Surfaces of 20th century facades: reflections on their archaeological awareness

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Abstract

The archaeological approach to the study of elevations is applied here to 20th-century architecture. In particular, post-World War II facades are examined through several case studies. This research uses the method of the archaeology of architecture: the meticulous attention to materials, workmanship, and technological devices, the examination of the socio-economic context, and the analysis of the motivations behind specific choices. These elements contribute to discovering the history of an artefact in a given period of time as completely as possible. The archaeology of architecture has been widely experimented on historical buildings since the 1970s; very rare has been the application to the study of contemporary buildings. The authors, on the basis of the research already started in 2018, at this stage of the study seek to further develop the topic under investigation, also with comparisons on a broader national and international scale. The architectural surfaces of the second half of the 20th century are analyzed here by studying individual components on the facades: the colour and texture of the plaster, any tile, wood, or stone coverings, or the exposed concrete work. The final aim is to develop an overall method of investigation that considers the specificity of the period examined and the possible adaptation of analysis tools that can help in the archaeological study of these contemporary architectures.

Keywords: Daneri, Bottoni, 20th century, facades, Archaeological Knowledge

1. Introduction

In the second half of the 20th century, the surfaces of architecture changed considerably, transforming cities and landscapes. It was a change in geometries and relationships between solids and voids, between windowed parts and masonry, with new textures, materials and surface processing. This change is a key point in architectures that have one of their emblems in the simplification of forms. The presence or absence of a material, polished or opaque, smooth or rough, one shade of colour or another, can even radically change the appearance of the facade and the relationship between its parts. Within a broader analysis of 20th-century architecture, it is important to consider these aspects as well as ask what reasons lie behind specific choices and what the technical implications are. We have therefore chosen to tackle one of the possible themes: that of 20th-century facades, starting from the analysis of some of the most commonly used materials and using mainly the tools of the archaeology of architecture. Several are the reasons for this choice: 1) in contemporary architecture, surfaces are not negligible elements; they strongly characterize facades, and they are important to be studied; 2) surfaces are elements at risk in evolution: degradation, restoration interventions, plaster, painting, stone cladding removal, we recommend in-depth studies for their conservation; 3) we wanted to deepen particularities of a targeted archaeological reading.

2. The Method

In this research, therefore, an attempt was made to determine whether there is a possibility/need for an archaeology of contemporary architecture and, if so, what its possible benefits, limitations, and difficulties are. Some questions addressed in this first phase of the research are: is there a mindset evolution in 20th-century architecture? Is this architecture made to last a certain period of time, or on the contrary, is it seen as timeless? What changes can be detected in its facades? The present study is part of a broader research on contemporary archaeology: in particular, reference is made here to the research projects of the University of Genoa, PRA2019-22, on the knowledge and conservation of existing contemporary structures [1,2]. The research, which is described in this article, started from an examination of the literature of the sector, going on to select some of the most representative and iconic facades of the second half of the 20th century in Italy: the final target is to understand the choices made in their realization and any discrepancies with respect to the initial projects, if available and consultable. In the second phase, the aim is to better understand the “minor” buildings of this period,

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which often lack any form of written documentation and for which, therefore, the archaeology of architecture may become the only possible tool. The selected examples take into account the various elements specific to the archaeology of architecture: great importance is attached to material data, examination of details, understanding of the execution and any different time phases, and cross-referencing of different documentary sources. The first results of this research are discussed here, focusing on the coated surfaces: 1) simply painted, 2) plastered, 3) with special coatings and with different materials (stone, ceramic, wood, etc.). The cases with materials more akin to the previous historical period were deliberately chosen: for example, in the claddings, attention was focused on those in stone, wood and ceramics, leaving out, for the time being, claddings with more innovative materials for the period in question, such as aluminium and glass. This decision is motivated by the possibility of making more comparisons between different time periods, particularly between the contemporary and the historical eras. These can be particularly useful to fine-tune possible corrections in the tools already used in architectural archaeology by adapting them to contemporary architecture. After this phase, these same tools can be applied to more innovative materials, incorporating further corrections as necessary. At this stage, acting "step by step" with gradual and progressive steps was deemed necessary. So far, in the field of contemporary architecture, in fact, we only have sporadic research applying some tools of architectural archaeology but no articulated and complete study. Window surfaces are excluded from this part of the research; these elements will be dealt with in a specific study section [3].

3. Results

Let's look at the architectonical phases of the second half of the 20th century. We can identify some particular elements in. the situation in Liguria (emblematic of a broader, national and supranational situation): 1) The years 1945-59: old-new relationship still rich in stimuli, interventions as compensation for the wounds of the war (museums by Albini, Labò, INA- Casa Daneri). 2)1960s-70s: economic boom and great urban expansion (public housing, ex lege167, e.g., Bernabò Brea district), major school and health building projects. 3)The 1980s-2000s: implementation of large architectural, urban and territorial projects and redevelopment of the existing city (Colombian-1992, G8-2001, Capital of Culture-2004) [4]. Therefore, this research on facades has tried to keep these different phases of major changes in mind. We wanted to start by identifying some aspects of the architecture of this period through the analysis of some of its greatest exponents (Scarpa, Bottoni, Ponti, Daneri, among others).

3.1. Coated surfaces: the colour

One of the most interesting outcomes of recent research work and stratigraphic analyses carried out on 20th-century buildings has been the discovery that these architectures were coloured much more than might have been expected; even when white was used, it is hardly ever absolute white [5]. New materials were used, but there was also a long persistence of traditional paintwork that was never completely supplanted. We tried to understand the reasons for this: what was actually available on the market when the industry began to impose modern materials? What characteristics did these new products have, and how were they used? Who were the most famous architects and designers who used the new products, and who was still tied to tradition? Colour, especially after World War II, was used in architecture to focus attention on detail or to correct specific spatial effects [6, 7]. In Italy, through the voice and pen of architects such as Gio Ponti, figurative currents demand to get rid of the "fake antique" and the "ugly modern", and colour contributes to this result [8, and specifically Chiara Toscani, «*Tutto al mondo deve essere coloratissimo*», p. 97-105]. Ponti started experimentation on the relationship between colour, architectural space, light, innovative materials and different finishes (e.g., ceramics, majolica, Gabbianelli or D'Agostino tiles, Joo ceramics used for wall surfaces of numerous buildings since the 1950s). This constant compositional research conducted through colour, therefore, is closely linked to a crucial issue for architecture and for Ponti's own biography, namely the identification of a new modern language, which was defined both through a new typological and spatial structure of buildings and vital experimentation of materials (such as cement, iron, linoleum) and the colours applied to them [8]. Another great exponent of contemporary architecture who made skilful and calibrated use of colour in his architecture is C.M. Daneri. The walls of the loggias in the buildings of the Bernabò Brea district (1950-53) are treated by customizing individual flats with different colours: breaking up the repetitiveness of the facades, everyone can recognize their own home from the outside [9]. They move from the use of colour to convey an idea of the home to use it to direct attention to detail or to distinguish the individual user. All this, however, is not only present in Italy: Le Corbusier's buildings are among the most important testimonies of modern architecture. This is also largely due to his masterful use of light and colour. Observations on the restorations of Maison Blanche and Villa La Roche [10] have served to document and highlight Le Corbusier's principles of colour application. Very interesting are his 'harmonious colour charts' of 1931 and 1959 and the *'claviers de coleurs'* (colour keyboards): tools to identify the most suitable colour combinations to understand his different colour preferences from early works up to the masterpieces of the 1950s and the inspirations he drew from the colours of Renaissance frescoes as well as from the avant-garde paintings of De Stijl [8].

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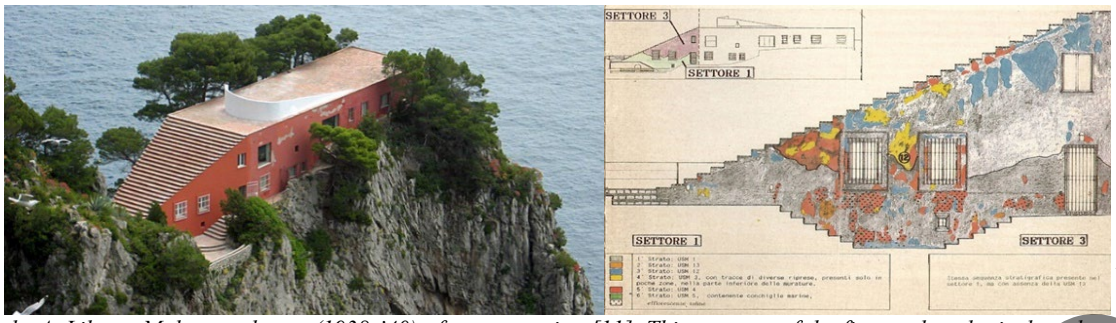
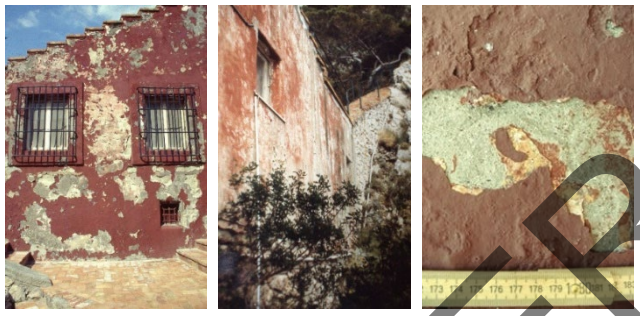


Fig. 01 a,b: A. Libera, Malaparte house (1938-'40) after restoration [11]. This was one of the first archaeological analyses carried out on contemporary buildings [12] (source: Pertot archive)



Figg. 02a,b,c: A. Libera, Malaparte house, details. The state of degradation of the paintwork and the complex layering can be seen (source: Pertot archive).

Until the end of World War II, traditional paints based on water, lime or different types of animal glue or oil-based (mainly linseed oil) were still widely used: only a few types of paint for many different purposes. The weaknesses were: the long time needed to complete the work, the technical difficulties and the necessity of skilled labour. All the studies carried out by the industries in the second half of the 20th century were increasingly aimed at developing painting systems that could be applied in any outdoor conditions, drying quickly and not necessarily requiring special expertise. The industry produced increasingly specialized products that varied according to the type of substrate, finish and exposure conditions: the role of the craftsmen changed, and the way of working on the building site changed, too. «*The young painter, in addition to being called upon to execute a certain ornamentation that entails a good knowledge of drawing and colour, will often find himself in the need to use a wide variety of materials, to execute certain paints on surfaces made up of materials that once did not exist, to have to do a job in a limited time that does not allow for the usual systems and materials... today painting is a technique whereas once it was an art...*» [13]. The concept of painting also changes, painting is not just given by one or more layers of colour, but it is part of a more complex "package". Whoever is in charge of choosing a paint must consider, much more than in the past, not only the final effect but the properties that the different layers must have and the performance they must respond to [14]. The spread of new polymers, starting in the 1960s, completely changed the approach to painting. During the 20th century, there were also several changes in taste, even limited to exterior paintwork: what in the 1970s was considered a quality (e.g., full and intense colours, compact surfaces) thirty years later would have been perceived rather as a flaw. These changes will also influence the design and realization of the overall facade structure.

3.2 Coated surfaces: The Plaster

Another very important factor in the final appearance of a facade is the plaster: sometimes, it can have a processed surface (smooth, grainy, striped) or a material composition specifically designed for particular effects. Terranova plaster is one of the most widespread in the 20th century. Research on Milanese facades built between 1932 and 1992 [14] showed that in the original product, the binder consisted exclusively of powdered hydrated lime, while waxes, oils and glycerin were added during the quenching phase, with a water-repellent and fluidifying function. A unique feature was the addition of mica flakes, which made the surfaces reflective, a distinguishing and original feature of this finish. By starting with the 1936 samples, the grain size values decreased slightly, and there was a change in the choice of aggregate: from quartz-silicate with mica to silicate aggregate (from 1988) to carbonate aggregate in more recent cases. Another type of plaster used in this period was the FULGET, produced in Italy. It consisted of selected marble grit ranging in size from 3 to 5 mm and white or grey cement; in some cases, suitable dyes were added to the mixture. There are also types of coloured paste plasters that imitate natural building materials (usually various types of stone and marble), some made with asbestos fibres; others with celite, marble dust, sawdust, cotton or glass fibres to achieve a rougher, fresco-like surface. Sometimes, after execution, sand and compressed air would be sprayed on the surface to make it rough; in other cases, again, to imitate

the opacity of a fresco, a white pyroxylin [DUCO] primer would be applied with a solvent. During the 20th century, for all the different types of plaster, there was a progressive change of binder: from lime to cement.

3.2.1. "Marmorino" and "stucco lucido", special plasters

However, there are also plasters with a more traditional composition alongside the newly formulated plasters. Some contemporary architects deliberately choose these plasters of 'old workmanship' for their facades, for example, great masters such as Scarpa and Daneri, who often required *marmorino* and *stucco* polished works for their facades. For example, the plastering of Villa Zentner in Zurich (1966) was prepared with a cement mortar rendering, hydraulic lime and cement curling and a smooth finish with the addition of marble powder, while "special Venetian stucco" was used on the large columns, entrance panels and ceilings [15]. The Venetian stucco is a complex process: the mixture of water, plaster, animal glue, linseed oil and pigments is spread several times on the wall. The surface is sanded between each coat to make it finer and finer, and the frequent passes of the spatula give the brilliance of the final result. A craftsman takes about 4 hours to complete one square metre of polished plaster, and often, even in a large company, few workers could produce it. An annotation regarding the laying of the plaster on a building site (Banca Popolare di Verona, 1973) shows Scarpa's almost maniacal interest in these materials [16]. This attention to materials is not only found in elite buildings for particular clients but can be said to be more related to the architect's way of working than to the client or the type of use for which the building was intended. Indeed, Daneri used the same *marmorino* polished with hot irons in the Bernabò Brea district, even though it was an economical building project, as he had used in the elegant Piazza Rossetti district (1934-58) in the same years; the only difference was the final washing and the size of the aggregate [9]. The buildings in the district are arranged along the north-south axis and are characterized by facades covered with polished stucco to the south and slate slabs to the north.

Product	Product Specifications	Product Variety	Application modes	Characteristics, composition and performance
BETONIT	Protective colouring material	Bentonit enamel Bentonit opaque	Applies directly to cement or lime.	Bentonite is a natural clay derived from the alteration of glassy effusive rocks. The material is composed of a mineral with a particular lamellar crystalline structure that is non-toxic and chemically inert, but it is with the presence of water that bentonite transforms, becoming an impermeable and water-repellent gel.
CEMENTITE	Product for finishing and preparation layer	Cementite produced by the company Tassoni of Bolzaneto (Genoa, Italy). Similar products: Chronmalite Titanite.	Dries and petrifies even on wet surfaces.	Matt, white, petrifying, washable, waterproof, elastic enamel. Product obtained by the reaction of a carbonate and a somewhat acid resin, with the addition of titanium compound, zinc white, white lead.
DUCO	Finishing product	Product originating in the United States from DuPont, later also manufactured in Italy.	Applied without any preparation except washing the surface with petrol to remove all traces of oil, grease or wax.	Special nitrocellulose varnish. Dries quickly, adheres well to the surface to which it is applied, and does not streak or crack. It can also be washed with hot water.
SILEX	Protective product	German product	It is applied without any preparation of the surface on which it is applied.	Liquid for hardening and waterproofing stone, particularly limestone and stoneware. It is also used to prevent the formation of dust on concrete floors.
SILEXORE	Finishing product	Originally produced in France, it was then also manufactured in Italy by Stabilimenti L. Van Malderen SA in Milan.	It is applied directly to the plaster without preparation. It is suitable for protecting plaster, terracotta, crumbling stone and all materials subject to weathering. It may also be applied to wood.	Petrifying paint based on silicates (potassium silicate), unalterable, washable, acid-proof Wood treated with silexore, becomes non-combustible. It was used with poor results by Sironi, Carrà, Campigli, De Chirico, Severini, Funi, and Cagli (perhaps spread too thickly).
STALFIT	Finishing product	Product in regular use in Italy.	It is applied directly to the plaster without any special care; it is prepared in four gradations and with a wide variety of colours.	Wall enamel, resistant, petrifying, washable.
FIXOMNA	Finishing product	Produced by the Italian company Fixomnia of Milan.	It is applied directly to the plaster without any special preparation layers.	It is applied directly to the plaster without any special preparation layers.
DECORAL	Finishing product	Produced by Decoral group (1974 Arcore, Veneto)	It is applied to metals and PVC. Specific pre-treatments must be provided for powder coating.	Resin paints, paint treatments for metal elements, polyurethane powder products and sublimated films. The Decoral process originates from 'Aluminium Decoration'. It is an industrial process for decorating aluminium and other non-deformable materials at 200 °C. The process uses a technology based on the physical process of sublimation.
STIBIUM	Finishing product	Produced by "Società anonima industriale per la fabbricazione di pitture, vernici e colori di Genova".	It is applied directly to the plaster without any special preparation layers.	

ALPHA RUBBOL CETOL	Product for finishing and preparation layer	Produced by Synthèse in 1947, today AKZO NobelResins.	It is applied directly to the plaster without any special preparation layers.	Interior wall paints, enamels, impregnating agents and varnishes. In particular, since 1928, we have cellulose-based enamels.

Tab.01: Selection of some of the new-generation products made between the wars and also used in more recent times. (Excerpted and adapted from [8]. All products are created for interior and exterior applications with the exception of Bentonit opaque, designed for exterior surfaces and Alpha, suitable for interior wall paints)

3.3. Covered surfaces: stone and ceramic tile coverings

In the interwar years, the surface finishes changed considerably. There is a strong interest in new materials and a great curiosity towards industry experiments. Some stone and ceramic tile claddings are analyzed in detail below, as these are the most widespread types, especially in urban areas. This, however, does not exclude the fact that claddings in other materials also had a considerable impulse: the industry, for example, produces surfaces that imitate different types of metal (steel, tin, copper or bronze) or have polished, glazed effects.

3.3.1 Stone Coatings

A study conducted in the Milan area on 80 residential buildings with particular technical or compositional qualities, made by the best-known designers in the second half of the 20th century [17], highlighted a fairly common situation, at least in the Italian context: the increasing use of materials other than local ones for the facades and the frequent recourse to specific treatments and processes. Even those architects who had previously distinguished themselves through a refined use of stone often opted for other materials such as plaster, exposed reinforced concrete, prefabricated elements, glass, metal, ceramic material of various shapes and sizes, etc. During the period under consideration, stone was used exclusively for cladding purposes. More than 50 different lithotypes were identified, only a small part of which had already been used in historical Milanese architecture. In some periods, there is a prevalence of light-colour lithotype (the 1950s), but this preference was partly abandoned in the 1960s (with the exception of travertine and *botticino*, which continue to be used). Depending on the lithotype used and the laying system, slabs of various thicknesses and sizes are used. Some traditionally used materials are adopted in unusual ways; e.g. the Beola is used in polished slabs for cladding entire facades; in the architectural tradition, this material was used, instead, in natural split slabs for cladding only the base of buildings. In the early post-war period, the processes were generally the traditional ones (e.g. marble polished with 'paste' so as not to have too polished surfaces), and new ones were later introduced, such as flaming (a process using a blowtorch at 600 °C that makes the surface of the slab irregular and rough). In addition, some materials, such as porphyry, which have always been used with a split surface, have been applied with a sawed or polished surface. In certain cases, there are examples of ribbed surfaces (series of parallel grooves), surfaces worked with a tool (point), oriented in a direction that does not coincide with the sides of the slab, or split surfaces for generally worked lithotypes (travertine type). Since we are dealing with cladding slabs, various installation techniques have been experimented with to resolve the degradation phenomena linked to the different thermal expansion coefficients between the stone material and the reinforced concrete structure of the building or between the material and the "padding" mortar. The methods gradually changed: the more traditional one was with only padding mortar; subsequently, the slabs were secured by metal clamps (copper, brass, double-galvanized iron) with a load-bearing function and by a padding mortar inserted between the slab and the wall structure; the joints (2-3 mm thick) between the slabs were sealed with elastically deformable material. The shapes of the clamps used vary widely, as do the grooves in the slabs and the cutting of the edges at the joints. In recent years, the thin slabs are embedded in a metal lattice structure fixed to the masonry for so-called ventilated facades, and their edges are free of sealed joints.

Geographical region	*Lithotype name*	*Type of rock*	*Characteristics*	*Origin*
Stones of traditional use				
Lombardia	*Botticino*	*Dolomite limestone*	*Creamy yellow colour with reddish-black veins, presence of fossil residues*	*Botticino, Nuvolera (BS)*
	Ceppo dell'Adda	*Conglomerate -sandstone*	*Brownish with multicoloured clasts*	*Brembate (BG) Trezzo d'Adda (MI)*
	Ghiandone ValMasino	*Granodiorite*	*Grey background, large white spots*	*Val Masino (SO)*
	Serizzo Val Masino	*Diorite*	*Dark grey background, small white spots*	*Val Masino (SO)*
	Marmo di Zandobbio	*Dolomite*	*Light background, rosy hues*	*Zandobbio, Trescore B. (BG)*
Piemonte	*Beola*	*Tabular gneiss*	*Greyish-white background with streaks*	*Beura Cardezza,Villadossola VB*
	Granito bianco di Montorfano	*Granite*	*Greyish-white background, small black spots*	*Montorfano (VB)*
	Granito rosa di Baveno	*Granite*	*Predominantly pink with small black spots*	*Monte Mottarone, Bevano (VB)*
	Marmo di Boden	*Calcescisto*	*Greyish background*	*Boden (VB)*
	Marmo di Candoglia e di Ornavasso	*Calcitic marble*	*Pink, white, grey background, dark veins*	*Candoglia, Ornavasso (VB)*

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	Marmo di Crevola	*Dolomite marble*	*White background, brownish veins*	*Crevoladossola (VB)*
Toscana	*Marmo bianco di Carrara*	*Calcitic marble*	*Plain white background, small stains and veins*	*Alpi Apuane*
Stones used since the post-war period				
Lombardia	*Conglomerato Val Camonica*	*Conglomerate*	*Dark red with varicoloured spots*	*Darfo (BS)*
Veneto	*Perlino bianco*	*Limestone*	*Thin white background veins*	*Asiago (VI)*
	Pietra di Vicenza	*Calcarenite*	*Yellowish-white background*	*Monti Berici (VI)*
	Trachite	*Trachite*	*Grey background with light spots, brown variegations*	*Zovon, Montenegrotto Colli Euganei (PD)*
Puglia	*Pietra di Trani*	*Compact limestone*	*Yellow-brown background with spots and veins*	*Trani (BA)*
Repubblica Sudafricana	*African red (?)*	*Granite*	*Almost uniform red*	
Stones used since 1960				
Sardegna	*Granito bianco sardo*	*Granite*	*White with small black spots*	*Sassari*
Toscana	*Lavagrigia*	*Ignimbrite*	*Grey or greenish-grey background with black or white spots*	*Manciano (GR)*
	Lavarossa	*Ignimbrite*	*Reddish or brown background with small multicoloured spots*	*Manciano (GR)*
Stones used since 1970s				
Toscana	*Bardiglio apuano*	*Calcitic marble*	*Light blue-grey background, up to dark grey with grey and white veins and shades*	*Alpi Apuane*
Friuli Venezia Giulia	*Pietra piasentina*	*Sandstone limestone*	*Uniform hazel-grey with brown hues*	*Cividale del Friuli, Torreano (UD)*
Stones used since 1980s				
Toscana	*Giallo di Siena*	*Calcitic marble*	*Uniform yellow background with delicate lighter shades*	*Montagnola senese (SI)*
	Santafiore	*Sandstone*	*Hazelnut, brown variegated*	*Manciano (GR)*
Sardegna	*Granito grigio perla*	*Granite*	*Greyish white with a brownish tendency*	*Buddusò (SS)*
Lazio	*Peperino*	*Ignimbrite*	*Greenish grey, elongated black spots*	*M. Cimini, Vitorchiano (VT)*
Marche	*Travertino ascolano*	*Travertine*	*Light yellowish-brown*	*Acquasanta Terme (AP)*
Finlandia	*Baltic Brown*	*Orbicular granite*	*Reddish circular spots on dark background, good uniformity*	*Ylamaa*
	Kuru grey	*Granite*	*Dark grey with black spots*	*Kuro*
Norvegia	*Merald pearl*	*Syenite*	*Bluish background, iridiscences*	*Larvik*
Egitto	*Granito rosso di Assuan*	*Granite*	*Red spots on black background*	*Assuan*
Brasile	*Juparanà*	*Migmatite*	*Yellowish with dark variegations*	*Minas Gerais*
India	*Juparanà*	*Migmatite*	*Yellowish with dark variegations*	
India	*Verde Guatemala*	*Oficalce*	*Dark green background, white veins of varying thickness and pattern*	*India*
Zimbadwe	*Nero assoluto Zimbadwe*	*Gabbro*	*Black background with small grey areas*	*Mikoto*
Spagna	*Rosa porriño*	*Granito*	*Pink and white with black dots*	*Porriño, Mos. Pontevedra*
Francia	*Rosso Franica*	*Calcitic marble*	*Dark red background with broad white areas and veins*	*Linguadoca (Caunes)*

Tab.02: Comparison between the lithotypes traditionally used in Milan area facades and the newly imported lithotypes used after World War II (taken from [17])

Lithotype	*Kind*	*Surface processing*
Granite	*Granito di Baveno, graniti sardi, Kuru Grey*	*Sawn surface, surface machined with tools such as hammer and bush hammer, heat-treated surface. Sanded surface, polished surface*
Rocks similar to granites	*Sienite della Balma, emeral pearl*	
Gneiss	*Beola*	*Split surface. Sawn surface, Polished surface*
Marbles	*Marmi apuani*	*Surface machined with tool (drill or chisel) Polished surface*
Compact limestones	*Pietra di Trani*	
Travertines		*Tooled surfaces, Sanded surfaces, Polished surfaces (usually for the interior if for the exterior with grouted cavities)*
Soft limestones	*Pietra di Finale, Arenarie tipo Santaflora, Tufi tipo Lavarossa e Peperino*	*Sawn surface* *Surface machined with a tool*
Conglomerates	*Diversi tipi di Ceppo*	*Sawn surface* *Surface machined with a tool (bushhammer)*

Tab.03: Main workings identified in specific lithotypes in Milanese facades in the post-World War II period (source: [17]).

***3.3.2 Ceramic cladding: a dialogue between Piero Bottoni and Carlo Scarpa*:** In the second half of the 20th century, there were many cases of facades covered with glazed tiles, especially in large cities. It was a trend that partly emerged long ago but was further developed and enriched in this period.

Piero Bottoni's experience in Milan: Bottoni masterfully combines chromatic research with skilful use of mosaic art. His facades are designed to reflect light and colours with great attention to context (urban, natural and cultural context), express the symbolic value of the functions and reinvent tradition. After World War II, there are eight episodes in which Bottoni intervenes with colour and enamelled and painted surfaces (Qt8, Corso Genova 4). «*Here, too, a restless calm animates the building: on the one hand, the confirmation of the spatiality of the street with the choice not to break through the building curtain; on the other hand, the shiny, coloured overhangs of the balconies covered with tiles to light up the facade in a neo-plastic sense, but always discreetly, in this case using cold tones, as the context requires: white for the front parapet and the slab; indigo for the side parapets*». One of the four projects for QT8, the *'Casa Giardino'* (1950-51), was not realized. In the three examples realized - the terraced houses with shops in Via Agrigento (1950-53), the Small Pavilion for exhibitions (1951) and the Incis house in Via Bertinoro (1953-58), the chromatic research is linked to mosaic art. Cream-coloured and grey ceramic tiles cover the exterior of the Small Pavilion, creating an abstract decoration (now removed). In other cases, the colours of the rainbow combine functionality, economy and expressive festivity. With the Town Hall in Sesto San Giovanni (1961-71), mosaic art and chromatic research reached the highest point: hundreds of ceramic tiles covered the volume of the town hall with shades ranging from black to red to yellow to give importance and weight. Alongside this, the high volume of the offices is covered with terracotta panels in horizontal bands from brown to light pink to give a fading effect.

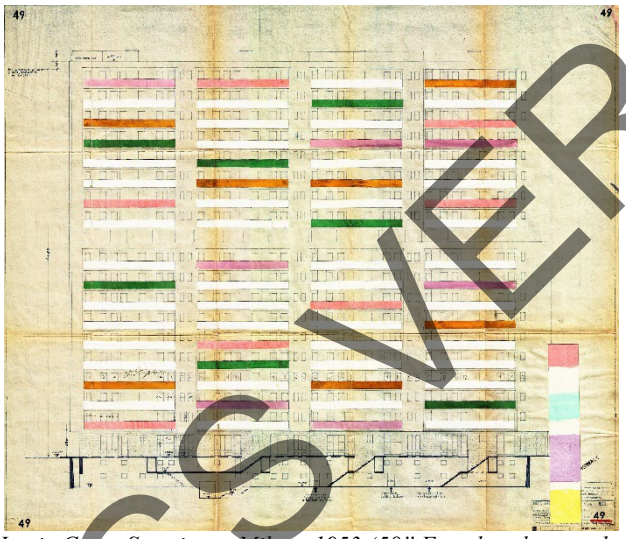

Fig.03: P. Bottoni, "Palazzo Ina in Corso Sempione , Milano 1953-'58".Façade colour study. (source: Archivio Piero Bottoni, DASTU, Politecnico di Milano])

These elements clearly refer to his forty years of experience pursued "*on the mass-volume value of colour and its expressive value*" [8], as Bottoni himself declared. Indeed, this facade decoration succeeds in expressing the representative values of architecture and, at the same time, in redeeming both the context's poverty of meaning and rational architecture from accusations of expressive aridity. This building "transforms a soulless place of greyish whiteness, creating a city: it infuses the shapeless industrial and working-class agglomeration with urban dignity. «*This explains why, in the realm of the Breda and Falck blast furnaces, pursuing the idea of a civil acropolis representative of the values of the working-class community, forged in the Resistance and which became the ruling class with the fall of Fascism, Bottoni assigned to the building-emblem of direct democracy (the "presidential body") the appearance of a glowing steel ingot resting on pilotis. This also explains the choice of a muted colour scheme for the office tower. The fading effect, which limits its brutalist taste, also reduces its importance with weight, as is appropriate for a service architecture*» [8]. But there is another reason: the more subdued hue is not intended to contrast the colours of the sky because the sky is a "matrix" of this building. From inside, the office tower has its facades punctuated by long horizontal bands of 'shed' windows, allowing those who work inside to catch a glimpse of the sky. A vivid polychromy covers the ground attachment of the tower; instead, it is an allusive mosaic of the shape of a tree. The image of the tree is in ideal continuity with the numerous ones that crown the complex (wanted by Bottoni). Here, there is another characteristic feature of Bottoni: his ability to reinvent tradition. The lower volume (the presidential building), in fact, evokes the *broletto* of the municipal civilization, while the office building recalls the medieval defence tower, and with the colour Bottoni exalts and makes unequivocal the presence of the most important building in the city, [...] just as the municipal buildings were once identified in historic cities for environmental prominence. Another building considered a post-World War II masterpiece is the INA building in Corso Sempione in Milan (1953-58). The NE-SE facades of the building were initially intended to be polychrome like the rest of the building (the balconies covered with 20x20 plain tiles in white, yellow, pink, light green, and purplish-red colours), but this solution was discarded, and they were simply covered with white painted plaster. The reason is not only a reference to Mies Van der Rohe, whom Bottoni admired no less than Gropius and Le Corbusier; it is also a chance to listen to and dialogue with the context. In this case, the two facades become "the mirror that absorbs and reflects, without taking away the scene". The INA building, in fact, absorbs and reflects the colours of the two most important buildings

on Corso Sempione: Terragni's Casa Rustici with its pinks, one of the most significant examples of Italian rationalism, and the Castello Sforzesco with its reds and the greens of the park, the symbol of Milan's history and identity. Bottoni, however, does not renounce colour, and inside the *'rue intérieure'* on the ground floor has a colourful side all covered in blue and pink tiles [8: 161-179].

Carlo Scarpa's experience: «*The mosaics to be laid outside were finally ordered from the Donà company of Murano in April 1968: 1900 silver-coloured tesserae in white gold material. The glassworks was famous for the luminosity of its materials, given by the gold background with which the coloured elements were also finished, and for the internal chamfering along the edges that allowed the tesserae to be perfectly matched without the joint being visible from outside*» [15]. The tesserae in question are those that Scarpa inserted on the external surfaces of Villa Zentner, a double band along the tower (the projecting volume of the staircase) and around the entire cement perimeter of the house: 7.7 cm tesserae on each side, covered in metal foil and green glass paste with 15 mm joints in cement. Describing this solution, which had already been proposed at the Fondazione Querini Stampalia (1961-63) and which would be used in the Brion tomb (1969-'78), Scarpa himself explained that "the mosaic serves to lighten and render a vibration with some chromatic notes". This decorative detail serves to show that the Zentner house is indeed "modernly antique and anciently modern", Viennese and, at the same time, a Venetian memory. The care of this element in the external decoration of the villa is not limited to the choice of the type of tile, but, as in many other cases, Scarpa governs the whole process up to the installation. "In the composition of decorative details, Scarpa, in fact, establishes an order that he adjusts and adapts with slight variations. Scarpa succeeds in introducing an effect of mobility by skilfully handling precious materials and natural light, transforming this experience into a brief, luxurious moment. As already observed by Francesco Dal Co for Villa Ottolenghi, the words of L. Kahn, with whom Scarpa has a relationship of profound affinity, seem to resonate for Zentner house: «*A wall is built in the hope that, at a given moment, light will give it an almost unrepeatable moment*»" [15].

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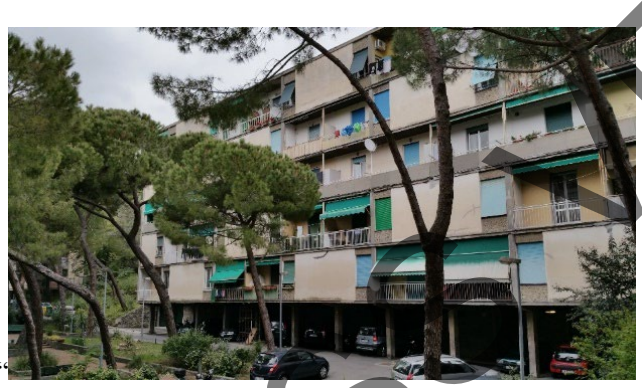
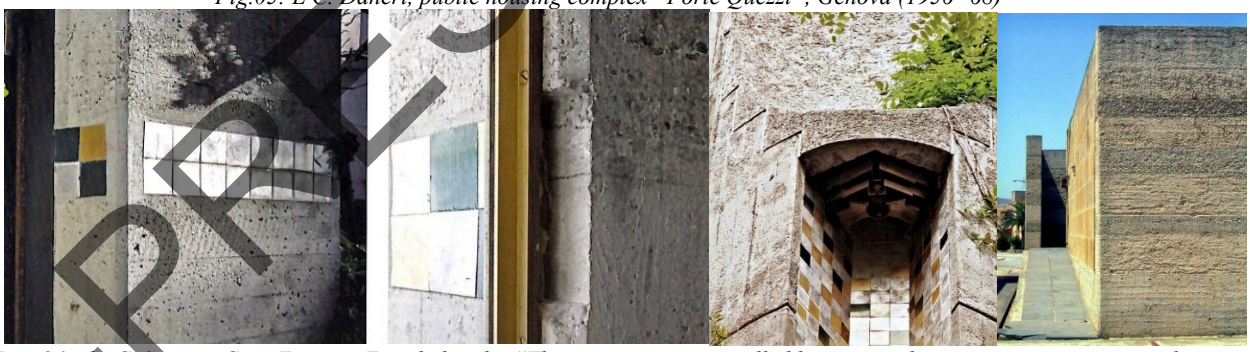


Fig.04: L.C. Daneri, Residential building in via Bernabò Brea, Genova (1950-53)
Fig.05: L.C. Daneri, public housing complex "Forte Quezzi", Genova (1956-'68)



Figg.06 a,b: C. Scarpa, Casa Zentner, Zurich details: "The composition controlled by rigorously geometric processes needs at a certain point an interference, a balance that no predefined order can give" and this creates a sense of disconcertment in the observer who is not inclined to consider such a balanced result as random, source [16].
Fig.07: C. Scarpa, Casa Zentner, detail, "Gold shines even in the darkness, even in absolute darkness, if nothing beats a pinch of light", source [16].
Fig.08: F. Venezia. Gibellina Nuova 2003 (source: Angelo Del Vecchio archive).

3.4 What consequences for the archaeology of architecture applied to contemporary surfaces?

Some initial conclusions can be drawn in this first phase of the research.

The architectural archaeological analysis identifies and studies homogeneous areas of the building (SU, stratigraphic units) and their respective relationships to identify construction phases and history and support restoration interventions [18]. This investigation path involves the understanding of the building, its history, and the social dynamics that revolve around it [19].

In the cases examined, like Casa Malaparte and, somehow, Villa Zander, many decisions were taken directly on the construction yard, with very few traces in written archive documents. A meticulous architecture reading was performed,

extracting data directly from artefacts, and it allowed us to overcome document limitations and achieve the reconstruction of building history.

In the part of the research described in this paper, we focused only on one aspect: wall surfaces. We arrived at the following conclusions for modern architectures:1) external surfaces are commensurate with the internal ones, more than in traditional architecture (see Bottoni but not only); architecture archaeology should take this into account, examine and compare both internal and external surfaces; 2) the surface and the treatment of colour and material in many cases is related to other elements of the facade, such as windows, railings, etc. also, in this case, the stratigraphic analysis must highlight these elements; 3) in the second half of 20th-century fashion changes more rapidly than before. This situation provides good chrono-typological indicators, both materials and technical solutions; 4) the supply basin for materials in this period is far wider than before (for example, stones on the facade); this adds complexity to chronotipology, which has to take into account a more extended territory and a large number of products; 5) some help comes from the Internet, as there is more information on the web on this period, it is more likely that text-based researches on the web bring documental information.

4. Conclusions

The work of the archaeologist consists mainly of distinguishing, identifying, and separating; he/she can decipher clues and recognize and understand signs of different cultures [20]. For some time now, there has been an increasing interest in the use of archaeology in the contemporary age [21]. The study of contemporary materiality is very important and strategic because it makes it possible to link history with the meaningful memory of the community, thus reinforcing the profound meaning of "cultural heritage" [22]. These issues are increasingly important in the preservation and enhancement of heritage, whatever it may be, tangible or intangible, and from whatever era it may be [2]. An archaeological reading of contemporary facades will be able to answer the questions raised by these first analyses. However, some difficulties still need to be addressed in order to use this tool profitably: 1) the extreme complexity inherent in 20th and 21st-century architecture will have to be better and better understood, 2) even the small differences in industrial productions will have to be grasped to a greater extent, 3) a skilful use of the oral source will have to be made, and 4) strategies will have to be prepared to govern the fascination of images [1]. One of the problems that emerged in the analysis of contemporary architecture is the relationship of materials to the action of time and the inevitable consequences of the changes this entails. In many cases, 20th-century architecture does not address this issue positively; in most buildings, the image they carry forward is one of an "eternal present", making their appearance even more disconcerting 20-30 years after their construction. Some exponents of this period, however, with a very refined knowledge of materials, such as Scarpa and Venezia, mastered these aspects in an egregious manner: in the wooden cladding of Villa Palazzetto in Monselice by Scarpa [23] and in the washed concrete of Gibellina by Venezia [24] the passage of time is taken into account. At the same time, since the design phase, action has been taken to ensure that this transformation constitutes a further positive element of enjoyment of the work. These aspects have a considerable influence on the aesthetic level, and even more, they create the need for an archaeological reading of contemporary architecture. It becomes important, for example, to understand whether a certain type of material was intentionally placed there by the designer, at the limit even imposing a sort of "artificial ageing", as in the case of the diluted types of cement by Venezia, or whether, instead, we are in the presence of different construction phases. This becomes even more important when dealing with lesser-known architectures or with less available documentation. What has been summarised in this article may give an insight into the potential of the archaeology of architecture as applied to contemporary architecture. The archaeology of architecture can help reconstruct the complex relationship between the intentions, wills, and dispositions of the designer and actual realization during construction. Possessing the basic information on the technical culture of a given period, knowing what was feasible within a given geographical and temporal context, and understanding the most frequent problems that had to be solved on the building site are fundamental steps in order to set up any preservation project based on an understanding of the material values of a work E.Benvenuto once said that «*There is another concept of history... man includes as his own dimension the history that belongs to him (1991). Hence, the first and fundamental step of a conscious reflection on the fate of the 'modern' implies a renewed questioning of what history is for us in a world radically changed in its horizons of meaning and in view of a destiny that cannot be sought or constructed except by clarifying our relations with the more recent past, after having long studied and debated the more ancient one. The latter is now distant and, as history and historical reflection teach us, its study appears somewhat reassured, even if its subject matter is still dense with sometimes nefarious consequences for the present. On the other hand, the former is immanent in our daily lives and ignoring it or suffering it carelessly is risky because we build or destroy it every day by drawing the future through an elusive present. Therefore, we cannot ignore that this dimension of transient and risky temporariness can, paradoxically, lead to definitive losses no less painful than those that, every day, we inflict on the 'heritage' of more ancient formation*» [25]. The stratigraphy of the cladding helps to understand the building microhistories and the status, values and messages of the builders and users. Consequently, it allows us to understand and conserve both tangible and intangible heritage [18].

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