Face of the Façade: Stucco Renderings in Interwar Cracow Architecture

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Abstract. The Modernist architecture of the mid-war era speaks to us through the simple form, colour and texture of buildings’ façades rather than through rich decoration. In this purity, each element had a specific meaning. Smooth walls of cuboids articulated with horizontal fenestration, occasionally enriched with a modest cornice introduced a sense of harmony, peace and organization into the city skyline, no matter whether it was a streamlined building, or a residence in a garden. For these reasons, one of the most important features of Modernist architecture was the manner in which architectural surfaces were finished and as a result of their relative simplicity, stucco renderings gathered great popularity at the time. In the mid-war period, Cracow experienced exceptional growth: the area of the city expanded from 6 km² to almost 47 km² by the beginning of WWII, with most of this development occurring during the Modernist era. It constitutes a valuable architectural resource which should be preserved and restored for its exceptional functional and architectural values. This paper will discuss one of the many issues which have not been widely recognized so far: stucco renderings, which were widely introduced in the discussed period and which constitute an important aspect of the character of Modernist architecture as a such. The text will cover a short discussion of the characteristics of this heritage resource, along with the associated techniques and technology of Modernist stucco, together with difficulties encountered during renovation work.

1. Introduction

This paper discusses stucco renderings covering the façades of Modernist buildings from the interwar period (the exterior stucco). Few periods in architectural history have recently attracted as much attention – research into interwar Modernism has produced a vast corpus of publications, as numerous scholars have set out to investigate the radical leap from Historicism to Modernism and its consequences – the paradigm shift in expectations of urban planning, construction and civil engineering, or various works by outstanding architects [1]. A number of associations and organisations have made it their goal to examine the architecture of this period. The most distinguished of these is DOCOMOMO, which defines its mission as the promotion of Modernist works and identification of exceptional objects of universal value, and actively campaigns to obtain special protection status for them [2]. In fact, the pool of interwar buildings that enjoy legal protection is already relatively large, and certain architectural complexes (such as the White City in Tel Aviv), have even made it onto the UNESCO World Heritage List. There are publications that thoroughly discuss the protection of Modernist gems, with ample illustrations drawn from real life renovation projects [3]. Nonetheless, certain technical or technological construction-related problems are less well known, and much less popular. Meanwhile, the excellent quality of materials, high
functionality and elegance of Modernist fittings, and most of all, the impressive durability of terrazzo floors or window frames – to mention just a few elements – make us pause in awe and scratch our heads, asking, how did they do it? Interwar Modernism is, de facto, the last period in the history of architecture and construction when the bulk of the tasks still involved hand-work, requiring the engagement of highly-skilled craftsmen. One could say that those were the final days of traditional craftsmanship in building construction.

Plasterwork and rendering in Modernism rarely makes it into academic papers, despite the availability of source materials from this – quite recent – period [4]. One could speculate that the low interest in plasterwork is a consequence of its perception as a protective measure, rather than an immanent part of the building and a constituent part of its architectural expression. As such, rarely does it undergo any preservation or conservation treatments. When the protective quality or aesthetic value of the plasterwork is lost or weakened, it is simply replaced or covered with a new layer, for instance to ensure thermal insulation.

Figures 1, 2. The classic typology of façade finishing: ceramic tiling or stone-like stucco along the baseline; higher levels are covered with stucco, ceramic details or stone-like stucco1.

Unlike regular plasterwork, the cases I will focus on in this paper form a class of their own – stucco renderings based on pre-packaged stucco mixes (further referred to as simply “stucco”; certain necessary terminological clarifications follow below). Pre-packaged plastering/ rendering mixes had been available earlier, with some formulated to imitate ashlar, whereas others were meant to be coated with paint.

1 All photos represent buildings located in Cracow and were taken by the author.
However, it wasn’t until later that the mass production of pre-packaged mixes really took off, radically transforming the appearance of towns and cities and giving them a new touch. Most importantly though, it inspired architects to experiment with innovative plastering. Of the early pre-packaged mix producers, the one that stands out most is a corporation founded in 1927 by the American O. A. Malone, often referred to as “the man who put colour into California”. The company produced brightly coloured plastering mixes known as “jazz plaster”, which only proves the importance that stucco used to have in the appearance of towns and cities. Polish producers were manufacturing pre-packaged plastering mixes as early as at the turn of the century, but it was only in the interwar period that the business really started to flourish, with a production boom soon following.

Despite the impact of aggressive airborne deterioration factors, stucco has retained its quality to this day; it can even seem ‘indestructible’. The biggest risk to its preservation comes from human activity, both intentional and unintentional: vandalism, unprofessional renovation works, or building insulation projects can all cause irreparable damage. This is often attributable to the lack of awareness that, being a testimony to ingenious technological thought, stucco has unique value. Importantly, since a typical Modernist façade finishing is relatively simple and subtle, it is the plastering that determines, to a large extent, the character of the building, and hence the association with the face, (and hence the title). The authors of a study on historic stucco and its proper conservation, refer to it as the “vest of the house”: *Der Putz ist das ´Kleid des Hauses´* [6].

The purpose of this paper is to discuss the issues related to the stucco rendering technique in Poland and its protection under current legal regulations. By proposing this topic, the author hopes to inspire interest in the subject among scholars and professionals from other countries, broaden up the debate and facilitate the exchange of experiences.

2. Modern architecture

The construction boom that took place in post-World War I Europe was spurred by several factors. The first, most obvious, was post-war damage. On the other hand, galloping technical progress made construction materials cheaper, and the construction process itself much faster and more efficient. One additional factor was a shift in the architectural paradigm, with comfort and functionality becoming architecture’s most desirable features, and simplicity and sophistication the main measures of architectural expression. These new concepts of urban planning had a deep effect on the intense conversion and extension of Polish towns and cities, giving them new, functional districts and elegant urban promenades.

These trends were also observable in the territory of Poland when it formally regained its place on the map of Europe in 1918. The urgent need to rebuild the country coincided with the need to construct the foundations of the newly-restored state, and the two forces mutually reinforced each other. In the twenty years of the interwar period, Poland witnessed the construction of entirely new towns and cities, such as the Central Industrial District, and Gdynia – a port city erected where a small fishermen’s settlement used to be. Cracow was not immune to these changes either – new industrial and residential areas sprang up all around the city, and a number of monumental new edifices were added [8].

Due to its geological location and ample active quarries in the area, Cracow became home to companies producing construction materials, pre-packaged plastering mixes in particular, which were further transported by rail to other cities all over Poland. This is why the relevance of the issues discussed in this paper is not limited to the context of local construction, but can be said to be representative of the entire country, at least to a certain extent [9].

The new, Modernist shapes of buildings required new aesthetic solutions. When designing the forms of these building based on the interplay of the proportions of simple masses, architects limited the means of expression to modestly-profiled cornices and slight plinth protrusions, emphasizing fenestration lines or underlining the weight of the base section (Fig. 1). Ornamental motifs still popular during Historicism become geometricized (Art Deco), to be later rejected completely (Bauhaus), while sculptures, if at all, appeared within the portal [10]. This seemingly restrictive reliance on formal measures turned out to be a great inspiration for designers to engage in playful use of wall colour and texture (Fig. 2). This is why plastered surfaces have become a key measure of artistic expression in Modernist buildings.
3. Technical and terminological issues

When it comes to the terms used to denote the techniques discussed in this paper, certain terminological discrepancies and differences between English-speaking countries need to be addressed. In this paper, the terms ‘stucco’/‘stucco rendering’ refer to a type of external plastering, made of a pre-packaged plastering mix containing colour pigments. A distinguishing feature of this plasterwork is that it was not intended to be coated with paint, and hence finishing and tooling constituted an important stage in the stucco rendering process.

Figures 3, 4. Stucco owes its glistening shine in the sun to additives. In the lower layers of this façade, terrazzo was applied, black and white in this case, while the stone-like stucco above provides additional colour variety.

4. Construction

Polish manufacturers patented their products, giving them their own names, such as terrabona, elzyt, terrazzo, terrazyt, litozyt. Nonetheless, the composition of the mixes was similar. Their main ingredient was a mineral binding: Portland cement, slaked or hydraulic lime (or a mixture of both). Aggregates included coloured fine grit, sand or sand-gravel, with additives of mineral pigments, crushed stone sand, mica, crash glass, and nacre. The ratio of binding agent, aggregate and the cement-to-lime ratio was kept at 1:4. At the construction site, water was added to the mix to produce 5-6 m² of stucco per 100 kg of pre-packaged formula. The mixes differed in terms of the aggregate’s grain size (fine, medium and large), and the method of application and finishing. These included dash, trowelled and textured, as well as artificial

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2 “Historically, the term plaster has often been interchangeable with stucco; the term is still favored by many, particularly when referring to the traditional lime-based coating. By the nineteenth century stucco, although originally denoting fine interior ornamental plasterwork, had gained wide acceptance in the United States to describe exterior plastering. Render and rendering are also terms used to describe stucco, especially in Great Britain.” Anne E. Grimmer, The Preservation and Repair of Historic Stucco, Technical Preservation Services, National Park Service U.S. Dept. of the Interior [on-line] https://www.nps.gov/tps/how-to-preserve/briefs/22-stucco.htm, Accessed 20/02/2018.
stone finishes (polished, worked-out with chisels). Depending on the grain size, 100 kg of mix yielded from 5 to 6.25 square meters of stucco [11].

4.1. The stucco face of a façade

Depending on the final composition and rendering, the stucco found on the façades of buildings in Cracow can be classified into three basic types:

1) Stucco par excellence – Typically fine-grained, traditionally layered and additionally worked to enrich the texture of the surface. Oftentimes the formulas contained mica or broken glass to make them glitter in the sun (Fig. 3). The colours typically reference natural stone and their palettes of hues and brightness, the most frequent being grey and ochre, but red and green can also be encountered. This type of stucco was usually layered on above the first level. Its texture typically had a smooth or float finish, but on some façades worm or chicken-foot print, produced with special tools, can also be found.

2) Stone-like stucco (between stucco and artificial stone) – This type of stucco is characterised by a gross grain aggregate and is worked once dry: ground, sanded, scored, polished, etc. The stucco is applied in stages, forming a surface that resembles stone cladding with recessed joins. Single, dry ‘blocks’ were worked in local stonework tradition, which mandated that the edges be finished with small incisions, while the remainder of the surface be either left smooth or given a simple texture, such as a point finish (Figs. 5, 6).

3) Terrazzo – Traditionally uses cement as the binding agent, with a mix of crushed stone (marble, quartz, granite), and additives to reinforce its aesthetic effect, including (amongst others) glass or nacre. Terrazzo gained popularity when electric grinding machines came into use and new types of ornamental forms facilitated the execution of multi-coloured patterns (using divider strips).

The classic façade of a Modernist building in Cracow is terrazzo, applied as a narrow, ground-level base strip (Fig. 4), covering the steps of the entry stairs (and further stretching up to the floor and the finishing of the staircase steps and walls). Stone-like stucco is usually found up to the first floor level, in the trimmings of the openings and sometimes also in the sections of cornices. Finally, stucco was also layered onto the remaining surface area (Fig. 7).
Figure 7. The classic look of the lower sections of the façade – narrow strips in the trimmings of the openings and ashlar edges, plaque centres with a point finish structure. Note emblem of the house above the door.

5. Problems of preservation and conservation

Despite the extended period of its negligence, the general condition of the rendering that has survived in Cracow can still be classified as excellent. However, two major patterns of damage loom over it: strong dirt on the one hand, and detachment and structural disintegration on the other.

5.1. Dirt

Dirt is the main type of damage manifesting itself across the exterior surfaces of Cracow’s buildings. It is a city with a major level of air pollution that has persisted for decades, and this has been particularly detrimental to the appearance of its buildings’ façades – their true colours are well hidden beneath dark layers of accretions. The nature of these accretions is inconsistent, which substantially complicates the cleaning process. These are both chemical accretions occurring as a result of the leaching of the binding agent (black crust or black spots), as well as fatty accretions of various airborne particles, such as soot. To remove them it is necessary to modify cleaning methods accordingly. One important factor in selecting the best cleaning method is the size of the surface – in the case of some of the larger, more impressive structures, their surface area can stretch for thousands of square meters. Drastic methods, such as high-pressure jet cleaning, pose a threat to the historic stucco and are out of the question. Typically, several methods are used in combination: the surface dirt is removed using superheated steam cleaning, while the more tightly-bound chemical accretions are dealt with using chemical methods. For example, chemical cleaning with various agents mixed to form a thixotropic paste or gel, which facilitates application on vertical surfaces, or dry ice blasting. Usually, this process is enough for a façade to regain its proper appearance (Fig. 8). However, other, much more serious damage is often unfortunately discovered.

5.2. Structural degradation

Structural degradation comes in two forms: it can either be of the internal structure of the stucco, peeling off, or manifest itself in the detachment of the stucco from the substrate (Fig. 9). This is where we encounter the biggest problem in stucco conservation. With traditional plasterwork it would be sufficient to patch the holes, or partially replace the areas affected by the loss of cohesion, and then re-paint the whole. But when it comes to stucco, such a solution is out of the question, or at least should be. Stucco is not meant to be coated with paint at all. Furthermore, filling and painting over multiple minor holes produces a poor visual effect – the surface ends up looking as if it were covered with stains, since it is
virtually impossible to match the exact colour, structure and texture of the filler with the original. In consequence, to preserve a building’s attractive looks by putting its appearance above the material truth and the value that stems from historic technique, the surface of the stucco on the upper levels of a building façade that is simply painted, or rather glazed with a special mineral paint, irreversibly changes the character of that façade. Once painted, the façade ceases to glitter in the sun, losing the architect’s original intention.

An alternative to this is to make a ‘copy of the stucco’ based on detailed examination of its original composition and preparation of a new, identical mix to replace the damaged stucco across the entire surface of the building. This move, although more radical, is more appropriate than patch-work painting of repaired surfaces.

Figures 8, 9. In many cases, it is sufficient to clean the surface to expose the elegance, colour and texture of the stucco in its entirety. In Figure 8 above (left), only the lower section of the façade has been cleaned. Unfortunately, sometimes the damage is irreparable and the stucco needs to be reconstructed (Fig. 9).

5.3. Deliberate alterations
The third type of damage is intentional, such as vandalism (graffiti, etc), accidental conversions (e.g. when a façade is chased to install fittings), or when new layers are added, either to replace the old stucco or to cover it, for instance as part of thermo-modernisation work. Whilst it is impossible to discuss all of these at this point, what needs to be emphasized is that such measures are purely a product of low awareness that stucco has unique historic value as a remnant of the past. Careless damage to historical artefacts is an issue in many areas of old arts and craftsmanship, but in this case it is compounded by the widespread belief that Modernist objects are devoid of historical value.

6. Results and discussion
This study briefly summarises a fairly complex issue in the protection of buildings and structures erected in the recent past. Even a perfunctory discussion of the techniques used in the interwar period shows that the products of old craftsmanship, even if their value is deemed purely technical, deserve to be protected. And hence a question about conservation techniques appears, or at least, we should ask ourselves what a
renovated façade should finally look like. Does it really need to appear brand new? Are we ready to allow certain new colour ‘vibes’ in order to preserve an original that cannot be recreated after all?

In her library research, this author did not identify any studies dedicated to this subject – obviously, this doesn’t mean that they don’t exist. Rather, that it is difficult then to determine to what extent similar solutions have been applied in other countries. Available research on the colour palette of so-called Bauhaus school façades show that they were typically painted, with the most popular colour being white [12]. The author hopes that this study will encourage a confrontation between the material presented and the experiences of professionals dealing with architectural heritage in other countries.

7. Conclusions
The history of art offers a quite thorough description of the formal and aesthetic aspects of architecture and its ideological underpinnings, but leaves the technicalities of construction aside. The potential of modern technology enables us to reconstruct various constituent parts of buildings, and replace them with contemporary products. Historic plasterwork can be replaced with new material in a way that is indiscernible to the eye, while also improving the thermal insulation of the building, or its aesthetic value. Whether this is the right way to approach the technical heritage of the past, which continues to be marginalised, is a question that begs answering.

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