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RESHAPING THE BUILT HERITAGE OF HISTORICAL WINERIES AND WINE CELLARS: NEW PROGRAMS AND TYPES OF INTERVENTIONS

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Wine architecture is closely related to the ever-changing social, economic, environmental, and cultural context regarding winemaking activity. In the Middle Ages, spaces intended for wine production were first built as part of a complex of monasteries and castles and later, due to the improvement of winemaking techniques, as independent wine cellars. By the beginning of the 20th century, the expansion of viticulture and winemaking led to the construction of wine caves, cellars, estates, villages, wine houses and cathedrals, creating a wide range of historical forms of wine architecture. The establishment of larger industrial plants and organized wine production in the first half of the 20th century resulted in the abandonment of many old wine cellars. However, the turn of the 21st century brought about a renewed appreciation for wine landscapes and architecture, leading to increased awareness of the importance of protecting and restoring the built wine heritage. Further, due to the rapid development of integrative design concepts that combine wine production and tourism, the need to expand the spatial capacities of historical wineries and wine cellars arose simultaneously. This paper delves into reshaping the built heritage of historic wineries and wine cellars in the 21st century, analyzing different design principles. The research relies on the theoretical background of protecting built heritage regarding architectural interventions on historical buildings. The paper employs a comparative analysis of selected examples, in order to identify and classify new programs and architectural interventions resulting from the reshaping process.

***Key words*: built heritage, historical wineries, wine cellars, architectural interventions.**

INTRODUCTION

Winemaking is a tradition that dates back to the early beginnings of our civilization. Human knowledge about wine is approximately ten thousand years old, making wine consumption a significant cultural phenomenon (Feher *et al*., 2007). As a result, wine has substantial and far-reaching symbolic significance (Charters, 2006). From the Middle Ages, when wine production areas were part of large complexes, to the later emergence of independent wine cellars marked by advancements in winemaking techniques, wine architecture has undergone significant physical transformations (Liu *et al*., 2020). By the beginning of the 20th century, the first wineries characterized by organized production appeared, signalling a shift in wine architecture from caves and cellars as part of monasteries and villas, through wine castles, villages, and estates, to single one-story urban and sub-urban wine houses.

Numerous social circumstances in the 20th century have significantly impacted the transformation of traditional wine architecture and landscapes (Messina *et al*., 2019). Mass production and industrialization of the winemaking process have resulted in the abandonment of numerous historic wine cellars more suitable for traditional society. Nevertheless, a notable revival in the recognition,

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preservation, and revitalization of built wine heritage has been noticeable in recent years, connected to contemporary wine architecture and landscape acknowledgement by the world heritage framework (Ćirić and Stanojević, 2016). Many historic European wine cellars have been successfully restored to revive the wine tradition and preserve the heritage of viticulture and winemaking. Some are still used for winemaking, while others are adapted for new uses, mainly tourism resorts.

Since the middle of the 20th century, tourism has become a significant underpinning for the evolution of the contemporary concept of wineries (McGregor and Robinson, 2019). Contemporary wineries implement a wide range of public facilities: wine bars, tasting rooms, guest rooms, restaurants, wine museums, and terraces (Harea, 2019). The 21st century in the domain of wine architecture determines the progressive development of integrated architectural concepts that balance wine production as a primary activity and tourism as a new component. This balance has created an objective need to expand and redevelop originally built facilities for wine production. That primarily affects historical forms of wineries and wine cellars, reshaping their form and changing their functional programme.

This paper deals with transforming historical forms of wine architecture to meet the rapidly evolving demands of contemporary society. The research analyzes different design principles in reshaping historical wineries and wine cellars initially built in Europe from the Middle Ages to the beginning of the 20th century, summarizing the best known historical forms of wine architecture. The research aims to determine the new programs and types of architectural interventions and to find a correlation between these aspects of transformation and the typology of the original wine architecture form.

RESEARCH METHODOLOGY

The research methodology consists of the following steps:

- Step 1 – Theoretical framework – defining levels of architectural interventions on historic buildings;
- Step 2 – Conceptual framework – defining the typology of historical forms of wineries and wine cellars developed by the beginning of the 20th century;
- Step 3 – Selecting examples of transformed historical wineries and wine cellars for deeper analysis;
- Step 4 – Comparative analysis of selected examples; and
- Step 5 – Determining reshaping models in the 21st century.

In Step 1, Theoretical background, the authors use empirical and analytic scientific methods to collect theoretical insights related to architectural interventions on built heritage, summarize them, and examine the levels of new interventions on historical buildings. Using the historical, empirical and analytic scientific methods in Step 2, the authors provide an overview of the main characteristics of specific historical forms of wine architecture developed by the beginning of the 20th century (Step 3). Step 4 of the research relies on a comparative analysis of selected examples of historical wineries and wine cellars that have gone through the process of reshaping in the 21st century, as a response to contemporary changes in winery design. Examples for comparative analysis were selected given the following conditions:

- they are located in Europe, the continent that is considered the founder of wine culture;
- the historical forms were developed between the Middle Ages and the beginning of the 20th century;
- they are recognized as an essential wine-built heritage;
- in the transformation process, they kept wine production as a contemporary purpose; and
- in spatial extension, a physical connection exists between the historical and new volumes.

The source materials for comparative analysis included data on historical development and transformation processes from published studies, project documentation, available photo documentation, and orthophoto maps. To determine the reshaping models, 24 selected historical wineries and wine cellars transformed in the 21st century were compared from the perspective of previous vs. new functions and the character of the interventions. In Step 5, by comparative, qualitative, and quantitative analysis and then synthesis, the reshaping models were defined, and conclusions reached.

THEORETICAL BACKGROUND – ARCHITECTURAL INTERVENTIONS ON BUILT HERITAGE

In 1964, the necessity of preserving valuable architectural heritage was recognized when ICOMOS (International Council on Monuments and Sites) adopted the Venice Charter, defining the "concept of a historical monument" that "encompasses not only specific architectural works but also urban and rural environments as an evidence of a particular civilization, significant development, or historical event" (ICOMOS, 1964). Policies and strategies for protecting and preserving architectural heritage have developed through four waves: 1. preservation, 2. conservation, 3. revitalization, and 4. heritage management (Carmona *et al*., 2010). Over time, just as the scale of objects requiring preservation gradually changed (from individual buildings to cultural landscapes), the spectrum of objects subject to protection has also changed.

Bloszies (2012) pointed out that preserving old buildings is not solely based on rational thinking, such as significant architectural qualities, but also on emotional dogma, such as personal connection, or fear that new structures would be inferior to existing ones. This combination of rational and emotional factors underscores the complexity and depth of the issue. Koolhaas and Otero-Pailos (2014) further advocated that preservation, the idea of protecting heritage, is not an enemy of modernity but is one of its inventions. Lynch (1972) highlighted the necessity for the adaptability of existing structures and spaces, noting that the urban environment, which cannot be changed, is actually "called upon to its destruction". In 2005, UNESCO suggested the principle in the Vienna Memorandum that in interventions in the historical environment, "all forms of pseudo-historical architectural expression should be avoided because it equally denies both history and contemporary times" (UNESCO, 2005). These diverse perspectives, while unintentional, have given rise to

one of the main challenges facing historic urban areas today – aggressive and "iconic" architectural interventions.

Still, heritage protection paradigms suggest that the level of intervention must be limited. In adapting and using old structures or facilities in response to new requirements, it is essential to determine the necessary and acceptable scope of interventions. Several researchers have dealt with this aspect of transformation in architecture, exploring the relationship between existing and new structures. As can be seen from comparing the divisions of different authors (Jevremović, 2022), the first task with regard to considering the results of interventions is to determine their level and place, so in this sense, it is possible to recognize the following cases (Figure 1):

- *I preservation with internal adaptation* – modification of only the internal organization with temporary or permanent interventions – insertions, according to Bollack (2013), adaptations according to Bloszies (2012) or subjections, according to Šijaković and Perić (2014) – while preserving the existing structure of the facade sheath as the carrier of values and meanings;
- *II preservation with new small-sized interventions* – interventions that involve adding a specific structure, but of a smaller scale, proportionally much more minor and dimensionally uncompetitive compared to the existing one. Bollack (2013) calls this form "parasitic" precisely to emphasize the dependent relationship of new elements to existing structures; for Bloszies (2012), these are small interventions; Stratton (2005) calls the form conservation with details;
- *III Juxtapositions of old and new* – major interventions that involve changes in volumes, additions that seriously compete with the existing structure in scope; often terminologically defined as juxtaposition (Bollack, 2013; Stratton, 2005) or symbiosis (Šijaković and Perić, 2014), the current and new structure are in "dialogue", to create a new balance, a new composition; and
- *IV Imposition of new volumes and forms* – a substantial transformation of the building, which primarily involves deleting or diminishing the existing object's previous identity and character. The authors use wrappers, imposition, and subversion to explain the development of this situation.

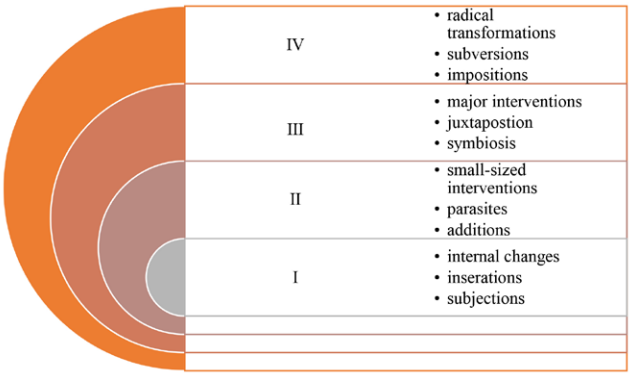


Figure 1. The scheme of mutual relationship at different levels of intervention
(Source: Jevremović, 2022)

HISTORICAL FORMS OF WINE ARCHITECTURE DEVELOPED BY THE 20TH CENTURY

Archaeological data unveil the first documented attempt to preserve wine, a cellar in Tel Kabra, the capital of a Middle Bronze Age Canaanite kingdom, unearthed in Israel in 2013. This cellar, dating back to 1700 BC, contained at least 40 vessels for storing wine, a testament to the sophistication of ancient wine culture (Pelgrift, 2015). In ancient times, especially in Egypt and Greece, wine was essential to religious ceremonies. In ancient Rome, wine villas were built, and residential living spaces were created within vineyard estates, with cellars designed for making and storing wine (*cella vinaria*) (Figure 2) (Woschek *et al.*, 2012). The wine was stored in amphorae buried under the ground to maintain a stable temperature (Dodd *et al.*, 2023). These rooms were primarily on the ground floor, while the first fully buried Roman cellars were *catacombs*. Wine was stored in the rooms next to the kitchen among the less wealthy Romans. The design and positioning of these cellars took into account the challenge of overheating the interior and ensuring dark and cool conditions (Vitruvius, 1914).

In the Middle Ages, wine was a part of everyday life and an alternative drink to water, whose contamination problem was pronounced (Estreicher, 2006). Wine architecture appears as buried wine cellars, with a simple, functional organization, part of a complex of monasteries, hospitals, castles, and palaces (Antešević, 2010). Medieval castles had their vineyards and areas for wine production located in the basement, and the walls of these rooms were built of solid stone (Howland, 2014). The cellars of monasteries and castles had complex underground arch support constructions, which contributed to the stability of the buildings and adequate microclimatic conditions for wine storage. Because of this, wine cellars were called *caves*. Due to the expansion of the winemaking and wine trade, some European cities developed underground networks of wine cellars. Many of these so-called *wine tunnels* were spread over several underground levels.

Figure 2. Roman wine villa: Villa of the Quintili
(Source: Dodd et al., 2023)

The wine industry and its architecture underwent significant transformations from the 15th to the beginning of the 19th century. Geographical discoveries led to the expansion of viticulture on the grounds of the New World and promoted the global wine trade. The invention of glass bottles led to the spatial

and functional separation of the phases for the fermentation, storage, and bottling of wine (Tattersall *et al*., 2015).

Wine cellar villages, developed throughout Europe from the 13th to the 19th century, were built as temporary settlements for wine-growing families. The most preserved villages comprise groups of single-story wine cellars dug in to maintain a stable temperature for wine maturation, creating the wine landscapes recognized in cultural tourist routes (Figure 3). Most were built of stone, partially or entirely buried, and sometimes covered with greenery. The orientation and spatial organization of buildings in the context of the bioclimatic approach were essential factors (Alfirević, 2011). Some of these settlements were groups of two-storey buildings, where the basement – the lower floor – was used for wine production, and the upper floor was used for housing the family (Pantelić, 1960).

Figure 3. Wine village Hercegkút
(Source: https://www.amusingplanet.com/2020/11/the-wine-cellars-of-hercegkut.html)

This period was defined by the construction of wine estates. In France, wine estates appeared in the form of so-called *chateaux*-wine castles, Renaissance palaces or manor houses with large vineyard estates, which included residential villas, production facilities, and gardens (Figure 4) (Phillips, 2018). These complexes had impressive wine storage areas, with barrels becoming an aesthetically important part of the architecture. Since the beginning of the 19th century, especially in Bordeaux and the Loire Valley, the name *chateaux* has been retained for any wine estate, while in Burgundy, they were called *domaine* (Woschek *et al*., 2012). In Portugal, rural wine estates have been known as *quinta* since the 16th century (Rosado *et al*., 2020). They have one main production facility – the winery, housing facilities, and other supporting contents. Wine estates were built traditionally with pitched roofs, terracotta tiles, and white walls. Due to the development of wine tourism, some wine estates have been transformed into hotels and cultural centres.

Along with the emergence of the Industrial Revolution, the construction of individual wineries and wine cellars for significant quantities of wine began. The first forms were *winemakers' houses*, where wine production was on the underground floor while living quarters were on the upper floor (Rosado *et al*., 2020). Many wine cellars were connected to taverns, allowing people to socialize while tasting wine. In the same period, consumer tastes were changing, which

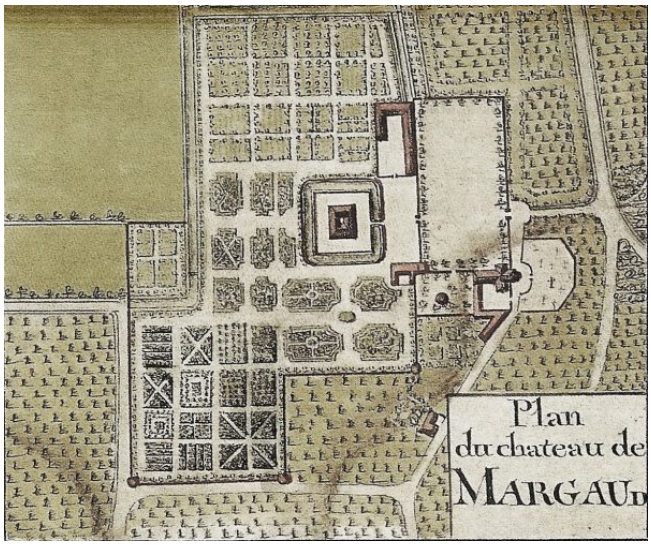


Figure 4. Urban plan of wine chateau Margaux in France from the 16th century
(Source: https://www.chateau-margaux.com/en/le-domaine/histoire)

led to changes in production methods (Messina *et al*., 2019). So-called *wine houses* were cellars specialized in producing sherry, port, sparkling, and champagne wine. At the beginning of the 19th century, they were rustically built using earth tones and natural materials – stone and wood. In the second half of the 19th century, wine houses characterized various styles, including Gothic, Baroque, Rococo, Neoclassicism and Art Deco, with much facade ornamentation (Woschek *et al*., 2012). The vinification process and ageing were often in two different facilities. Vinification occurred in a rural or peri-urban facility near a vineyard, while wine storage was in urban areas (Yraveda Soriano, 2006).

Wine cellars were usually basilica-type with a prismatic volume, a gabled roof, longitudinally placed naves and a modular skeletal structural system (Figure 5) (Rosado *et al*., 2020). They comprised connected modular pavilions, enabling phased construction of the anticipated production capacities while omitting the inner courtyard (Aladro-Prieto *et al*., 2022). Facilities intended for production built outside settlements, such as *cloister wineries*, included passages organized around the inner courtyard (Yraveda Soriano, 2006). In Andalusia, especially in the Jerez region, above-ground one-story buildings specializing in producing

Figure 5. Sherry bodega Osborne in Spain
(Source: https://www.sherrynotes.com/2023/bodegas/bodega-visit-tour/visiting-osborne/)

and storing sherry wine were built as two-bay to eight-bay warehouses (Aladro-Prieto, 2012). *Port wine houses* were designed along the banks of the Duoro River, which combined the production and storage process (Quintela *et al*., 2023).

Basilica-type wineries have been built since the end of the 19th century with an exceptionally high ceiling (double the height of the ground floor), giving them grandeur, a double-sloping roof, and several longitudinal aisles divided by arches and thin pillars (Yraveda Soriano, 2006). The high ceiling contributed to maintaining low temperatures for wine ageing, and the strategically chosen locations allowed protection from excessive exposure to the sun and wind. The term *cathedral of wine* was officially adopted in the first decades of the 20th century when new wineries in Catalonia arose parallel with the development of the modernism movement, and as a symbol of the renewal of wine-growing cooperatives after the damage caused by phylloxera (Cuerva *et al*., 2019). Basilica-type wineries have an authentic architectural expression and monumentality, with an ample interior made up of a multi-nave space with arches and vaults, resembling the morphology of religious cathedrals (Figure 6) (Azanza Lopez, 2018). Such facilities characterized the Art Nova style, imbued with the ideology present in this area using paraboloid arches, primarily built in brick (Llorens Duran, 2013). It is possible to observe the division of the internal production space into the stages of the production process and the creation of two-story cellars, which enables the gravitational fall of the grapes.

Figure 6. Wine cathedral El Pinell de Brai, Spain (Source: https://katalonien-tourismus.de/katalonien-bietet/kultur-und-erbe/el-pinell-de-brai-eine-kathedrale-fuer-den-wein-der-terra-alta)

Table 1 provides an overview of the general characteristics of different wine architecture forms developed before the beginning of the 20th century.

Table 1. The overview of characteristics of historical forms of wine architecture developed by the beginning of the 20th century

Historical form	Cella vinaria	Wine cave/cellar	Wine cellars village	Wine estate	Wine house	Wine cathedral
Epoch	ancient period	Middle Age	13th - 19th	15th - 19th	18th - 19th	19th - 20th
Location type	urban, suburban	suburban	rural	suburban, rural	urban, suburban	urban, suburban
Position of wine cellar	ground floor or basement of the villa	basement of castles & monasteries or individual tunnel	basement of a winemaker house or individual building	basement of a palace or individual production building	basement of a winemaker's house or the whole facility	the whole facility
Purpose of wine cellar	production & storage	production & storage	production & storage	production & storage	production or storage	production & storage
No. of floors of wine cellar	single floor	single floor	1-2 floors	1-2 floors	1-2 floors	double height, single floor
Other functions	residential	residential, religious	residential or none	residential, recreation	residential or none	none
Layout form of wine cellar	compact, rectangular or square	elongated, rectangular	compact, rectangular or square	compact, rectangular	multi-nave longitudinal, rectangular	multi-nave longitudinal, rectangular
Construction	masonry	masonry	masonry	masonry	skeletal, frame	skeletal, frame
Recognizable features	buried amphorae and arched ceiling	tunnel with an arched ceiling	multiplay semiunderground cellar units	vineyard area and main palace or manor house	multiplay connected gabled roof naves	monumental cathedral multi-nave expression
Architectural style	Classical	Gothic, Romanesque	traditional local folk architecture	Renaissance, Baroque, Neo-classicism	Gothic, Art Deco, Rococo, Baroque	Art Nova, Modernism
Facade openings character	stone, marble	no facade openings	rectangular, with arched or decorative upper parts	uniform rhythm, rec-tangular or with an arched upper part	uniform rhythm, rec-tangular or with an arched upper part	uniform rhythm, with decorative parts
Interior and facade material	interior colourful ornaments	stone	stone, wood	stone, wood, brick	stone, wood, brick	brick
Facade colour and ornaments	no openings or with an arched upper part	none	none or white and blue walls	white facade colour and ornaments	none or white walls with ornaments	white walls, colourful ornaments

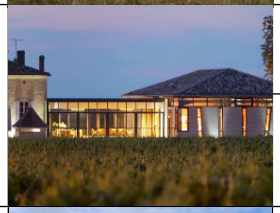
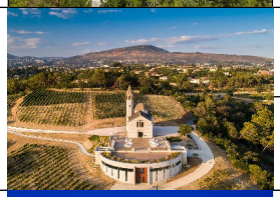
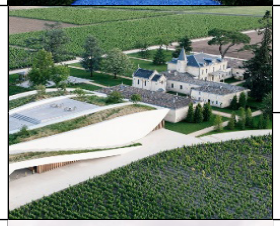
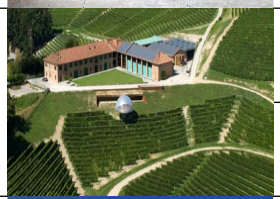
RESHAPING HISTORICAL WINERIES AND WINE CELLARS

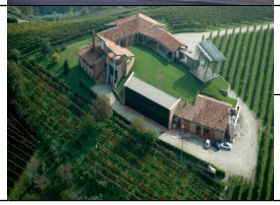
Comparative analysis of selected examples

As most ancient wine architecture is preserved as archaeological sites, untouched by the transformations of the 21st century, this period is not included in the comparative analysis. Also, the comparative analysis does not include wine cathedrals, as these buildings remain the same today. Table 2 compares the 24 selected historical forms of wineries and wine cellars. In addition to the primary data concerning the location, the original construction, and the transformation year, the table also contains data about the former and contemporary purposes. In terms of the interventions they have undergone, the analysis includes the parameters of form, materials, facade details and the impact the intervention had on the original identity. Finally, the comparative table recognizes the theoretically set levels of architectural interventions. The wineries are listed chronologically according to the original historical form's construction year.

Table 2. List of selected historical wineries and wine cellars transformed in the 21st century – comparative analysis

The building's name and location (with photo)		Year	Purpose	Type of interventions		LEVEL
		built-up	original	form	material	
		reshaped	current	identity	facade	
Klos. Eberbach, Germany		1130s	**wine cellar** within a monastery	preserved, restored	preserved, restored	I
		1986 -today; in stages	wine resort (monastery, hotel, restaurant, wine cellar)	preserved, restored	preserved, restored	
Castello di Ama, Italy		13th century	**wine cellar** within a medieval castle	preserved, restored	preserved, restored	I
		2000s	wine resort (winery, restaurant, hotel)	preserved, restored	preserved, restored	
Kobyl, Czech Republic		13th century	**wine cellars village**	preserved, restored	preserved, restored	I
		2015	cellars with wine tasting	preserved, restored	preserved, restored	
Castello Banfi, Italy		1430s	**wine cellar** within a medieval castle	preserved, restored	preserved, restored	I
		2000s	wine resort (winery, hotel, museum)	preserved, restored	preserved, restored	
Baron de Ley, Spain		1540s	**wine cellar** within a monastery	preserved, restored	preserved, restored	I
		2018	winery with wine tasting	preserved, restored	preserved, restored	
Dominio del Pidio, Spain		16th century	**wine cellar village**	preserved, restored	preserved, restored	I
		2018	cellars with wine tasting	preserved, restored	preserved, restored	
Mukhrani, Georgia		16th century	**wine estate** with palace	preserved, new hidden volume	preserved; green roof, glass wall	II
		2016	new winery, visitor centre, tasting room	preserved & new detail	preserved; glass vertical division	

Dominique, France		16th century	**wine estate**	additional coloured volume	preserved; stainless steel slats, glass wall	IV
		2010-2014	new winery with a visitor centre and restaurant	accent on a new part	glass vertical division closed long walls	
Villemaurine, France		17th century	**wine estate** with palace	one-side expansion, three volumes	added concrete panels, glass walls	III
		2005	extended winery with tasting room	contrast achieved	preserved, glass vertical division	
Chateau de la Chaize, France		1670s	**wine estate** with palace	preserved, hidden new	preserved; use of glass and green roof	II
		2017 -2022	new winery, visitor centre, tasting room	preserved & new detail	preserved; glass vertical division	
Chateau de Bellet, France		1770s	**wine estate** with chapel	additional curved volume	added concrete panels, glass areas	III
		2015	winery; tasting room, store, terrace	contrast achieved	rhythmical vertical openings	
Pedesclaux, France		1810s	**wine estate** with palace	symmetrical expansions	added glass envelope	III
		2009-2014	extended winery, visitor centre, tasting	accent on heritage	preserved; divided glass	
Chateau Cheval Blanc, France		1830s	**wine estate** with palace	additional curved volume	preserved; added concrete, wood, green roof, glass bond	IV
		2006- 2011	new winery, visitor centre, tasting room	accent on a new part	no details, long wall strokes	
Marques de Riscal, Spain		1850s	**wine house**	added volume	preserved; added steel, titanium panels, stone	III
		2005	winery with hotel and visitor centre, restaurant	contrast achieved	curved areas pattern	
Monsordo winery, Italy		1850s	**wine estate**	preserved, restored	preserved; added glass bubble	II
		2009	winery with viewpoint	preserved & new detail	preserved with distanced bubble detail	
Tondonia, Spain		1870s	**wine house**	new "decanter" volume	preserved; timber, glass, metal panels	III
		2001-2006	winery with wine pavilion	contrast achieved	preserved with curved detail	
Kurtatsch, Italy		1890s	**wine house**	inserted expansion	green roof, stone wavy wall	III
		2017 - 2020	winery with a shop and tasting room	contrast achieved	wavy carved wall strokes	

Cantina Tramin, Italy		1898	**wine estate**	symmetrical expansions	preserved; added glass and metal envelope	IV
		2010	new winery with a visitor centre, tasting	accent on a new part	coloured mesh	
Dellas Freres, France		19th century	**wine estate** with a manor house	additional wavy volume	preserved; added a stone wall, glass bond	IV
		2019	new winery; guest house with rooms	accent on a new part	no details, long wall stroke	
Galoupet, France		19th century	**wine estate**	one-side expansion	preserved; added stone, steel, glass	II
		2014 -2016	extended winery, shop, visitor centre	contrast achieved	preserved with a new canopy	
Clemens Strobl, Austria		19th century	**wine estate** with a manor house	one-side expansion	preserved; added glass bond, concrete walls	III
		2019	winery with wine tasting	contrast achieved	copy of the rhythm of openings	
Ingelheim, Germany		1900s	**wine house**	added small roof volume	added glass, metal panels	II
		2019	wine shop, visitor centre, restaurant	preserved & new detail	preserved with vertical division of roof blocks	
Sasbach, Germany		1930s	**wine house**	one-side expansion	preserved; perforated metal plate	III
		2012-2013	winery with a tasting room	contrast achieved	facade "print" pattern	
Bricco Roche Winery, Italy		20th century	**wine estate**	preserved, restored	preserved; added glass cube	II
		2001	winery with a tasting room	preserved & new detail	preserved with inserted higher cube	

Results and discussion: new programs vs. architectural interventions

The comparative analysis reveals the most common ways of adaptive reuse of historical wineries and wine cellars in the 21st century. This transformation, which has seen the retention of wine production in all of the examples, is a direct response to the needs of modern society. These needs, particularly the increasing interest in wine tourism and the need to expand the wine production capacity, have led to the introduction of new public content. As a result, all the facilities under analysis are now open to visitors.

Medieval complexes have most often been converted into wine resorts. In addition to preserved wine cellars, mandatory facilities include accommodation – hotel rooms, a wine shop, a wine tasting room and a restaurant. This transformational approach resulted from the complexes being under the highest degree of protection (permitted architectural interventions are limited). In terms of spatial capacity, the initially built wine cellars do not offer the possibility of implementing a technologically improved wine production process. Similarly, wine cellar villages have preserved their original purpose, while opening their doors for wine tasting.

Wine estates, which evolved from the 15th to the 19th century, have played a pivotal role in increasing wine production capacity. That has often led to extending existing wine cellars or constructing new facilities dedicated to wine production. The original buildings frequently become visitor centres, with reception areas, restaurants, and accommodation. This transformation is commonly observed in wine estates with palaces and manor houses. In contrast, rural wine estates typically undergo small-scale interventions to implement visitor content, such as viewpoints, wine tasting rooms, and wine shops. Further, the wine houses are often extended, with the original building remaining dedicated to production and the new part serving as public space.

Regarding reshaping, the research relies on a theoretical framework that recognizes four levels of architectural interventions that determine the degree of prevalence and where they occur in architectural heritage buildings. Comparative analysis shows that the highest degree of preservation of the original structure and identity (I level), where interventions are limited to the interior, is present in medieval wine cellars and wine cellar villages under the highest protection. Other levels of intervention are represented in historic wineries and wine cellars, regardless of the original period of construction. Practice shows that the most prevalent form of remodelling is the juxtaposition of old and new (III level), achieved by emphasizing the contrast of the historical form, materials, and modern interventions. The architectural interventions have a direct correlation with spatial capacity expansion. Table 3 provides an overview of the correlation between historical forms of wine architecture and the parameters of reshaping in the 21st century – spatial capacity change, level of architectural interventions and type of contents.

Table 3. The correlation of historical forms of wine architecture and parameters of reshaping (• the least frequent, • • • the most often)

	Historical form	Wine cellar in complex	Wine cellars village	Wine estate	Wine house
Spatial capacity	no expansion	●●●	●●●	-	-
	small-scale expansion	-	-	●●	●
	medium-scale expansion	-	-	●●●	●●●
	large-scale expansion	-	-	●●	-
Level of interventions	preservation with internal adaptation	●●●	●●●	-	-
	preservation with new small-sized interventions	-	-	●●	●
	juxtapositions of old and new	-	-	●●●	●●●
	imposition of new volumes and forms	-	-	●●	-
Contents	historical wine cellar	●●●	●●●	●	●●●
	new wine cellar	-	-	●●●	●
	wine tasting	●●●	●●●	●●●	●●●
	visitor centre with a wine shop	-	-	●●●	●●
	restaurant	●●	-	●	●●
	accommodation	●●●	-	●	●
	viewpoint	-	-	●	-

The results indicate the following possible models of reshaping historic wineries and wine cellars, based primarily on the cause that led to the transformation and then both in terms of new programs and architectural interventions:

- ***The showpiece model –*** This is characteristic of wineries and wine cellars with the highest degree of protection, where tourism is highly prominent today. The need to promote and affirm built heritage in the wine industry has led to transformation. Depending on the new purpose, there are two different models – *Model 1.1* when cellars are part of larger complexes (monasteries, castles), whereby these historical forms usually become wine resorts (examples: *Kloster Eberbach, Castello Banfi*, and *Castello di Ama*), and *Model 1.2* describing wine cellar villages that have retained their original purpose or have been abandoned, but remain witnesses of the development of winemaking and viticulture (examples: *Dominio del Pidio* and *Kobyli wine cellar village*). In both cases, the original form, materials and facade articulation are completely preserved, with interventions limited only to the interior.
- ***The complementary model –*** This is characteristic of historical wineries and wine cellars, where the primary volume was extended due to the need to introduce tourist content. The most significant number of transformed wineries and wine cellars belong to this reshaping model. Depending on the nature of the interventions, we distinguish – *Model 2.1* when the extension occurs "in detail" (II level) due to the introduction of one individual unit (*Bricco Roche winery* and *Monsordo winery*), and *Model 2.2* when the extensions are more pronounced in the spatial capacity they provide, and the contrast between the old and the new stands out in terms of form (III level; *Marques de Riscal, Villemaurine, Pedesclaux, Tondonia, Kurtatsch, Clemens Strobl,* and *Sasbach)*. In both cases, the expansion is usually carried out by introducing tasting rooms, visitor centres, restaurants and hotels.
- ***The rivalry model*** – This is characteristic of historic wineries and wine cellars where the need arose to expand production capacity by constructing a new industrial plant. Regarding the transformation of the form, we distinguish two approaches – *Model 3.1*, in which the form of the new winery stands out radically and imposes itself on the original structure (IV level – examples: *Dellas Freres, La Dominique* and *Chateau Cheval Blanc*) and *Model 3.2* whereby the volume of the new winery is hidden by digging into the ground, so that the historical and architectural values of the original building remain in the foreground (II level – examples: *Chateau de la Chaize* and *Chateau Mukhrani*). In both cases, the original facility has become a visitor centre with a restaurant, accommodation and tasting room.

CONCLUSIONS

This paper has examined the reshaping patterns of wineries and wine cellars' historical forms. A comparative analysis of selected European examples yielded results that indicated the most common models of transformation in the characteristic forms of wine architecture developed by the beginning of the 20th century. The results, supported by a historical review of the development of wine architecture and theories dealing with architectural interventions on built heritage, led to the following conclusions:

- The transformation of historical wineries and wine cellars in the 21st century stemmed from the need to promote built heritage (for the oldest wine architecture forms), expand wine production capacity (for estates and cellars with a long tradition of winemaking), and the need to implement content intended for visitors, as a consequence of the trend of wine tourism;
- Regarding new content, restaurants, tasting rooms, wine shops, viewpoints, and accommodation are the most common. The research has included only facilities that have continued to produce wine. Thus, future research can focus on historical wineries and cellars that have lost their original function through transformation;
- The research shows that all types of transformations of historical wineries and wine cellars can be classified under three reshaping scenarios:
  a) the showpiece model – preservation of the original structure while maintaining the original purpose, with partial or complete adaptation to a new purpose;
  b) the complementary model – the extension of the original structure with the addition of new public contents, accompanied by a contrast between the historical and the contemporary, of different scope and intensity;
  c) the rivalry model – the construction of a completely new structure, which is physically connected to the original one, and which competes with it to a greater or lesser extent in terms of spatial proportions, aesthetics and other architectural values; and
- The most frequent reshaping in the transformation process comes down to the contrast of old and new, whereby modern architectural interventions, which are mainly neutral (simple forms, with glass as the primary material), highlight the historical facility and its importance. In the adaptive reuse process, historical buildings are usually adapted into content intended for visitors to become open to the public and contribute to the creation of appropriate storytelling about the culture of wine and the development of winemaking.

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