fragments were offered to public museums in Belgium to be included in their collection. Only the Design Museum Ghent acquired a selection of objects but (up

to the time of publication) did not exhibit any of the pieces.[28] The next two steps of the protocol were aimed at the integration of the fragments in new projects. On the one hand, Rotor strived to reuse some of the interiors in their entirety. The Abattoirs de Bomel, a cultural center located in a former slaughterhouse, is furnished by Rotor almost exclusively with furniture of the former restaurant of the Generale Bank by Christophe Gevers.[1] Although a number of individual features are preserved, many elements that defined the atmosphere of the space (original colors, lighting, and mirroring subdivisions between different areas of the restaurant) have not been preserved or replicated. Hence, the new interior composition fails to preserve or recreate the ensemble value of the fashionable 1970s interior by Gevers. On the other hand, fragments were to be reused in public buildings. Several projects have been realized in that respect: for instance, Rotor designed the offices of the social housing association Zonnige Kempen (Westerloo), including several suspended ceiling panels, a decorative tree in white and green laminate marquetry, and granite tiles from the bank. In another example, in the library of Sint-Pieters-Woluwe, Plus Office integrated suspended ceiling panels by Jules Wabbes in the lecture and reading room. As the last step, the remaining materials were bought on the market. Some of those ended up being used in projects by Belgian architects and designers, in do-it-yourself interiors, or as *object trouvé* in private collections.

Heritage value transmitted through the spolia

Several of the projects conducted with fragments of the bank are without a doubt interesting from an ecological and architectural perspective. The value of repurposing

[1] www.rotordb.org, accessed 4 March 2021.

bank fragments as a method of heritage conservation can, however, be questioned. Although the furniture and features that were custom designed by Jules Wabbes, executed with a very high level of craftsmanship, certainly possess value as an object,[29-31] the significance of the bank interiors was found in the exquisite combination of high-quality materials, their rich textures, the colors, and the elegant lighting of the space. The same is true of the interiors by Christophe Gevers, which although not executed with the same luxury of material and craftsmanship as Wabbes', were also fashionable ensembles with distinct atmospheric quality and strongly representative of 1970s Belgian interior design.[32]

Figure 1 (left): Cafeteria before decomposition. Photo by J. Van Hevel. © urban.brussels

Figure 2 (right): Recomposition of the cafeteria by Christoph Gevers in the Abbatoirs de Bommel by Rotor. © Abbatoirs de Bommel


Figure 3 (left): Interior of Jules Wabbes Generale Bank before decomposition. Photo by J. Van Hevel. © urban.brussels

Figures 4 (right): Pharmacie Emilie (2019), Brussels, Nathalie De Leeuw; suspended ceiling (Jules Wabbes).

Lin'an History Museum in Hangzhou (China) by the Amateur Architecture Studio

Origin of the spolia

The Amateur Architecture Studio has worked with reclaimed materials in many of their projects, including the Xiangshan campus at the China Academy of Art (2004 and 2007), the Five Scattered Houses Gallery (2005), the Ningbo Tengtou Pavilion for the Expo 2010 in Shanghai, Ningbo History Museum (2008), and most recently, the Lin'an History Museum in Hangzhou (2020). In all of these projects, the materials (various types of stones, bricks, and ceramic tiles) originate from vernacular constructions in villages in the surroundings of the construction site that were demolished to clear space for modern development work. For the museum in Lin'an, materials came from villages that previously stood within the area in which the museum is located.[33] The materials

were collected from demolition sites on the initiative of the architect.

Integration of the spolia in a new setting

The collected debris was used for the construction of some of the façades of the museum pavilions and is stacked using a vernacular Chinese building technique *wa pan*. This technique of stacking debris of various forms and materials was traditionally used by villagers to reconstruct their buildings after the destruction caused by typhoons. To implement this technique as cladding for a modern concrete building, the architect and craftsmen had to bring their knowledge together; they merged traditional and modern ways of construction to come to this result. Besides *wa pan*, other traditional techniques were used as a source of inspiration, for example, for the wooden roof construction and bamboo features in the building.

Apart from using vernacular building techniques, the building reflects the traditional Chinese landscape in other ways. The typology of the pavilions is a contemporary interpretation of traditional rural buildings. Moreover, the gardens that connect the different parts of the museum show characteristics of the farmlands that were there before the museum was built. Nevertheless, the building is clearly modern in its scale and its construction techniques and materials, including concrete, steel, and glass.

Heritage value transmitted through the spolia

The reused materials in the work of the Amateur Architecture Studio were not carefully dismantled, aiming to pass on the historic value of a particular monument of the past, as was the case for ancient spolia. However, the materials are not entirely anonymous either as they were taken from demolition sites in the immediate surroundings of the museum, and hence, represent a strong connection with the place itself. Moreover, apart

from the preservation of the material substance, the use of the *wa pan* building technique can be read as a form of preserving immaterial heritage value. In a rapidly modernizing society like China, the practice of such vernacular techniques risk getting lost. The continuous practice of *wa pan*, even though in a modernized form, is a means to hand over this craftsmanship to younger generations.


Figures 5 & 6: Lin'an History Museum in Hangzhou © Iwan Baan

Reflection

The literature study presented above shows that scholarly investigations into the reuse of architectural fragments as a strategy for contemporary design are limited. Furthermore, reflections on the opportunities and threats of preserving heritage through the reuse of architectural fragments are even more scarce. However, as material reuse is becoming increasingly important for sustainable design, this discussion is relevant and urgent. Future research on the topic could include, on the one hand, theoretical reflections on the meaning of the fragment in relation to architectural design and the conservation of architectural heritage. On the other hand, there is a need for documentation of good practices regarding the reuse of building materials. Existing inventories of projects (e.g., Opalis.eu) and protocols for the decomposition and distribution of second-hand materials focus on the ecological aspect of sustainable design. However, an evaluation of projects and protocols in light of heritage

conservation could be a tool to gain more insight into the potentiality and pitfalls of conserving architectural heritage through the reuse of fragments.

The influence of a legislative measures on the practice of reuse of materials has not been addressed in most of the reviewed sources. However, in practice the impact of legislations and policies on the implementation of reuse of fragments is denotative. On the one hand, as illustrated by the example of the Generale Bank in Brussels, pressure on owners and developers from local authorities or influential stakeholders (e.g. environmental or heritage organisations) may enforce reuse of materials from demolitions sites. In other circumstances, however, the legal framework in force may prevent reuse salvaged materials or the relocation of fragments of (protected) heritage buildings or sites. A better understanding of the positive and negative impacts of legislations and policies on the reuse of architectural fragments is essential to steer the future implementation of this practice.

The two precedent-setting case studies discussed above illustrate some of the opportunities and threats of reusing fragments as a means of heritage conservation. As Dale Kinney stated about the use of spolia throughout history:

> *"Spoliation entails a forcible transfer of ownership… Spolia are survivors of violence, about which they might be mute (if they bear no visible signs of it) or eloquent. The burden of testimony rests largely with the spoliated object, if it survives to bear witness."*[12]

In both examples discussed in this paper, the reused architectural fragments—or spolia—are in some way witnesses to a 'violent act'. In the case of the Generale Bank, the fragments are a reminder of the demolition of a modern postwar building and its interior, which according to many, could be considered as architectural heritage, and that could still serve its original function or could have quite easily been adapted to

meet contemporary needs. In the case of the Lin'an History Museum, the fragments represent the tangible memory of the rural landscape and its linked vernacular architecture that disappeared as a result of rapid and radical modernization of the Chinese society and landscape.

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